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FIPA Vacuum Technology

www.fipa.com

FIPA
Material in Motion

Editorial | Only those who think ahead stay ahead

„Only those who think ahead stay ahead.“

Vacuum Technology Expertise

With the headquarter in Ismaning / Germany, just outside of Munich, FIPA specialises in developing and marketing innovative vacuum technology for handling a wide variety of products.

In doing so we cover the entire process chain, from vacuum generation to system peripherals, through to vacuum cups and gripper systems at the interface with your product.

Our aim is to offer the right solution for every customer and every requirement. Either by selecting a suitable product from our extensive standard range or by developing a customised solution that is tailored to your exact requirements.

Our modular product and component construction kit forms the basis for this. The construction kit is being continually expanded and developed, allowing us to respond promptly to shifting market requirements.

Our innovative product solutions, combined with a competent workforce, a practiced service culture, an international sales network and reliable partners make FIPA a pioneering company in the field of vacuum technology.

This catalogue represents our extensive range of vacuum cups and vacuum components. Please contact us if you need a customised solution. We would be pleased to develop it for you.

FIPA: vacuum technology for streamlining your material flow!

Best regards, Rainer Mehrer
CEO of FIPA GmbH

Order information

> **Please add the part number with the respective material code to your order.**

> **Please turn the page for available materials and material selection!**

Overview of vacuum cup materials

Short designation	Material code	Hardness [Shore A ± 5°]	Commercial designation	Commercial name (example)	Short-term working temperature [°C]	Abrasion resistance	Flexibility	Oil-resistance	Fuel resistance	Ozone and weathering resistance	Acid resistance	Leaching resistance
BR-AS	10-AS	60	Butadiene rubber, anti-static		-50 / +100	++	+	0	0	0	+	++
CR	9	50 - 60	Chloroprene	Neoprene®	-40 / +110	+	+	++	0	++	+	+
EPDM	15	50		Vistalon®	-40 / +130	+	++	0	0	++++	+++	+++
FKM	7	65	Fluor rubber (FPM)	Viton®	-10 / +230	0	0	++++	++++	++++	+++	+++
Foam rubber	12						++++					
HNBR	14	55	Hydrogenated acrylonitrile-butadiene rubber	Therban®	-30 / +160	++	+	++++	++	+++	+	+
NBR	1	50 - 60	Nitrile rubber	Perbunan®	-30 / +90	+	+	+++	+	0	0	0
NBR-AS	1-AS	50 - 70	Nitrile rubber, anti-static		-30 / +90	+	+	+++	++	0	0	+
NR	4	35 - 45	Natural rubber	SMR	-40 / +80	++	++++	0	0	0	+	++
NR	3	50 - 65	Natural rubber	SMR	-40 / +80	++	+++	0	0	0	+	++
PU	5	50 - 65	Polyurethane (EU/AU)	Urepan®	-20 / +80	++	+	+++	++	+	0	0
SBR	13	50 - 60	Styrene-butadiene-rubber (SBR)	Buna®	-30 / +80	+++	++	0	0	+	+	+
SI	8	35 - 45	Silicone rubber	Elastosil®	-40 / +200	0	++++	0	0	+++	0	0
SI	2	50 - 65	Silicone rubber	Elastosil®	-40 / +200	0	+++	0	0	+++	0	0
SI-AS	2-AS	50 - 60	Silicone rubber, anti-static		-40 / +200	0	+++	0	0	+++	0	0
SI-FS	2-FS	40	Fluorosilicone		-50 / +190	0	+++	+	+	+++	++	+++
Tepuflex®	17	50	Thermoplastic elastomer		0 / +60	+++	++	0	0	+++	0	0
Thermalon®	19	60			0 / +160	++	+	+++	++	0	+	+
TPU	18	60	Thermoplastic elastomer	Elastollan®	0 / +65	+++	0	+++	++	+++	0	+
Varioflex®	16	30 / 60	Polyurethane (2 Shore Hardnesses)		+10 / +50	+++	++++	+++	+++	++	0	+++
Vinyl	V	50 - 55	PVC (soft)		0 / +60	+++	++	+	+	++	++	++
Vulkollan®	11	75		Vulkollan®	-40 / +80	++++	+	+++	++	+++	+	+

++++ = Excellent +++ = Very good ++ = Good + = Fair 0 = Low to satisfactory

Ordering example: Flat vacuum cup made of silicone 50° Shore A

Item No.		
102.030.222. *	> Add material code >	102.030.222.2

Note!

> Depending on the application, vacuum cups are subject to mechanical and chemical stresses. The data serve therefore only as guidelines.

> Special vacuum cups fitted with felt linings are extremely low-marking and can be deployed at temperatures up to a max. of 500 °C.

> Material colors may change, but the quality remains unaffected.
Material colors: bg = beige, bl = blue, br = brown, g = green, ge = yellow, gr = gray, or = orange, r = red, sw = black, tr = transparent, w = white

Sachgerechte Lagerung von Elastomeren

Some elastomer parts are stored for long periods. This can affect product quality. Changes are the result of individual or combined influences of special factors, such as deformation, oxygen, ozone, light, heat, moisture, oils and solvents. For this reason, precautions must be taken to ensure that the service life will not be considerably shortened by incorrect storage. Storage and the recording of time in storage is governed by ISO 2230 and DIN 7716.

Heat

> Storage temperature of elastomers should preferably be between +5 °C and +25 °C.
> Direct contact with heat sources (such as radiators) or direct sunlight should be avoided.
> Storage at low temperatures can cause elastomers to harden. In this temperature range, therefore, moulded parts must be handled with great care to avoid deformations.

Moisture

> Relative humidity in storage areas should be below 70 %. Avoid extremely wet or dry conditions. No condensation should be present.

Light, ozone

> Elastomer parts should be stored away from light sources and ozone. In particular, direct sunlight or strong artificial light containing an ultraviolet band should be avoided. The use of individual containers, especially plastic bags, is preferred, provided they are UV-protected.

Deformation

> Elastomer components should be stored free of compressions or deformations and in an unbent state. Items delivered in an unbent state should be kept in their original packaging.

Contact with liquids or grease

> Moulded elastomer parts should not come into contact during storage with solvents, oils or grease, if not already so packed by the manufacturer.

Contact with metal and non-ferrous metals

> Direct contact with certain metals such as manganese, iron, copper and its alloys, e.g. brass, damages some elastomers and should be avoided during storage.
> Due to the potential for plasticiser migration or migration of other components, elastomers should not be stored in contact with PVCs.

Length of storage and inspection (empirical values)

The useful life of elastomeric products depends to a considerable degree on the type of elastomer. If the above-mentioned recommendations for storage are observed, the various elastomers can be stored for the times given below:

AU, EU, BR, SBR, NR, thermoplastics	4 years
NBR, HNBR, CR	6 years
EPDM	8 years
FKM, SI, SI-FS	10 years

After the specified time, moulded elastomer parts should be inspected. An extension of shelf life is then possible. Elastomer parts and components less than 1.5 mm thick are more susceptible to attack by oxidation, even when stored under ideal conditions as recommended. The inspection interval should therefore be shorter than indicated above.

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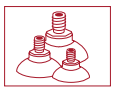
Vacuum cups - Series 	27
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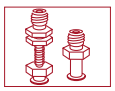
Fastening elements vacuum cups 	407
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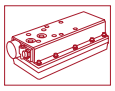
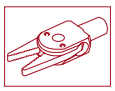
Vacuum gripping systems 	477
Special grippers 	495
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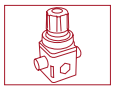
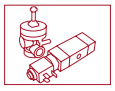
Control technology 	633
Valve technology 	643
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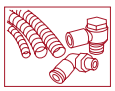
Connectors 	701
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Criteria that affect quality, such as choice of materials or robustness can be taken forgranted nowadays. At FIPA, we focus more on offering the right solution for every requirement.

Competence in vacuum cups and vacuum components

As a system provider, FIPA covers the entire process chain from vacuum generation, through system peripherals, to the optimal vacuum cups for your product.
A wide range of highly-efficient vacuum pumps and ejectors are available for optimum vacuum generation. This allows very short cycle times and compressed air savings up to 97 % to be achieved.

FIPA offers the widest range of vacuum cups in the world - perfectly tailored to the needs and application areas found in various industries.

Whatever the industry, FIPA produces complete gripper and vacuum systems that are individually tailored to customer requirements.
The high level of compatibility also allows third-party systems to be quickly and easily optimised with quality FIPA products.

Efficient and reliable

It is crucial that all components work together perfectly in order to ensure the proper functioning of vacuum cups and gripper systems.
FIPA components are designed on the basis of quality, efficiency, space-saving and market requirements, in collaboration with our clients. On the basis of extensive testing and always with an eye on market requirements.

The full FIPA product line:

Vacuum Technology

Generate

Generate

Regulate

Filter

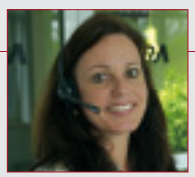
Control

Check / Monitor

Suction

Service

> It's part of the package at FIPA.



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End-of-Arm-Tooling

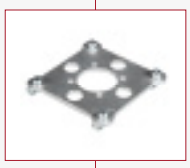
> Request a catalogue now
at www.fipa.com

Fix

Connect

Grab

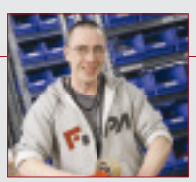
Change



Grip

Grip

Cut



Expertise in End-of-Arm-Tooling (EOAT)

In addition to vacuum components and vacuum cups, FIPA is also your point of contact when it comes to End-of-Arm-Tooling, e.g. for industrial robot applications. Here, we continue to operate on the modular design principle and offer a comprehensive range of grippers, pneumatic air nippers and accessories. In addition, we provide complete gripper systems that are individually tailored to your requirements.

As a result of system compatibility, we ensure that existing systems from other providers can be quickly and easily expanded and optimised using FIPA products.
From base plates and extrusion systems to gripper parts and air nippers - all components are completely compatible with one another.

FIPA products are successfully utilised across all in various industries, such as the plastics, automotive, packaging and electronic industries.

Service as a company principle

FIPA is characterised by a strong service culture in combination with professional project management.
Our technical sales department will provide you with expert practical advice in all questions relating to product range, application options, system integration and system project management.

FIPA - your partner for material flow

FIPA listens to its clients carefully and finds the right product or tailor-made system solution for their application.

Structure of order number:

Using the example of a flat vacuum cup with a diameter of 30 mm made of silicone material

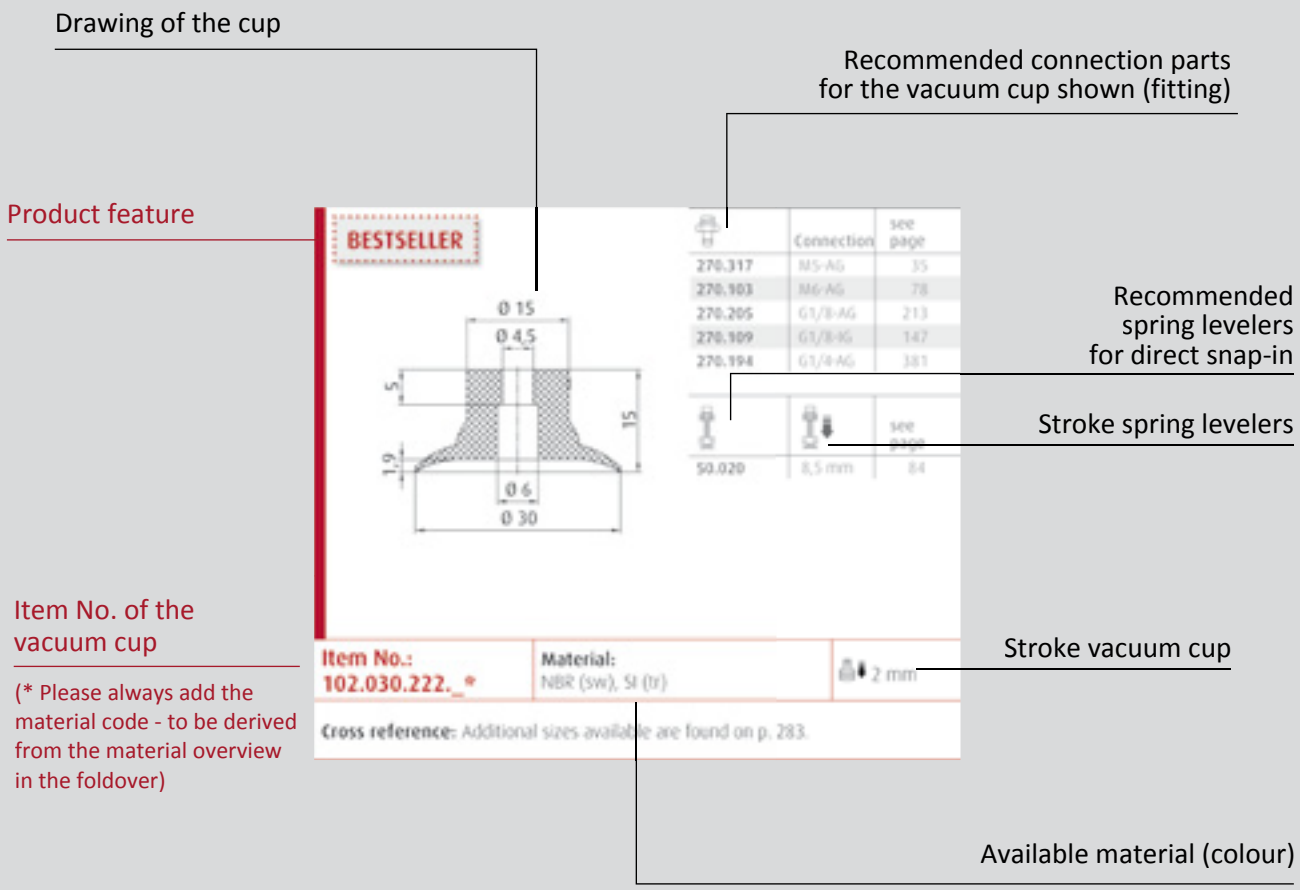
Item No.
102. 030. 222. 2

Material code

(derived from the material overview in the foldover)

Vacuum cup diameter

Structure of the drawings



All dimensions in this catalogue are given in mm. Changes in any form are reserved.

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Sheet metal handling 7

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Plastics 12

Foods industry 15

Packaging 16

Printing industry, Films & Paper 19

Notes:

FIPA vacuum cups for sheet metal handling

> Oil-resistant materials, such as NBR, are primarily used in the handling of sheet metal.

Flat vacuum cups for dynamic sheet handling - SM-F

> Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs. Good absorption of lateral forces
> Supports help to prevent deep-drawing or deformation of thin sheets
> Vulcanised connection thread ensures a secure fit
> Diameter: 30 - 125 mm

> See page 64

Bellows vacuum cups with 1.5 folds for dynamic sheet handling - SM-B

> Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs. Good absorption of lateral forces
> Internal supports help to prevent deep-drawing or deformation of thin sheets
> Leak-free suction even with curved surfaces due to flexible sealing lip
> Secure fit due to vulcanised connection thread
> Diameter: 30 - 125 mm

> See page 133

Non-slip flat vacuum cups - SM-P

> Distinct, radially encircling supporting ribs increase holding force
> The firmly bolted fittings (from a diameter of 20 mm) ensure good process security
> Diameter: 10 - 50 mm

> See page 62

Flat vacuum cups with safety sealing lips - SFU-S

> High process reliability through multiple sealing lip
> Good stability due to vulcanised retainer plate, as well as support surfaces for the product
> Diameter: 30 - 225 mm

> See page 68

Continued on the next page

FIPA Vacuum cups for sheet metal handling

Heavy-duty flat vacuum suction plates - SFPL-D

> Vulcanised steel carrier plate allows lifting of very heavy loads
> Secure gripping of uneven surfaces thanks to additional inner sealing lip
> Diameter: 160 - 300 mm

> See page 73

Vacuum suction plate with foamed sealing lip - SP-PLM

> Good sealing of heavily textured surfaces
> Cost-effective replacement of worn seals
> Diameter: 35 - 300 mm

> See page 72

Flat XXL suction rings - SFR

> Large, flat suction seals vulcanised on steel ring for handling very large loads
> Connection through circular, circumferentially placed thread holes
> Diameter: 450 - 920 mm

> See page 74

Oval vacuum suction plates - SOPL-S

> High suction force on a small footprint
> Rubberised support surfaces help prevent warping of the product
> Individual machine connection
> Dimensions: 110x40 - 580x180 mm

> See page 160

Varioflex® bellows cups, 1.5 and 2.5 folds for dry sheets - SP-BX

> Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
> Soft lip for optimal sealing
> Long service life and low wear
> Short cycle times and high process reliability
> Low marking

1.5 folds - SP-BX1

> Good adaptation to uneven product surfaces
> Supports (Ø 20 - 75 mm) stabilise the product
> Diameter: 15 - 75 mm

> See page 107

2.5 folds - SP-BX2

> Good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Diameter: 15 - 75 mm

> See page 110

FIPA Vacuum cups for sheet metal handling

Bellows vacuum suction plates - SBPL-E

> Gentle handling of heavy, sensitive products
> Good adaptation to concave or convex surfaces
> Rubberised support surfaces prevent deformation of workpieces
> Diameter: 150 - 350 mm

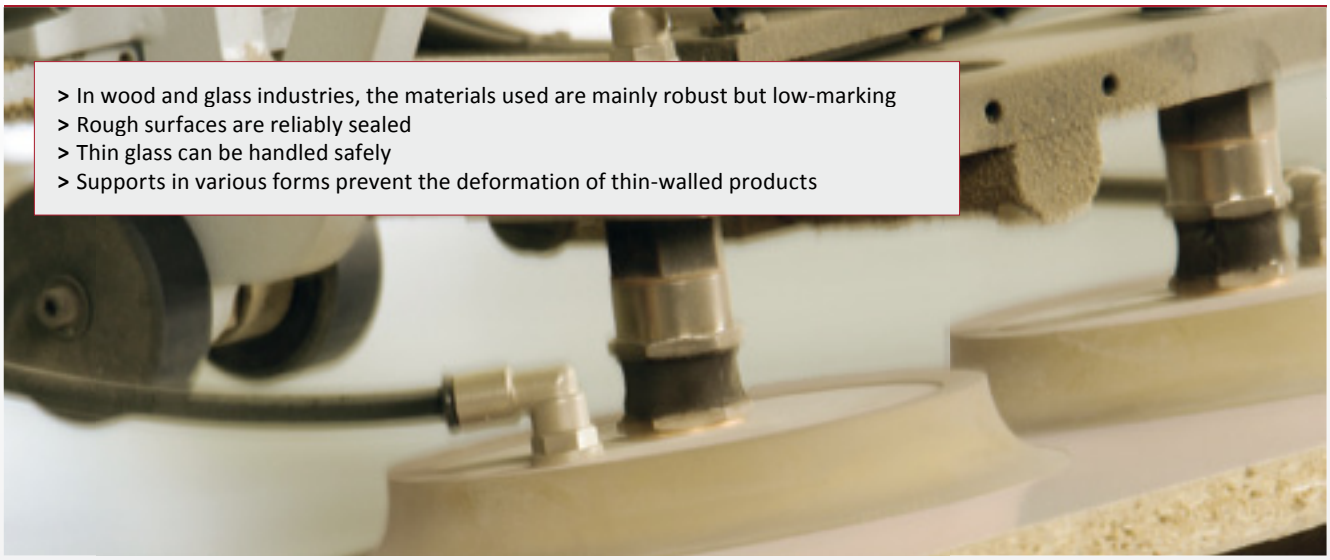
> See page 137

Suction plates with leakage reduction - SPLT

> Reliable suction with variable product shapes in systems with multiple vacuum cups
> Combination of 4x4 or 6x6 bellows vacuum cups with 2.5 folds
> Flow restrictions prevent the collapse of the vacuum when individual vacuum cups are not in use

> See page 487

FIPA Vacuum cups for the wood and glass industries



> In wood and glass industries, the materials used are mainly robust but low-marking
> Rough surfaces are reliably sealed
> Thin glass can be handled safely
> Supports in various forms prevent the deformation of thin-walled products

Flat vacuum cups for textured surfaces - SFU-R

> Optimal sealing of rough and uneven surfaces thanks to very fine sealing lips
> Enhanced safety thanks to two-fold, internal safety sealing lip
> Interlocking, clip-in retaining plate for quick and inexpensive replacement of the sealing lip
> Diameter: 40 - 200 mm

> See page 66

Flat vacuum cups for porous products - SFU-RT

> Separation of porous plate materials through simultaneous suction and punctual blow-off of the product
> Enhanced safety thanks to two-fold, internal safety sealing lip
> Diameter: 160 mm

> See page 67

Oval vacuum suction plates for textured surfaces - SOPL-R

> Leak-free gripping of many problematic product surfaces thanks to very flexible, thinly tapered sealing lip
> Increased security due to vulcanised carrier plate
> Dimensions: 90x50 - 190x90 mm

> See page 158

Oval vacuum suction plates - SOPL-S and SOPL-A

> High suction power with minimal space requirement
> Rubberised support surfaces help prevent warping of the product
> Available in the following materials: NBR (low-marking) and NR (wear-resistant)
> Dimensions: 110x40 - 580x180 mm

> See page 160

FIPA Vacuum cups for the wood and glass industries

Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

> Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
> Soft lip for optimal sealing
> Long service life and low wear
> Short cycle times and high process reliability
> Low-marking

1.5 folds - SP-BX1

> Good adaptation to uneven product surfaces
> Supports (Ø 20 - 75 mm) stabilise the product
> Diameter: 15 - 75 mm

> See page 107

2.5 folds - SP-BX2

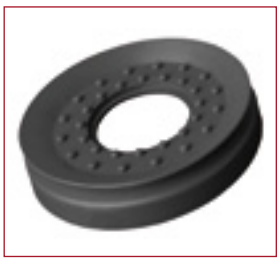
> Good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Diameter: 15 - 75 mm

> See page 110

Bellows vacuum suction plates Softgrip - SBPL-SG

> Very gentle handling of sensitive products thanks to highly flexible fold walls
> Combines the flexibility of bellows cups with the stability of flat vacuum suction plates
> Central support block with safety sealing lip ensures a firm grip
> Diameter: 150 - 210 mm

> See page 136



Short lift vacuum cups SFK

> Minimal lift for flat, sensitive surfaces
> Supports prevent deformation of the product and increase stability
> Available in the following materials: NBR and SI
> Particularly suited for use in clamping systems
> Diameter: 65 - 150 mm

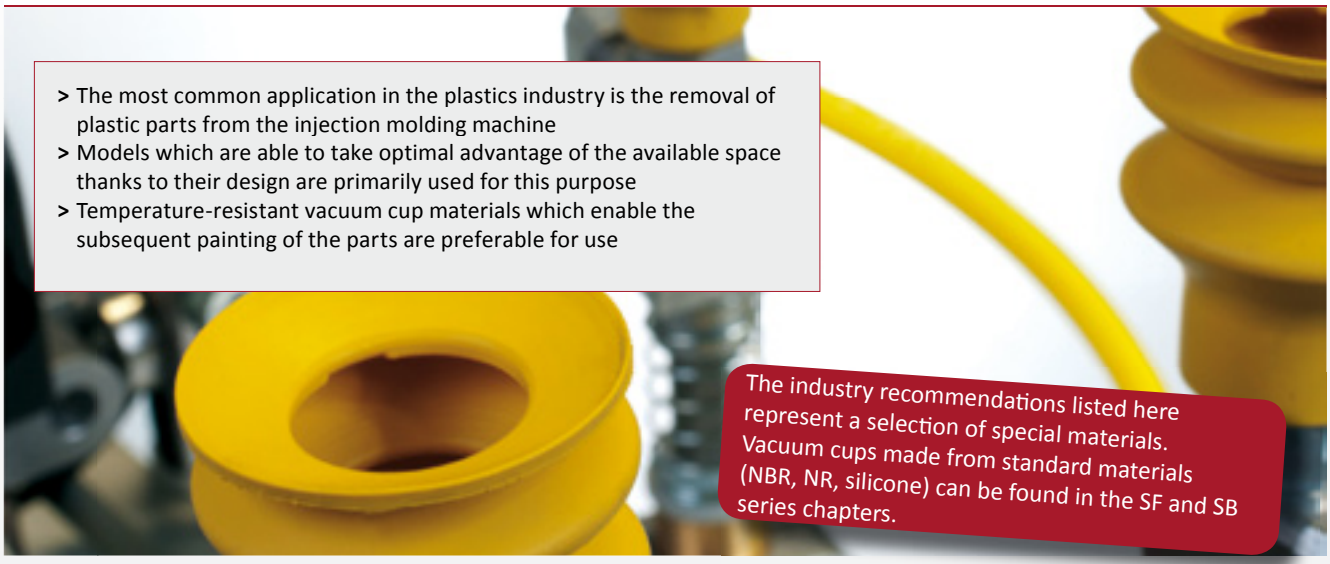
> See page 70

High temperature vacuum cups with felt pad - SX-F

> Outstanding low-marking properties thanks to special felt coating
> Highest temperature resistance (FKM briefly up to 300 °C; special silicone with an evaporated silicone lock made of aluminium briefly up to 500 °C)
> Diameter: 25 - 160 mm

> See page 164

FIPA Vacuum cups for the plastics industry

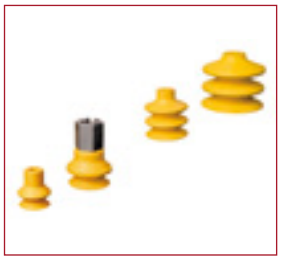


> The most common application in the plastics industry is the removal of plastic parts from the injection molding machine
> Models which are able to take optimal advantage of the available space thanks to their design are primarily used for this purpose
> Temperature-resistant vacuum cup materials which enable the subsequent painting of the parts are preferable for use

The industry recommendations listed here represent a selection of special materials. Vacuum cups made from standard materials (NBR, NR, silicone) can be found in the SF and SB series chapters.

HNBR vacuum cups

> Standard material for removing hot plastic parts from an injection molding machine
> Heat-resistant up to 160 °C
> No silicones or other adhesive-repelling substances, enabling later painting of the products
> Low-marking
> Wear-resistant material



Bellows vacuum cups, 1.5 folds - SKH-B1
> Good adaptation to uneven product surfaces
> Bellows compensates for height differences
> Diameter: 5 - 43 mm

> See page 86

Bellows vacuum cups, 2.5 folds - SKH-B2
> Very good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Particularly gentle handling thanks to good cushioning
> Diameter: 5 - 60 mm

> See page 94

Flat vacuum cups with a short lift - SFK
> Flat vacuum cups with a short lift for flat surfaces
> Minimal space requirement thanks to virtually vertical suction lip
> Great suction power thanks to the largest active vacuum suction surface possible
> Diameter: 20 - 45 mm

> See page 70

Oval vacuum cups - SKH-O
> Flat vacuum cups in an oval design for the handling of narrow products
> Narrow width enables the gripping of ribbed surfaces
> Significantly greater suction power than round vacuum cups of equal width
> Dimensions: 4x2 - 45x15 mm

> See page 146

FIPA Vacuum cups for the plastics industry

Thermalon® vacuum cups

> Optimised material for less to marking
> Heat-resistant up to 160 °C
> No silicones or other adhesive-repelling substances, enabling later painting of the products

Bellows vacuum cups, 1.5 folds - SKT-B1
> Good adaptation to uneven product surfaces
> Diameter: 11 - 63 mm

> See page 84

Bellows vacuum cups, 2.5 folds - SKT-B2
> Very good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Particularly gentle placement on product surfaces
> Diameter: 5 - 62 mm

> See page 92

Oval vacuum cups - SKH-O
> Oval-shaped flat vacuum cups for the handling of narrow products
> Narrow width enables the gripping of ribbed surfaces
> Significantly greater suction power than round vacuum cups of equal width
> Dimensions: 4x2 - 45x15 mm

> See page 144

Flat vacuum cups - SKT-F
> Flat vacuum cups with a flexible single sealing lip
> Low internal volume saves energy
> Diameter: 5 - 60 mm

> See page 36

Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

> Excellent service life and superior retention force
> Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
> Soft lip for optimal sealing
> Short cycle times and high process reliability
> Operating temperature: 10 - 50 °C
> Low-marking

1.5 folds - SP-BX1
> Good adaptation to uneven product surfaces
> Supports (Ø 20 - 75 mm) stabilise the product
> Diameter: 15 - 75 mm

> See page 107

2.5 folds - SP-BX2
> Good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Diameter: 15 - 75 mm

> See page 110

Notes:

FIPA Vacuum cups for the food industry

> The requirements for vacuum cups in the food industry range from the handling of pre-packaged food up to the direct handling of unpackaged foodstuffs
> The special shape and consistency of the products usually requires marked adjustments to the design of the cup
> All FIPA vacuum cups for the food industry are manufactured from FDA-approved materials

Vacuum cups for chocolates - SL-P

> Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
> Low-marking and FDA-approved

Flat vacuum cups - SL-PF
> Diameter: 16 - 22 mm

> See page 58

Bellows vacuum cups - SL-PB
> Diameter: 12 - 16 mm

> See page 125

Vacuum cups for baked goods - SL-B

> Multiple folds ensure a high degree of height adjustment and gentle product handling
> FDA-approved
> Diameter: 34 - 60 mm

> See page 126

Detectable vacuum cups for baked goods - SL-BD

> Detectable, providing optimum assurance that the product is not contaminated by vacuum components
> Multiple folds ensure a high degree of height adjustment and gentle product handling
> FDA-approved
> Diameter: 35 - 40 mm

> See page 128

Vacuum cups for eggs - SL-E

> Bellows vacuum cups in a design specially optimised for handling eggs
> Gentle attachment to the product and a high lifting motion thanks to a long vacuum cup lift
> FDA-approved
> Diameter: 33 - 34 mm

> See page 129

FIPA Vacuum cups for the packaging industry

> The packaging industry uses primarily wear-resistant vacuum cup materials which are resilient and flexible enough for complex applications (e.g. erection of boxes, handling of flexible goods, goods packaged in foil, palletising, etc.)

Vinyl bellows cups, 1.5 and 2.5 folds - SBV

> Wear-resistant material - long service life
> Good adaptation to curved or flexible product surfaces

1.5 folds - SBV 1
> Diameter: 5 - 70 mm

> See page 113

2.5 folds - SBV 2
> Diameter: 4 - 50 mm

> See page 116

Vinyl oval bellows cups - SO-BV

> Compensates for height differences and enables gentle set down on the workpiece
> Good adaptation to curved or flexible product surfaces
> Wear-resistant material - long service life
> Dimensions: 35x28 - 100x55 mm

> See page 149

Bellows vacuum cups 1.5 and 2.5 folds with special connection for standard packaging machines - SV-SB

> Smooth suspension for gentle product handling
> Available in NR and silicone (FDA-approved)
> Diameter: 16 - 40 mm

> See page 130

Vacuum cups specially optimised for handling foils and foil-packaged goods can be found on p. 20

FIPA Vacuum cups for the packaging industry

Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

> Excellent service life and superior retention force
> Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
> Soft lip for optimal sealing
> Long service life and low wear
> Short cycle times and high process reliability
> Low marking

1.5 folds - SP-BX1

> Good adaptation to uneven product surfaces
> Supports (Ø 20 - 75 mm) stabilise the product
> Diameter: 15 - 75 mm

> See page 107

2.5 folds - SP-BX2

> Good adaptation to uneven product surfaces
> Large range of height and angle adjustment
> Diameter: 15 - 75 mm

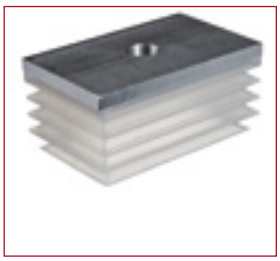
> See page 110

Silicone flat cups (FDA-approved) for use with tubes - SV-T

> With straight or conical opening
> Direct machine connection through pipe mounting
> Handling of cans or tubes
> Diameter: 11 - 46 mm

> See page 60

Silicone rectangular bellows cups, 2.5 and 3.5 folds - SV-RB



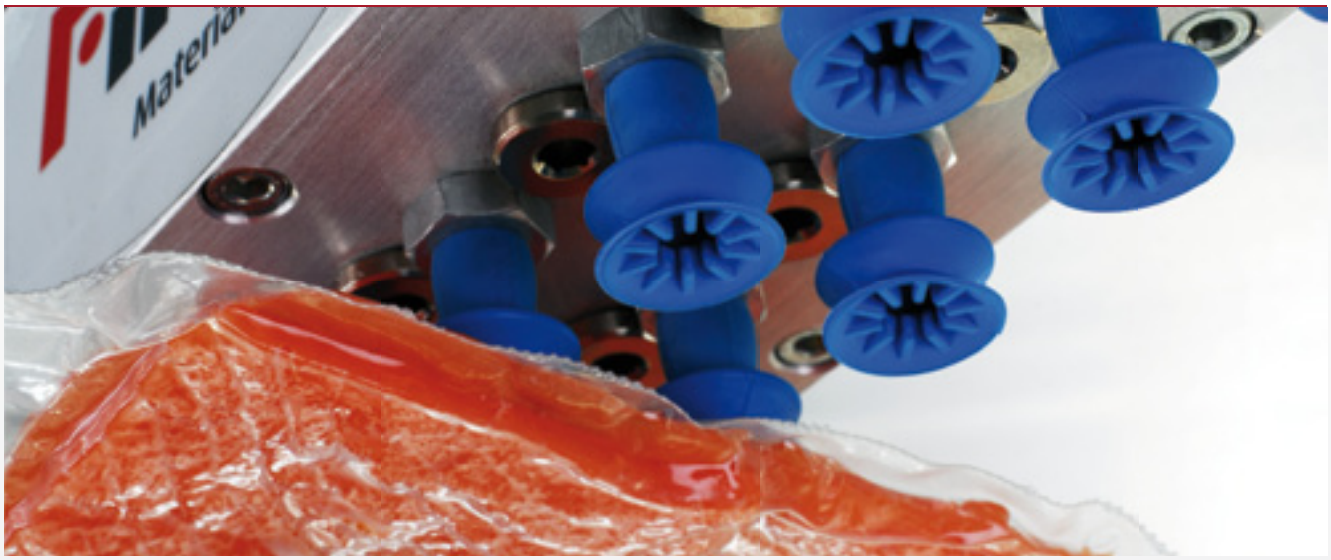
> Handling of flexible parts and workpieces with uneven surfaces or products with flexible outer packaging
> FDA-approved vacuum cup material
> Dimensions: 52x25 - 80x50 mm

> See page 150

Vacuum cups specially optimised for handling foils and foil-packaged goods can be found on p. 20

Notes:

FIPA Vacuum cups for the handling of foils and paper



Flat vacuum cups for foils and paper with and without supports - SD-F

> Available in the materials NR, Vinyl, SI and NBR
> Soft and flexible sealing lip for the optimum sealing of flexible substrates
> Supports prevent the aspiration and wrinkling of foils and paper
> Handling of foil-packaged goods

> See page 22

Bellows vacuum cups for foils and paper - SD-B

> Available in the materials NR, NBR, CR and SI
> Bellows allow for good compensation of height and angle differences
> Soft and flexible sealing lip for the optimum sealing of flexible substrates
> Supports prevent the aspiration and wrinkling of foils and paper
> Handling of foil-packaged goods

> See page 23

Vacuum cups with connection, compatible to Mueller-Martini machines - SD-MM

> Available in the materials NR, SI, Vinyl and Vulkollan®
> High cycle times possible
> Wear-resistant materials

> See page 24

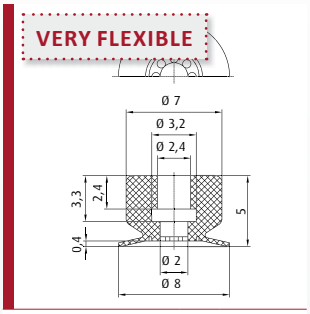
Suction discs - SD-S

> Available in the materials NR and polyurethane
> Suitable for universal use

> See page 26

Flat vacuum cups with cleats for Films & Paper - SD-FA

VERY FLEXIBLE

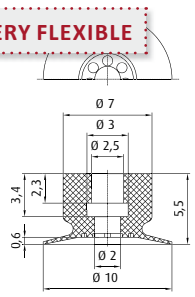


Item no. 104.008.070._*

Material	
NBR (sw), SI-FS (r)	0.5 mm

Details see page 181

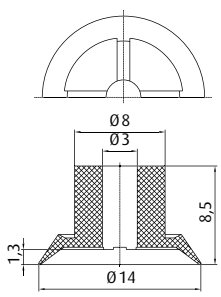
VERY FLEXIBLE



Item no. 104.010.071._*

Material	
NBR (sw), SI-FS (r)	0.7 mm

Details see page 184

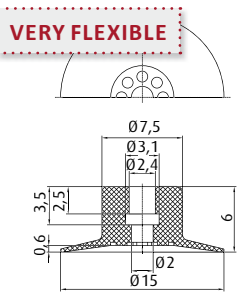


Item no. 102.014.089._*

Material	
NBR (sw)	1.5 mm

Details see page 188

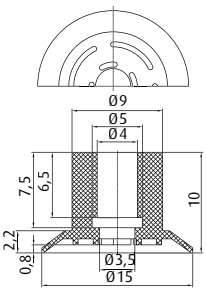
VERY FLEXIBLE



Item no. 104.015.072._*

Material	
NBR (sw), SI-FS (r)	1.1 mm

Details see page 190

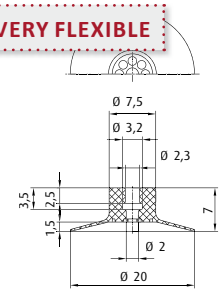


Item no. 102.015.431._*

Material	
SI (tr), NR (bg)	0.5 mm

Details see page 190

VERY FLEXIBLE

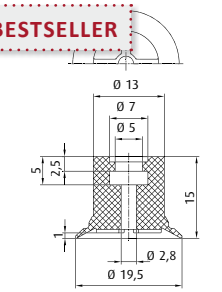


Item no. 104.020.073._*

Material	
NBR (sw), SI-FS (r)	1.6 mm

Details see page 201

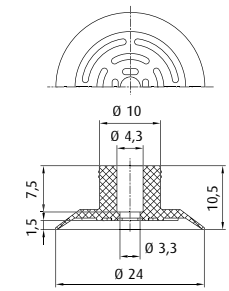
BESTSELLER



Item no. 102.020.083._*

Material	
NBR (sw), SI (tr), SI (r)	1 mm

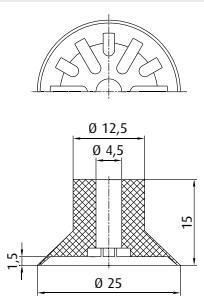
Details see page 198



Item no. 102.024.457._*

Material	
SI (tr), NR (bg)	1.8 mm

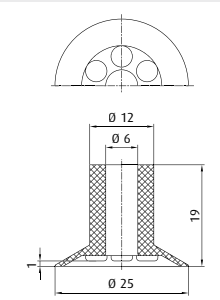
Details see page 207



Item no. 104.025.043._*

Material	
Vinyl (bl)	1.5 mm

Details see page 211

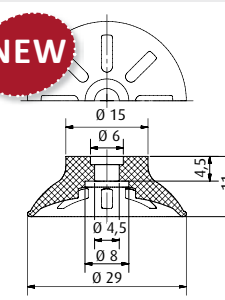


Item no. 104.025.094._*

Material	
NR (br)	1 mm

Details see page 211

NEW

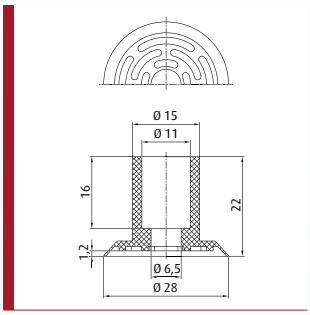


Item no. 102.029.509._*

Material	
NR (br)	4 mm

Details see page 217

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

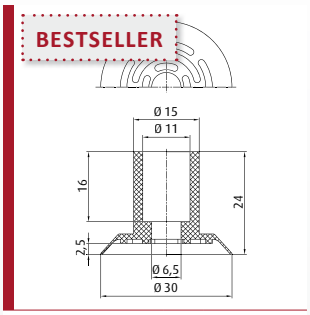


Item no. 104.029.093._*

Material	
NR (sw)	1 mm

Details see page 216

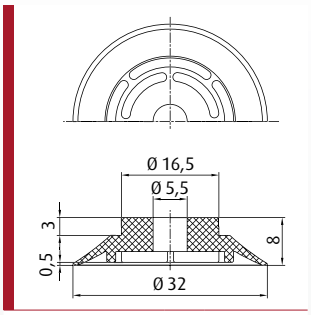
BESTSELLER



Item no. 104.030.009._*

Material	
NBR (sw), SI (w), SI (tr), NR (sw)	3 mm

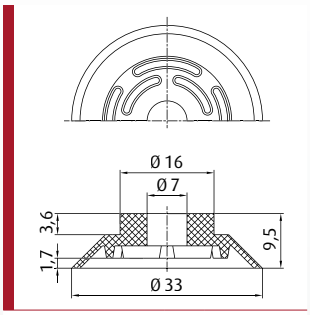
Details see page 221



Item no. 102.032.104._*

Material	
NR (bg)	1.8 mm

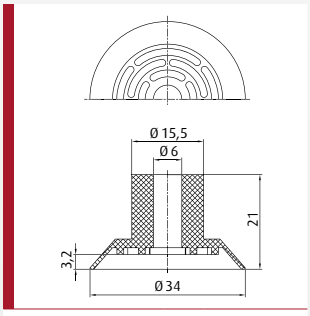
Details see page 224



Item no. 102.033.398._*

Material	
Vinyl (bl)	2 mm

Details see page 224

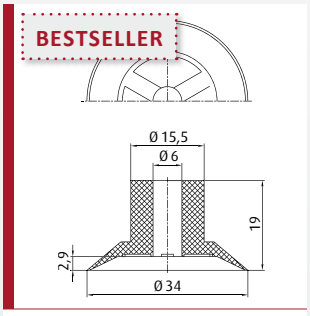


Item no. 104.034.036._*

Material	
NR (bg)	3 mm

Details see page 225

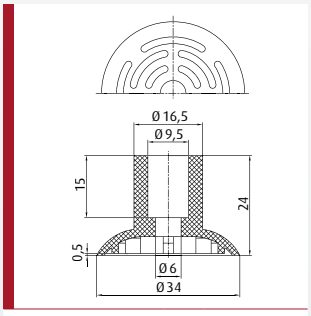
BESTSELLER



Item no. 104.034.054._*

Material	
Vinyl (bl)	3 mm

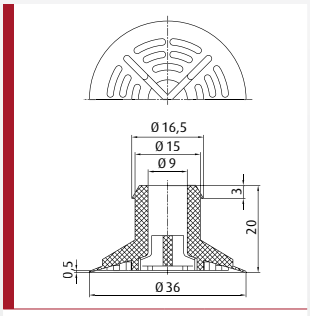
Details see page 226



Item no. 116.034.001._*

Material	
NR (sw), NR (bg)	0.5 mm

Details see page 226

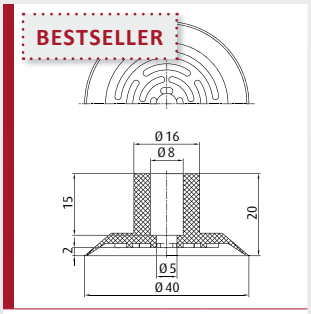


Item no. 102.036.342._*

Material	
SI (tr)	0.5 mm

Details see page 229

BESTSELLER



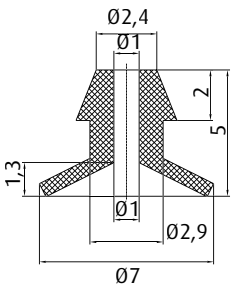
Item no. 104.040.018._*

Material	
SI (tr), NR (sw), NR (br)	2 mm

Details see page 233

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

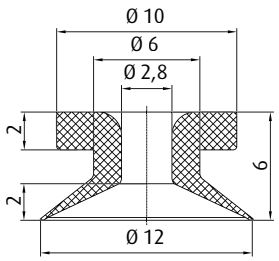
Flat vacuum cups for Film & Paper - SD-F



Item no. 102.007.266._*

Material	
SI (tr)	1.5 mm

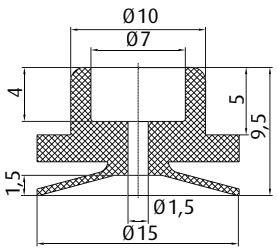
Details see page 179



Item no. 102.012.267._*

Material	
NR (bg)	2.5 mm

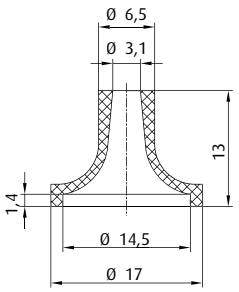
Details see page 186



Item no. 102.015.339._*

Material	
Vinyl (bl)	1.5 mm

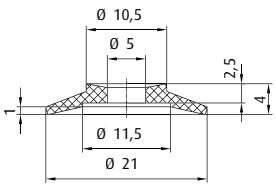
Details see page 189



Item no. 102.017.276._*

Material	
NR (br)	3 mm

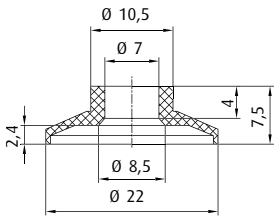
Details see page 195



Item no. 102.021.063._*

Material	
NR (sw)	1 mm

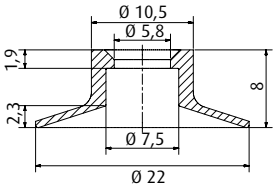
Details see page 204



Item no. 102.022.185._*

Material	
NR (gr)	0.5 mm

Details see page 204



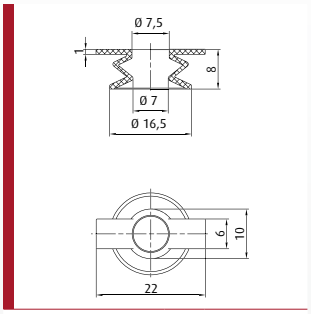
Item no. 102.022.526._*

Material	
NR (bl)	2 mm

Details see page 204

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups for Films & Paper - SD-B

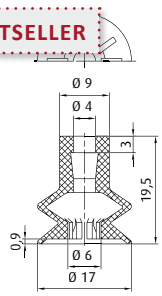


Item no. 23.017.102._*

Material	
NR (sw)	5.5 mm

Details see page 300

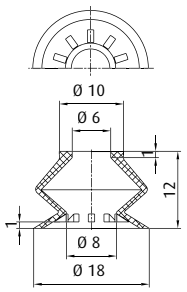
BESTSELLER



Item no. 23.018.175._*

Material	
SI (tr), NR (bl)	5.5 mm

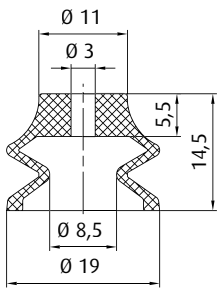
Details see page 300



Item no. 23.018.082._*

Material	
SI (tr), NR (bl), CR (sw)	5.5 mm

Details see page 301

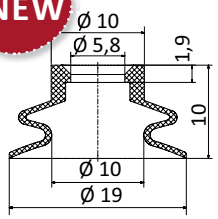


Item no. 23.019.168._*

Material	
NR (bl), NR (br)	5.5 mm

Details see page 304

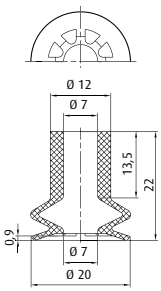
NEW



Item no. 23.019.254._*

Material	
SI (tr)	3.5 mm

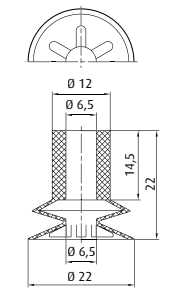
Details see page 304



Item no. 23.020.133._*

Material	
NBR (sw), SI (tr)	4 mm

Details see page 305

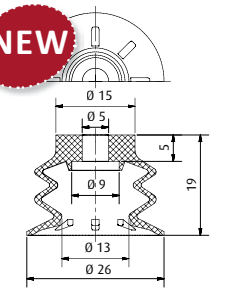


Item no. 23.023.099._*

Material	
NR (br)	5 mm

Details see page 310

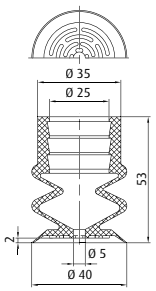
NEW



Item no. 21.026.162._*

Material	
NR (br)	9 mm

Details see page 314



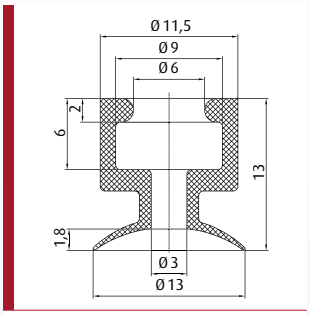
Item no. 21.040.141._*

Material	
NR (bg)	18 mm

Details see page 328

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

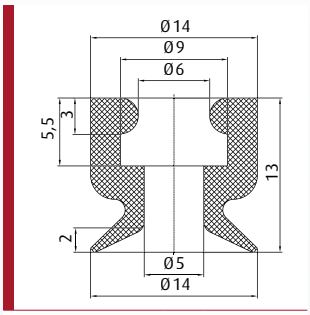
Vacuum cups compatible to machines manufactured by Mueller-Martini - SD-MM



Item no. 102.012.332._*

Material	
NR (or)	1.5 mm

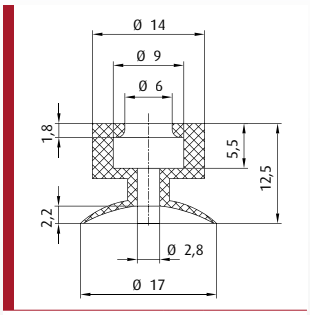
Details see page 187



Item no. 102.014.333._*

Material	
NR (or)	2 mm

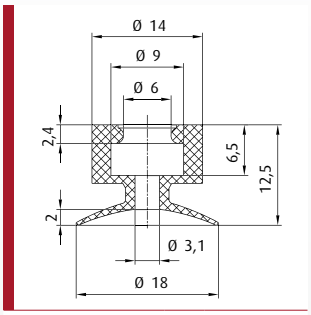
Details see page 187



Item no. 102.016.255._*

Material	
SI (r)	3 mm

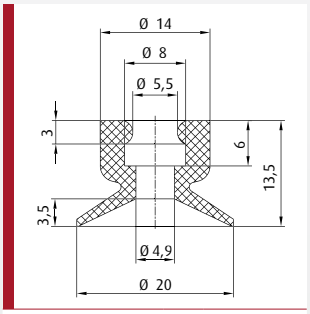
Details see page 193



Item no. 102.018.442._*

Material	
NR (or)	2 mm

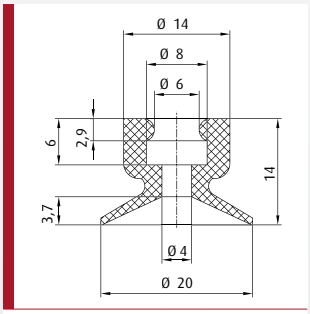
Details see page 196



Item no. 102.020.140._*

Material	
NR (sw), NR (or)	3 mm

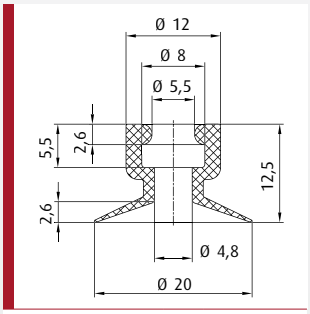
Details see page 198



Item no. 126.020.004._*

Material	
NR (or)	3.5 mm

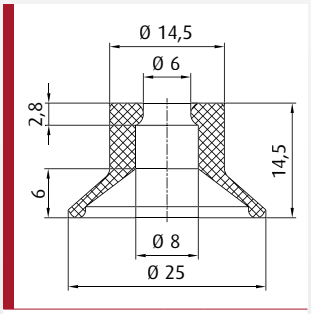
Details see page 198



Item no. 126.020.005._*

Material	
SI (tr)	1 mm

Details see page 199

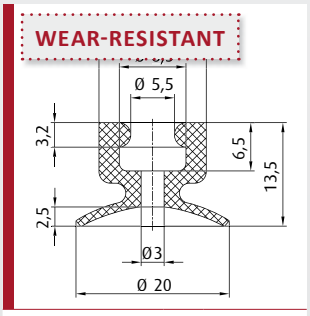


Item no. 102.025.102._*

Material	
NR (g)	4 mm

Details see page 209

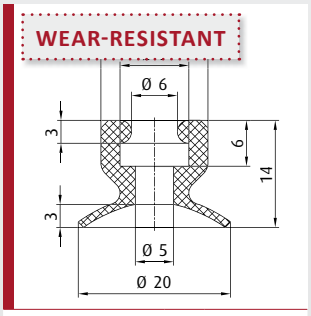
Vulkollan® flat vacuum cups - SD-MM-VU



Item no. 102.020.299._*

Material	
Vulkollan® (br)	3.5 mm

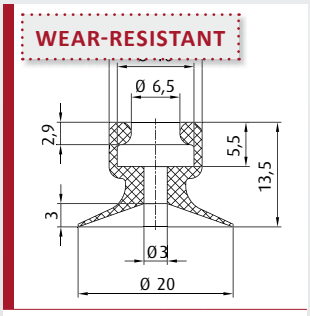
Details see page 199



Item no. 102.020.300._*

Material	
Vulkollan® (br)	3 mm

Details see page 199



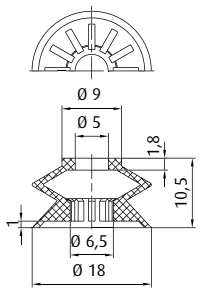
Item no. 102.020.308._*

Material	
Vulkollan® (br)	1 mm

Details see page 199

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups - SD-MM



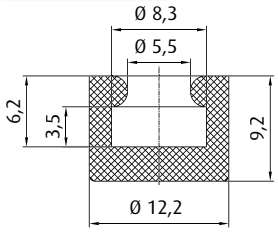
Item no. 23.018.183._*

Material	
NR (or)	5.5 mm

Details see page 300

Accessories - SD-MM

RUBBER CAP



Item no. 77.101

Material
NR (r)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Suction discs - SD-S

Ordering notes

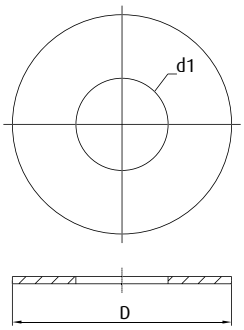
> Packing unit = 100 pieces
> When ordering, supplement the item no. with the material code according to ordering logic.

Ordering logic

Material code	Material	Thickness	Colour
01	NR	0.5	green
02	NR	0.8	pink
03	NR	1.0	beige

Material code	Material	Thickness	Colour
04	NR	1.6	white
05	NR	2.0	green
06	PU	0.8	transparent

Dimensions



Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.13.001._XX	NR, PU	12.7	1.6
3.16.003._XX	NR, PU	15.9	1.6
3.16.007._XX	NR, PU	15.9	3.2
3.17.002._XX	NR, PU	17.5	3.2
3.19.004._XX	NR, PU	19.1	6.4
3.19.005._XX	NR, PU	19.1	1.6
3.19.011._XX	NR, PU	19.1	4.8
3.21.006._XX	NR, PU	20.6	4.8
3.22.008._XX	NR, PU	22.2	4.8
3.22.012._XX	NR, PU	22.2	6.4
3.24.010._XX	NR, PU	23.8	9.5
3.25.013._XX	NR, PU	25.4	4.8
3.25.014._XX	NR, PU	25.4	6.4
3.25.015._XX	NR, PU	25.4	9.5
3.27.016._XX	NR, PU	27.0	3.2
3.27.017._XX	NR, PU	27.0	6.4

Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.27.018._XX	NR, PU	27.0	9.5
3.29.019._XX	NR, PU	28.6	6.4
3.29.020._XX	NR, PU	28.6	12.7
3.29.021._XX	NR, PU	28.6	14.3
3.30.022._XX	NR, PU	30.2	9.5
3.30.023._XX	NR, PU	30.2	12.7
3.30.024._XX	NR, PU	30.2	14.3
3.32.025._XX	NR, PU	31.8	4.8
3.32.026._XX	NR, PU	31.8	9.5
3.32.027._XX	NR, PU	31.8	12.7
3.32.028._XX	NR, PU	31.8	14.3
3.32.046._XX	NR, PU	31.8	6.4
3.32.047._XX	NR, PU	31.8	11.1
3.35.029._XX	NR, PU	34.9	9.5
3.35.030._XX	NR, PU	34.9	12.7
3.35.031._XX	NR, PU	34.9	14.3

Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.38.032._XX	NR, PU	38.1	9.5
3.38.033._XX	NR, PU	38.1	12.7
3.38.034._XX	NR, PU	38.1	14.3
3.38.035._XX	NR, PU	38.1	15.9
3.38.045._XX	NR, PU	38.1	11.1
3.41.036._XX	NR, PU	41.3	9.5
3.41.037._XX	NR, PU	41.3	12.7
3.41.038._XX	NR, PU	41.3	14.3
3.41.039._XX	NR, PU	41.3	15.9
3.44.040._XX	NR, PU	44.5	7.9
3.44.041._XX	NR, PU	44.5	12.7
3.44.042._XX	NR, PU	44.5	14.3
3.44.043._XX	NR, PU	44.5	15.9
3.50.044._XX	NR, PU	50.8	12.7

Flat vacuum cups SF **28**

Bellows vacuum cups SB **75**

Oval vacuum cups SO **138**

Special vacuum cups SX **162**

FIPA Flat vacuum cups SF

> Handling of flat products with smooth surfaces
> Low cup volume enables short cycle times
> Good stability allows the products to pivot

Universal flat vacuum cups - SFU-A

> Very shallow cup with single sealing lip for handling smooth or slightly rough surfaces
> Great stability allows high acceleration
> Connection by means of plug-in nipple (up to a diameter of 50 mm), or vulcanised carrier plate (from a diameter of 60 mm)
> Diameter: 1 - 200 mm

> See page 32

High temperature Thermalon® cups - SKT-F

> Optimised special material for improved resistance to marking
> Heat-resistant up to 160 °C
> No silicones or paint-wetting-impairment substances (PWIS), enabling later painting of the products
> Diameter: 5 - 60 mm

> See page 36

Universal flat vacuum cups - SFU-B

> Very shallow cup with single sealing lip for handling smooth or slightly rough surfaces
> Great stability allows high acceleration
> Connection via firmly bolted nipple (from a diameter of 20 mm), thereby increasing process security
> Diameter: 0.7 - 60 mm

> See page 38

Flat vacuum cups, modular - SP-F

> Universal flat vacuum cups in even, supported or deep design
> Design: Replacement sealing lip for attachment to fitting
> Diameter: 5 - 150 mm

> See page 42

FIPA Flat vacuum cups SF

Flat vacuum cups with fixed mounted fittings - SP-F

> Universal flat vacuum cups in even or supported design
> Series with sensing valve prevents dropping of the product if individual vacuum cups in a system are not in contact with the product
> Design: Complete with vacuum cup fitting and filter screen
> Diameter: 20 - 150 mm

> See page 47

Flat vacuum cups with a flexible lip - SFU-F

> Soft, very flexible single sealing lip for handling sensitive products
> Good sealing to slightly rough surfaces
> Diameter: 4 - 40 mm

> See page 50

Flat vacuum cups with curved lip - SFU-D

> Universal flat vacuum cups with tapering curved sealing lip
> Pre-tension of the sealing lip enables gripping of uneven, slightly curved products
> Diameter: 4 - 85 mm

> See page 52

Flat vacuum cups with long shaft - SFU-L

> Gentle handling of particularly sensitive, uneven and slightly curved products
> Long, slim design enables pipe mounting and low gimbal leveling for uneven product surfaces
> Diameter: 6 - 60 mm

> See page 56

Vacuum cups for chocolates - SL-PF

> Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
> Low-marking and FDA-approved
> Diameter: 16 - 22 mm

> See page 58

Silicone cups (FDA-approved) for use with tubes - SV-T

> With straight or conical opening
> Direct machine connection through pipe mounting
> Handling of cans or tubes

> See page 60

Continued on the next page

FIPA Flat vacuum cups SF

Non-slip vacuum cups - SM-P

> Flat vacuum cups for the handling of sheet metal
> Distinct, radially encircling supporting ribs increase holding force
> Diameter: 10 - 50 mm

> See page 62

Flat vacuum cups for dynamic sheet handling - SM-F

> Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs. Good absorption of lateral forces
> Supports help to prevent deep-drawing or deformation of thin sheets
> Vulcanised connection thread ensures a secure fit
> Diameter: 30 - 125 mm

> See page 64

Flat vacuum cups for textured surfaces - SFU-R

> Optimal seal with rough and uneven surfaces thanks to very fine sealing lips
> Enhanced safety due to two-fold, internal safety sealing lip
> Interlocking, clip-in retaining plate for quick and inexpensive replacement of the sealing lip
> Diameter: 40 - 200 mm

> See page 66

Flat vacuum cups for porous products - SFU-RT

> Separation of porous plate materials by simultaneous suction and punctual blow-off of the product
> Enhanced safety due to two-fold, internal safety sealing lip
> Diameter: 160 mm

> See page 67

Flat vacuum cups with safety sealing lips - SFU-S

> High process reliability through multiple sealing lip
> Good stability due to vulcanised retainer plate, as well as support surfaces for the product
> Diameter: 30 - 225 mm

> See page 68

Short lift vacuum cups SFK

> Minimum lift for flat, sensitive surfaces
> Supports prevent deformation of the product and increase stability
> Particularly suited for use in clamping systems
> Diameter: 20 - 150 mm

> See page 70

FIPA Flat vacuum cups SF

Vacuum suction plate with foamed sealing lip - SP-PLM

> Good sealing of heavily textured surfaces
> Cost-effective replacement of worn seals
> Diameter: 35 - 300 mm

> See page 72

Heavy-duty flat vacuum suction plates - SFPL-D

> Vulcanised steel carrier plate allows lifting of very heavy loads
> Secure gripping of uneven surfaces thanks to additional inner sealing lip
> Diameter: 160 - 300 mm

> See page 73

Flat XXL suction rings - SFR

> Large, flat suction seals vulcanised on steel ring for handling very large loads
> Connection through circular, circumferentially placed thread holes
> Diameter: 450 - 920 mm

> See page 74

Universal flat vacuum cups - SFU-A

Product Description	Advantage
Very shallow cup with single-lip seal for handling various products with smooth or rough surfaces. Connection up to Ø 50 mm by means of plug-in nipple, from Ø 60 mm with vulcanised carrier plate (boltable)	> Great stability allows high acceleration > Fast cycle times are possible, due to the cup's low volume > Cost-effective replacement of worn seals

Ordering notes:

Ø 1 mm to Ø 3 mm: PU = 10 pieces

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Connection thread
102.001.002._*	SFU-A -1.5	0.3	NBR (sw), SI (tr)	--
102.002.004._*	SFU-A-2	0.4	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	--
102.003.005._*	SFU-A -3	0.5	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.005.009._*	SFU-A -5	0.9	NBR (sw), SI (tr), SI-AS (sw), FKM (sw)	--
102.006.013._*	SFU-A -6	1	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.008.017._*	SFU-A -8	1.4	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.010.024._*	SFU-A -10	1.2	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	--
102.015.030._*	SFU-A-15	2	NBR (sw), SI (tr), PU (bl)	--
102.015.309._*	SFU-A-15A	1.9	NBR (sw), SI (tr), PU (bl)	--
102.020.041._*	SFU-A -20	2	NBR (sw), SI (tr), PU (bl)	--
102.025.047._*	SFU-A -25	2.5	NBR (sw), SI (tr), PU (bl)	--
102.030.053._*	SFU-A -30	2	NBR (sw), SI (tr), PU (bl)	--
102.035.056._*	SFU-A -35	3	NBR (sw), SI (tr)	--
102.040.061._*	SFU-A -40	3.5	NBR (sw), SI (tr), PU (bl)	--
102.050.065._*	SFU-A -50	4	NBR (sw), SI (tr), PU (bl)	--
102.060.303._*	SFU-A -60	5	NBR (sw), SI (tr), PU (bl)	G1/4-female
102.080.304._*	SFU-A -80	6	NBR (sw), SI (tr), PU (bl)	G1/4-female
102.095.305._*	SFU-A -95	6	NBR (sw), SI (tr), PU (bl)	G1/4-female
154.120.018._*	SFU-A -120	7	NBR (sw), SI (tr)	--
154.150.020._*	SFU-A -150	9	NBR (sw), SI (tr)	--
154.191.025._*	SFU-A -200	13	NBR (sw), SI (tr), PU (bl)	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

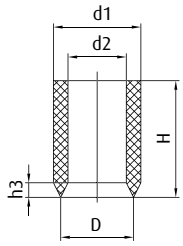
Accessories

Item no.	Suitable fittings										Suitable spring levelers (Snap-In)	
	M3-male	M5-male	M5-female	M6-male	M10x1.25-female	G1/8-male	G1/8-female	G1/4-male	G1/4-female	G1/2-female	Spring leveler	
102.001.002._*	270.011 (p.408)	--	--	--	--	--	--	--	--	--	--	--
102.002.004._*	270.014 (p.408)	270.300 (p.411)	--	--	--	--	--	--	--	--	--	--
102.003.005._*	270.014 (p.408)	270.300 (p.411)	--	--	--	--	--	--	--	--	--	--
102.005.009._*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.006.013._*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.008.017._*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.010.024._*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.015.030._*	--	270.200 (p.411)	--	--	--	270.064 (p.418)	270.065 (p.422)	--	--	--	--	--
102.015.309._*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.020.041._*	--	270.311 (p.411)	--	--	--	270.063 (p.419)	270.061 (p.422)	--	--	--	--	--
102.025.047._*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.030.053._*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.035.056._*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.040.061._*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.050.065._*	--	--	--	--	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	--	--	--
102.060.303._*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
102.080.304._*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
102.095.305._*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
154.120.018._*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--
154.150.020._*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--
154.191.025._*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--

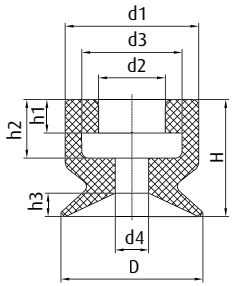
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

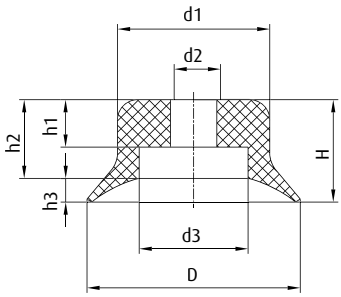
Dimensions



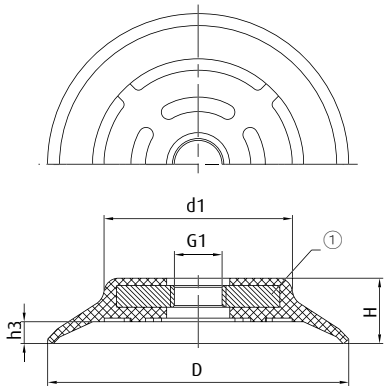
Drawing A



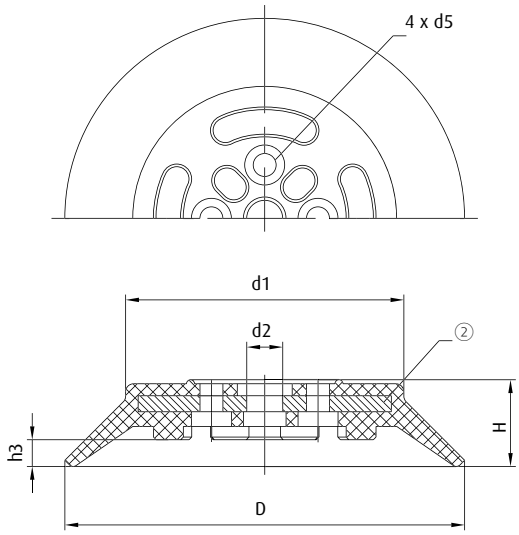
Drawing B



Drawing C



Drawing D



Drawing E

① = Aluminium ② = Steel

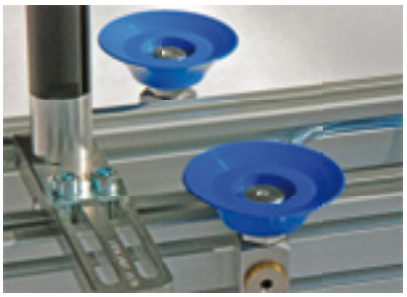
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.001.002._*	A	1.5	1.8	1.2	--	--	--	--	2.5	--	--	0.3
102.002.004._*	B	2.5	4	2	3	1.2	--	--	4	1.5	2.5	0.5
102.003.005._*	B	4	4	2	3	1.2	--	--	4	1.5	2.5	0.5
102.005.009._*	B	5	7.5	3.8	6	1.3	--	--	6.5	1.8	3.9	0.8
102.006.013._*	B	6.5	7.5	4	6	2	--	--	7	2	4	1
102.008.017._*	B	8.5	8	4	6	2	--	--	7	2	3.5	1.4
102.010.024._*	B	11	8.5	4	6	2	--	--	7.5	1.8	3.8	1.4
102.015.030._*	C	15	12	4.5	7.5	--	--	--	8	2.6	2.1	2.1
102.015.309._*	B	15.5	9	3.8	6	2	--	--	8	2.2	4.4	2
102.020.041._*	C	21	15	4.6	11	--	--	--	10	4.5	8	2.4
102.025.047._*	C	25	16	6	11	--	--	--	14	7	11	3
102.030.053._*	C	30	14	6	11	--	--	--	12	7	10	2
102.035.056._*	C	36	21	6	11	--	--	--	14	7	11.2	2.8
102.040.061._*	C	42	24	6	11	--	--	--	14	7	11.2	2.8
102.050.065._*	C	50	27	8	20	--	--	--	15	7.4	11.5	3.5
102.060.303._*	D	62	38	--	--	--	--	G1/4	16	--	--	4.8
102.080.304._*	D	83	52	--	--	--	--	G1/4	18	--	--	6
102.095.305._*	D	95	66	--	--	--	--	G1/4	18	--	--	5.5
154.120.018._*	E	117	90	14	--	--	8.5	--	26	--	--	9
154.150.020._*	E	150	104	13.5	--	--	8.5	--	33	--	--	10
154.191.025._*	E	193	142	13	--	--	8.5	--	40	--	--	15.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature Thermalon® cups - SKT-F

UP TO 160 °C & MINIMUM MARKING



Product Description

Flat vacuum cups for smooth surfaces especially suitable for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture optimised for the plastics industry with a hardness of 60° Shore A.
Connection up to Ø 50 mm by means of plug-in nipple, from Ø 60 mm with vulcanised carrier plate (boltable).

Advantage

> Extremely low-marking
> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Great stability allows high acceleration

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Usage temperature [°C]
102.005.496._*	SKT-F-5	0.9	Thermalon® (bl)	0 - 160
102.008.497._*	SKT-F-8	1.3	Thermalon® (bl)	0 - 160
102.010.498._*	SKT-F-10	1.5	Thermalon® (bl)	0 - 160
102.015.499._*	SKT-F-15	1.9	Thermalon® (bl)	0 - 160
102.020.500._*	SKT-F-20	2.3	Thermalon® (bl)	0 - 160
102.025.501._*	SKT-F-25	3	Thermalon® (bl)	0 - 160
102.030.502._*	SKT-F-30	2	Thermalon® (bl)	0 - 160
102.040.503._*	SKT-F-40	3.9	Thermalon® (bl)	0 - 160
102.050.504._*	SKT-F-50	4	Thermalon® (bl)	0 - 160
102.060.505._*	SKT-F-60	4.9	Thermalon® (bl)	0 - 160

Accessories

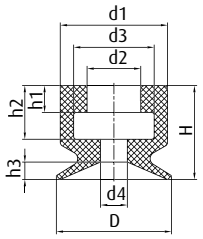
	Suitable fittings							Suitable spring levelers (Snap-In)	
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	
102.005.496._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.008.497._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.010.498._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.015.499._*	270.200 (p.411)	--	--	270.064 (p.418)	270.065 (p.422)	--	--	50.330 (p.454)	10
102.020.500._*	270.311 (p.411)	--	--	270.063 (p.419)	270.061 (p.422)	--	--	--	--
102.025.501._*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--
102.030.502._*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

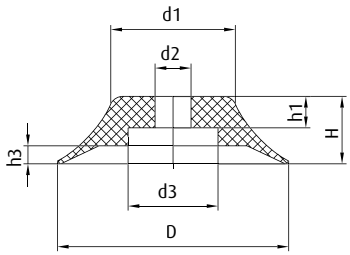
Accessories

Item no.	Suitable fittings							Suitable spring levelers (Snap-In)	
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	
102.040.503._*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--
102.050.504._*	--	--	--	270.012 (p.421)	270.020 (p.423)	270.491 (p.429)	270.492 (p.434)	--	--
102.060.505._*	--	--	--	--	--	--	--	--	--

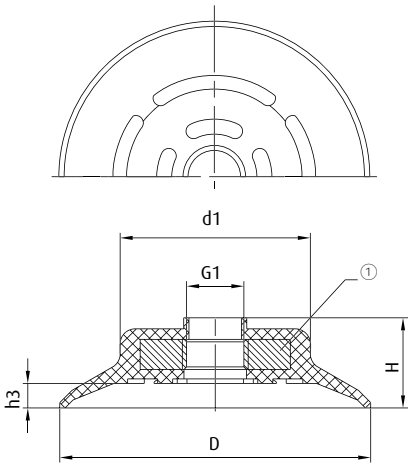
Dimensions



Drawing A



Drawing B



Drawing C

① = Aluminium

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.005.496._*	A	5.5	7.5	4	6	1.5	--	6.5	2	4	0.9
102.008.497._*	A	8.5	8	4	6	2	--	7	2	4	1.3
102.010.498._*	A	11	8.5	4	6	2	--	7.5	2	4	1.4
102.015.499._*	B	15.5	12	4.5	8	--	--	8	2.7	--	1.8
102.020.500._*	B	21	15	4.5	11	--	--	10	4.5	--	2.2
102.025.501._*	B	26	16	6	11	--	--	14	7	--	2.8
102.030.502._*	B	31	14.5	6	11	--	--	12	7	--	2
102.040.503._*	B	41	24	6	11	--	--	14	7	--	3.9
102.050.504._*	B	51	27.5	8	20	--	--	15	7	--	4
102.060.505._*	C	62	38	--	30	--	G1/4	18	--	--	5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Universal flat vacuum cups - SFU-B

Product Description	Advantage
Very shallow cup with single-lip seal for handling various products with smooth or slightly rough surfaces. Connection up to Ø 15 mm by means of plug-in nipple, from Ø 20 mm with firmly screwed-in nipple. Compatible "snap-in" spring levelers available.	> Great lateral stability allows high acceleration > Supported by support faces from Ø 30 mm > Fastest cycle times are possible due to the cup's low volume > Cost-effective replacement of worn seals > High process reliability due to fixed, non-rotating seat of the screw nipple

Technical data

Item no.	Model / Lip dimensions	Material / Colour	
102.001.425._*	SFU-B-0.7	NBR (sw), SI-AS (sw)	0
102.001.463._*	SFU-B-1	NBR (sw), SI-AS (sw)	0
102.002.464._*	SFU-B-1.5	NBR (sw), SI-AS (sw)	0
102.002.279._*	SFU-B-2	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.2
102.003.280._*	SFU-B-3	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3
102.004.281._*	SFU-B-4	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3
102.006.282._*	SFU-B-6	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.5
102.008.283._*	SFU-B-8	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1
102.010.284._*	SFU-B-10	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1
102.015.285._*	SFU-B-15	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1.5
102.020.286._*	SFU-B-20	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.025.287._*	SFU-B-25	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.030.288._*	SFU-B-30	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.040.289._*	SFU-B-40	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.050.290._*	SFU-B-50	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.060.291._*	SFU-B-60	NBR (sw), SI (tr), PU (bl), FKM (gr)	2.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

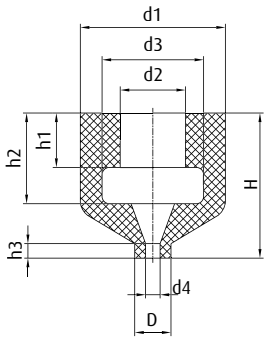
Accessories

Item no.	Suitable fittings								Suitable spring levelers (Snap-In)							
	M3-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler		Spring leveler		Spring leveler		Spring leveler	
102.001.425._*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.001.463._*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.002.464._*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.002.279._*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.003.280._*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.004.281._*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.006.282._*	--	270.283 (p.409)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.008.283._*	--	270.283 (p.409)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
102.010.284._*	--	270.010 (p.411)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
102.015.285._*	--	270.010 (p.411)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
102.020.286._*	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.025.287._*	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.030.288._*	--	--	270.460 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.040.289._*	--	--	270.498 (p.414)	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)	50.170 (p.456)	20	50.171 (p.456)	30	50.172 (p.456)	40	50.173 (p.456)	50
102.050.290._*	--	--	270.499 (p.414)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	50.174 (p.456)	20	50.175 (p.456)	30	50.176 (p.456)	40	50.177 (p.456)	50
102.060.291._*	--	--	--	270.512 (p.416)	--	--	--	--	--	--	--	--	--	--	--	--

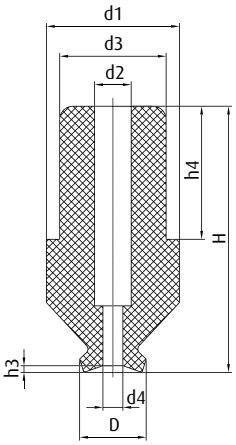
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

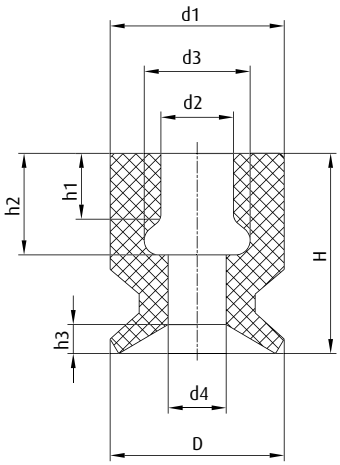
Dimensions



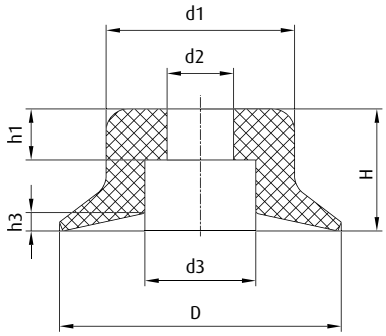
Drawing A



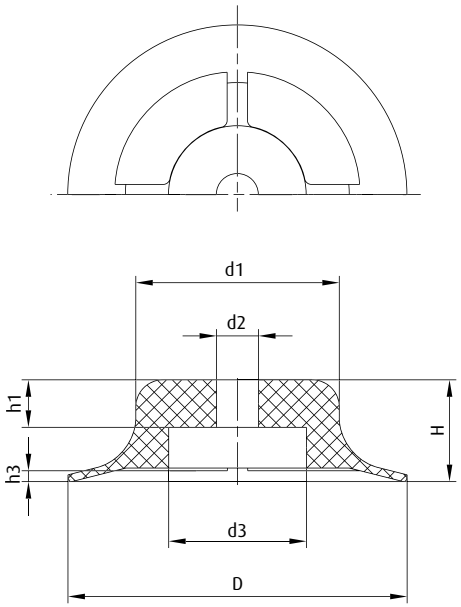
Drawing B



Drawing C



Drawing D



Drawing E

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	h4 [mm]
102.001.425._*	A	0.7	4	1.8	2.9	0.2	4	1.5	2.4	0.4	--
102.001.463._*	A	1	4	1.8	2.8	0.4	4	1.5	2.5	0.4	--
102.002.464._*	A	1.5	4	1.8	2.8	0.7	4	1.5	2.5	0.4	--
102.002.279._*	B	2	4	1.1	3.2	0.6	8	--	--	0.2	4
102.003.280._*	B	3	4	1.2	3.3	0.8	8	--	--	0.3	4
102.004.281._*	B	4	4	1.2	3.3	1.2	8	--	--	0.5	4
102.006.282._*	C	6	6	2.5	3.6	2	7	2.3	3.5	1	--
102.008.283._*	D	8	6	2.6	3.6	--	5.5	2.6	--	1	--
102.010.284._*	D	10	10	4	6	--	8	3	--	1	--
102.015.285._*	D	15	11	3.9	6	--	9	3.1	--	2.4	--
102.020.286._*	D	20	15	6	10	--	10	4.1	--	1.7	--
102.025.287._*	D	25	17	6	10	--	11	4.6	--	1.7	--
102.030.288._*	E	30	17	6	12	--	11	5	--	1.9	--
102.040.289._*	E	40	25	6	15	--	14	7	--	1.6	--
102.050.290._*	E	50	30	6	20	--	15	7	--	1.6	--
102.060.291._*	E	60	40	10.5	28	--	22	11	--	2.3	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups, modular - SP-F

Product Description	Advantage
Universal flat vacuum cup in even, supported or deep design. Design: Replacement sealing lip for attachment to fitting.	> High suction force > Fast cycle times possible > Very resistant to wear (Tepuflex®) > Compatible with established products from other vendors

Ordering notes:

Explanation of the ending of the accessory fitting:
> S: with screen

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Accessories Retaining ring
	Smooth design			
102.005.090._*	SP-F-5	0.5	SI (tr), CR (sw)	--
102.007.091._*	SP-F-7	1	SI (tr), CR (sw)	--
102.009.092._*	SP-F-9	1.5	SI (tr), CR (sw)	--
102.011.093._*	SP-F-10	1	SI (tr), CR (sw)	--
102.016.098._*	SP-F-15	2	SI (tr), CR (sw)	--
102.020.095._*	SP-F-20	2.5	SI (tr), CR (sw)	78.011 (p.475)
102.030.096._*	SP-F-30	3.5	SI (tr), CR (sw)	78.011 (p.475)
102.040.094._*	SP-F-40	4	SI (tr), CR (sw)	78.012 (p.475)
102.050.097._*	SP-F-50	6.5	SI (tr), CR (sw)	78.013 (p.475)
	With cleats			
104.016.003._*	SP-FA-16	0.5	SI (tr), CR (sw)	--
125.020.004._*	SP-FA-20	1	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.025.007._*	SP-FA-25	1	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.030.010._*	SP-FA-30	2	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.040.013._*	SP-FA-40	2	Tepuflex® (or), SI (tr), CR (sw)	78.012 (p.475)
125.050.017._*	SP-FA-50	2.5	Tepuflex® (or), SI (tr), CR (sw)	78.013 (p.475)
154.078.027._*	SP-FA-75	3	Tepuflex® (or), SI (tr), CR (sw)	--
154.113.028._*	SP-FA-110	5	Tepuflex® (or), SI (tr), CR (sw)	--
154.155.026._*	SP-FA-150	5	Tepuflex® (or), SI (tr), CR (sw)	--
	Deep design			
122.016.012._*	SP-FD-16	1.5	SI (tr), CR (sw)	--
122.022.022._*	SP-FD-20	2.5	SI (tr), CR (sw)	78.011 (p.475)
122.032.036._*	SP-FD-30	5	SI (tr), CR (sw)	78.011 (p.475)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Accessories

Item no.	Suitable fittings									
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G3/8-male	G3/8-female	G1/2-female	G3/4-female
Smooth design										
102.005.090._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.007.091._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.009.092._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.011.093._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
102.016.098._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
102.020.095._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
102.030.096._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
102.040.094._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
102.050.097._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
With cleats										
104.016.003._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
125.020.004._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.025.007._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.030.010._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.040.013._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
125.050.017._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
154.078.027._*	--	--	--	--	270.527-S (p.424)	--	--	270.528-S (p.436)	270.529-S (p.436)	--
154.113.028._*	--	--	--	--	--	--	--	270.530-S (p.437)	270.531-S (p.437)	--
154.155.026._*	--	--	--	--	--	--	--	--	270.532-S (p.437)	270.533-S (p.437)
Deep design										
122.016.012._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
122.022.022._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
122.032.036._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--

Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups, modular

Example:

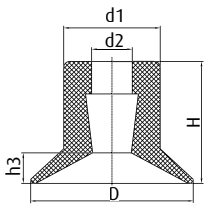
Assembly example

Assembly example

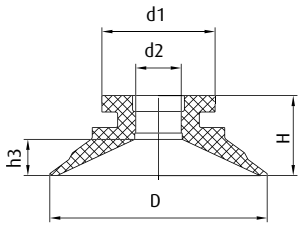
* Fittings are optionally available with and without filter screen
** Fittings come fitted with filter screen as standard

> The modular series allows you to assemble your own vacuum cups
> Worn sealing lips can be replaced quickly, cost-effective and easily
> High flexibility thanks to a large selection of fitting threads

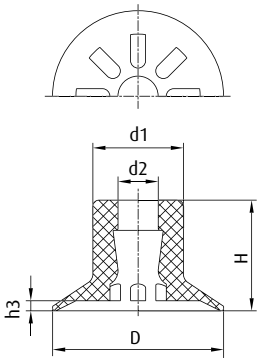
Dimensions



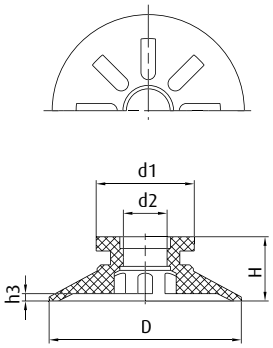
Drawing A



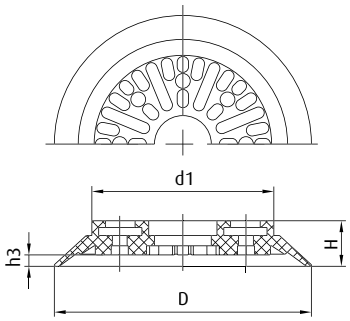
Drawing B



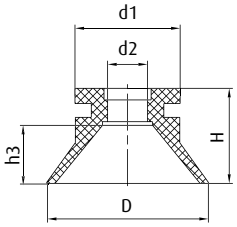
Drawing C



Drawing D



Drawing E



Drawing F

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	**H** [mm]	**h3** [mm]
Smooth design						
102.005.090._*	A	5	4.5	2	6	0.5
102.007.091._*	A	7	5	2	7	0.9
102.009.092._*	A	9.5	5	2	7	1.1
102.011.093._*	A	11	9	3.8	10.5	0.8
102.016.098._*	A	16	9.5	4	12	3
102.020.095._*	B	22	14.5	5.5	8	3
102.030.096._*	B	32	14.5	6.5	10.5	4.7
102.040.094._*	B	42	20	7	13.5	6
102.050.097._*	B	52	27	11	19	8.5
With cleats						
104.016.003._*	C	17	9	4	11	1
125.020.004._*	D	22	14.5	5.5	8	0.9
125.025.007._*	D	28	14	5.5	9	1
125.030.010._*	D	32	14.5	6.5	10.5	1.2
125.040.013._*	D	42	20	7	13.5	2.1
125.050.017._*	D	53	27	12	17.5	2
154.078.027._*	E	78	55	--	13	3
154.113.028._*	E	113	80	--	20	5
154.155.026._*	E	155	109	--	24	5
Deep design						
122.016.012._*	F	17.5	9	4	17	8
122.022.022._*	F	22	14.5	5.5	13	8
122.032.036._*	F	32	14.5	5.5	19.5	14.4

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Flat vacuum cups with fully assembled fitting - SP-F

Product Description

Universal flat vacuum cups in even or supported design. Series with sensing valve prevents dropping of the product if individual vacuum cups in a system are not in contact with the product.
Version: Complete with vacuum cup fitting and filter screen.

Advantage

> High suction force
> Fast cycle times possible
> Very resistant to wear (Tepuflex®)
> Compatible with established products from other vendors

Technical data

Item no.	Model / Lip dimensions	Connection thread		Material / Colour	Accessories Spare cup
	Smooth design with fitting & filter screen				
120.020.006._*	SP-F-20	G1/8-male, M5-female	2.5	SI (tr), CR (sw)	102.020.095._* (p.205)
120.030.013._*	SP-F-30	G1/8-male, M5-female	3.5	SI (tr), CR (sw)	102.030.096._* (p.223)
120.040.076._*	SP-F-40	G1/8-female	4	SI (tr), CR (sw)	102.040.094._* (p.234)
120.050.078._*	SP-F-50	G1/8-female	6.5	SI (tr), CR (sw)	102.050.097._* (p.242)
	Smooth design with fitting, filter screen & touch valve				
121.030.006._*	SP-F-30	G1/8-male, M5-female	2.5	SI (tr), CR (sw)	102.030.096._* (p.223)
121.040.007._*	SP-F-40	G1/8-female	4	SI (tr), CR (sw)	102.040.094._* (p.234)
121.050.008._*	SP-F-50	G1/8-female	2.5	SI (tr), CR (sw)	102.050.097._* (p.242)
	With cleats, fitting & filter screen				
123.020.003._*	SP-FA-20	G1/8-male, M5-female	1	Tepuflex® (or), SI (tr), CR (sw)	125.020.004._* (p.205)
123.025.010._*	SP-FA-25	G1/8-male, M5-female	1	Tepuflex® (or), SI (tr), CR (sw)	125.025.007._* (p.216)
123.030.019._*	SP-FA-30	G1/8-male, M5-female	2	Tepuflex® (or), SI (tr), CR (sw)	125.030.010._* (p.223)
123.040.028._*	SP-FA-40	G1/8-female	2	Tepuflex® (or), SI (tr), CR (sw)	125.040.013._* (p.235)
123.050.034._*	SP-FA-50	G1/8-female	2.5	Tepuflex® (or), SI (tr), CR (sw)	125.050.017._* (p.242)
152.078.133._*	SP-FA-75	G1/8-female	3	Tepuflex® (or), SI (tr), CR (sw)	154.078.027._* (p.252)
152.078.136._*	SP-FA-75	G3/8-female	3	Tepuflex® (or), SI (tr), CR (sw)	154.078.027._* (p.252)
152.078.139._*	SP-FA-75	G1/2-female	3	Tepuflex® (or), SI (tr), CR (sw)	154.078.027._* (p.252)
152.113.134._*	SP-FA-110	G3/8-female	5	Tepuflex® (or), SI (tr), CR (sw)	154.113.028._* (p.262)
152.113.137._*	SP-FA-110	G1/2-female	5	Tepuflex® (or), SI (tr), CR (sw)	154.113.028._* (p.262)
152.155.135._*	SP-FA-150	G1/2-female	5	Tepuflex® (or), SI (tr), CR (sw)	154.155.026._* (p.269)
152.155.138._*	SP-FA-150	G3/4-female	5	Tepuflex® (or), SI (tr), CR (sw)	154.155.026._* (p.269)
	With cleats, fitting, filter screen & touch valve				
124.030.002._*	SP-FA-30	G1/8-male, M5-female	2	SI (tr), CR (sw)	125.030.010._* (p.223)
124.040.006._*	SP-FA-40	G1/8-female	2	SI (tr), CR (sw)	125.040.013._* (p.235)
124.050.009._*	SP-FA-50	G1/8-female	2.5	SI (tr), CR (sw)	125.050.017._* (p.242)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups with fully mounted fitting

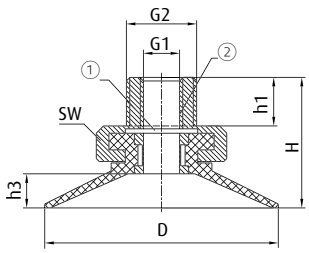
Example:

or

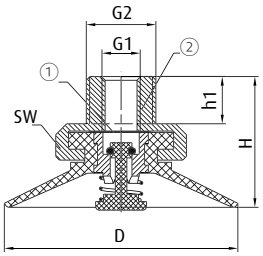
* Version with touch valve available only for flat vacuum cups in smooth design and flat vacuum cups with cleats

> High process reliability thanks to permanently installed fitting
> Worn sealing lips can be replaced if necessary

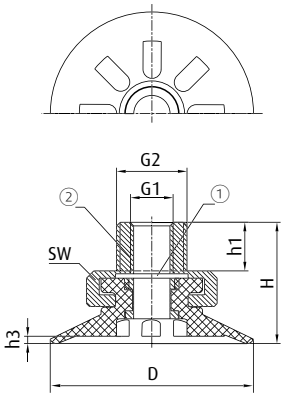
Dimensions



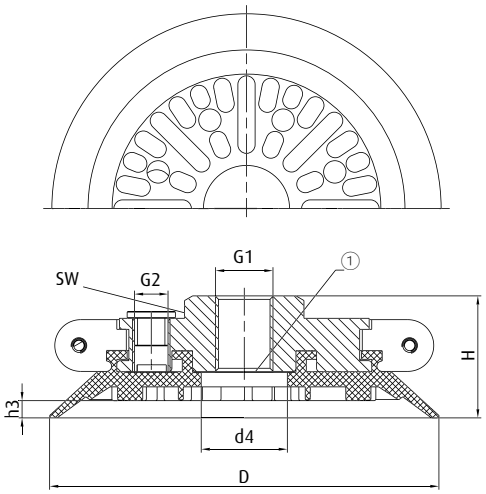
Drawing A



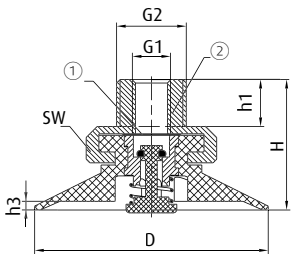
Drawing B



Drawing C



Drawing D



Drawing E

① = Filter screen ② = Aluminium

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø **D** [mm]	Ø **d4** [mm]	**G1**	**G2**	**H** [mm]	**h1** [mm]	**h3** [mm]	**SW**
Smooth design with fitting & filter screen									
120.020.006._*	A	22	--	M5	G1/8	15.5	6.5	3	17
120.030.013._*	A	32	--	M5	G1/8	18	6.5	4.5	17
120.040.076._*	A	42	--	G1/8	--	22	--	6	12
120.050.078._*	A	52	--	G1/8	--	27	--	8.5	12
Smooth design with fitting, filter screen & touch valve									
121.030.006._*	B	32	--	M5	G1/8	18	6.5	--	17
121.040.007._*	B	42	--	G1/8	--	22	--	--	12
121.050.008._*	B	52	--	G1/8	--	27	--	--	12
With cleats, fitting & filter screen									
123.020.003._*	C	22	--	M5	G1/8	15.5	6.5	0.9	17
123.025.010._*	C	28	--	M5	G1/8	16.5	6.5	1	17
123.030.019._*	C	32	--	M5	G1/8	18	6.5	1.2	17
123.040.028._*	C	42	--	G1/8	--	22	--	2.1	12
123.050.034._*	C	53	--	G1/8	--	26	--	2	12
152.078.133._*	D	78	10	G1/8	--	26	--	3	28
152.078.136._*	D	78	10	G3/8	--	26	--	3	28
152.078.139._*	D	78	10	G1/2	--	26	--	3	28
152.113.134._*	D	113	25	G3/8	G1/8	35	--	5	30
152.113.137._*	D	113	25	G1/2	G1/8	35	--	5	30
152.155.135._*	D	155	25	G1/2	G1/8	38	--	5	38
152.155.138._*	D	155	25	G3/4	G1/8	38	--	5	38
With cleats, fitting, filter screen & touch valve									
124.030.002._*	E	32	--	M5	G1/8	18	--	1.2	17
124.040.006._*	E	42	--	G1/8	--	22	--	2.1	12
124.050.009._*	E	53	--	G1/8	--	26	--	2	12

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups with a flexible lip - SFU-F

Product Description	Advantage
Flat vacuum cups with a soft, very flexible single-lip seal for handling highly sensitive products. Connection via plug-in nipple. Compatible "snap-in" spring levelers available.	> Gentle product handling > Very good fit to the product surface > Good seal over a slightly rough surface > Low volume of the cup enables fast cycle times > Cost-effective replacement of worn seals

Technical data

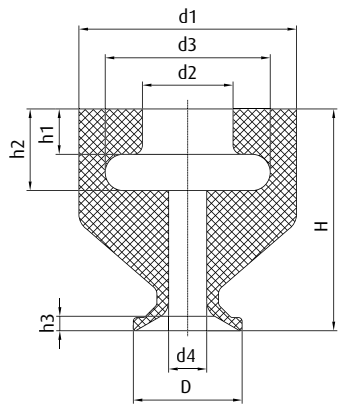
Item no.	Model / Lip dimensions		Material / Colour
102.004.216._*	SFU-F-4	1	NBR (sw), SI (tr)
102.006.217._*	SFU-F-6	1	NBR (sw), SI (tr)
102.008.218._*	SFU-F-8	1	NBR (sw), SI (tr)
102.010.219._*	SFU-F-10	1	NBR (sw), SI (tr)
102.015.220._*	SFU-F-15	2	NBR (sw), SI (tr)
102.020.221._*	SFU-F-20	2	NBR (sw), SI (tr)
102.030.222._*	SFU-F-30	2	NBR (sw), SI (tr)
102.040.223._*	SFU-F-40	2	NBR (sw), SI (tr)

Accessories

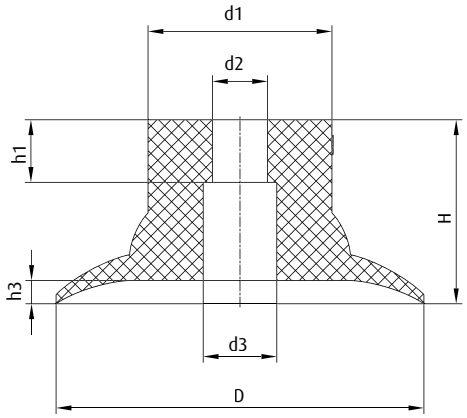
	Suitable fittings					Suitable spring levelers (Snap-In)					
Item no.	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	Spring leveler		Hose outside Ø	Spring leveler		Hose outside Ø
102.004.216._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
102.006.217._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
102.008.218._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
102.010.219._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
102.015.220._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
102.020.221._*	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	50.020 (p.454)	8.5	6
102.030.222._*	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	50.020 (p.454)	8.5	6
102.040.223._*	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	50.020 (p.454)	8.5	6

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	**H** [mm]	**h1** [mm]	**h2** [mm]	**h3** [mm]
102.004.216._*	A	3.8	12	5	9	1.1	12	2.5	4.5	0.7
102.006.217._*	A	6	12	5	9	2.1	12.5	2.5	4.5	0.8
102.008.218._*	A	8	12	5	9	2	12.5	2.5	4.5	1.7
102.010.219._*	A	10.5	12	5	9	3	14.5	2.5	4.5	4.2
102.015.220._*	A	16	12	5	9.5	3.3	14	2.4	4.7	2.3
102.020.221._*	B	20	12	4.5	6	--	15	4.7	--	2.1
102.030.222._*	B	30	15	4.5	6	--	15	5	--	1.9
102.040.223._*	B	40	19.5	4.7	6.5	--	15	5	--	2

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups with curved lip - SFU-D

Product Description	Advantage
Universal flat vacuum cups with tapering curved sealing lip. Connection via plug-in nipple.	> Pre-tension of the sealing lip enables gripping of uneven, slightly curved products > Large lift

Technical data

Item no.	Model / Lip dimensions		Material / Colour
112.004.001._*	SFU-D-4	0.5	NBR (sw), SI (r)
112.005.002._*	SFU-D-5	0.7	NBR (sw), SI (r)
112.006.003._*	SFU-D-6	1	NBR (sw), SI (r)
112.008.007._*	SFU-D-8	1.5	NBR (sw), SI (w), NR (sw)
112.010.011._*	SFU-D-10	2	NBR (sw), SI (w)
112.012.015._*	SFU-D-12	2	NBR (sw), SI (w), NR (sw)
112.015.022._*	SFU-D-15	2	NBR (sw), SI (w), NR (sw)
112.018.024._*	SFU-D-18	2.3	NBR (sw), SI (w), NR (sw)
112.020.031._*	SFU-D-20	2.3	NBR (sw), SI (w), NR (sw)
112.022.037._*	SFU-D-22	2.5	NBR (sw), SI (w)
112.025.042._*	SFU-D-25	4.5	NBR (sw), SI (w), NR (sw)
112.030.052._*	SFU-D-30	4.5	NBR (sw), SI (w)
112.035.060._*	SFU-D-35	5	NBR (sw), SI (w), NR (sw)
112.040.071._*	SFU-D-40	4	NBR (sw), SI (tr)
112.045.077._*	SFU-D-45	7	NBR (sw), SI (w), NR (sw)
112.060.091._*	SFU-D-60	9	NBR (sw), SI (tr)
112.085.102._*	SFU-D-85	12	NBR (sw), SI (tr), NR (sw)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

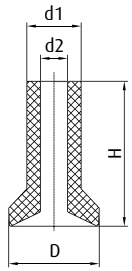
Accessories

Item no.	Suitable fittings							
	M3-male	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
112.004.001._*	270.025 (p.408)	--	--	--	--	--	--	--
112.005.002._*	270.025 (p.408)	--	--	--	--	--	--	--
112.006.003._*	270.025 (p.408)	--	--	--	--	--	--	--
112.008.007._*	--	270.536 (p.409)	--	--	--	--	--	--
112.010.011._*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.012.015._*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.015.022._*	--	270.134 (p.409)	--	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.018.024._*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.020.031._*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.022.037._*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.025.042._*	--	270.443 (p.410)	--	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
112.030.052._*	--	270.443 (p.410)	--	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
112.035.060._*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.040.071._*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.045.077._*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.060.091._*	--	--	--	--	--	--	270.042 (p.431)	--
112.085.102._*	--	--	--	--	--	--	270.216 (p.431)	--

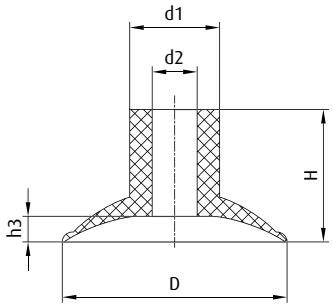
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

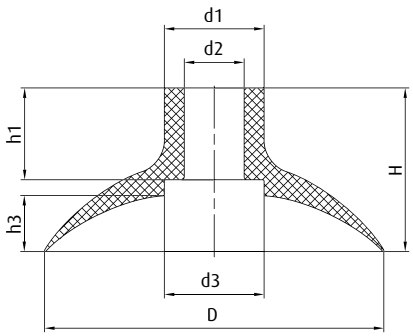
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	**H** [mm]	**h1** [mm]	**h3** [mm]
112.004.001._*	A	4	3	1.5	--	7.5	--	--
112.005.002._*	A	5	3	1.5	--	8	--	--
112.006.003._*	A	6	3	1.5	--	8	--	--
112.008.007._*	B	8	5	2.8	--	8	--	1.6
112.010.011._*	B	10	6.5	3.8	--	10.5	--	1.9
112.012.015._*	B	12	8	4	--	11	--	1.7
112.015.022._*	B	15	8	4	--	12	--	2.5
112.018.024._*	B	18	8	3.9	--	11.5	--	2.3
112.020.031._*	B	20	8	4	--	12	--	2.3
112.022.037._*	B	22	8	4	--	13	--	2.5
112.025.042._*	B	25	12	6	--	16	--	4.3
112.030.052._*	B	30	12	6	--	17	--	4.4
112.035.060._*	B	35	15	10	--	16.5	--	5.2
112.040.071._*	B	40	15	10	--	16	--	4
112.045.077._*	B	45	15.5	10	--	17	--	7.5
112.060.091._*	C	60	15	10	25	23	10	9
112.085.102._*	C	85	25	15	25	41	23	14

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Flat vacuum cups with long shaft - SFU-L

Product Description	Advantage
Flat vacuum cups for handling sensitive or uneven and slightly curved products. Long, slim design enables pipe mounting and low gimbal leveling for uneven product surfaces.	> Gentle handling of particularly sensitive products > Cost-effective replacement of worn seals

Technical data

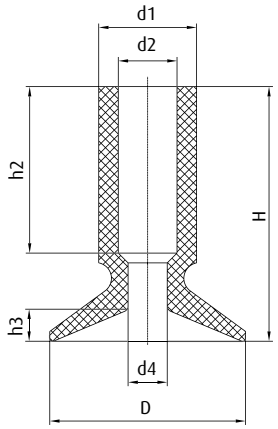
Item no.	Model / Lip dimensions		Material / Colour
122.006.002._*	SFU-L-6	1.5	NBR (sw), SI (tr)
122.010.005._*	SFU-L-10	1.5	NBR (sw), SI (tr)
122.016.009._*	SFU-L-16	5	NBR (sw), SI (tr), NR (sw)
122.025.025._*	SFU-L-25	5	NBR (sw), SI (tr), NR (sw)
122.040.043._*	SFU-L-40	4	SI (tr), NR (sw)
122.060.059._*	SFU-L-60	10	NBR (sw), SI (tr), NR (sw)

Accessories

	Suitable fittings				
Item no.	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
122.006.002._*	270.001 (p.409)	--	--	--	--
122.010.005._*	270.022 (p.409)	--	--	--	--
122.016.009._*	270.013 (p.410)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
122.025.025._*	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
122.040.043._*	--	--	--	270.049-1 (p.426)	--
122.060.059._*	--	--	--	270.049-1 (p.426)	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d4** [mm]	**H** [mm]	**h2** [mm]	**h3** [mm]
122.006.002._*	6	4	2	1	12	8	1.3
122.010.005._*	10	5	3	2	13	8.5	1.6
122.016.009._*	16	8	4.8	3	20	13	3.8
122.025.025._*	25	12	8	4	30	18	5.5
122.040.043._*	43	20	11	4.4	41	22	10.2
122.060.059._*	62	24	11	6	45	21	14.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups for chocolates - SL-PF

Product Description	Advantage
Flat vacuum cups made of FDA-approved material for handling delicate products with heavily textured surfaces.	> Gentle handling of the most sensitive surfaces > Also suitable for three-dimensional products, e.g. chocolates

Technical data

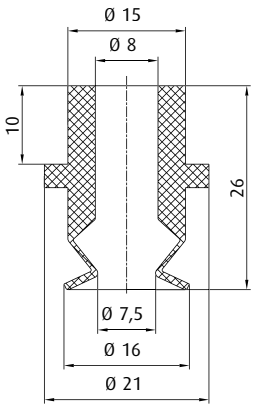
Item no.	Model / Lip dimensions		Material / Colour
107.016.008._*	SL-PF-16	2.4	SI (tr)
102.018.345._*	SL-PF-18	--	SI (tr)
107.018.004._*	SL-PF-18A	--	SI (tr)
102.022.043._*	SL-PF-22	5	SI (tr)

Accessories

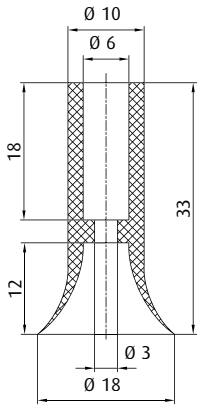
	Suitable fittings				
Item no.	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
107.016.008._*	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
102.018.345._*	270.443 (p.410)	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
107.018.004._*	270.399 (p.410)	270.033 (p.416)	270.478 (p.421)	--	--
102.022.043._*	--	270.112 (p.419)	270.114 (p.422)	270.113 (p.425)	270.178 (p.431)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

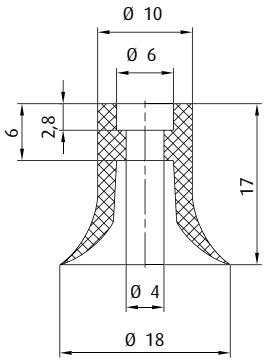
Dimensions



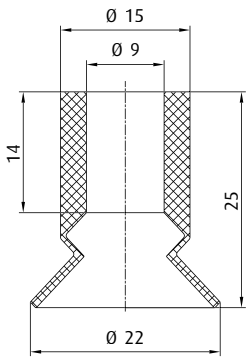
Drawing A



Drawing B



Drawing C



Drawing D

Item no.	Drawing
107.016.008._*	A
102.018.345._*	B
107.018.004._*	C
102.022.043._*	D

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vacuum cups for handling tubes - SV-T

Product Description

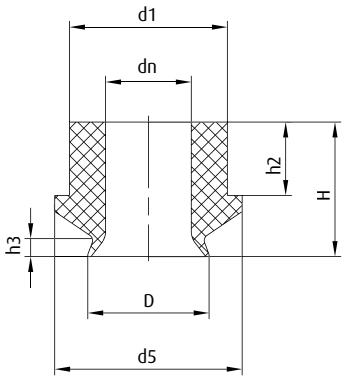
Special FDA-compliant seals for pipe mounting

Technical data

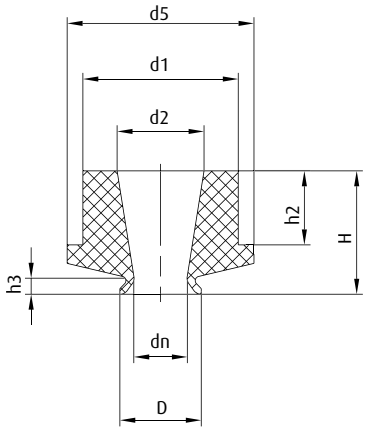
Item no.	Model / Lip dimensions	Material / Colour
With straight passage - SV-TG		
107.019.076._*	SV-TG-19	SI (tr)
107.019.112._*	SV-TG-20	SI (tr)
107.022.107._*	SV-TG-22	SI (tr)
107.025.109._*	SV-TG-25	SI (tr)
107.026.111._*	SV-TG-26	SI (tr)
107.028.108._*	SV-TG-28	SI (tr)
107.032.113._*	SV-TG-32	SI (tr)
107.037.114._*	SV-TG-37	SI (tr)
107.045.115._*	SV-TG-46	SI (tr)
With conical passage - SV-TK		
107.011.103._*	SV-TK-11	SI (tr)
107.012.106._*	SV-TK-12	SI (tr)
107.013.101._*	SV-TK-13	SI (tr)
107.013.105._*	SV-TK-13A	SI (tr)
107.015.102._*	SV-TK-15	SI (tr)
107.017.066._*	SV-TK-17	SI (tr)
107.018.104._*	SV-TK-18	SI (tr)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d5 [mm]	Ø dn [mm]	H [mm]	h2 [mm]	h3 [mm]
With straight passage - SV-TG									
107.019.076._*	A	18.5	25	--	30	14	21	12	2.2
107.019.112._*	A	19.5	25	--	30	14	22	12	2.9
107.022.107._*	A	22	25	--	30	17	21.5	12	2.5
107.025.109._*	A	25	25	--	31	17	22	12	2.6
107.026.111._*	A	26	25	--	30	17	23	12	5.5
107.028.108._*	A	28	25	--	30	19	24	12	5.5
107.032.113._*	A	32	32	--	40	25	25	13	2.3
107.037.114._*	A	37	45	--	53	29	31	17.5	2.7
107.045.115._*	A	46	45	--	54	37	32	17.5	--
With conical passage - SV-TK									
107.011.103._*	B	11	25	13.5	31	7.5	21	12	1.2
107.012.106._*	B	12.5	25	14	30	10.5	21	12	1.9
107.013.101._*	B	13	25	14	30	10.5	20	12	1.1
107.013.105._*	B	13	25	14	30	8.5	20	12	2.6
107.015.102._*	B	15	25	16	30	10.5	20	12	3
107.017.066._*	B	17.5	25	17	31	12.5	20	12	2.7
107.018.104._*	B	18	25	18	30	14	21	12	2.4

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Anti-slip flat vacuum cups - SM-P

Product Description

Flat vacuum cups of oil-resistant NBR for handling metal sheets.
Distinct radially extending cleats increase the holding force and prevent “deep drawing” of the product as well as any slipping of oily sheets.
The firmly bolted holder (from Ø 20 mm) provides a secure seating.

Technical data

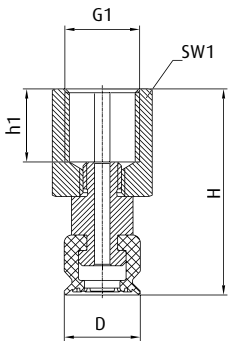
Item no.	Model / Lip dimensions	Connection thread		Material / Colour
With female thread - SM-PI				
100.010.100._*	SM-PI-10	G1/8-female	0.5	NBR (sw)
100.020.101._*	SM-PI-20	G1/8-female	1.1	NBR (sw)
100.030.102._*	SM-PI-30	G1/8-female	1.8	NBR (sw)
100.040.103._*	SM-PI-40	G1/8-female	2.5	NBR (sw)
100.050.104._*	SM-PI-50	G1/4-female	3.1	NBR (sw)
With male thread - SM-PI				
100.010.110._*	SM-PA-10	G1/8-male	0.5	NBR (sw)
100.020.111._*	SM-PA-20	G1/8-male	1.1	NBR (sw)
100.030.112._*	SM-PA-30	G1/8-male	1.8	NBR (sw)
100.040.113._*	SM-PA-40	G1/8-male	2.5	NBR (sw)
100.050.114._*	SM-PA-50	G1/4-male	3.1	NBR (sw)

Accessories

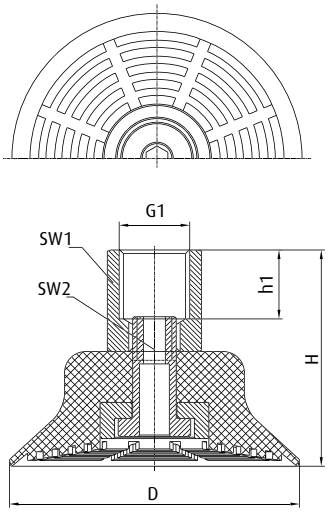
Spare cup
104.010.065.1 (p.183)
104.020.066.1 (p.201)
104.030.067.1 (p.219)
104.040.068.1 (p.231)
104.050.069.1 (p.239)
104.010.065.1 (p.183)
104.020.066.1 (p.201)
104.030.067.1 (p.219)
104.040.068.1 (p.231)
104.050.069.1 (p.239)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

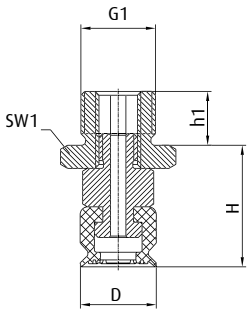
Dimensions



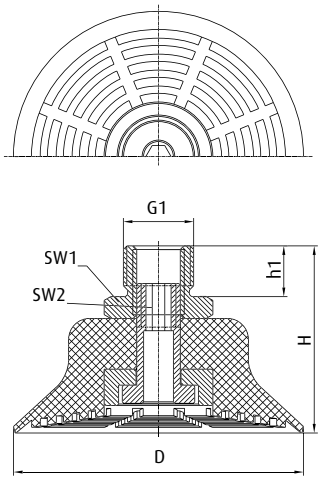
Drawing A



Drawing B



Drawing C

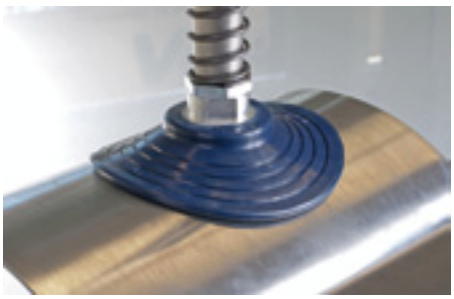


Drawing D

Item no.	Drawing	Ø D [mm]	G1	H [mm]	h1 [mm]	SW1	SW2
With female thread - SM-PI							
100.010.100._*	A	10	G1/8	27	9.5	13	--
100.020.101._*	B	20	G1/8	24	9.5	13	3
100.030.102._*	B	30	G1/8	26	9.5	13	3
100.040.103._*	B	40	G1/8	30	9.5	13	3
100.050.104._*	B	50	G1/4	35	11	17	3
With male thread - SM-PI							
100.010.110._*	C	10	G1/8	16	7	13	--
100.020.111._*	D	20	G1/8	23	8	13	3
100.030.112._*	D	30	G1/8	25	8	13	3
100.040.113._*	D	40	G1/8	29	8	13	3
100.050.114._*	D	50	G1/4	32	10	17	3

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Flat vacuum cups for dynamic sheet handling - SM-F



Product Description

Robust, round NBR flat vacuum cups, 60° Shore A with vulcanised fitting made of aluminium and large area, multi-part “anti-slip” cleats.
Various connection threads available.
Silicone-free.

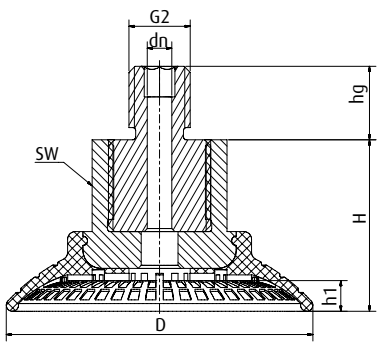
Advantage

- Reliable, non-slip handling of oily sheets due to “anti-slip” cleats. Good absorption of lateral forces
- Supports help to prevent deep-drawing or deformation of thin sheets
- Leak-free suction even with slightly curved surfaces due to flexible sealing lip
- Vulcanised connection thread ensures a secure fit

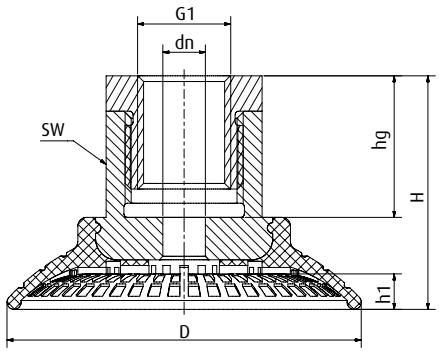
Technical data

Model / Lip dimensions	Thread (Aluminium)						
	G1/4-male	G1/4-female	G3/8-female	M10-male	M14x1.5-male	Rectangular adapter	
SM-F-30	103.030.030.1	103.030.031.1	103.030.032.1	103.030.033.1	103.030.034.1	103.030.035.1	3
SM-F-40	103.040.036.1	103.040.037.1	103.040.038.1	103.040.039.1	103.040.040.1	103.040.041.1	4
SM-F-50	103.050.042.1	103.050.043.1	103.050.044.1	103.050.045.1	103.050.046.1	103.050.047.1	5
SM-F-60	103.060.048.1	103.060.049.1	103.060.050.1	103.060.051.1	103.060.052.1	103.060.053.1	6
SM-F-80	103.080.054.1	103.080.055.1	103.080.056.1	103.080.057.1	103.080.058.1	103.080.059.1	7.6
SM-F-100	103.100.060.1	103.100.061.1	103.100.062.1	103.100.063.1	103.100.064.1	103.100.065.1	9.5
SM-F-125	103.125.066.1	103.125.067.1	103.125.068.1	103.125.069.1	103.125.070.1	103.125.071.1	12.5

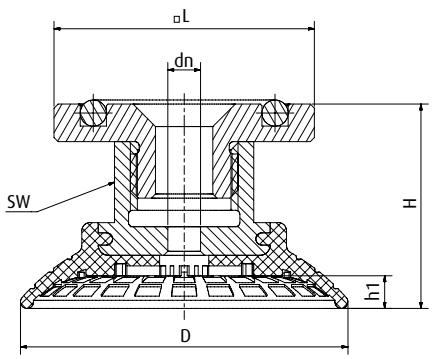
Dimensions



Drawing A



Drawing B



Drawing C

„Anti-Slip“-Cleats (SM-F-100)

Phone +49 (0)89 / 96 24 89-0

Item no.	Drawing	G1 (female)	G2 (male)	Ø D [mm]	Ø dn [mm]	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
103.030.030._*	A	--	G1/4	30	4	--	20	3	10	17
103.030.031._*	B	G1/4	--	30	4	--	20	3	12	17
103.030.032._*	B	G3/8	--	30	4	--	36	3	10	17
103.030.033._*	A	--	M10	30	4	--	20	3	12	17
103.030.034._*	A	--	M14x1.5	30	4	--	20	3	12	17
103.030.035._*	C	--	--	30	4	32	23.2	3	--	17
103.040.036._*	A	--	G1/4	40	4	--	22	4	10	17
103.040.037._*	B	G1/4	--	40	4	--	22	4	12	17
103.040.038._*	B	G3/8	--	40	4	--	38	4	10	17
103.040.039._*	A	--	M10	40	4	--	22	4	12	17
103.040.040._*	A	--	M14x1.5	40	4	--	22	4	12	17
103.040.041._*	C	--	--	40	4	32	25	4	--	17
103.050.042._*	A	--	G1/4	50	6	--	28	5	10	22
103.050.043._*	B	G1/4	--	50	6	--	33	5	20	22
103.050.044._*	B	G3/8	--	50	6	--	28	5	15	22
103.050.045._*	A	--	M10	50	4	--	28	5	12	22
103.050.046._*	A	--	M14x1.5	50	6	--	28	5	12	22
103.050.047._*	C	--	--	50	6	32	27.5	5	--	22
103.060.048._*	A	--	G1/4	60	6	--	31	6	10	22
103.060.049._*	B	G1/4	--	60	8	--	36	6	20	22
103.060.050._*	B	G3/8	--	60	8	--	31	6	15	22
103.060.051._*	A	--	M10	60	4	--	31	6	12	22
103.060.052._*	A	--	M14x1.5	60	6	--	31	6	12	22
103.060.053._*	C	--	--	60	6	32	30.5	6	--	22
103.080.054._*	A	--	G1/4	80	6	--	35	7.6	10	22
103.080.055._*	B	G1/4	--	80	8	--	40	7.6	20	22
103.080.056._*	B	G3/8	--	80	8	--	35	7.6	15	22
103.080.057._*	A	--	M10	80	4	--	35	7.6	12	22
103.080.058._*	A	--	M14x1.5	80	6	--	35	7.6	12	22
103.080.059._*	C	--	--	80	8	32	34.5	7.6	--	22
103.100.060._*	A	--	G1/4	100	6	--	36	9.5	10	22
103.100.061._*	B	G1/4	--	100	8	--	41	9.5	20	22
103.100.062._*	B	G3/8	--	100	8	--	36	9.5	15	22
103.100.063._*	A	--	M10	100	4	--	36	9.5	12	22
103.100.064._*	A	--	M14x1.5	100	6	--	36	9.5	12	22
103.100.065._*	C	--	--	100	8	32	35.5	9.5	--	22
103.125.066._*	A	--	G1/4	125	6	--	43	12.5	10	22
103.125.067._*	B	G1/4	--	125	8	--	48	12.5	20	22
103.125.068._*	B	G3/8	--	125	8	--	43	12.5	15	22
103.125.069._*	A	--	M10	125	4	--	43	12.5	12	22
103.125.070._*	A	--	M14x1.5	125	6	--	43	12.5	12	22
103.125.071._*	C	--	--	125	8	32	42.5	12.5	--	22

Flat vacuum cups for textured surfaces - SFU-R

Product Description

Flat vacuum cups with safety sealing lips to handle rough surfaces, as well as smooth but very uneven products.
Connection via an interlocking, snap-in aluminium plate

Advantage

- Leak-free gripping of many difficult product surfaces thanks to extremely flexible, thinly tapered sealing lip
- High stability under lateral forces
- Optimum process reliability due to additional double lip seal
- Cleats help prevent warping of the product
- Cost-effective, tool-free changing of worn seals

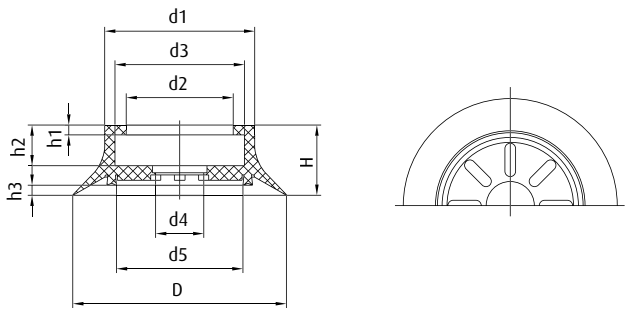
Technical data

Item no.	Model / Lip dimensions		Material / Colour
102.040.357._*	SFU-R-40	3	SI (tr), NR (br)
102.070.234._*	SFU-R-70	6	NBR (gr), SBR (br), SI (tr), NR (bg), NR (br)
102.100.269._*	SFU-R-100	5	SBR (br), NBR (gr), NR (br)
102.200.350._*	SFU-R-200	5	NR (w)

Accessories

	Suitable fittings		
Item no.	G1/8-female	G1/4-female	G1/2-female
102.040.357._*	270.234 (p.438)	--	--
102.070.234._*	--	270.179 (p.438)	--
102.100.269._*	--	270.180 (p.438)	--
102.200.350._*	--	--	270.335 (p.438)

Dimensions



Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h1** [mm]	**h2** [mm]	**h3** [mm]
102.040.357._*	40	26	17.5	21	8	21	12.5	2.9	6	2.5
102.070.234._*	70	50	33	43	14	40	30	3.5	17	5.4
102.100.269._*	100	70	50	61	23	59	33	4.6	19	4.7
102.200.350._*	200	168	148	158	25	158	31	5	18.5	3.2

Flat vacuum cups for separating porous products - SFU-RT

Product Description

Patented flat vacuum cups for stacking of partially air-permeable plate material that air is drawn through.
Separates uppermost plate layer from underlying plate layers.
Soft sealing lip made of abrasion-resistant NR. Secure handling even of rough surfaces thanks to additional internal safety sealing lip.
High stability under lateral forces.
Cost-effective replacement of the wear part, as it comes in two parts.

Ordering notes

Elastomer seal and carrier plate 270.380 must be ordered separately

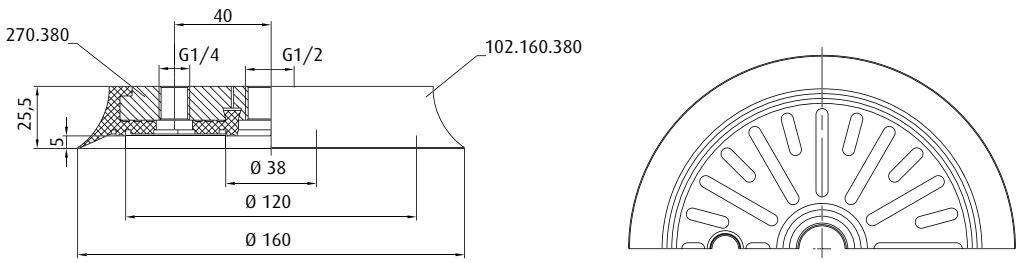
Technical data

Item no.	Model / Lip dimensions		Material / Colour	Suitable fittings
102.160.380.4	SFU-RT-160	6	NR (bg)	270.380

Functional principle

Task: Access the top layer of porous materials without carrying along the lower layers.
Simultaneous intake (outer chamber) and selective blowing in a separate central chamber breaks adhesive forces between the layers.
The unwanted take-up of lower layers is prevented.
The air pressure level should be between 1 and 3 bar and is dependent on the nature of the product.

Dimensions



Gripping force [N] at vacuum level [%]

Item no.	20 % Vacuum	30 % Vacuum	40 % Vacuum	50 % Vacuum	60 % Vacuum	70 % Vacuum
102.160.380.4	83	137	186	230	280	324

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

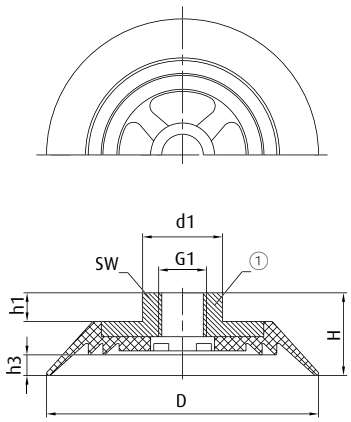
Flat vacuum cups with double safety sealing lips - SFU-S

Product Description	Advantage
Flat vacuum cups with dual internal safety sealing lip as well as vulcanised carrier plate made of aluminium.	> High process reliability through multiple sealing lip > Excellent lateral stability due to vulcanised carrier plate, as well as rubberised support surfaces for the product

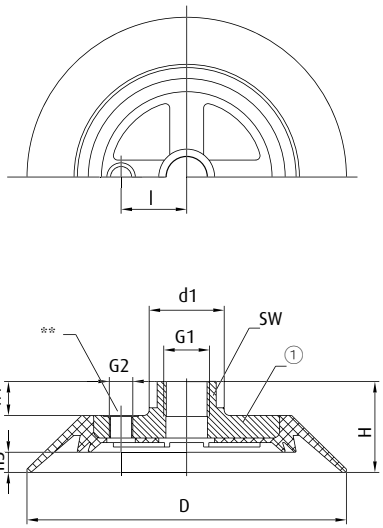
Technical data

Item no.	Model / Lip dimensions	Connection thread		Material / Colour
150.030.031._*	SFU-S-30	M5-female	3	SI (r), CR (sw)
150.050.032._*	SFU-S-50	G1/8-female	5.5	SI (r), FKM (sw), CR (sw)
150.075.033._*	SFU-S-75	G1/4-female	6	SI (r), FKM (sw), CR (sw)
150.100.034._*	SFU-S-100	G3/8-female	9	NBR (sw), SI (tr), NR (w)
150.150.010._*	SFU-S-150	G1/2-female	9	SI (gr), CR (gr)
150.225.018._*	SFU-S-225	G3/4-female	9.5	SI (gr), CR (gr)

Dimensions



Drawing A



Drawing B

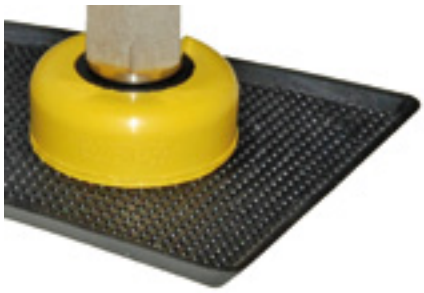
① = Aluminium ** = Vacuum connection at the side possible

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

Item no.	Drawing	Ø **D** [mm]	**l** [mm]	Ø **d1** [mm]	**G1**	**G2**	**H** [mm]	**h1** [mm]	**h3** [mm]	**SW**
150.030.031._*	A	29	--	10	M5	--	17.5	7	3	8
150.050.032._*	A	50	--	18	G1/8	--	18.5	7	5.5	14
150.075.033._*	A	75	--	22	G1/4	--	23	8	5.5	17
150.100.034._*	A	100	--	30	G 3/8	--	30	10	9	24
150.150.010._*	B	146	30	34	G1/2	G1/8	42	15.5	9	27
150.225.018._*	B	223	50	49	G3/4	G1/8	52	20	9.5	40

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

Flat vacuum cups with a short lift - SFK



Product Description

Flat vacuum cups with a minimum lift for flat surfaces. HNBR version especially suited for removing hot plastic parts from an injection moulding machine, as they are silicone-free and temperature-resistant up to 160 °C.
SFK-G series particularly suitable for clamping elements. Connection via a form-locking, snap-in aluminium plate.

Advantage

- Great suction power thanks to the largest active vacuum suction surface possible
- Minimised wear, as the suction lip does not slide over the product during suction
- Low space requirement
- Cost-effective replacement of worn seals

Technical data

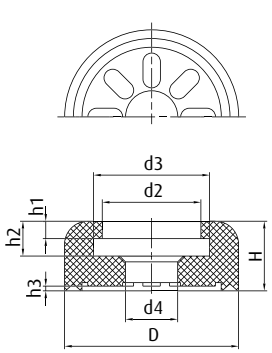
Item no.	Model / Lip dimensions		Material / Colour
	SFK-K		
102.020.458._*	SFK-K-20	0.5	HNBR (ge), NR (br)
102.030.459._*	SFK-K-30	0.8	HNBR (ge), NR (br)
102.045.460._*	SFK-K-45	1.2	HNBR (ge), NR (br)
	SFK-G		
154.065.003._*	SFK-G-65	3	NBR (sw), SI (w), NR (sw)
154.110.014._*	SFK-G-110	1.5	NBR (sw), SI (w)
154.150.021._*	SFK-G-150	2	NBR (sw), SI (w)

Accessories

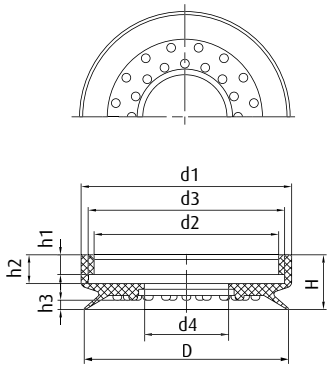
	Suitable fittings				
Item no.	M5-male	G1/8-female	G1/4-female	G3/8-female	G1/2-female
SFK-K					
102.020.458._*	270.521 (p.412)	--	--	--	--
102.030.459._*	--	270.234 (p.438)	--	--	--
102.045.460._*	--	270.235 (p.438)	--	--	--
SFK-G					
154.065.003._*	--	270.158 (p.438)	270.264 (p.438)	270.161 (p.438)	270.286 (p.438)
154.110.014._*	--	--	270.224 (p.438)	270.167 (p.438)	270.266 (p.438)
154.150.021._*	--	--	270.171 (p.438)	270.173 (p.438)	270.268 (p.438)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

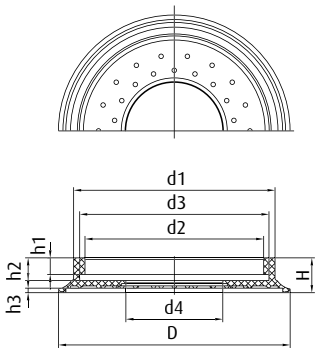
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	**H** [mm]	**h1** [mm]	**h2** [mm]	**h3** [mm]
SFK-K										
102.020.458._*	A	20	20	10	14	6.5	12	3	7	0.5
102.030.459._*	A	30	30	17	20	9	12	3	6	0.8
102.045.460._*	A	45	45	25	28	9	12	3.5	5.5	1.2
SFK-G										
154.065.003._*	B	65	67	59	63	27	17.5	6.3	9	3
154.110.014._*	C	114	96	88	91	53	17	8	11	1.2
154.150.021._*	C	153	133	118	125	64	23	11	15	3

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vacuum suction plates with foam rubber sealing lip - SP-PLM

Product Description

Flat vacuum suction plate with a soft, foamed sealing lip made of EPDM.
The sealing lip snaps (form-locking) into a support plate.

Advantage

> Good sealing of heavily textured surfaces
> Cost-effective replacement of worn seals

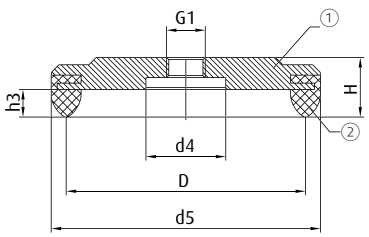
Technical data

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Material / Colour
160.042.001._*	SP-PLM-35	G1/8-female	1	22	EPDM (sw)
160.067.003._*	SP-PLM-60	G1/8-female	1	63	EPDM (sw)
160.107.006._*	SP-PLM-100	G1/2-female	1	234	EPDM (sw)
160.145.014._*	SP-PLM-140	G1/2-female	1	588	EPDM (sw)
160.215.009._*	SP-PLM-200	G3/4-female	2.5	1,220	EPDM (sw)
160.315.012._*	SP-PLM-300	G3/4-female	2.5	2,482	EPDM (sw)

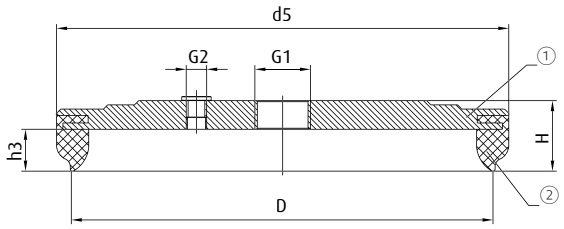
Accessories

Spare cup	Touch valve
102.038.451.15 (p.227)	270.129 (p.670)
102.060.452.15 (p.244)	270.129 (p.670)
102.100.453.15 (p.259)	270.130 (p.670)
102.140.454.15 (p.266)	270.130 (p.670)
102.210.455.15 (p.273)	--
102.310.456.15 (p.279)	--

Dimensions



Drawing A



Drawing B

① = Aluminium ② = EPDM foamed

Item no.	Drawing	Ø D [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	G2	H [mm]	h3 [mm]
160.042.001._*	A	35	20	43	G1/8	--	15	7
160.067.003._*	A	60	20	68	G1/8	--	15	7
160.107.006._*	A	100	30	108	G1/2	--	19	7
160.145.014._*	A	138	30	145	G1/2	--	24	7
160.215.009._*	B	201	--	215	G3/4	G1/8	34	20
160.315.012._*	B	300	--	315	G3/4	G1/8	34	20

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Heavy-duty flat vacuum suction plates - SFPL-D

Product Description

Heavy-duty vacuum suction plate for both smooth and rough surfaces such as metal sheets, cut marble, granite, precast concrete, metal plates or rough-sawn wood. Central mounting connection - lateral vacuum port.

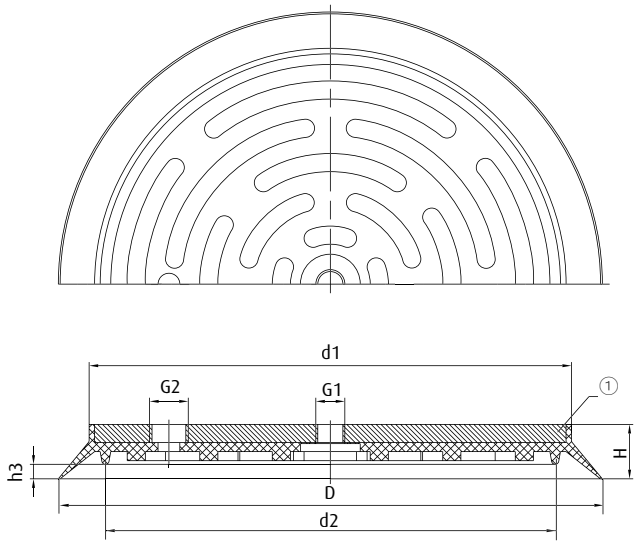
Advantage

> Vulcanised steel carrier plate allows lifting of very heavy loads
> Secure gripping of uneven surfaces thanks to additional inner sealing lip
> Lateral vacuum connection

Technical data

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Material / Colour
152.160.127._*	SFPL-D-160	M12-female	9	970	CR (sw)
152.200.128._*	SFPL-D-200	M12-female	9	1,741	CR (sw)
152.250.129._*	SFPL-D-250	M12-female	9	2,990	CR (sw)
152.300.130._*	SFPL-D-300	M16-female	12	4,370	NBR (sw)
152.350.131._*	SFPL-D-350	M16-female	13	6,274	NBR (sw)

Dimensions



① = Steel

Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	**G1**	**G2**	**H** [mm]	**h3** [mm]
152.160.127._*	160	124	109	M12	G3/8	28	9
152.200.128._*	200	166	146	M12	G3/8	27	7.5
152.250.129._*	250	212	194	M12	G3/8	27	7
152.300.130._*	300	266	248	M16	G1/2	30	8
152.350.131._*	350	316	298	M16	G1/2	30	8

Flat XXL suction rings - SFR

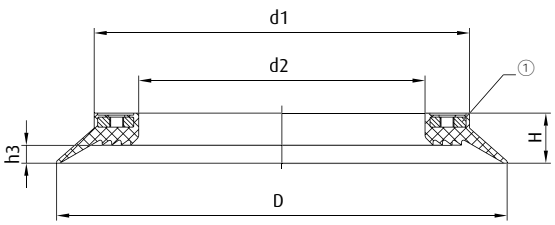
Product Description

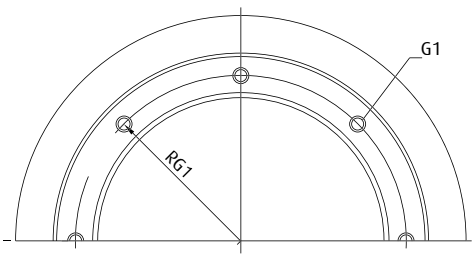
Large flat suction seals vulcanised on steel ring for handling very large loads. Mounting through circular, circumferentially placed thread holes.

Technical data

Item no.	Material / Colour	
152.285.099._*	NBR (sw)	11
152.450.105._*	NBR (sw)	18
152.540.106._*	NBR (sw)	18
152.630.107._*	NBR (sw)	18
152.720.108._*	NBR (sw)	18
152.920.109._*	NBR (sw)	18

Dimensions





① = Ring made of vulcanised ST37

Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	**G1**	**R G1**	**H** [mm]	**h3** [mm]
152.285.099._*	285	250	160	4xM12	102.5	32	11
152.450.105._*	450	375	286	8xM12	165	50	18
152.540.106._*	540	465	375	8xM12	210	50	18
152.630.107._*	630	556	464	12xM12	255	50	18
152.720.108._*	720	646	554	12xM12	300	50	18
152.920.109._*	920	846	754	12xM12	400	50	18

FIPA Bellows vacuum cups SB

> Gentle handling of delicate products
> Bellows allow for height and angle compensation
> Good adaptation to curved surfaces
> Lifting of the product occurs via the lifting movement of the bellows

Bellows vacuum cups, universal, 1.5 folds - SBU 1

> Universal bellows vacuum cups for handling sensitive or uneven products
> Diameter: 5 - 88 mm

> See page 81

High temperature Thermalon® bellows cups, 1.5 folds - SKT-B1

> Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
> Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Diameter: 11 - 63 mm

> See page 84

High temperature HNBR bellows cups, 1.5 folds - SKT-B1

> Universal vacuum cup for removing hot plastic parts to be painted from an injection molding machine
> Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Diameter: 5 - 43 mm

> See page 86

Bellows vacuum cups, universal, 2.5 folds - SBU 2

> Universal vacuum cup with large stroke for handling sensitive or uneven products
> Diameter: 4 - 88 mm

> See page 89

Continued on the next page

FIPA Bellows vacuum cups SB

High temperature Thermalon® bellows cups, 2.5 folds - SKT-B2

> Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
> Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Diameter 5 - 62 mm

> See page 92

High temperature HNBR bellows cups, 2.5 folds - SKH-B2

> Universal vacuum cup with large stroke for removing hot plastic parts to be painted from an injection molding machine
> Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Diameter: 5 - 60 mm

> See page 94

Bellows vacuum cups, universal, 3.5 folds - SBU 3

> Gentle handling of sensitive products
> Very large lifting movement
> Diameter: 18 - 25 mm

> See page 96

Vulkollan® bellows cups, universal, 1.5 to 2.5 folds - SBU-VU

> Sturdy vacuum cup with minimal wear and a long service life - thereby offering long maintenance intervals
> Short cycle times thanks to very good retraction
> Diameter: 9 - 62 mm

> See page 97

Bellows vacuum cups, 1.5 and 4.5 folds, modular - SP-B

> Widely spread out bellows vacuum cups with a short or long stroke
> Design: Replacement sealing lip for attachment to fitting
> Diameter: 5 - 160 mm

> See page 100

Bellows vacuum cups, 1.5 and 4.5 folds, with fixed mounted fittings - SP-B

> Widely spread out bellows vacuum cups with a short or long stroke
> Design: Complete with vacuum cup fitting and filter screen
> Diameter: 20 - 160 mm

> See page 104

FIPA Bellows vacuum cups SB

Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

> Excellent service life and superior retention force
> Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
> Soft lip for optimal sealing
> Long service life and low wear
> Short cycle times and high process reliability
> Low-marking

1.5 folds - SP-BX1
> Supports (Ø 20 - 75 mm) stabilise the product
> Diameter: 15 - 75 mm

> See page 107

2.5 folds - SP-BX2
> Diameter: 15 - 75 mm

> See page 110

Vinyl bellows cups, 1.5 and 2.5 folds - SBV

> Wear-resistant material - long service life
> Good adaptation to curved or flexible product surfaces

1.5 folds - SBV 1
> Diameter: 5 - 70 mm

> See page 113

2.5 folds - SBV 2
> Diameter: 4 - 50 mm

> See page 116

Bellows vacuum cups, 1.5 folds - SBF-A

> High degree of holding force thanks to supports at the sealing lip
> Fine, flexible sealing lip suitable for uneven surfaces
> Supporting ribs prevent the deformation of thin-walled products
> High process reliability due to fixed, non-rotating seat of the screw fitting
> Diameter: 10 - 80 mm

> See page 119

Bellows vacuum cups, 1.5 folds - SBF-B

> Soft sealing lip and soft bellows enable adaptation to curved or flexible product surfaces
> Extremely gentle handling of sensitive products
> Cost-effective replacement of worn seals thanks to plug-in fittings
> Diameter: 6 - 20 mm

> See page 122

Continued on the next page

FIPA Bellows vacuum cups SB

Bellows vacuum cups, 4.5 folds - SBF-C

> Fine, flexible sealing lip fits in perfectly with irregularities of the product (e.g. bag-packaged goods)
> Large stroke for the gentle handling of sensitive products
> Connection via screwed fittings (hollow bolt + adapter)
> Diameter: 10 - 50 mm

> See page 124

Bellows vacuum cups for chocolates - SL-PB

> Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
> Low-marking and FDA-approved
> Diameter: 12 - 16 mm

> See page 125

Vacuum cups for baked goods SL-B

> Multiple folds ensure a high degree of height adjustment and gentle product handling
> FDA-approved
> Diameter: 34 - 60 mm

> See page 126

Detectable vacuum cups for baked goods - SL-BD

> Detectable, providing optimum assurance that the product is not contaminated by vacuum components
> Multiple folds ensure a high degree of height adjustment and gentle product handling
> FDA-approved
> Diameter: 35 - 40 mm

> See page 128

Vacuum cups for eggs - SL-E

> Bellows vacuum cups in a design specially optimised for handling eggs
> Gentle attachment to the product and a high lifting motion thanks to a long vacuum cup stroke
> FDA-approved
> Diameter: 33 - 34 mm

> See page 129

Bellows vacuum cups 1.5 and 2.5 folds with special connection for standard packaging machines - SV-SB

> Smooth suspension for gentle product handling
> Available in silicone (FDA-approved) and NR
> Diameter: 16 - 40 mm

> See page 130

FIPA Bellows vacuum cups SB

Bellows vacuum cups, 1.5 folds for dynamic sheet handling - SM-B

> Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs. Good absorption of lateral forces
> Internal supports help to prevent deep-drawing or deformation of thin sheets
> Leak-free suction even with curved surfaces due to flexible sealing lip
> Secure fit thanks to vulcanised connecting thread
> Diameter: 30 - 125 mm

> See page 133

Bellows vacuum suction plates softgrip - SBPL-SG

> Very gentle handling of sensitive products thanks to highly flexible fold walls
> Combines the flexibility of bellows cups with the stability of flat vacuum suction plates
> Central support block with safety sealing lip ensures a firm grip
> Diameter: 150 - 210 mm

> See page 136

Bellows vacuum suction plates - SBPL-E

> Gentle handling of heavy, sensitive products
> Good adaptation to concave or convex surfaces
> Rubberised support surfaces prevent deformation of workpieces
> Diameter: 150 - 350 mm

> See page 137

Notes:

Bellows vacuum cups, universal, 1.5 folds - SBU 1

Product Description	Advantage
Universal bellows vacuum cups with 1.5 folds for handling sensitive or uneven products. Connection up to Ø 75 mm by means of plug-in nipple, from Ø 88 mm with vulcanised bracket.	> Bellows compensates for differences in height and enables good adaptation to curved or uneven product surfaces > Soft attachment for sensitive products > Cost-effective replacement of worn seals

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Connection thread
23.005.181._*	SBU 1-5	2	1.5	NBR (sw), SI (tr)	--
23.011.008._*	SBU 1-11	4.5	1.5	NBR (sw), SI (tr)	--
23.013.120._*	SBU 1-13	4	1.5	NBR (sw), SI (tr), NR (gr)	--
23.016.016._*	SBU 1-16	6	1.5	NBR (sw), SI (tr)	--
23.019.119._*	SBU 1-19	4	1.5	NBR (sw), SI (tr)	--
23.022.028._*	SBU 1-22	8	1.5	NBR (sw), SI (tr)	--
23.025.137._*	SBU 1-25	9	1.5	NBR (sw), SI (tr), NR (gr)	--
23.033.039._*	SBU 1-33	12	1.5	NBR (sw), SI (tr), NR (gr)	--
23.043.096._*	SBU 1-43	12	1.5	NBR (sw), SI (tr), NR (gr)	--
23.053.033._*	SBU 1-53	11	1.5	NBR (sw), SI (tr), NR (gr)	--
23.075.151._*	SBU 1-75	20	1.5	NBR (sw), SI (tr)	--
22.088.158._*	SBU 1-88	23	1.5	NBR (sw), SI (tr)	G1/4-male
22.088.159._*	SBU 1-88	23	1.5	NBR (sw), SI (tr)	G1/4-female

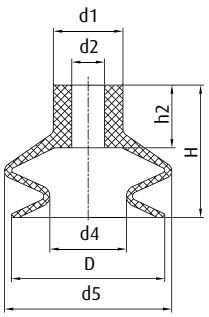
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

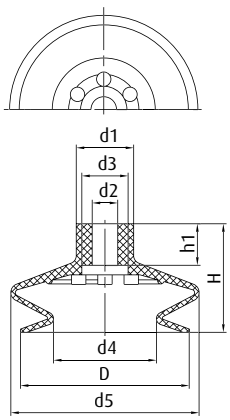
Accessories

Item no.	Suitable fittings							
	M5-male	M5-female	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.181._*	270.195 (p.409)	--	--	--	--	--	--	--
23.011.008._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.013.120._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.016.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.019.119._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.022.028._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.025.137._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.033.039._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.043.096._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.053.033._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.075.151._*	--	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
22.088.158._*	--	--	--	--	--	--	--	--
22.088.159._*	--	--	--	--	--	--	--	--

Dimensions



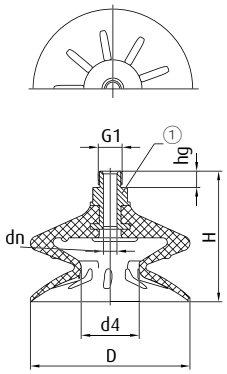
Drawing A



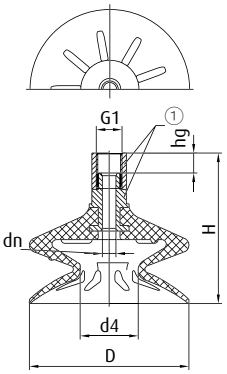
Drawing B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing C



Drawing D

① = Aluminium fitting, vulcanised

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	hg [mm]
23.005.181._*	A	5	3	1.5	--	2	5	--	--	13	--	9.5	--
23.011.008._*	A	12	10	5	--	4.5	12	--	--	16	--	9	--
23.013.120._*	A	13.5	10	3.8	--	5	13.5	--	--	16	--	9	--
23.016.016._*	A	16	10	5	--	8	17	--	--	19	--	9	--
23.019.119._*	A	18.5	10	4.5	--	11	19.5	--	--	15	--	8.5	--
23.022.028._*	A	22	10	4.5	--	11	24	--	--	19	--	9	--
23.025.137._*	A	24	10	4	--	10	24	--	--	23	--	9	--
23.033.039._*	B	33.5	18	8	16.5	17	36	--	--	28	13	--	--
23.043.096._*	B	43	18	8	14.5	23	45	--	--	27	12	--	--
23.053.033._*	B	53	18	8	14.5	32	59	--	--	34	13	--	--
23.075.151._*	B	75	27	11	--	43	70.5	--	--	52	--	22	--
22.088.158._*	C	88	--	--	--	32	88	7.5	G1/4	72	--	--	9
22.088.159._*	D	88	--	--	--	32	88	7.5	G1/4	83	--	--	11

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature Thermalon® bellows cups, 1.5 folds - SKT-B1

UP TO 160 °C & MINIMUM MARKING

Product Description

Bellows vacuum cups for uneven surfaces especially suited for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A.
Connection via plug-in nipple.

Advantage

> Extremely low-marking
> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces

Technical data

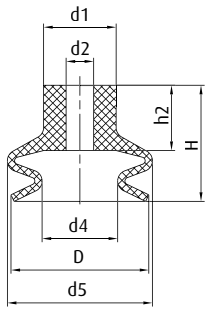
Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Usage temperature [°C]
23.011.234._*	SKT-B1-11	5.5	1.5	Thermalon® (bl)	0 - 160
23.014.235._*	SKT-B1-14	5	1.5	Thermalon® (bl)	0 - 160
23.016.236._*	SKT-B1-16	8.5	1.5	Thermalon® (bl)	0 - 160
23.018.237._*	SKT-B1-18	5	1.5	Thermalon® (bl)	0 - 160
23.020.238._*	SKT-B1-20	5	1.5	Thermalon® (bl)	0 - 160
23.022.239._*	SKT-B1-22	8	1.5	Thermalon® (bl)	0 - 160
23.025.240._*	SKT-B1-25	12	1.5	Thermalon® (bl)	0 - 160
23.033.241._*	SKT-B1-33	11	1.5	Thermalon® (bl)	0 - 160
23.043.242._*	SKT-B1-43	12.5	1.5	Thermalon® (bl)	0 - 160
23.053.243._*	SKT-B1-53	15	1.5	Thermalon® (bl)	0 - 160
23.063.244._*	SKT-B1-63	15	1.5	Thermalon® (bl)	0 - 160

Accessories

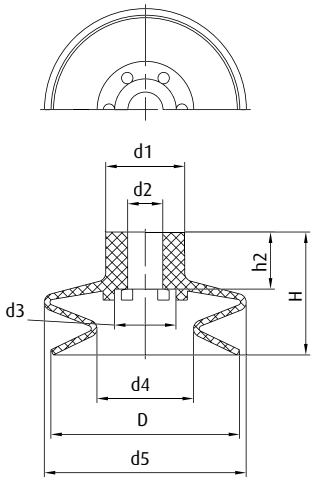
	Suitable fittings						
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.011.234._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.014.235._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.016.236._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.018.237._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.020.238._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.022.239._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.025.240._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.033.241._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.043.242._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.053.243._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.063.244._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h2** [mm]
23.011.234._*	A	11	10	3.8	--	5	12	16	9
23.014.235._*	A	13	10	3.8	--	5	14	16	9
23.016.236._*	A	16	10	3.8	--	8	17.5	19	9
23.018.237._*	A	18	10	3.8	--	8	18	16.5	9
23.020.238._*	A	19	10	3.8	--	10.5	20	16	9
23.022.239._*	A	22	10	3.8	--	11	24	19	9
23.025.240._*	A	24	10	3.8	--	9.5	25	23	9
23.033.241._*	B	33	18	8	14	17	36	28	13
23.043.242._*	B	43	18	8	14	22	46	28	13
23.053.243._*	B	53	18	8	14	33	59	34	13
23.063.244._*	B	63	18	8	14	44	67	34	13

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature HNBR bellows cups, 1.5 folds - SKH-B1

UP TO 160 °C & MINIMUM MARKING

Product Description

Bellows vacuum cups for uneven surfaces with suitability for removing hot plastic parts to be painted from an injection moulding machine. Connection via plug-in nipple.

Advantage

> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Minimum-marking
> Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces

Technical data

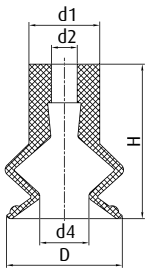
Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Usage temperature [°C]
23.005.178._*	SKH-B1-5	2	1.5	HNBR (ge)	0 - 160
23.008.166._*	SKH-B1-8	3.5	1.5	HNBR (ge)	0 - 160
23.011.008._*	SKH-B1-11	4.5	1.5	HNBR (ge)	0 - 160
23.015.122._*	SKH-B1-15	5	1.5	HNBR (ge)	0 - 160
23.016.016._*	SKH-B1-16	6	1.5	HNBR (ge)	0 - 160
23.020.124._*	SKH-B1-20	8	1.5	HNBR (ge)	0 - 160
23.030.125._*	SKH-B1-30	9	1.5	HNBR (ge)	0 - 160
23.043.096._*	SKH-B1-43	12	1.5	HNBR (ge)	0 - 160

Accessories

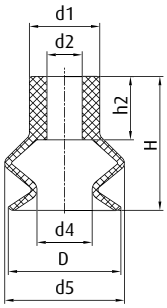
	Suitable fittings						
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.178._*	270.153 (p.409)	--	--	--	--	--	--
23.008.166._*	270.153 (p.409)	--	--	--	--	--	--
23.011.008._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.015.122._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--
23.016.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.020.124._*	270.311 (p.411)	--	--	270.063 (p.419)	270.061 (p.422)	--	--
23.030.125._*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.043.096._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

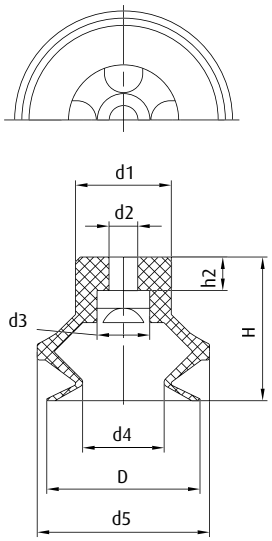
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h2** [mm]
23.005.178._*	A	6	5	2	--	2.2	--	9	--
23.008.166._*	A	9	5.5	2	--	3.8	--	12	--
23.011.008._*	B	12	10	5	--	4.5	12	16	9
23.015.122._*	C	15	8.5	3.6	6	8	17	16	1.7
23.016.016._*	B	16	10	5	--	8	17	19	9
23.020.124._*	C	21.5	15	4.5	11	10	23.5	20	4.6
23.030.125._*	C	32	20	6	11	17	36	30	7
23.043.096._*	B	43	18	8	--	23	45	27	12

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Bellows vacuum cups, universal, 2.5 folds - SBU 2

Product Description

Universal bellows vacuum cups with 2.5 folds for handling sensitive or uneven products over large lift movements.
Connection up to Ø 75 mm by means of plug-in nipple, from Ø 88 mm with vulcanised bracket.

Advantage

> Bellows compensate for differences in height and enable good adaptation to curved or uneven product surfaces
> Soft attachment for sensitive products
> Cost-effective replacement of worn seals

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Connection thread
21.004.083._*	SBU 2-4	3	2.5	SI (tr)	--
21.005.057._*	SBU 2-5	3	2.5	NBR (g), SI (g), SI-AS (sw)	--
21.006.093._*	SBU 2-6A	3	2.5	NBR (sw), SI (tr)	--
21.006.087._*	SBU 2-6	3.5	2.5	NBR (sw), SI (tr)	--
21.008.094._*	SBU 2-8	4	2.5	NBR (sw), SI (tr)	--
21.009.002._*	SBU 2-9	2	2.5	NBR (sw), SI (tr), SI-AS (sw), NR (gr), PU (bl)	--
21.010.119._*	SBU 2-10	8	2.5	NBR (sw), SI (tr)	--
21.012.135._*	SBU 2-12	7	2.5	NBR (sw), SI (tr), NR (gr), PU (bl)	--
21.014.133._*	SBU 2-14A	11	2.5	NBR (sw), SI (tr), NR (gr)	--
21.014.007._*	SBU 2-14	12	2.5	NBR (sw), SI (tr), PU (bl)	--
21.018.010._*	SBU 2-18	8	2.5	NBR (sw), SI (tr), PU (bl)	--
21.020.016._*	SBU 2-20	9	2.5	NBR (sw), SI (tr)	--
21.025.060._*	SBU 2-25	19	2.5	NBR (sw), SI (tr)	--
21.032.075._*	SBU 2-32	13	2.5	NBR (sw), SI (tr), NR (gr), PU (bl)	--
21.043.049._*	SBU 2-43	19	2.5	NBR (sw), SI (tr), NR (gr)	--
21.062.055._*	SBU 2-62	25	2.5	NBR (sw), SI (tr)	--
20.088.123._*	SBU 2-88	36	2.5	NBR (sw), SI (tr)	G1/4-male
20.088.124._*	SBU 2-88	36	2.5	NBR (sw), SI (tr)	G1/4-female

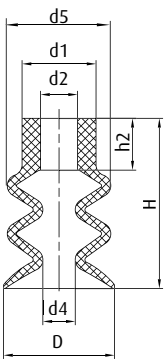
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

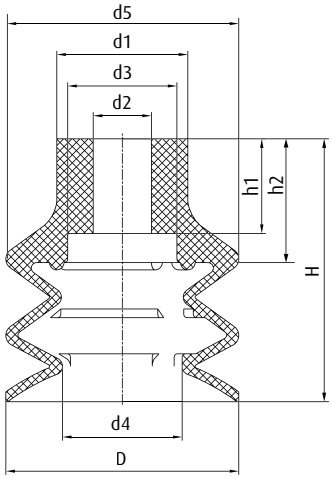
Accessories

Item no.	Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.004.083._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.005.057._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.006.093._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.006.087._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.008.094._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.009.002._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.010.119._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.012.135._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.014.133._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.014.007._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.018.010._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.020.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.025.060._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.032.075._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.043.049._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.062.055._*	--	--	270.315 (p.414)	--	--	270.540 (p.429)	270.539 (p.434)
20.088.123._*	--	--	--	--	--	--	--
20.088.124._*	--	--	--	--	--	--	--

Dimensions



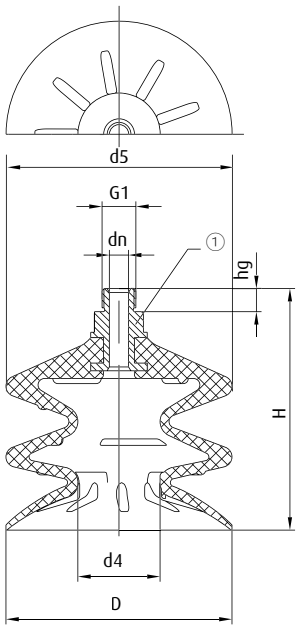
Drawing A



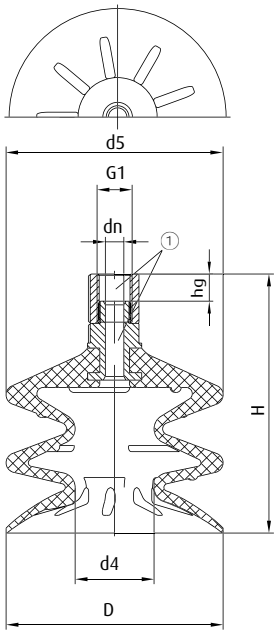
Drawing B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing C



Drawing D

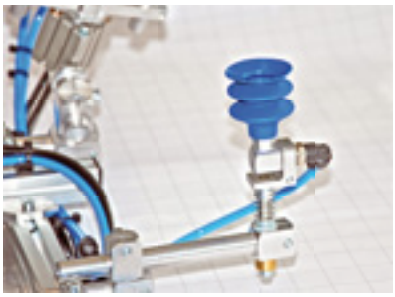
① = Aluminium fitting, vulcanised

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	hg [mm]
21.004.083._*	A	4.5	7	4	--	2	6.5	--	--	14	--	8	--
21.005.057._*	A	5.5	7	4	--	2.5	6.5	--	--	14	--	8.5	--
21.006.093._*	A	6	8	4	--	3	8	--	--	15	--	8	--
21.006.087._*	A	6.5	9	5	--	2.5	6.5	--	--	14.5	--	7.5	--
21.008.094._*	A	7.5	8	4	--	4	7.5	--	--	15	--	8.5	--
21.009.002._*	A	9	9	5	--	4	9	--	--	15	--	7	--
21.010.119._*	A	10	10	5	--	4.5	10	--	--	21	--	7	--
21.012.135._*	A	12	10	5	--	5	12	--	--	21	--	9	--
21.014.133._*	A	14	10	3.8	--	5.5	14	--	--	23	--	7.5	--
21.014.007._*	A	15	10	5	--	4.5	15	--	--	23	--	7	--
21.018.010._*	A	18	10	4.5	--	7	18	--	--	22	--	8.5	--
21.020.016._*	A	20	10	4.5	--	10	20	--	--	23	--	9	--
21.025.060._*	A	25	10	4.8	--	10	25	--	--	33	--	8	--
21.032.075._*	B	32	18	8	15	16.5	32	--	--	36	13	17	--
21.043.049._*	B	42	20	8	15	15.5	42	--	--	46	13	17	--
21.062.055._*	B	62	21	8.5	14.5	27.5	62	--	--	54	13	14.7	--
20.088.123._*	C	88	--	--	--	32	88	7.5	G1/4	94	--	--	9
20.088.124._*	D	88	--	--	--	32	88	7.5	G1/4	105	--	--	11

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature Thermalon® bellows cups, 2.5 folds - SKT-B2

UP TO 160 °C & MINIMUM MARKING



Product Description

Bellows vacuum cups for uneven surfaces especially suited for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A.
Connection via plug-in nipple.

Advantage

> Extremely low-marking
> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Long vacuum cup lift and good adaptation to curved or uneven product surfaces

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Number of folds	Usage temperature [°C]
21.005.146._*	SKT-B2-5	3	Thermalon® (bl)	2.5	0 - 160
21.007.147._*	SKT-B2-7	3	Thermalon® (bl)	2.5	0 - 160
21.009.148._*	SKT-B2-9	3	Thermalon® (bl)	2.5	0 - 160
21.012.149._*	SKT-B2-12	7	Thermalon® (bl)	2.5	0 - 160
21.014.150._*	SKT-B2-14	10	Thermalon® (bl)	2.5	0 - 160
21.018.151._*	SKT-B2-18	10	Thermalon® (bl)	2.5	0 - 160
21.020.152._*	SKT-B2-20	10	Thermalon® (bl)	2.5	0 - 160
21.025.153._*	SKT-B2-25	20	Thermalon® (bl)	2.5	0 - 160
21.032.154._*	SKT-B2-32	14.5	Thermalon® (bl)	2.5	0 - 160
21.042.155._*	SKT-B2-42	22	Thermalon® (bl)	2.5	0 - 160
21.052.156._*	SKT-B2-52	27	Thermalon® (bl)	2.5	0 - 160
21.062.157._*	SKT-B2-62	31	Thermalon® (bl)	2.5	0 - 160

Accessories

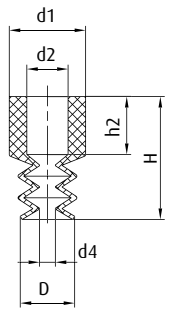
	Suitable fittings						
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.005.146._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.007.147._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.009.148._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.012.149._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.014.150._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.018.151._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.020.152._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.025.153._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.032.154._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.042.155._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

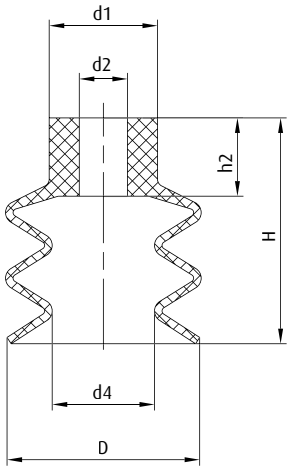
Accessories

Item no.	Suitable fittings						
	M5-male	**M5-female**	**M6-male**	**G1/8-male**	**G1/8-female**	**G1/4-male**	**G1/4-female**
21.052.156._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.062.157._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d4** [mm]	**H** [mm]	**h2** [mm]
21.005.146._*	A	5.5	7	4	2.2	13.5	8
21.007.147._*	A	6	8.5	4.5	1.8	14	6.5
21.009.148._*	A	9.5	9	4.4	4	15	7.5
21.012.149._*	B	12	10	3.8	5	21	9
21.014.150._*	B	14	10	3.8	5	23	9
21.018.151._*	B	17.5	10	3.8	7.5	23	9
21.020.152._*	B	20	10	3.8	10	23	9
21.025.153._*	B	25	10	3.8	10	34	9
21.032.154._*	B	32	18	8	17	38	13
21.042.155._*	B	42	18	8	18.5	46	13
21.052.156._*	B	52	18	8	25	49	13
21.062.157._*	B	62	21	8	30	55	13

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature HNBR bellows cups, 2.5 folds - SKH-B2

UP TO 160 °C & MINIMUM MARKING

Product Description

Bellows vacuum cups for uneven surfaces with suitability for removing hot plastic parts to be painted from an injection moulding machine. Connection via plug-in nipple.

Advantage

> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Minimum-marking
> Long vacuum cup lift and good adaptation to curved or uneven product surfaces

Technical data

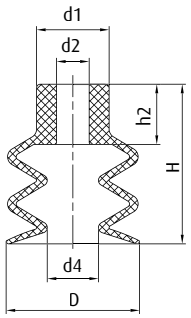
Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Usage temperature [°C]
21.005.057._*	SKH-B2-5	3	2.5	HNBR (ge)	0 - 160
21.007.089._*	SKH-B2-7	3	2.5	HNBR (ge)	0 - 160
21.009.002._*	SKH-B2-9	2	2.5	HNBR (ge)	0 - 160
21.012.135._*	SKH-B2-12	7	2.5	HNBR (ge)	0 - 160
21.014.053._*	SKH-B2-14	9	2.5	HNBR (ge)	0 - 160
21.018.010._*	SKH-B2-18	8	2.5	HNBR (ge)	0 - 160
21.020.016._*	SKH-B2-20	9	2.5	HNBR (ge)	0 - 160
21.032.075._*	SKH-B2-32	13	2.5	HNBR (ge)	0 - 160
21.043.049._*	SKH-B2-43	19	2.5	HNBR (ge)	0 - 160
21.060.051._*	SKH-B2-60	25	2.5	HNBR (ge)	0 - 160

Accessories

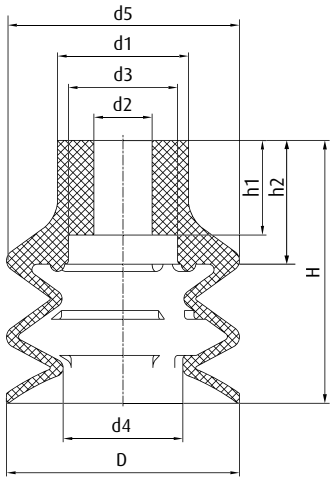
	Suitable fittings						
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.005.057._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.007.089._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--
21.009.002._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.012.135._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.014.053._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.018.010._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.020.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.032.075._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.043.049._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.060.051._*	--	--	270.315 (p.414)	--	--	270.540 (p.429)	270.539 (p.434)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h1** [mm]	**h2** [mm]
21.005.057._*	A	5.5	7	4	--	2.5	--	14	--	8.5
21.007.089._*	B	7	7.5	4	5.5	3	7	10	2	3.5
21.009.002._*	A	9	9	5	--	4	--	15	--	7
21.012.135._*	A	12	10	5	--	5	--	21	--	9
21.014.053._*	A	14	8	4	--	5.5	--	18	--	5.5
21.018.010._*	A	18	10	4.5	--	7	--	22	--	8.5
21.020.016._*	A	20	10	4.5	--	10	--	23	--	9
21.032.075._*	B	32	18	8	15	16.5	32	36	13	17
21.043.049._*	B	42	20	8	15	15.5	42	46	13	17
21.060.051._*	B	61	22	8	14	28	61	57	14	18.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups, universal, 3.5 folds - SBU 3

Product Description	Advantage
Universal bellows vacuum cups with 3.5 folds for handling sensitive or uneven products over very large lift movements. Connection via plug-in nipple.	> Bellows compensate for differences in height and enable good adaptation to curved or uneven product surfaces > Soft attachment for sensitive products > Cost-effective replacement of worn seals

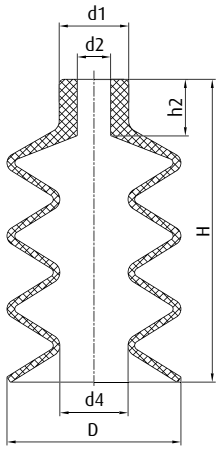
Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.018.031._*	SBU 3-18	12	3.5	NBR (sw), SI (tr)
25.025.005._*	SBU 3-25	24	3.5	NBR (sw), SI (tr)

Accessories

	Suitable fittings					
Item no.	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male
25.018.031._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)
25.025.005._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)

Dimensions



Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d4** [mm]	**H** [mm]	**h2** [mm]
25.018.031._*	18	9.5	5	8	29	7
25.025.005._*	25	10	4.8	10	44	8

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vulkollan® bellows cups, universal, 1.5 to 2.5 folds - SBU-VU

SBU1-VU

SBU2-VU

Product Description	Advantage
Extremely robust universal bellows vacuum cups, material made from Vulkollan®	> Minimal abrasion > Very long life cycle > Very good resetting, enabling fast cycle times > Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces > Cost-effective replacement of worn seals

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
	Bellows vacuum cups, 1.5 folds - SBU1-VU			
23.020.169._*	SBU1-VU-20	7	1.5	Vulkollan® (br)
23.030.170._*	SBU1-VU-30	8	1.5	Vulkollan® (br)
23.050.171._*	SBU1-VU-50	10	1.5	Vulkollan® (br)
	Bellows vacuum cups, 2.5 folds - SBU2-VU			
21.009.106._*	SBU2-VU-9	2	2.5	Vulkollan® (br)
21.020.090._*	SBU2-VU-20	8	2.5	Vulkollan® (br)
21.032.091._*	SBU2-VU-30	16	2.5	Vulkollan® (br)
21.030.076._*	SBU2-VU-31	14	2.5	Vulkollan® (br)
21.051.097._*	SBU2-VU-50	18	2.5	Vulkollan® (br)
21.062.092._*	SBU2-VU-60	25	2.5	Vulkollan® (br)

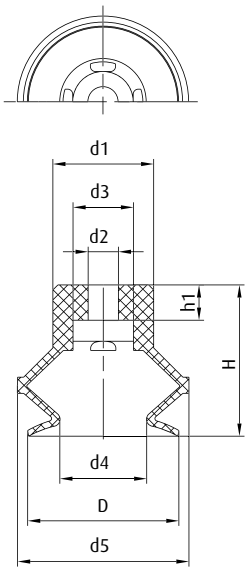
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

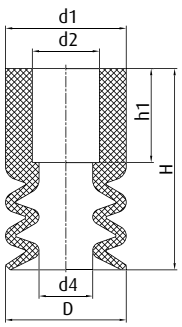
Accessories

Item no.	Suitable fittings M5-male	M5-female	M6-male	M8-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
Bellows vacuum cups, 1.5 folds - SBU1-VU								
23.020.169._*	--	--	270.312/19 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
23.030.170._*	--	--	270.312/19 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
23.050.171._*	--	--	270.314 (p.415)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)
Bellows vacuum cups, 2.5 folds - SBU2-VU								
21.009.106._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.020.090._*	270.024 (p.410)	--	270.104 (p.413)	--	270.033 (p.416)	270.478 (p.421)	--	--
21.032.091._*	--	--	270.315 (p.414)	--	270.132 (p.417)	270.114 (p.422)	270.190, 270.540 (p.428)	270.192, 270.539 (p.432)
21.030.076._*	--	--	--	270.255 (p.415)	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)
21.051.097._*	--	--	--	--	270.132 (p.417)	270.114 (p.422)	270.204 (p.427)	270.324 (p.432)
21.062.092._*	--	--	270.315 (p.414)	--	--	--	270.540 (p.429)	270.539 (p.434)

Dimensions



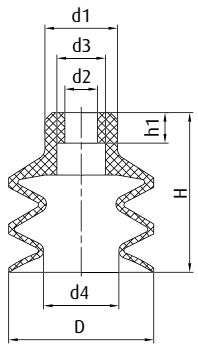
Drawing A



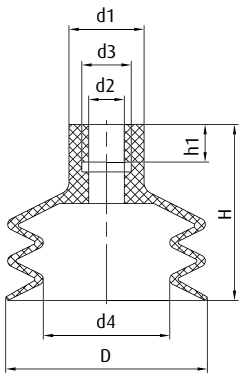
Drawing B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

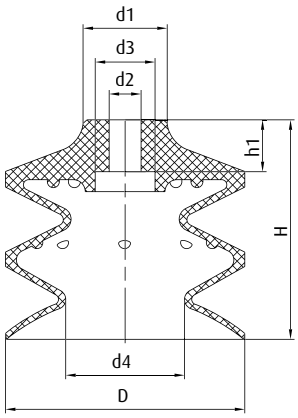
Dimensions



Drawing C



Drawing D



Drawing E

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h1** [mm]
Bellows vacuum cups, 1.5 folds - SBU1-VU									
23.020.169._*	A	20	15	6	12	12.5	22	22	7
23.030.170._*	A	30	20	6	12	17	34	30	7
23.050.171._*	A	50	29	9	20	31	56	37	7
Bellows vacuum cups, 2.5 folds - SBU2-VU									
21.009.106._*	B	9	9	5	--	4	--	15	7
21.020.090._*	C	20	10	4.5	6.5	10.5	--	22	4.2
21.032.091._*	B	30	18	8	15	17	--	38	13
21.030.076._*	C	31	18.5	8	15	19.5	--	29	7
21.051.097._*	D	51	19	9	12.5	32	--	45	9.5
21.062.092._*	E	60	21	8	15	30	--	55	13

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups with 1.5 and 4.5 folds, modular - SP-B

Product Description	Advantage
Bellows vacuum cups with a short or long lift. Version: Replacement sealing lip for attachment to fitting	> High suction force > Fast cycle times possible > Very resistant to wear (Tepuflex®) > Compatible with established products from other vendors

Technical data

Accessories

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Filter disc	Retaining ring	Stiffening ring
	Bellows vacuum cups, 1.5 folds						
23.005.178._*	SP-B1-5	2	1.5	SI (r), SI-AS (sw), CR (sw)	--	--	--
23.008.166._*	SP-B1-8	3.5	1.5	SI (r), SI-AS (sw), CR (sw)	--	--	--
23.011.007._*	SP-B1-10	5	1.5	SI (tr), SI-AS (sw), CR (sw)	--	--	--
23.016.015._*	SP-B1-15	7	1.5	SI (tr), SI-AS (sw), CR (sw)	--	--	--
23.020.026._*	SP-B1-20	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	78.200 (p.474)	78.011 (p.475)	--
23.030.037._*	SP-B1-30	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	78.201 (p.474)	78.011 (p.475)	--
23.040.045._*	SP-B1-40	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	78.202 (p.474)	78.012 (p.475)	--
23.050.054._*	SP-B1-50	12	1.5	Tepuflex® (or), SI (tr), CR (sw)	78.203 (p.474)	78.013 (p.475)	--
23.078.065._*	SP-B1-75	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	--	--	--
23.117.069._*	SP-B1-110	29	1.5	Tepuflex® (or), SI (tr), CR (sw)	--	--	--
23.160.072._*	SP-B1-150	41	1.5	Tepuflex® (or), SI (tr), CR (sw)	--	--	--
	Bellows vacuum cups, 4.5 folds						
25.020.025._*	SP-B4-20	16	4.5	SI (tr), CR (sw)	--	78.011 (p.475)	78.000 (p.475)
25.030.026._*	SP-B4-30	21	4.5	SI (tr), CR (sw)	--	78.012 (p.475)	78.001 (p.475)
25.040.027._*	SP-B4-40	20	4.5	SI (tr), CR (sw)	--	78.012 (p.475)	78.002 (p.475)
25.050.028._*	SP-B4-50	25	4.5	SI (tr), CR (sw)	--	78.013 (p.475)	78.003 (p.475)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Accessories

Item no.	Suitable fittings									
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G3/8-male	G3/8-female	G1/2-female	G3/4-female
Bellows vacuum cups, 1.5 folds										
23.005.178._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
23.008.166._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
23.011.007._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
23.016.015._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
23.020.026._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
23.030.037._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
23.040.045._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
23.050.054._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
23.078.065._*	--	--	--	--	270.527-S (p.424)	--	--	270.528-S (p.436)	270.529-S (p.436)	--
23.117.069._*	--	--	--	--	--	--	--	270.530-S (p.437)	270.531-S (p.437)	--
23.160.072._*	--	--	--	--	--	--	--	--	270.532-S (p.437)	270.533-S (p.437)
Bellows vacuum cups, 4.5 folds										
25.020.025._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
25.030.026._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
25.040.027._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
25.050.028._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--

Ordering notes:

Explanation of the ending of the accessory fitting:
> S with screen

Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups - modular

Example:

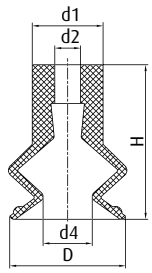
Assembly example

Assembly example

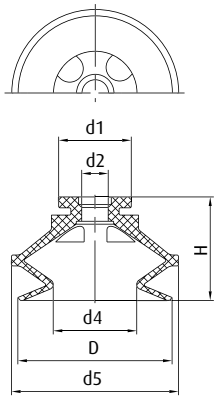
* Fittings are optionally available with and without filter screen
** Fittings come fitted with filter screen as standard

> The modular series allows you to assemble your own vacuum cups
> Worn sealing lips can be replaced quickly, cost-effective and easily
> High flexibility thanks to a large selection of fitting threads

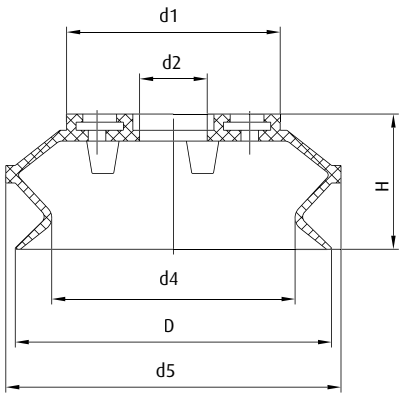
Dimensions



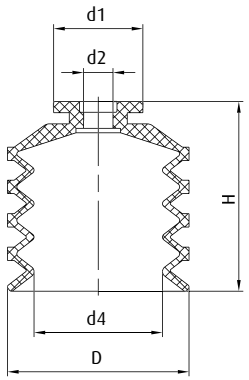
Drawing A



Drawing B



Drawing C



Drawing D

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]
Bellows vacuum cups, 1.5 folds							
23.005.178._*	A	6	4.5	2	2.2	--	9
23.008.166._*	A	9	5.5	2	3.8	--	12
23.011.007._*	A	11	9	3.9	5.5	--	17
23.016.015._*	A	16	9	3.9	8	--	19
23.020.026._*	B	21	14.5	5.5	11	24	19.5
23.030.037._*	B	33	15	5.5	18.5	37	28
23.040.045._*	B	43	20	7.5	23	46	29
23.050.054._*	B	53	26	10.5	32	58	35
23.078.065._*	C	81	55	10	59	84	37
23.117.069._*	C	117	79	25	90	124	50
23.160.072._*	C	160	110	24	112	166	67
Bellows vacuum cups, 4.5 folds							
25.020.025._*	D	20	14.5	5	14	--	23
25.030.026._*	D	31	20	6.5	22	--	32
25.040.027._*	D	41	20	6.5	29	--	43
25.050.028._*	D	51	27	10.5	37	--	53

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups, 1.5 and 4.5 folds, with fully assembled fitting - SP-B

Product Description	Advantage
Bellows vacuum cups with a short or long lift. Version: Complete with vacuum cup fitting and filter screen.	> High suction force > Fast cycle times possible > Very resistant to wear (Tepuflex®) > Compatible with established products from other vendors

Technical data

Accessories

Item no.	Model / Lip dimensions	Connection thread		Number of folds	Material / Colour	Spare cup	Filter disc	Stiffening ring
	Complete vacuum cups, 1.5 folds with fitting & filter screen							
22.020.020._*	SP-B1-20	G1/8-male, M5-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.020.026._* (p.308)	78.200 (p.474)	--
22.030.033._*	SP-B1-30	G1/8-male, M5-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.030.037._* (p.321)	78.201 (p.474)	--
22.040.045._*	SP-B1-40	G1/8-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.040.045._* (p.332)	78.202 (p.474)	--
22.050.056._*	SP-B1-50	G1/8-female	12	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.050.054._* (p.338)	78.203 (p.474)	--
22.078.163._*	SP-B1-75	G1/8-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
22.078.166._*	SP-B1-75	G3/8-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
22.078.169._*	SP-B1-75	G1/2-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
22.117.164._*	SP-B1-110	G3/8-female	29	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.117.069._* (p.355)	--	--
22.117.167._*	SP-B1-110	G1/2-female	29	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.117.069._* (p.355)	--	--
22.160.165._*	SP-B1-150	G1/2-female	41	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.160.072._* (p.358)	--	--
22.160.168._*	SP-B1-150	G3/4-female	41	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.160.072._* (p.358)	--	--
	Complete vacuum cups, 4.5 folds with fitting & filter screen							
24.020.033._*	SP-B4-20	G1/8-male, M5-female	16	4.5	SI (tr), CR (sw)	25.020.025._* (p.308)	--	78.000 (p.475)
24.030.039._*	SP-B4-30	G1/8-female	21	4.5	SI (tr), CR (sw)	25.030.026._* (p.318)	--	78.001 (p.475)
24.040.074._*	SP-B4-40	G1/8-female	20	4.5	SI (tr), CR (sw)	25.040.027._* (p.330)	--	78.002 (p.475)
24.050.087._*	SP-B4-50	G1/8-female	30	4.5	SI (tr), CR (sw)	25.050.028._* (p.337)	--	78.003 (p.475)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

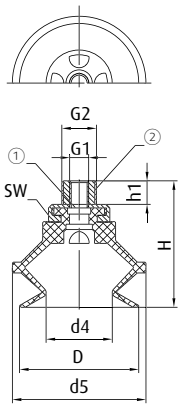
Bellows vacuum cups with fully assembled fitting

Example:

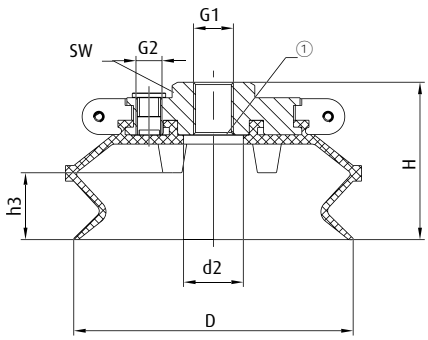
or

> High process reliability thanks to permanently installed fitting
> Worn sealing lips can be replaced if necessary

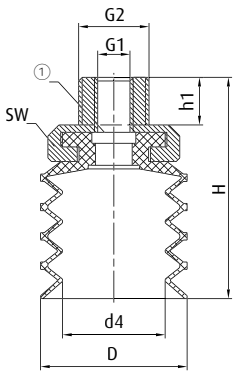
Dimensions



Drawing A



Drawing B



Drawing C

① = Filter screen ② = Aluminium

Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø d2 [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	G2	H [mm]	h1 [mm]	h3 [mm]	SW
Complete vacuum cups, 1.5 folds with fitting & filter screen											
22.020.020._*	A	21	--	11	24	M5	G1/8	27	6.5	--	17
22.030.033._*	A	33	--	18.5	37	M5	G1/8	35	6.5	--	17
22.040.045._*	A	43	--	23	46	G1/8	--	35	--	--	12
22.050.056._*	A	53	--	32	58	G1/8	--	42	--	--	12
22.078.163._*	B	81	10	--	--	G1/8	--	50	--	21.6	28
22.078.166._*	B	81	10	--	--	G3/8	--	50	--	21.6	28
22.078.169._*	B	81	10	--	--	G1/2	--	50	--	21.6	28
22.117.164._*	B	117	25	--	--	G3/8	G1/8	66	--	28	30
22.117.167._*	B	117	25	--	--	G1/2	G1/8	66	--	28	30
22.160.165._*	B	160	24	--	--	G1/2	G1/8	81.5	--	42	38
22.160.168._*	B	160	24	--	--	G3/4	G1/8	81.5	--	42	38
Complete vacuum cups, 4.5 folds with fitting & filter screen											
24.020.033._*	C	20	--	14	--	M5	G1/8	30	6.5	--	17
24.030.039._*	C	31	--	22	--	G1/8	--	40	--	--	12
24.040.074._*	C	41	--	29	--	G1/8	--	51	--	--	12
24.050.087._*	C	51	--	37	--	G1/8	--	61	--	--	12

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Varioflex® bellows cups, 1.5 folds - SP-BX1

NEW

COMPOSITE MATERIAL 60°/30°

Product Description

Bellows vacuum cups with 1.5 folds made of an extremely wear-resistant polymer.
Soft, flexible sealing lip in 30° Shore A (red).
Stable body in 60° Shore A (black).
Cleats stabilise the product.

Advantage

> Long life cycle reduces machine downtimes
> Perfect sealing performance on rough or uneven surface
> High stability and fast reset
> Oil and Ozone resistant
> Extremely low-marking
> Bellows compensate for height differences
> Cleats allow for fast acceleration

Notes:

Explanation of the type description:
> SP-BX1 = series name of the bellows vacuum cup with 1.5 folds
> -xx = nominal diameter
> Example: SP-BX1-15 = bellows vacuum cup with 1.5 folds and a nominal diameter of 15 mm

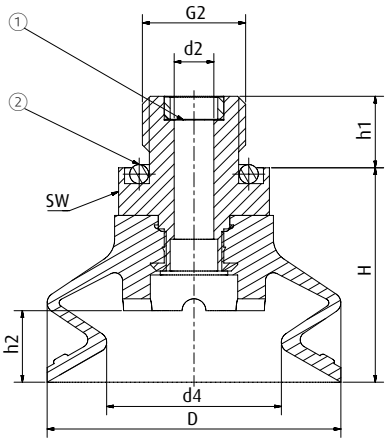
Technical data

Model / Lip dimensions	Ø [mm]	Connection thread 1	Item no.	Connection thread 2	Item no.	Connection thread 3	Item no.		Usage temperature [°C]	Accessories Spare cup
Bellows vacuum cups 1.5 folds - SP-BX1 fully assembled with fitting										
SP-BX1-15	16	M5-male	22.016.253.16	M6-male	22.016.254.16	--	--	4.5	10 - 50	23.016.263.16
SP-BX1-20	21	G1/8-male	22.021.255.16	--	--	--	--	5	10 - 50	23.021.264.16
SP-BX1-25	26	G1/8-male	22.026.256.16	--	--	--	--	5	10 - 50	23.026.265.16
SP-BX1-35	37	G1/8-female	22.037.257.16	G1/4-male	22.037.258.16	--	--	9	10 - 50	23.037.266.16
SP-BX1-50 -	53	G1/8-female	22.053.259.16	G1/4-male	22.053.260.16	G3/8-male	22.053.261.16	10	10 - 50	23.053.267.16
SP-BX1-75	75	G3/8-male	22.075.262.16	G3/8-female	22.075.263.16	--	--	18	10 - 50	--

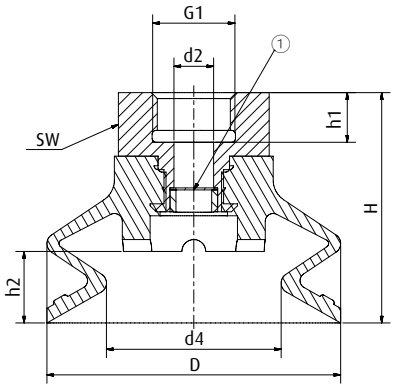
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

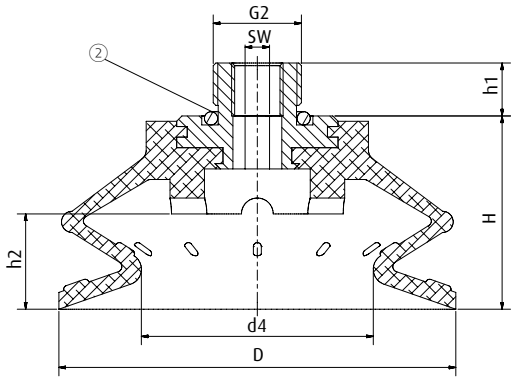
Dimensions



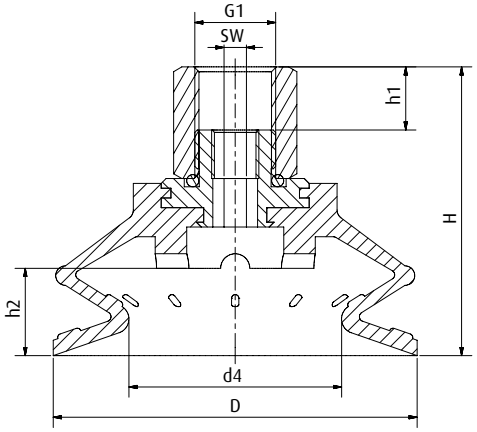
Drawing A



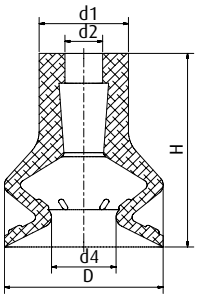
Drawing B



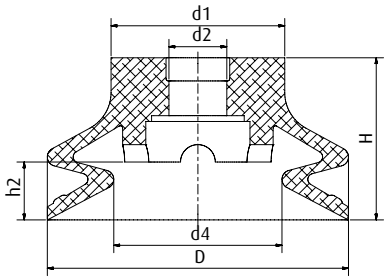
Drawing C



Drawing D



Drawing E



Drawing F

① = Filter screen ② = O-ring

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	G1 (female)	G2 (male)	H	h1 [mm]	h2 [mm]	SW
Bellows vacuum cups 1.5 folds - SP-BX1 fully assembled with fitting											
22.016 .253._*	A	16	--	2.5	6.5	--	M5	25	3.6	--	8
22.016.254._*	A	16	--	2.5	6.5	--	M6	24	6	--	13
22.021.255._*	A	21	--	4	12	--	G1/8	19	7	5	13
22.026.256._*	A	26	--	4	14.5	--	G1/8	19	7	5	13
22.037.257._*	B	37	--	5	22	G1/8	--	29	6.3	9	19
22.037.258._*	A	37	--	5	22	--	G1/4	27	9	9	19
22.053.259._*	B	53	--	8	32.5	G1/8	--	35	9	10	22
22.053.260._*	A	53	--	6	32.5	--	G1/4	32	9	10	22
22.053.261._*	A	53	--	6	32.5	--	G3/8	32	10	10	22
22.075.262._*	C	75	--	--	44	--	G3/8	36.5	10	18	8
22.075.263._*	D	75	--	--	44	G3/8	--	55	13	18	8
Spare cups											
23.016.263._*	E	16	9	4	6.5	--	--	19.5	--	--	--
23.021.264._*	F	21	11	5	12	--	--	14	--	5	--
23.026.265._*	F	26	15	5	14.5	--	--	14	--	5	--
23.037.266._*	F	37	20	7	22	--	--	21	--	9	--
23.053.267._*	F	53	26	10.5	32.5	--	--	26	--	10	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Varioflex® bellows cups, 2.5 folds - SP-BX2

NEW

COMPOSITE MATERIAL 60°/30°

Product Description

Bellows vacuum cups with 2.5 folds made of an extremely wear-resistant polymer.
Soft, flexible sealing lip in 30° Shore A (red).
Stable body in 60° Shore A (black).

Advantage

> Long life cycle reduces machine downtimes
> Perfect sealing performance on rough or uneven surface
> High stability and fast reset
> Oil and Ozone resistant
> Extremely low-marking
> Excellent height and angle compensation
> Optional: Filter disc from Ø 26 mm installed between the bellows

Notes:

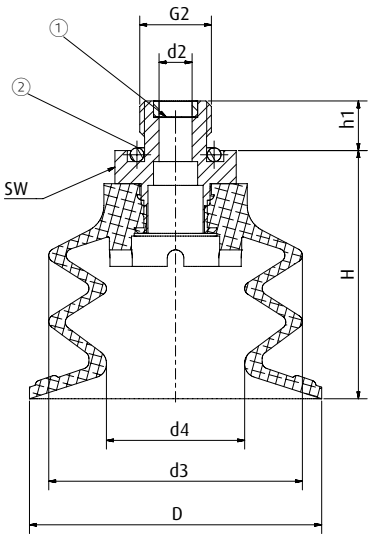
Explanation of the type description:
> SP-BX2 = series name of the bellows vacuum cup with 2.5 folds
> -xx = nominal diameter
> Example: SP-BX2-15 = bellows vacuum cup with 2.5 folds and a nominal diameter of 15 mm

Technical data

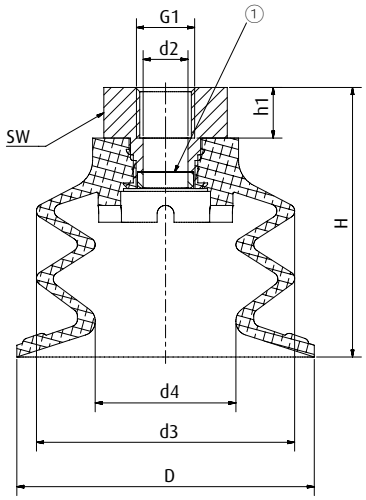
Model / Lip dimensions	Ø [mm]	Connection thread 1	Item no.	Connection thread 2	Item no.	Connection thread 3	Item no.		Usage temp. [°C]	Accessories Spare cup
Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting										
SP-BX2-15	16	M5-male	20.016.145.16	M6-male	20.016.146.16	--	--	5.5	10 - 50	21.016.175.16
SP-BX2-20	21	G1/8-male	20.021.147.16	--	--	--	--	6.5	10 - 50	21.021.176.16
SP-BX2-25	26	G1/8-male	20.026.148.16	--	--	--	--	8	10 - 50	21.026.177.16
SP-BX2-35	37	G1/8-female	20.037.149.16	G1/4-male	20.037.150.16	--	--	14	10 - 50	21.037.177.16
SP-BX2-50	53	G1/8-female	20.053.151.16	G1/4-male	20.053.152.16	G3/8-male	20.053.153.16	19	10 - 50	21.053.178.16
SP-BX2-75	77	G3/8-male	20.077.154.16	G3/8-female	20.077.155.16	--	--	25	10 - 50	--
Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting and filter										
SP-BX2-25	26	G1/8-male	20.026.148.16-FI	--	--	--	--	8	10 - 50	21.026.177.16-FI
SP-BX2-35	37	G1/8-female	20.037.149.16-FI	G1/4-male	20.037.150.16-FI	--	--	14	10 - 50	21.037.177.16-FI
SP-BX2-50	53	G1/8-female	20.053.151.16-FI	G1/4-male	20.053.152.16-FI	G3/8-male	20.053.153.16-FI	19	10 - 50	21.053.178.16-FI
SP-BX2-75	77	G3/8-male	20.077.154.16-FI	G3/8-female	20.077.155.16-FI	--	--	25	10 - 50	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

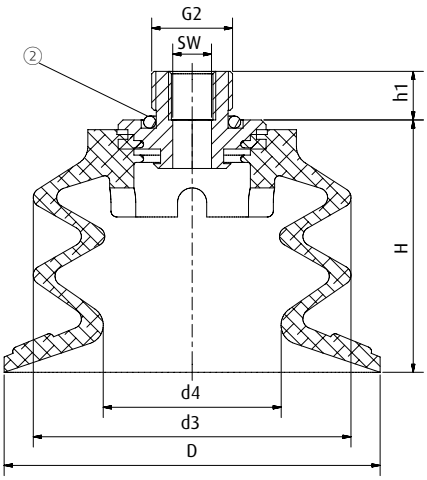
Dimensions



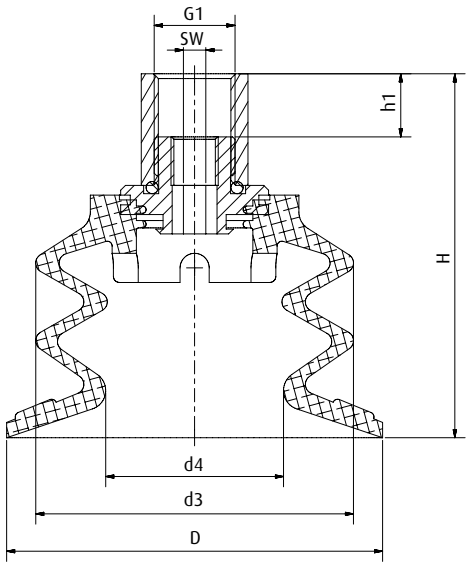
Drawing A



Drawing B



Drawing C



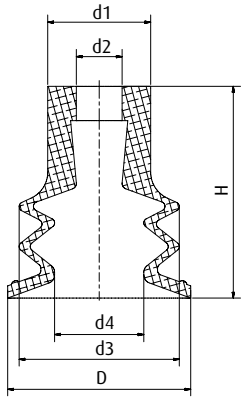
Drawing D

① = Filter screen ② = O-ring

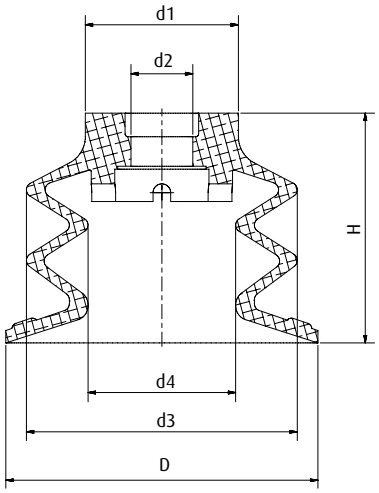
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing E



Drawing F

① = Filter screen ② = O-ring

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	G1 (female)	G2 (male)	H	h1 [mm]	SW
Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting											
20.016.145._*	A	16	--	2.8	14	9	--	M5	24	4	8
20.016.146._*	A	16	--	2.5	14	9	--	M6	23	6	13
20.021.147._*	A	21	--	4	20	12	--	G1/8	20.2	7	13
20.026.148._*	A	26	--	4	23	12	--	G1/8	24	7	13
20.037.149._*	B	37	--	5	31	18	G1/8	--	34.8	6.3	19
20.037.150._*	A	37	--	5	31	18	--	G1/4	32.8	9	19
20.053.151._*	B	53	--	8	46	25	G1/8	--	48	9	22
20.053.152._*	A	53	--	6	46	25	--	G1/4	45	9	22
20.053.153._*	A	53	--	6	46	25	--	G3/8	45	10	22
20.077.154._*	C	77.5	--	--	65.5	37	--	G3/8	52	10	8
20.077.155._*	D	77.5	--	--	65.5	37	G3/8	--	75	13	8
Spare cups											
21.016.175._*	E	16	9	4	14	9	--	--	18.5	--	--
21.021.176._*	F	21	11	5	20	12	--	--	15.2	--	--
21.026.177._*	F	26	15	5	23	12	--	--	19	--	--
21.037.177._*	F	37	20	7	31	18	--	--	27	--	--
21.053.178._*	F	53	26	10.5	46	25	--	--	39	--	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vinyl bellows cups, 1.5 folds - SBV 1

Product Description	Advantage
Durable bellows vacuum cups with 1.5 folds from snug-fitting, wear-resistant material. Very well suited for handling abrasive products such as cardboard. Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods. Connection via plug-in nipple.	> Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces > Flexible, soft lips > Long life cycle > Cost-effective replacement of worn seals

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
23.005.095._*	SBV 1-5	2	1.5	Vinyl (bl)
23.007.112._*	SBV 1-7	2	1.5	Vinyl (bl)
23.013.097._*	SBV 1-13	5	1.5	Vinyl (bl)
23.015.098._*	SBV 1-15	5	1.5	Vinyl (bl)
23.019.109._*	SBV 1-19	8	1.5	Vinyl (bl)
23.020.114._*	SBV 1-20	6	1.5	Vinyl (bl)
23.022.028._*	SBV 1-22	8	1.5	Vinyl (bl)
23.028.113._*	SBV 1-28	9	1.5	Vinyl (bl)
23.030.107._*	SBV 1-30	10.5	1.5	Vinyl (bl)
23.031.192._*	SBV 1-31	6	1.5	Vinyl (bl)
23.035.111._*	SBV 1-35	12	1.5	Vinyl (bl)
23.052.116._*	SBV 1-52	6	1.5	Vinyl (bl)
23.070.060._*	SBV 1-70	20	1.5	Vinyl (bl)

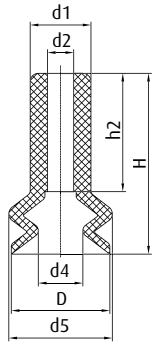
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

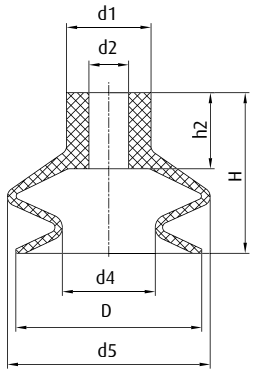
Accessories

	Suitable fittings					
Item no.	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.095._*	270.195 (p.409)	--	--	--	--	--
23.007.112._*	270.001 (p.409)	--	--	--	--	--
23.013.097._*	270.013 (p.410)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.015.098._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.019.109._*	--	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.020.114._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.022.028._*	270.013 (p.410)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.028.113._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.030.107._*	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.031.192._*	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.035.111._*	270.443 (p.410)	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
23.052.116._*	--	--	270.132 (p.417)	--	270.208 (p.425)	270.452 (p.431)
23.070.060._*	--	--	--	--	270.184 (p.431)	--

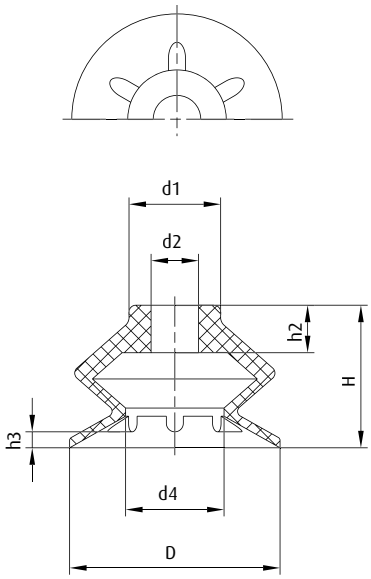
Dimensions



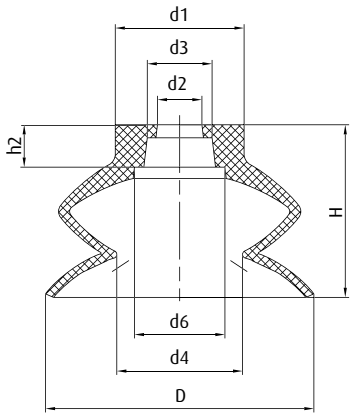
Drawing A



Drawing B



Drawing C



Drawing D

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø d6 [mm]	H [mm]	h2 [mm]	h3 [mm]
23.005.095._*	A	4.5	3	1.5	--	2.5	4	--	12.5	10	--
23.007.112._*	A	6	3.7	1.6	--	2.5	6.5	--	11	7	--
23.013.097._*	B	13	7.5	3.5	--	7.5	12.5	--	14.5	6.5	--
23.015.098._*	B	15.5	9	3.4	--	8.5	17	--	20.5	11.5	--
23.019.109._*	B	19	13	7	--	12	19	--	18	7.5	--
23.020.114._*	B	20	9.5	3.5	--	11	19	--	20	9.5	--
23.022.028._*	A	22	10	4.5	--	11	24	--	19	9	--
23.028.113._*	B	28	12.5	3.5	--	13	26	--	21	9	--
23.030.107._*	B	30	13	7	--	15	29.5	--	22	7	--
23.031.192._*	C	31	13.5	7	--	14.5	--	--	21	7	2.4
23.035.111._*	B	35	17	6	--	20	33	--	30	16	--
23.052.116._*	B	51	18.5	9.5	--	30	50	--	41	21	--
23.070.060._*	D	70	34	11.5	17	33	--	24	45	11	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vinyl bellows cups, 2.5 folds - SBV 2

Product Description

Durable bellows vacuum cups with a long lift, made of snug-fitting, wear-resistant material.
Very well suited for handling abrasive products such as cardboard.
Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods. Connection via plug-in nipple.

Advantage

> Long vacuum cup lift and good adaptation to curved or uneven product surfaces
> Flexible, soft lips
> Long life cycle
> Cost-effective replacement of worn seals

Technical data

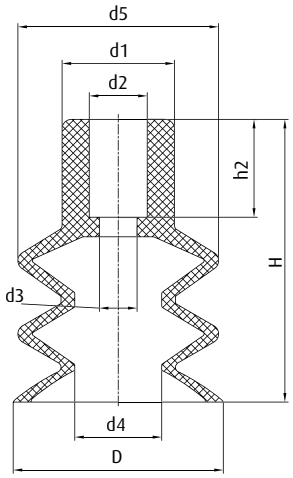
Item no.	Model / Lip dimensions		Number of folds	Material / Colour
21.004.142._*	SBV 2-4	1.3	2.5	Vinyl (bl)
21.006.001._*	SBV 2-6	3.5	2.5	Vinyl (bl)
21.010.070._*	SBV 2-10	5	2.5	Vinyl (bl)
21.018.068._*	SBV 2-18	11	2.5	Vinyl (bl)
21.023.066._*	SBV 2-23	9	2.5	Vinyl (bl)
21.029.069._*	SBV 2-29	10	2.5	Vinyl (bl)
21.032.082._*	SBV 2-32	14	2.5	Vinyl (bl)
21.040.027._*	SBV 2-40	16	2.5	Vinyl (bl)
21.050.084._*	SBV 2-50	20	2.5	Vinyl (bl)

Accessories

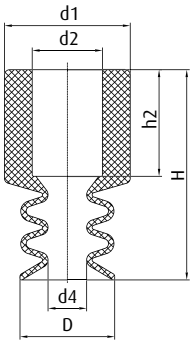
	Suitable fittings						
Item no.	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.004.142._*	270.195 (p.409)	--	--	--	--	--	--
21.006.001._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.010.070._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.018.068._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.023.066._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.029.069._*	--	--	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
21.032.082._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.040.027._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.050.084._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



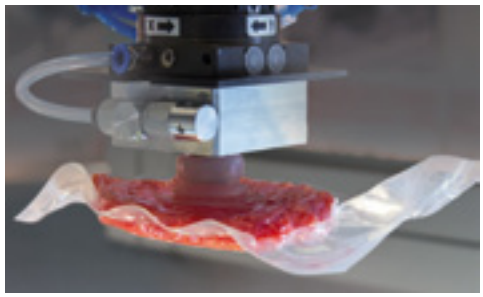
Drawing B

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	Ø **d5** [mm]	**H** [mm]	**h2** [mm]
21.004.142._*	A	3.5	3	1.5	1.5	2	4.5	12.5	9
21.006.001._*	B	6.5	8.5	5	--	2.5	--	14	7
21.010.070._*	B	10	10	5	--	5	--	15.5	7.5
21.018.068._*	A	19	10	5	5	9	19	24	9
21.023.066._*	A	23	17	11	11	13.5	23	26	12
21.029.069._*	A	29	15.5	8	5	12	28	39	13.5
21.032.082._*	A	32	17	11	11	19.5	32	35	14
21.040.027._*	A	40	20	10.5	8	18.5	40	53	13.5
21.050.084._*	A	50	19.5	10.5	6.5	30	50	49	13.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Bellows vacuum cups, 1.5 folds - SBF-A



Product Description

Bellows vacuum cup with soft, very flexible single sealing lip for handling highly sensitive products with high leveling adjustment.
Connection with fixed screwed nipple or attachment frame (Ø 80 mm).
Compatible "snap-in" spring levelers available.

Advantage

> Large holding force
> Fine, flexible sealing lip fits in perfectly with irregularities of the product
> Cleats for the sealing lip prevent retraction of flexible products (e.g. films)
> Cost-effective replacement of worn seals
> High process reliability due to fixed, non-rotating seat of the screw nipple

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Accessories Spare cup
	Rubber sealing lip for attachment to fitting				
23.010.139._*	SBF-A -10	4	1.5	NBR (sw), SI (tr)	--
23.020.140._*	SBF-A -20	6	1.5	NBR (sw), SI (tr)	--
23.030.141._*	SBF-A -30	8	1.5	NBR (sw), SI (tr)	--
23.040.142._*	SBF-A -40	9.5	1.5	NBR (sw), SI (tr)	--
23.050.143._*	SBF-A -50	11	1.5	NBR (sw), SI (tr)	--
23.080.144._*	SBF-A -80	10	1.5	NBR (sw), SI (tr)	--
	Full vacuum cups with receptacle				
22.080.161._*	SBF-A -80	10	1.5	NBR (sw), SI (tr)	23.080.144._* (p.348)

Accessories

Item no.	Suitable fittings								Suitable spring levelers (Snap-In)							
	M4-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler		Spring leveler		Spring leveler		Spring leveler	
Rubber sealing lip for attachment to fitting																
23.010.139._*	270.458 (p.408)	270.134 (p.409)	270.104 (p.413)	--	--	--	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
23.020.140._*	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50

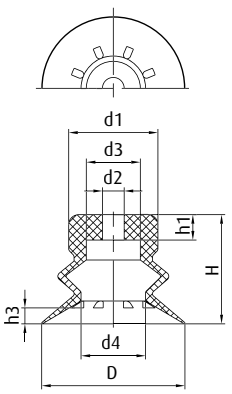
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

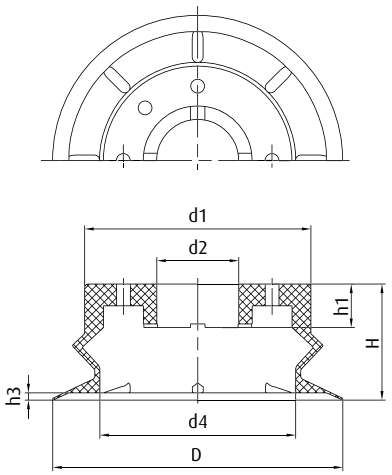
Accessories

Item no.	Suitable fittings								Suitable spring levelers (Snap-In)							
	M4-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler		Spring leveler		Spring leveler		Spring leveler	
23.030.141._*	--	--	270.460 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
23.040.142._*	--	--	270.498 (p.414)	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)	50.170 (p.456)	20	50.171 (p.456)	30	50.172 (p.456)	40	50.173 (p.456)	50
23.050.143._*	--	--	270.499 (p.414)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	50.174 (p.456)	20	50.175 (p.456)	30	50.176 (p.456)	40	50.177 (p.456)	50
23.080.144._*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Full vacuum cups with receptacle																
22.080.161._*	--	--	--	270.462 (p.416)	--	--	270.514 (p.429)	270.513 (p.434)	--	--	--	--	--	--	--	--

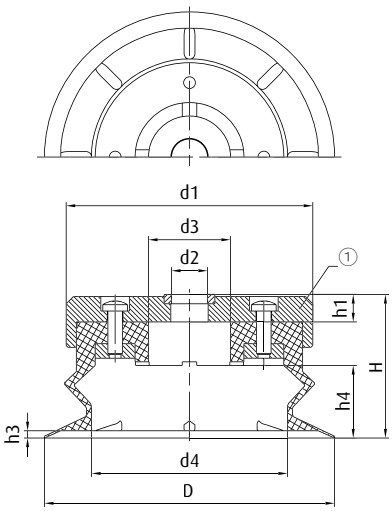
Dimensions



Drawing A



Drawing B



Drawing C

① = Aluminium

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	**H** [mm]	**h1** [mm]	**h3** [mm]	**h4** [mm]
Rubber sealing lip for attachment to fitting										
23.010.139._*	A	10	10	4	6	5	15.5	3	1	--
23.020.140._*	A	20	15	6	10	11	19	4	2	--
23.030.141._*	A	30	17	6	12	14	23	5	2.8	--
23.040.142._*	A	40	25	6	15	18	30	7	4.4	--
23.050.143._*	A	50	30	6	21	21	32	7	4	--
23.080.144._*	B	80	62	23	--	54	32	12	2	--
Full vacuum cups with receptacle										
22.080.161._*	C	80	68	10	23	54	40	7.5	2	20

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups, 1.5 folds - SBF-B

Product Description	Advantage
Bellows vacuum cup, 1.5 folds with soft sealing lip and a soft bellows for handling curved or uneven product surfaces. Connection via plug-in nipple. Compatible "snap-in" spring levelers available.	> Bellows compensate height differences > Good adaptation to curved or uneven product surfaces > Cost-effective replacement of worn seals

Technical data

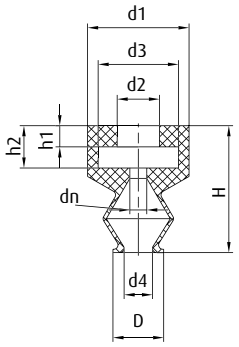
Item no.	Model / Lip dimensions		Number of folds	Material / Colour
23.006.145._*	SBF-B-6	5	1.5	NBR (sw), SI (tr)
23.008.146._*	SBF-B-8	5	1.5	NBR (sw), SI (tr)
23.010.147._*	SBF-B-10	5	1.5	NBR (sw), SI (tr)
23.015.148._*	SBF-B-15	7	1.5	NBR (sw), SI (tr)
23.020.149._*	SBF-B-20	6	1.5	NBR (sw), SI (tr)

Accessories

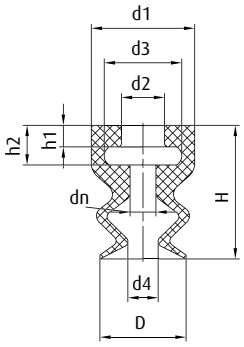
	Suitable fittings					Suitable spring levelers (Snap-In)					
Item no.	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	Spring leveler		Hose outside Ø	Spring leveler		Hose outside Ø
23.006.145._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
23.008.146._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
23.010.147._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
23.015.148._*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6
23.020.149._*	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	50.020 (p.454)	8.5	6

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø dn [mm]	H [mm]	h1 [mm]	h2 [mm]
23.006.145._*	A	6	12	5	9.5	3.4	2	15	2.5	5
23.008.146._*	B	8	12	5	9	4	2	14.5	2.5	4.5
23.010.147._*	B	10	12	5	9	3.5	3	15.5	2.5	4.5
23.015.148._*	B	15	12	5	9	5.5	3	17	2.5	4.5
23.020.149._*	B	20	12	4.5	6	6	6	20	5	9.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups, 4.5 folds - SBF-C

Product Description

Bellows vacuum cup, 4.5 folds, with a very thin, flexible sealing lip and a large lift. Fine, flexible sealing lip fits in perfectly with irregularities of the product (e.g. groceries packaged in bags).
Connection via screw nipples (hollow bolt + adapter)

Advantage

> Optimal height and angle compensation
> Very good fit to irregular products
> Gentle handling of sensitive products
> A very safe seat, bolted down with a bracket from the bottom
> Cost-effective replacement of worn seals

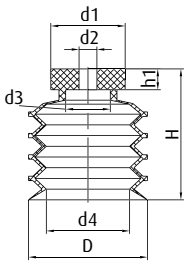
Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.010.044._*	SBF-C-10	4	4.5	NBR (sw), SI (tr)
25.020.045._*	SBF-C-20	10	4.5	NBR (sw), SI (tr)
25.030.046._*	SBF-C-30	14	4.5	NBR (sw), SI (tr)
25.040.047._*	SBF-C-40	19	4.5	NBR (sw), SI (tr)
25.050.048._*	SBF-C-50	26	4.5	NBR (sw), SI (tr)

Accessories

	Suitable fittings					
Item no.	M4-male	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
25.010.044._*	270.458 (p.408)	--	270.009 (p.417)	270.007 (p.422)	--	--
25.020.045._*	--	270.459 (p.414)	270.480 (p.420)	270.479 (p.423)	--	--
25.030.046._*	--	270.460 (p.414)	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
25.040.047._*	--	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)
25.050.048._*	--	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)

Dimensions



Item no.	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	**H** [mm]	**h1** [mm]
25.010.044._*	10	10	4	--	6	14.5	3
25.020.045._*	20	15	6	10	14	25	4
25.030.046._*	30	18	6	12	19	38.5	5
25.040.047._*	40	25	6	15	28	44	7
25.050.048._*	50	30	6	19	32	54	7

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups for chocolates - SL-PB

Product Description	Advantage
Bellows vacuum cups made of FDA-approved material for handling delicate products with heavily textured surfaces.	> Gentle handling of the most sensitive surfaces > Also suitable for three-dimensional products, e.g. chocolates

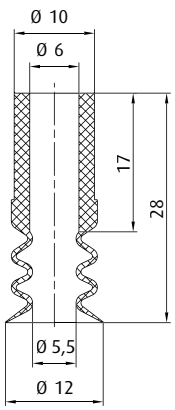
Technical data

Item no.	Model / Lip dimensions		Material / Colour	Number of folds
21.012.079._*	SL-PB-12	7	SI (w)	2.5
27.016.001._*	SL-PB-16	6	SI (tr)	1.5

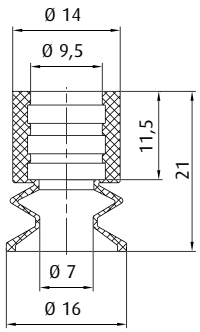
Accessories

	Suitable fittings					
Item no.	M5-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.012.079._*	270.443 (p.410)	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
27.016.001._*	270.244 (p.410)	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)

Dimensions



Drawing A



Drawing B

Item no.	Drawing
21.012.079._*	A
27.016.001._*	B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vacuum cups for baked goods - SL-B

Product Description	Advantage
Bellows vacuum cups especially suitable for baked goods such as waffles, bread, rolls, pizzas and donut.	> Large degree of leveling > Gentle attachment to the product > Good holding strength through optimised lip geometry > FDA-compliant

Ordering notes:

Matching assembly aid for special fitting 270.419: Item No. 90.007

Technical data

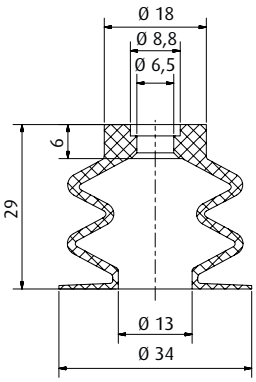
Item no.	Model / Lip dimensions		Number of folds	Material / Colour
21.034.179._*	SL-B-34	12	2.5	SI (tr)
25.038.016._*	SL-B-38	24	4.5	SI (tr)
27.039.017._*	SL-B-38A	20	5.5	SI (tr)
25.040.043._*	SL-B-40	24	4.5	SI (tr)
25.040.058._*	SL-B-40A	25	4.5	SI (bl)
21.060.074._*	SL-B-60	12	2.5	SI (tr)

Accessories

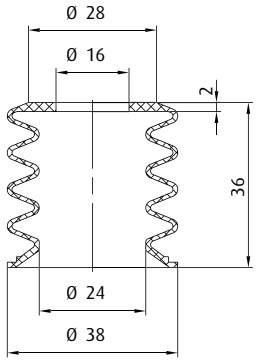
	Suitable fittings				
Item no.	Without Thread	M6-male	G1/4-male	G1/4-female	G1/2-male
21.034.179._*	--	270.039 (p.414)	--	--	--
25.038.016._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
27.039.017._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
25.040.043._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
25.040.058._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
21.060.074._*	--	--	--	--	270.372 (p.437)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

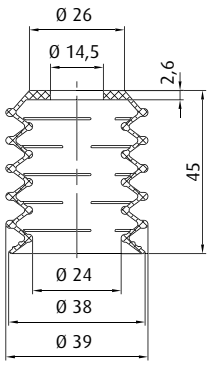
Dimensions



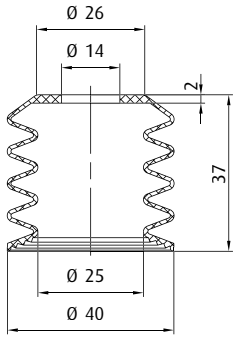
Drawing A



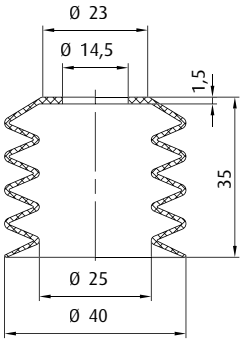
Drawing B



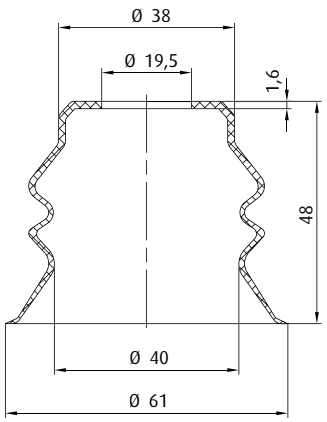
Drawing C



Drawing D



Drawing E



Drawing F

Item no.	Drawing
21.034.179._*	A
25.038.016._*	B
27.039.017._*	C
25.040.043._*	D
25.040.058._*	E
21.060.074._*	F

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Detectable vacuum cups for baked goods - SL-BD

DETECTABLE

Product Description	Advantage
Bellows vacuum cups especially suitable for baked goods such as bread, rolls or pizza. The vacuum cup material used is a special mixture that can be detected, for example by metal detectors from SAFELINE, and then separated and discarded.	> Detectable > FDA-compliant

Ordering notes:

Matching assembly aid for special fittings 270.419: Item No. 90.007

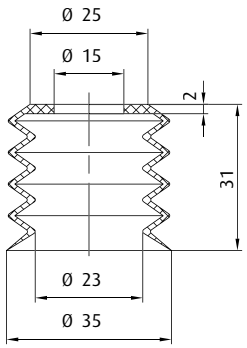
Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.035.069._*	SL-BD-35	25	4.5	SI (r)
25.040.066._*	SL-BD-40	28	4.5	SI (br), SI (bl)

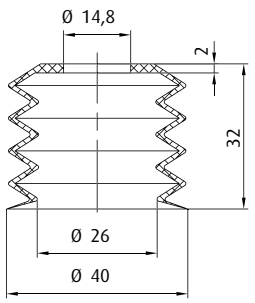
Accessories

	Suitable fittings
Item no.	Without Thread
25.035.069._*	270.419 (p.441)
25.040.066._*	270.419 (p.441)

Dimensions



Drawing A



Drawing B

Item no.	Drawing
25.035.069._*	A
25.040.066._*	B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vacuum cups for eggs - SL-E

Product Description	Advantage
Bellows vacuum cups made of FDA-compliant silicone in a design specially optimised for handling eggs. Very long vacuum cup lift.	> Good absorption > Great stroke movement

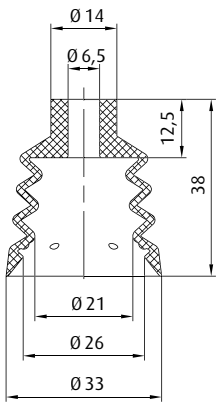
Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
27.033.008._*	SL-E-33	16	3.5	SI (tr)
27.034.023._*	SL-E-34	39	2.5	SI (r)

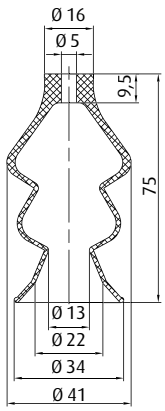
Accessories

	Suitable fittings				
Item no.	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
27.033.008._*	--	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)
27.034.023._*	270.443 (p.410)	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--

Dimensions



Drawing A



Drawing B

Item no.	Drawing
27.033.008._*	A
27.034.023._*	B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum cups, 1.5 and 2.5 folds - SV-SB

Product Description	Advantage
Bellows vacuum cups, 1.5 and 2.5 folds, for standard packaging machines. Soft, flexible sealing lip for smooth contact. FDA-compliant materials (SI).	> Gentle handling of sensitive products

Technical data

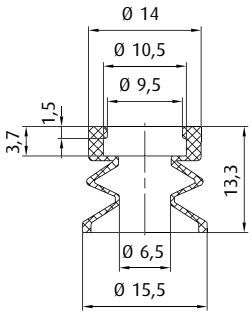
Item no.	Model / Lip dimensions		Number of folds	Material / Colour
Bellows vacuum cups 1.5 folds - SV-SB1				
23.016.232._*	SV-SB1-16	6	1.5	SI (tr)
23.030.230._*	SV-SB1-30	7	1.5	NR (gr)
Bellows vacuum cups 2.5 folds - SV-SB2				
21.030.030._*	SV-SB2-30	13	2.5	SI (tr), NR (bl)
21.040.132._*	SV-SB2-40	11	2.5	SI (tr), SI (bl)

Accessories

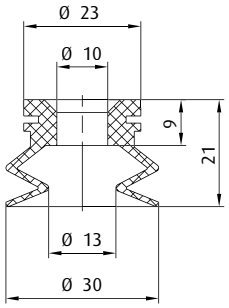
	Suitable fittings				
Item no.	M5-male	M6-male	M10-male	G1/4-male	G1/4-female
Bellows vacuum cups 1.5 folds - SV-SB1					
23.016.232._*	270.311 (p.411)	270.312/19 (p.414)	--	--	--
23.030.230._*	--	--	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
Bellows vacuum cups 2.5 folds - SV-SB2					
21.030.030._*	--	--	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
21.040.132._*	--	--	--	--	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

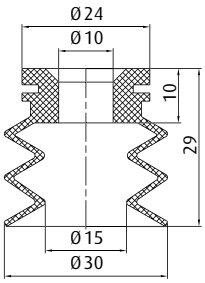
Dimensions



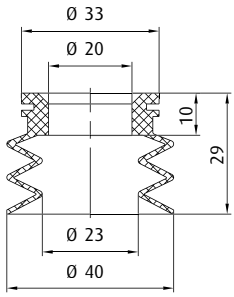
Drawing A



Drawing B



Drawing C



Drawing D

Item no.	Drawing
Bellows vacuum cups 1.5 folds - SV-SB1	
23.016.232._*	A
23.030.230._*	B
Bellows vacuum cups 2.5 folds - SV-SB2	
21.030.030._*	C
21.040.132._*	D

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Bellows vacuum cups with 1.5 folds for dynamic sheet handling - SM-B

NEW

Product Description

Robust, round NBR bellows vacuum cups, 60° Shore A with vulcanised fitting made of aluminium and large area, multi-part “anti-slip” cleats. Various connection threads available. Silicone-free.

Advantage

- Internal supports help to prevent deep-drawing or deformation of thin sheets
- Leak-free suction even with curved surfaces due to flexible sealing lip
- Fold geometry allows handling of three dimensional shaped sheets
- Secure fit due to vulcanised connection thread

Technical data

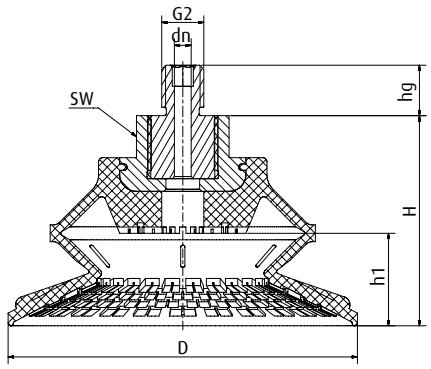
Model / Lip dimensions	Thread (Aluminium)						
	G1/4-male	G1/4-female	G3/8-female	M10-male	M14x1.5-male	Rectangular adapter	
SM-B-30	22.030.171.1	22.030.172.1	22.030.173.1	22.030.174.1	22.030.175.1	22.030.176.1	9
SM-B-40	22.040.177.1	22.040.178.1	22.040.179.1	22.040.180.1	22.040.181.1	22.040.182.1	10
SM-B-50	22.050.183.1	22.050.184.1	22.050.185.1	22.050.186.1	22.050.187.1	22.050.188.1	11.5
SM-B-60	22.060.189.1	22.060.190.1	22.060.191.1	22.060.192.1	22.060.193.1	22.060.194.1	14.5
SM-B-80	22.080.195.1	22.080.196.1	22.080.197.1	22.080.198.1	22.080.199.1	22.080.200.1	22
SM-B-100	22.100.201.1	22.100.202.1	22.100.203.1	22.100.204.1	22.100.205.1	22.100.206.1	26
SM-B-125	22.125.207.1	22.125.208.1	22.125.209.1	22.125.210.1	22.125.211.1	22.125.212.1	32

"Anti-Slip" Cleats (SM-B-80)

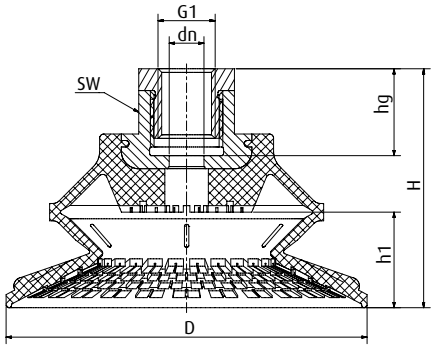
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

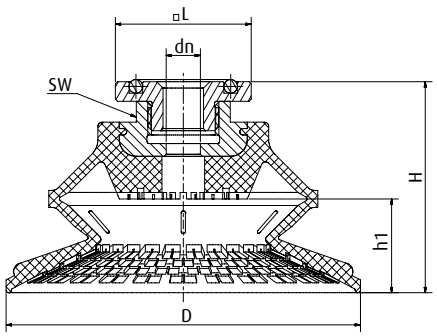
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø D [mm]	Ø dn [mm]	G1 (female)	G2 (male)	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
22.030.171._*	A	32	4	--	G1/4	--	28	9	10	17
22.030.172._*	B	32	4	G1/4	--	--	28	9	12	17
22.030.173._*	B	32	4	G3/8	--	--	44	9	10	17
22.030.174._*	A	32	4	--	M10	--	28	9	12	17
22.030.175._*	A	32	4	--	M14x1.5	--	28	9	12	17
22.030.176._*	C	32	4	--	--	32	31.2	9	--	17
22.040.177._*	A	42	4	--	G1/4	--	29	10	10	17
22.040.178._*	B	42	4	G1/4	--	--	29	10	12	17
22.040.179._*	B	42	4	G3/8	--	--	45	10	10	17
22.040.180._*	A	42	4	--	M10	--	29	10	12	17
22.040.181._*	A	42	4	--	M14x1.5	--	29	10	12	17
22.040.182._*	C	42	4	--	--	32	31.2	10	--	17
22.050.183._*	A	52	6	--	G1/4	--	37	11.5	10	22
22.050.184._*	B	52	6	G1/4	--	--	42	11.5	20	22
22.050.185._*	B	52	6	G3/8	--	--	37	11.5	15	22
22.050.186._*	A	52	4	--	M10	--	37	11.5	12	22
22.050.187._*	A	52	6	--	M14x1.5	--	37	11.5	12	22
22.050.188._*	C	52	6	--	--	32	36.5	11.5	--	22
22.060.189._*	A	63	6	--	G1/4	--	41.5	14.5	10	22
22.060.190._*	B	63	8	G1/4	--	--	46.5	14.5	20	22
22.060.191._*	B	63	8	G3/8	--	--	41.5	14.5	15	22
22.060.192._*	A	63	4	--	M10	--	41.5	14.5	12	22
22.060.193._*	A	63	6	--	M14x1.5	--	41.5	14.5	12	22
22.060.194._*	C	63	8	--	--	32	41	14.5	--	22

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Item no.	Drawing	Ø D [mm]	Ø dn [mm]	G1 (female)	G2 (male)	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
22.080.195._*	A	83	6	--	G1/4	--	50	22	10	22
22.080.196._*	B	83	8	G1/4	--	--	55	22	20	22
22.080.197._*	B	83	8	G3/8	--	--	50	22	15	22
22.080.198._*	A	83	4	--	M10	--	50	22	12	22
22.080.199._*	A	83	6	--	M14x1.5	--	50	22	12	22
22.080.200._*	C	83	8	--	--	32	49.5	22	--	22
22.100.201._*	A	103	6	--	G1/4	--	57	26	10	22
22.100.202._*	B	103	8	G1/4	--	--	62	26	20	22
22.100.203._*	B	103	8	G3/8	--	--	57	26	15	22
22.100.204._*	A	103	4	--	M10	--	57	26	12	22
22.100.205._*	A	103	6	--	M14x1.5	--	57	26	12	22
22.100.206._*	C	103	8	--	--	32	56.5	26	--	22
22.125.207._*	A	128	6	--	G1/4	--	68	32	10	22
22.125.208._*	B	128	8	G1/4	--	--	73	32	20	22
22.125.209._*	B	128	8	G3/8	--	--	68	32	15	22
22.125.210._*	A	128	4	--	M10	--	68	32	12	22
22.125.211._*	A	128	6	--	M14x1.5	--	68	32	12	22
22.125.212._*	C	128	8	--	--	32	67.5	32	--	22

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum suction plates softgrip - SBPL-SG

Product Description

Vacuum suction plate with 1.5 folds for gentle handling of heavy but sensitive products (e.g. glass plates). Divided support surfaces prevent deformation of the product and provide a firm grip. Additional safety sealing lip on the support block positions the product orthogonally to the ground.
Connection via an interlocking, snap-in aluminium plate.

Advantage

> Very careful handling due to soft sealing lip and lightly compressing bellows
> Cleats provide product support
> Cost-effective replacement of worn seals

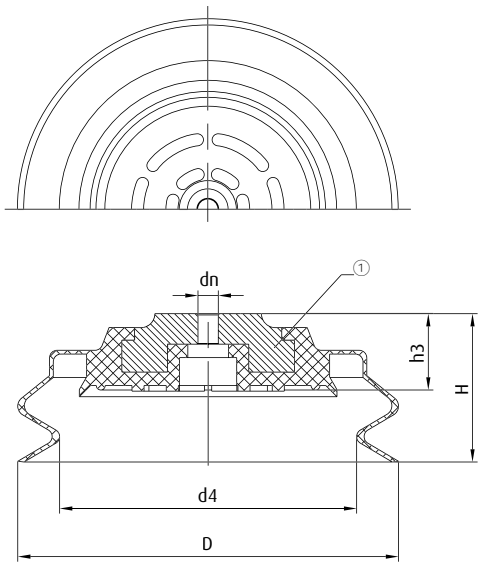
Technical data

Item no.	Model / Lip dimensions		Weight [g]	Material / Colour	Number of folds
22.150.109._*	SBPL-SG-150	28	353	NBR (sw)	1.5
22.210.115._*	SBPL-SG-210	32	860	NBR (sw)	1.5

Accessories

Spare cup
23.150.090.1 (p.357)
23.210.009.1 (p.360)

Dimensions



① = Aluminium

Item no.	Ø **D** [mm]	Ø **d4** [mm]	Ø **dn** [mm]	**H** [mm]	**h3** [mm]
22.150.109._*	150	117	8	58	30
22.210.115._*	212	180	8	65	31

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Bellows vacuum suction plates - SBPL-E

Product Description

Vacuum suction plate, 1.5 folds, vulcanised carrier plate made of steel. Soft sealing lip from a low-marking NBR blend and lightly compressing bellows for gentle handling of heavy but sensitive products (e.g. glass plates). Divided support surfaces provide a firm grip for all loads.

Advantage

> Gentle handling of heavy, sensitive products
> Good adaptation to both concave and convex surfaces
> Rubberised support surfaces prevent deformation of workpieces
> Low-marking

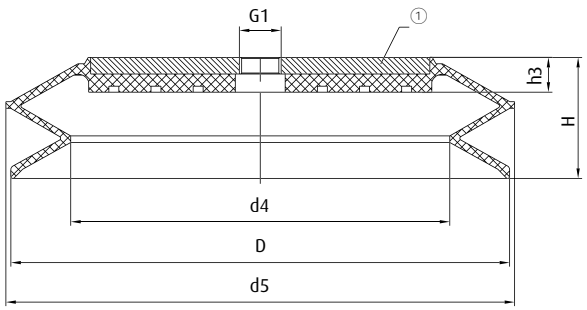
Ordering notes:

Customised drilling patterns on request

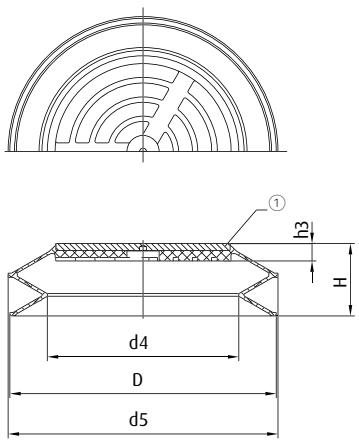
Technical data

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Number of folds	Material / Colour
22.150.084._*	SBPL-E-150	G1/2-female	32	460	1.5	NBR (gr)
22.200.087._*	SBPL-E-200	G1/2-female	30	860	1.5	NBR (gr)
22.250.088._*	SBPL-E-250	G1/2-female	38	1,900	1.5	NBR (gr)
22.300.091._*	SBPL-E-300	without	60	4,200	1.5	NBR (gr)
22.350.102._*	SBPL-E-350	without	55	4,200	1.5	NBR (gr)

Dimensions



Drawing A

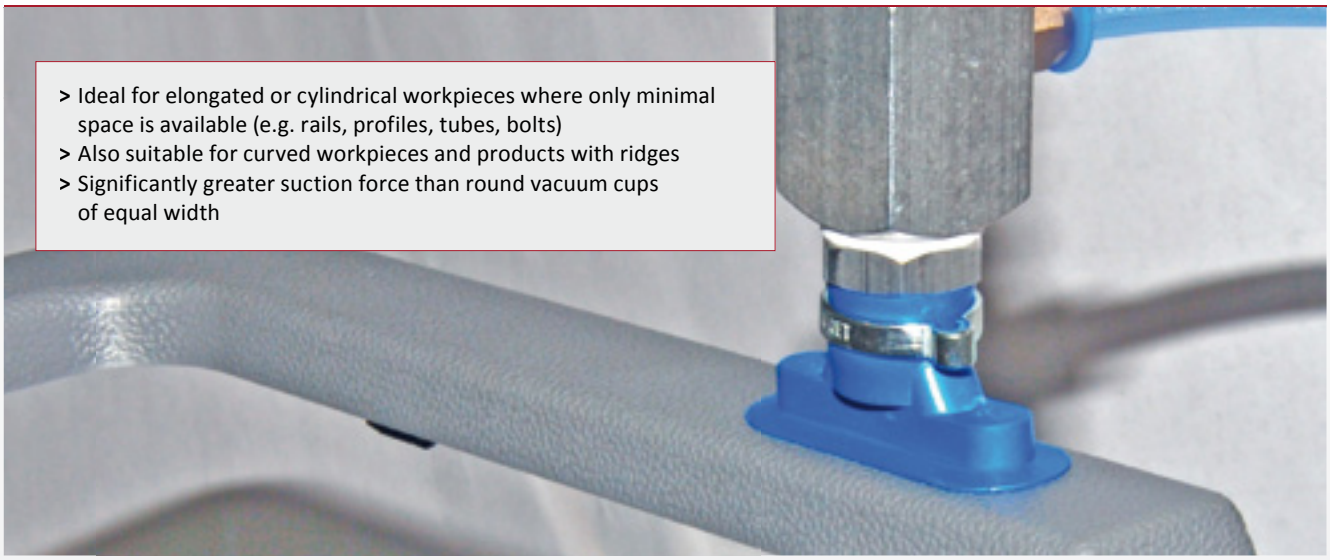


Drawing B

① = Steel

Item no.	Drawing	Ø D [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	H [mm]	h3 [mm]
22.150.084._*	A	150	94	157	G1/2	54	15.5
22.200.087._*	A	200	140	206	G1/2	57	17
22.250.088._*	A	250	190	255	G1/2	61	17.5
22.300.091._*	B	306	220	310	--	83	20
22.350.102._*	B	350	262	350	--	84	21

FIPA Oval vacuum cups SO



> Ideal for elongated or cylindrical workpieces where only minimal space is available (e.g. rails, profiles, tubes, bolts)
> Also suitable for curved workpieces and products with ridges
> Significantly greater suction force than round vacuum cups of equal width

Oval vacuum cups, flat, universal - SO-FU

> Soft sealing lip also allows for the pick-up of curved products
> Supports help to prevent warping of the product
> Dimensions: 4x2 - 100x30 mm

> See page 141

High temperature-resistant Thermalon® oval cups - SKT-O

> Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
> Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Dimensions: 4x2 - 75x25 mm

> See page 144

High temperature-resistant HNBR oval cups - SKH-O

> Universal vacuum cups for removing hot plastic parts to be painted from an injection molding machine
> Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
> Heat-resistant up to 160 °C
> Dimensions: 4x2 - 45x15 mm

> See page 146

Oval vacuum cups, 2.5 folds, universal - SO-BU

> Bellows compensate for level differences and enable gentle attachment to sensitive products
> The reinforcement wires fitted into the folds help prevent collapse at excessive vacuum levels
> Dimensions: 25x8 - 75x25 mm

> See page 148

FIPA Oval vacuum cups SO

Vinyl oval bellows cups - SO-BV

> Compensates for height differences and enables gentle set down on the workpiece
> Good adaptation to curved or flexible product surfaces
> Wear-resistant material - long service life
> Dimensions: 35x28 - 100x55 mm

> See page 149

Silicone ractangular bellows cups, 2.5 and 3.5 folds - SV-RB

> Handling of flexible parts, workpieces with uneven surfaces or products with flexible outer packaging
> FDA-approved vacuum cup material
> Dimensions: 52x25 - 80x50 mm

> See page 150

Oval vacuum cups, flat - SO-E

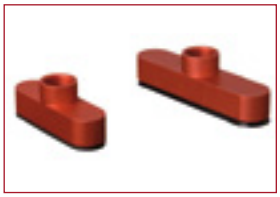
> Very slim design in a number of graduations
> Antistatic version also available
> Interlocking clip-in fittings ensure torsional rigidity and security against rotation
> Cost-effective replacement of worn seals
> Dimensions: 10x4 - 30x8 mm

> See page 152

Oval vacuum cups for cylindrical products - SO-Z

> Greater suction force over normal oval vacuum cups due to three-dimensional oval suction lip contour partially encompassing the workpiece
> Suitable for cylindrical products with diameters of 2 - 18 mm

> See page 154



Oval vacuum cups, flat - SO-C

> Vacuum cup housing of anodised aluminium enables torsion-resistant handling
> Screwed rubber clamping plate fixes rubber sealing lip
> Dimensions: 30x12 - 55x12 mm

> See page 157

Oval vacuum suction plates for textured surfaces - SOPL-R

> Leak-free gripping of many problematic product surfaces thanks to extremely flexible, thinly tapered sealing lip
> Incresed security due to vulcanised carrier plate
> Dimensions: 90x50 - 190x90 mm

> See page 158

Oval vacuum suction plates - SOPL-S and SOPL-A

> Durable vacuum suction plates for handling heavy, narrow products
> Rubberised support surfaces prevent the deformation of products
> Available in the following materials: NBR (low-marking) and NR (wear-resistant)
> Dimensions: 110x40 - 580x180 mm

> See page 160

Notes:

Oval vacuum cups, flat, universal - SO-FU

Product Description

Flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g., rails, profiles, tubes, bolts, etc.).
Size 100x35 mm reinforced with metal inserts.
Connection via plug-in nipple.

Advantage

> Significantly increased suction force compared to round vacuum cups of the same width
> Soft sealing lip also allows adhesion to curved products
> Cleats help to prevent warping of the product
> Cost-effective replacement of worn seals

Ordering notes:

From size 15x5 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation.

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Accessories Clamp
132.4x2.001._*	SO-FU-4x2	0.5	NBR (sw), SI (tr), PU (bl)	--
132.4x2.031._*	SO-FU-4x2A	0.5	NBR (sw), SI (tr), PU (bl)	--
132.7x4.002._*	SO-FU-7x4	0.8	NBR (sw), SI (tr)	--
132.7x4.034._*	SO-FU-7x4A	0.8	NBR (sw), SI (tr)	--
132.12x4.004._*	SO-FU-12x4	0.5	NBR (gr), SI (tr)	--
132.15x5.008._*	SO-FU-15x5	1	NBR (gr), SI (tr), PU (bl)	78.030 (p.476)
132.18x6.012._*	SO-FU-18x6	1	NBR (gr), SI (tr), PU (bl)	78.030 (p.476)
132.24x8.016._*	SO-FU-24x8	1	NBR (gr), SI (tr), PU (bl)	78.032 (p.476)
132.30x10.018._*	SO-FU-30x10	2	NBR (gr), SI (tr), PU (bl)	78.032 (p.476)
132.36x12.019._*	SO-FU-36x12	2	NBR (gr), SI (tr), PU (bl)	78.032 (p.476)
132.45x15.020._*	SO-FU-45x15	3	NBR (gr), SI (tr), PU (bl)	78.033 (p.476)
132.60x20.022._*	SO-FU-60x20	3	NBR (gr), SI (tr), PU (bg)	78.033 (p.476)
132.75x25.023._*	SO-FU-75x25	3	NBR (gr), SI (tr)	78.034 (p.476)
132.100x35.26._*	SO-FU-100x35	3	NBR (sw)	78.034 (p.476)

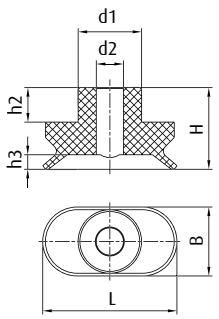
Continued on the next page

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

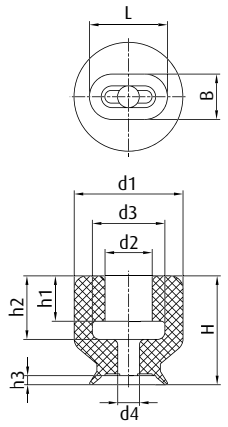
Accessories

Item no.	Suitable fittings								
	M3-male	M4-male	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
132.4x2.001._*	270.011 (p.408)	--	--	--	--	--	--	--	--
132.4x2.031._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--	--	--
132.7x4.002._*	270.025 (p.408)	--	--	--	--	--	--	--	--
132.7x4.034._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--	--	--
132.12x4.004._*	--	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
132.15x5.008._*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.18x6.012._*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.24x8.016._*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.30x10.018._*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.36x12.019._*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.45x15.020._*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.60x20.022._*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.75x25.023._*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.100x35.26._*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)

Dimensions



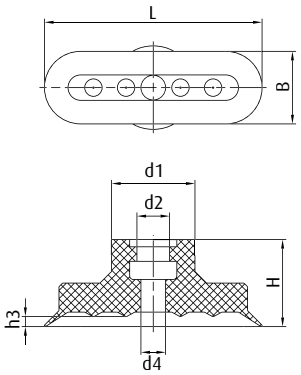
Drawing A



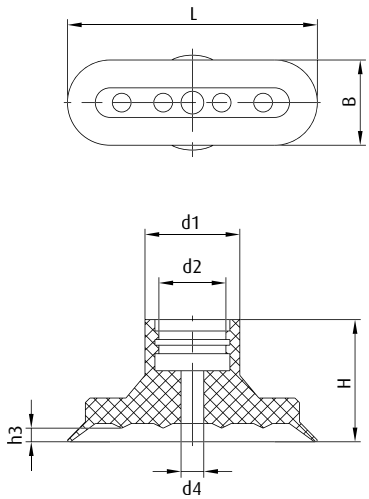
Drawing B

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing C



Drawing D

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
132.4x2.001._*	A	5	2.7	2	1	--	--	3	--	1.3	0.5
132.4x2.031._*	B	4.3	2.5	6	2.6	4	1.2	6	2.5	3.5	0.5
132.7x4.002._*	A	7.5	3.8	3.5	1.5	--	--	4.5	--	1.9	0.8
132.7x4.034._*	B	7.5	4	6	2.4	3	1.4	6	2.3	3	0.7
132.12x4.004._*	B	12	4	8	4	--	1.5	15	--	9.5	1
132.15x5.008._*	C	15	5	9	5	--	2	12	--	--	0.8
132.18x6.012._*	C	18	6	9	4.5	--	2	12	--	--	1.3
132.24x8.016._*	C	24	8	11.5	4.5	--	3	12	--	--	1.3
132.30x10.018._*	C	30	10	11.5	4.5	--	3.4	12	--	--	1.4
132.36x12.019._*	C	36	12	12	5	--	4	12	--	--	1.2
132.45x15.020._*	D	44	15	16.5	12	--	4	22	--	--	2.4
132.60x20.022._*	D	60	20	16.5	11.5	--	4	22	--	--	2.2
132.75x25.023._*	D	75	25	17.5	11	--	3.5	22	--	--	3
132.100x35.26._*	D	100	35	17.5	11.5	--	8	22	--	--	3.1

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature-resistant Thermalon® oval cups - SKT-O

UP TO 160 °C & MINIMUM MARKING

Product Description

Oval vacuum cups for smooth surfaces suitable for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A.
Connection via plug-in nipple.

Advantage

> Extremely low-marking
> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Significantly increased suction force compared to round vacuum cups of the same width
> Soft sealing lip also allows adhesion to curved products

Ordering notes:

From size 24x8 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation.

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Usage temperature [°C]
132.4x2.079._*	SKT-O-4x2	0.4	Thermalon® (bl)	0 - 160
132.7x4.080._*	SKT-O-7x4	0.5	Thermalon® (bl)	0 - 160
132.15x5.081._*	SKT-O-15x5	0.6	Thermalon® (bl)	0 - 160
132.18x6.082._*	SKT-O-18x6	1	Thermalon® (bl)	0 - 160
132.24x8.083._*	SKT-O-24x8	1	Thermalon® (bl)	0 - 160
132.30x10.084._*	SKT-O-30x10	1	Thermalon® (bl)	0 - 160
132.45x15.085._*	SKT-O-45x15	2	Thermalon® (bl)	0 - 160
132.60x20.086._*	SKT-O-60x20	2.5	Thermalon® (bl)	0 - 160
132.75x25.087._*	SKT-O-75x25	2.5	Thermalon® (bl)	0 - 160

Accessories

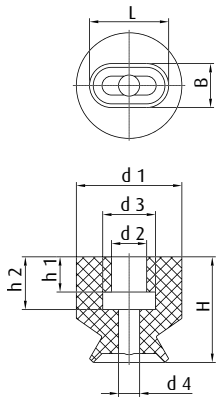
Item no.	Clamp
132.4x2.079._*	--
132.7x4.080._*	--
132.15x5.081._*	--
132.18x6.082._*	--
132.24x8.083._*	78.032 (p.476)
132.30x10.084._*	78.032 (p.476)
132.45x15.085._*	78.033 (p.476)
132.60x20.086._*	78.033 (p.476)
132.75x25.087._*	78.034 (p.476)

Accessories

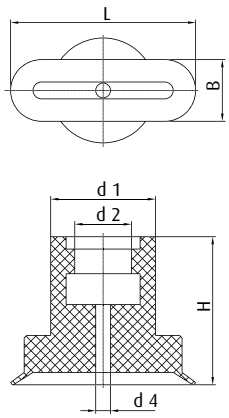
	Suitable fittings						
Item no.	M3-male	M4-male	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
132.4x2.079._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--
132.7x4.080._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--
132.15x5.081._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.18x6.082._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.24x8.083._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.30x10.084._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.45x15.085._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.60x20.086._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.75x25.087._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

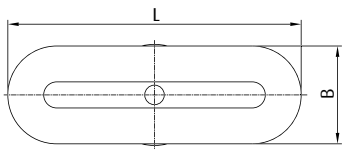
Dimensions

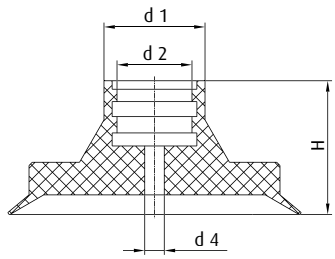


Drawing A



Drawing B





Drawing C

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]
132.4x2.079._*	A	4.5	2.5	6	2	3	1.2	6
132.7x4.080._*	A	7	3.5	6	2	3	1.4	6
132.15x5.081._*	B	15	5	8.5	4.6	--	1.2	12
132.18x6.082._*	B	18	6	8.5	4.6	--	1.5	12
132.24x8.083._*	B	24	8	11.5	5.5	--	1.5	12
132.30x10.084._*	B	30	10	11.5	5.5	--	2.5	12
132.45x15.085._*	C	45	15	15.5	11.5	--	3	21
132.60x20.086._*	C	60	20	15.5	11.5	--	4	21
132.75x25.087._*	C	75	25	17.5	11.5	--	4	21

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

High temperature-resistant HNBR oval cups - SKH-O

UP TO 160 °C & MINIMUM MARKING

Product Description

Oval vacuum cups for smooth surfaces suitable for removing hot plastic parts to be painted from an injection moulding machine.
Connection via plug-in nipple.

Advantage

> Free of silicone and other paint-wetting-impairment substances (PWIS)
> Minimum-marking
> Significantly increased suction force compared to round vacuum cups of the same width
> Soft sealing lip also allows adhesion to curved products

Ordering notes:

From size 15x5 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation

Technical data

Item no.	Model / Lip dimensions		Material / Colour	Usage temperature [°C]
132.4x2.031._*	SKH-O-4x2A	0.5	HNBR (ge)	0 - 160
132.7x4.034._*	SKH-O-7x4	0.8	HNBR (ge)	0 - 160
132.15x5.067._*	SKH-O-15x5	1	HNBR (ge)	0 - 160
132.24x8.066._*	SKH-O-24x8	1	HNBR (ge)	0 - 160
132.36X12.068._*	SKH-O-36x12	2	HNBR (ge)	0 - 160
132.45x15.064._*	SKH-O-45x15	3	HNBR (ge)	0 - 160

Accessories

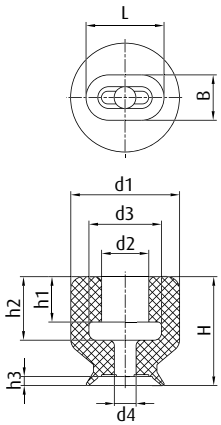
Clamp
--
--
78.030 (p.476)
78.032 (p.476)
78.032 (p.476)
78.033 (p.476)

Accessories

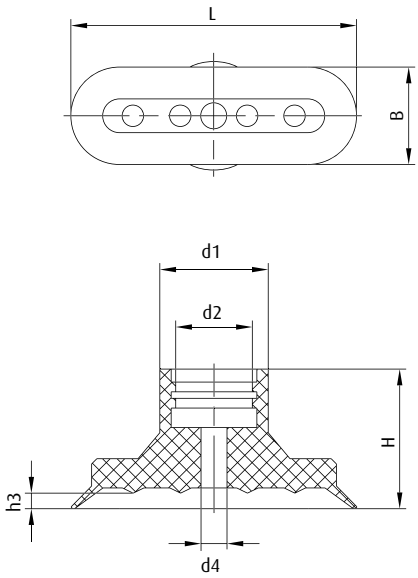
	Suitable fittings					
Item no.	M3-male	M4-male	M5-male	G1/8-male	G1/4-male	G1/4-female
132.4x2.031._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--
132.7x4.034._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--
132.15x5.067._*	--	--	--	270.431 (p.418)	--	--
132.24x8.066._*	--	--	--	270.431 (p.418)	--	--
132.36X12.068._*	--	--	--	270.431 (p.418)	--	--
132.45x15.064._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
132.4x2.031._*	A	4.3	2.5	6	2.6	4	1.2	6	2.5	3.5	0.5
132.7x4.034._*	A	7.5	4	6	2.4	3	1.4	6	2.3	3	0.7
132.15x5.067._*	B	15	5	9	5	--	2	12	--	--	0.8
132.24x8.066._*	B	24	8.5	12.5	5	--	3	13	--	--	1.5
132.36X12.068._*	B	36	12	12	5	--	4	12	--	--	1.6
132.45x15.064._*	B	44	15	16.5	12	--	4	22	--	--	2.4

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Universal oval vacuum cups, 2.5 folds - SO-BU

Product Description

Bellows vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g., rails, profiles, tubes, bolts, etc.). The reinforcement wires fitted into the folds helps prevent collapse at excessive vacuum levels. Connection via plug-in nipple.

Advantage

> Significantly increased suction force compared to round vacuum cups of the same width
> Bellows compensate for height differences
> Soft sealing lip also allows adhesion to curved products

Ordering notes:

> For fastening, the use of a gripper clamp (available separately) is recommended to prevent inadvertent rotation

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
138.25x8.002._*	SO-BU-25x8	6	2.5	NBR (gr), SI (tr)
138.45x15.003._*	SO-BU-45x15	8	2.5	NBR (gr), SI (tr)
138.75x25.004._*	SO-BU-75x25	11	2.5	NBR (gr), SI (tr)

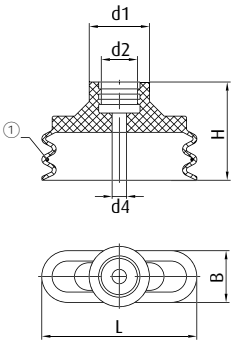
Accessories

Clamp
78.031 (p.476)
78.033 (p.476)
78.034 (p.476)

Accessories

	Suitable fittings					
Item no.	M5-male	M5-female	G1/8-male	G1/8-female	G1/4-male	G1/4-female
138.25x8.002._*	270.094 (p.411)	270.005 (p.412)	270.095 (p.418)	270.096 (p.422)	--	--
138.45x15.003._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)
138.75x25.004._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)

Dimensions



① = Wire strap stiffening

Item no.	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	H [mm]
138.25x8.002._*	25	8	10	4.5	2	18.5
138.45x15.003._*	45	15	17.5	10.5	4	29
138.75x25.004._*	75	25	17.5	10.5	6	35

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vinyl oval bellows cups - SO-BV

Product Description

Durable oval vacuum cup with height adjustment made of snug-fitting, wear-resistant material. Very well suited for handling abrasive products such as cardboard. Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods.
Connection via plug-in nipple or vulcanised carrier plate.

Advantage

- Significantly increased suction force compared to round vacuum cups of the same width
- Bellows compensates for differences in height and enables good adaptation to curved or uneven product surfaces
- Flexible, soft lips
- Long life cycle

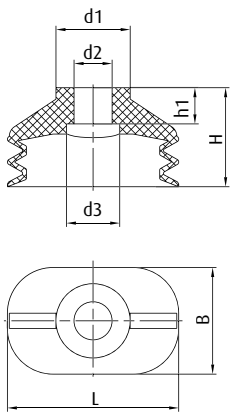
Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
138.35x28.001._*	SO-BV-35x28	9	2.5	Vinyl (bl)
138.45x28.013._*	SO-BV-45x28	9	2.5	Vinyl (bl)
130.97x55.126._*	SO-BV-100x55	11	1.5	Vinyl (bl)

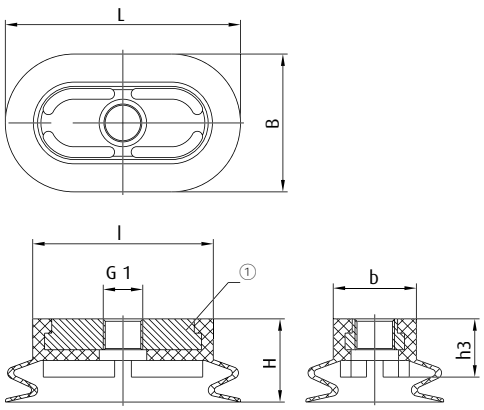
Accessories

	Suitable fittings		
Item no.	M10-male	G1/4-male	G1/4-female
138.35x28.001._*	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
138.45x28.013._*	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
130.97x55.126._*	--	--	--

Dimensions



Drawing A



Drawing B

① = Aluminium

Item no.	Drawing	L [mm]	B [mm]	l [mm]	b [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	G1	H [mm]	h1 [mm]	h3 [mm]
138.35x28.001._*	A	35	28	--	--	19.5	10	14	--	24	8.5	--
138.45x28.013._*	A	45	28	--	--	19.5	10	14	--	26	9.5	--
130.97x55.126._*	B	99	58	76	35	--	--	--	G3/8	35	--	25

Rectangular bellows vacuum cups - SV-RB

Product Description

Bellows vacuum cups in rectangular design made of FDA-compliant material (SI). Particularly suitable for film-packaged products and filled pouches. Also available with wire stiffening. Connection via an interlocking snap-in carrier plate.

Advantage

> Large suction surface due to rectangular design
> Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces
> Gentle attachment to the product
> Good fit for irregularities and folds thanks to soft sealing lip

Ordering notes:

Optional: Wire strap reinforcement available.
When ordering, please add "-VERS" to item number

Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
Bellows vacuum cups, 2.5 folds, for cylindrical products				
201.79x29.002._*	SV-RB-79x29	16	2.5	SI (tr)
Bellows vacuum cups, 2.5 folds, with flat sealing lip				
209.52x25.006._*	SV-RB-52x25	13	2.5	SI (tr)
209.60x29.001._*	SV-RB-60x29	13	2.5	NBR (sw), SI (tr)
Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip				
209.80x30.003._*	SV-RB-80x30	20	3.5	SI (tr)
209.80x40.004._*	SV-RB-80x40	20	3.5	SI (tr)
209.80x50.005._*	SV-RB-80x50	20	3.5	SI (tr)

Accessories

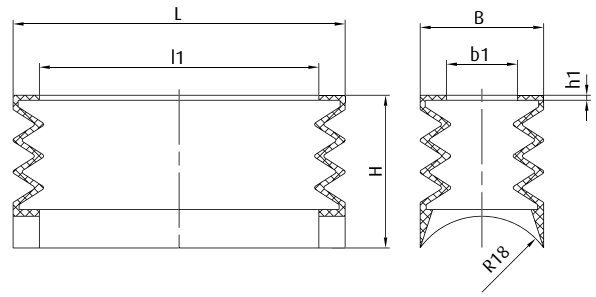
Item no.	Wire strap reinforcement
Bellows vacuum cups, 2.5 folds, for cylindrical products	
201.79x29.002._*	X 0020
Bellows vacuum cups, 2.5 folds, with flat sealing lip	
209.52x25.006._*	X 0022
209.60x29.001._*	X 0024
Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip	
209.80x30.003._*	X 0020
209.80x40.004._*	X 0023
209.80x50.005._*	X 0041

Accessories

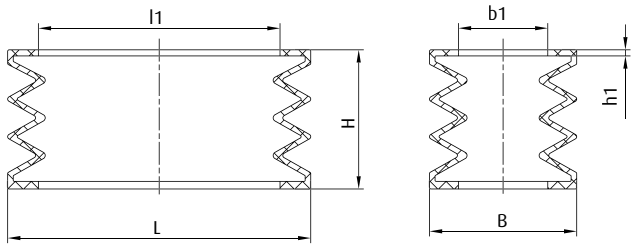
Item no.	Suitable fittings G1/8-female	G1/4-female
Bellows vacuum cups, 2.5 folds, for cylindrical products		
201.79x29.002._*	--	270.392 (p.439)
Bellows vacuum cups, 2.5 folds, with flat sealing lip		
209.52x25.006._*	270.508 (p.439)	--
209.60x29.001._*	--	270.509 (p.439)
Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip		
209.80x30.003._*	--	270.392 (p.439)
209.80x40.004._*	--	270.510 (p.439)
209.80x50.005._*	--	270.511 (p.439)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

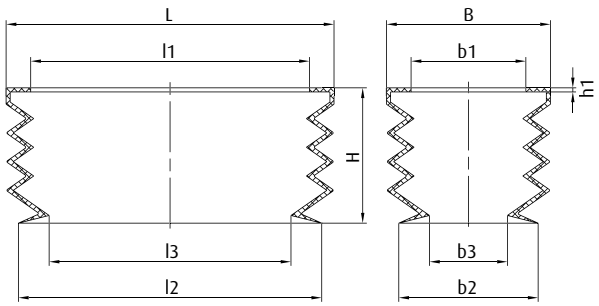
Dimensions



Drawing A



Drawing B

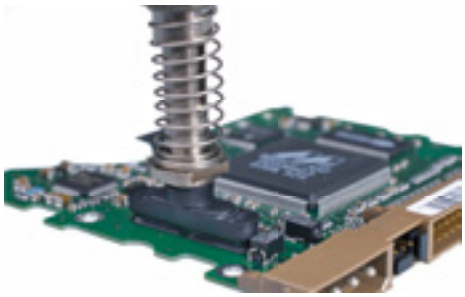


Drawing C

Item no.	Drawing	L [mm]	B [mm]	l1 [mm]	l2 [mm]	l3 [mm]	b1 [mm]	b2 [mm]	b3 [mm]	H [mm]	h1 [mm]
Bellows vacuum cups, 2.5 folds, for cylindrical products											
201.79x29.002._*	A	80	30	67	--	--	17	--	--	37	1.2
Bellows vacuum cups, 2.5 folds, with flat sealing lip											
209.52x25.006._*	B	53	26	40	--	--	13	--	--	28	1.2
209.60x29.001._*	B	60	29	48	--	--	17.5	--	--	27	1.2
Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip											
209.80x30.003._*	C	81	31	69	75	60	18	25	9	34	--
209.80x40.004._*	C	80	40	68	74	59	28	34	19	33	--
209.80x50.005._*	C	80	50	67	74	57	37	44	27	33	--

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Oval vacuum cups, flat - SO-E



Product Description

Small flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g. semiconductors, carrier plates, etc.). Connection via an interlocking snap-in plug-in nipple.

Advantage

- Significantly increased suction force compared to round vacuum cups of the same width
- Optimum bending strength due to elongated carrier plate in the plug-in nipple
- Secured against rotation
- Antistatic version available
- Cost-effective replacement of worn seals

Ordering notes:

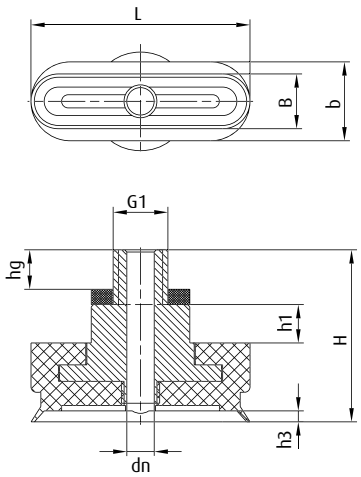
The cups are delivered fully assembled with fitting.
The listed fittings are spare parts.

Technical Data

Model / Lip dimensions	Item no.			Material / Colour	Spare cup	Spare fittings	
	M5-male	M6-male				M5-male	M6-male
SO-E-10x4	130.10x4.115._*	130.10x4.068._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x4.003._*	270.463	270.339
SO-E-10x5	130.10x5.116._*	130.10x5.071._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x5.007._*	270.463	270.339
SO-E-10x6	130.10x6.117._*	130.10x6.073._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x6.011._*	270.463	270.339
SO-E-20x4	130.20x4.118._*	130.20x4.069._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x4.005._*	270.464	270.340
SO-E-20x5	130.20x5.119._*	130.20x5.081._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x5.009._*	270.464	270.340
SO-E-20x6	130.20x6.120._*	130.20x6.074._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x6.013._*	270.464	270.340
SO-E-20x8	130.20x8.121._*	130.20x8.076._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x8.015._*	270.464	270.340
SO-E-30x5	130.30x5.123._*	130.30x5.072._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x5.010._*	270.464	270.340
SO-E-30x6	130.30x6.124._*	130.30x6.075._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x6.014._*	270.464	270.340
SO-E-30x8	130.30x8.125._*	130.30x8.077._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x8.017._*	270.464	270.340

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Item no.	L [mm]	B [mm]	b [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h3 [mm]	hg [mm]
130.10x4.115._*	10	4.6	7	2.5	M5	15.5	3.5	1	3.6
130.10x4.068._*	10	4.6	7	2	M6	15.5	3.5	1	4
130.10x5.116._*	10	5	7	2.5	M5	15.5	3.5	1	3.6
130.10x5.071._*	10	5	7	2	M6	15.5	3.5	1	4
130.10x6.117._*	10	6	7	2.5	M5	15.5	3.5	1	3.6
130.10x6.073._*	10	6	7	2	M6	15.5	3.5	1	4
130.20x4.118._*	20	4.3	7	2.5	M5	15.5	3.5	1	3.6
130.20x4.069._*	20	4.3	7	2	M6	15.5	3.5	1	4
130.20x5.119._*	20	5	7	2.5	M5	15.5	3.5	1	3.6
130.20x5.081._*	20	5	7	2	M6	15.5	3.5	1	4
130.20x6.120._*	20	6	7	2.5	M5	15.5	3.5	1	3.6
130.20x6.074._*	20	6	7	2	M6	15.5	3.5	1	4
130.20x8.121._*	20	8	8	2.5	M5	15.5	3.5	1	3.6
130.20x8.076._*	20	8	8	2	M6	15.5	3.5	1	4
130.30x5.123._*	30	5	7	2.5	M5	15.5	3.5	1	3.6
130.30x5.072._*	30	5	7	2	M6	15.5	3.5	1	4
130.30x6.124._*	30	6	7	2.5	M5	15.5	3.5	1	3.6
130.30x6.075._*	30	6	7	2	M6	15.5	3.5	1	4
130.30x8.125._*	30	8	8	2.5	M5	15.5	3.5	1	3.6
130.30x8.077._*	30	8	8	2	M6	15.5	3.5	1	4

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Oval vacuum cups for cylindrical products - SO-Z

Product Description

Oval vacuum cup for cylindrical products such as pins, needles, tubes, etc. Connection via plug-in nipple, hollow screw (SO-Z-10-18) or direct plug-in to the machine (SO-Z-4-10).

Advantage

> Significantly greater suction force over normal oval vacuum cups due to three-dimensional oval suction lip contour partially encompassing the workpiece
> Cost-effective replacement of worn seals

Technical data

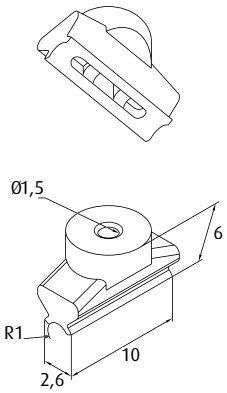
Item no.	Model / Lip dimensions	Suitable for cylindrical products with Ø [mm]	Material / Colour
201.10x3.005._*	SO-Z-2-4	2 - 4	NBR (sw), SI (tr)
201.10x6.006._*	SO-Z-3-7	3 - 7.5	NBR (sw), SI (tr)
132.15x7.073._*	SO-Z-4-10	4 - 10	SI (r)
201.12x9.007._*	SO-Z-6-13	6 - 13	NBR (sw), SI (tr)
9.23x11.036._*	SO-Z-10-18	10 - 18	SI (tr)

Accessories

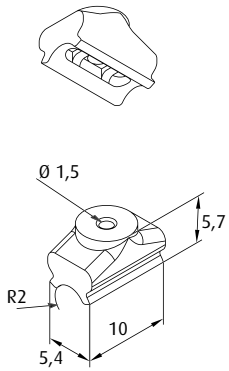
	Suitable fittings		
Item no.	M5-male	G1/8-male	G1/8-female
201.10x3.005._*	270.300 (p.411)	--	--
201.10x6.006._*	270.300 (p.411)	--	--
132.15x7.073._*	--	--	--
201.12x9.007._*	270.300 (p.411)	--	--
9.23x11.036._*	270.310 (p.411)	270.493 (p.420)	270.494 (p.423)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

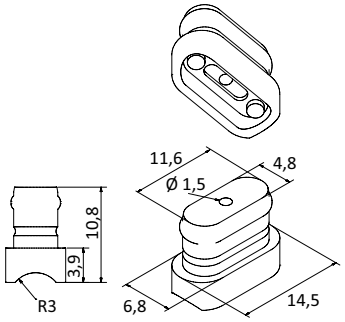
Dimensions



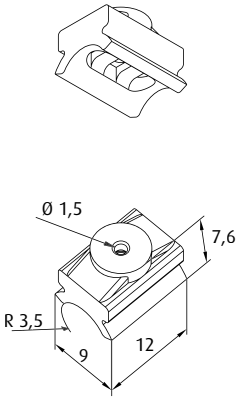
Drawing A



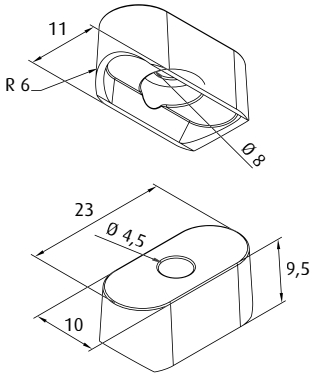
Drawing B



Drawing C



Drawing D



Drawing E

Item no.	Drawing
201.10x3.005._*	A
201.10x6.006._*	B
132.15x7.073._*	C
201.12x9.007._*	D
9.23x11.036._*	E

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Notes:

Oval vacuum cups, flat - SO-C

Product Description

Flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g. rails, profiles, tubes, bolts, etc.). Vacuum chamber housing of anodised aluminium. Rubber sealing lip is fixed by a screwed rubber clamping plate.

Advantage

> Significantly increased suction force compared to round vacuum cups of the same width
> Warp-resistant aluminium housing
> Cost-effective replacement of worn seals

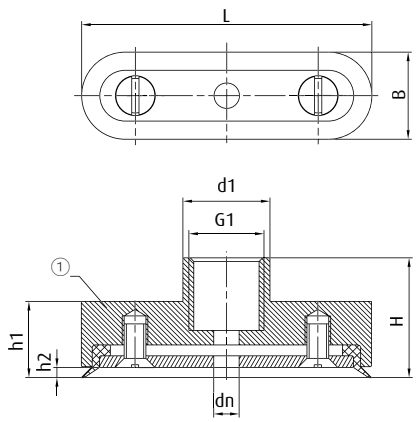
Technical data

Item no.	Model / Lip dimensions	Connection thread		Material / Colour
130.30x12.057._*	SO-C-30x12	G1/8-female	1	SI (tr), NR (sw)
130.40x12.058._*	SO-C-40x12	G1/8-female	1	SI (tr), NR (sw)
130.55x12.082._*	SO-C-55x12	G1/8-female	1	NBR (sw), SI (tr), NR (sw)

Accessories

Spare cup
132.30x12.025._* (p.374)
132.40x12.027._* (p.375)
132.55x12.029._* (p.378)

Dimensions



① = Aluminium

Item no.	L [mm]	B [mm]	Ø d1 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]
130.30x12.057._*	30	12	12	3.5	G1/8	16.5	10	1.3
130.40x12.058._*	40	12	12	3.5	G1/8	16.5	10	1.4
130.55x12.082._*	55	12	12	3.5	G1/8	16.5	10	1.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Oval vacuum suction plates for textured surfaces - SOPL-R

Product Description

Oval vacuum cups for handling both rough surfaces and smooth, markedly uneven products.
Connection via vulcanised aluminium plate.

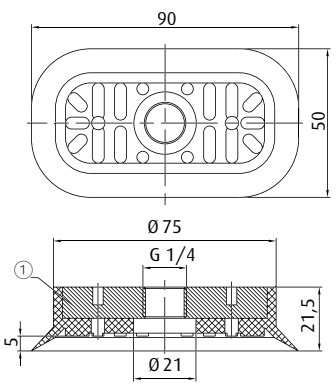
Advantage

> Leak-free gripping of difficult product surfaces thanks to extremely flexible, thinly tapered sealing lip
> Cleats help prevent warping of the product
> Optimum process reliability due to vulcanised backing plate, as well as additional internal safety sealing lip (190x90 mm and 120x65 mm)

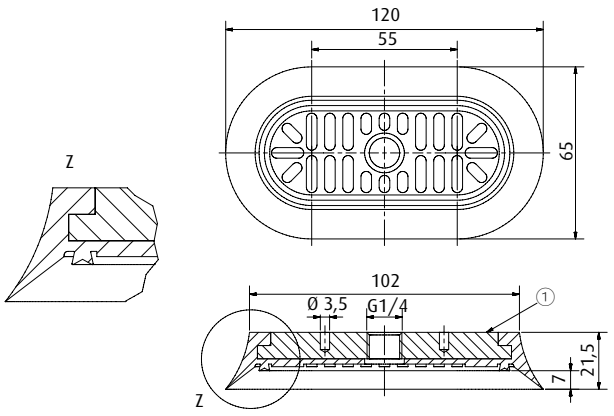
Technical data

Item no.	Model / Lip dimensions	Connection thread	Material / Colour		Weight [g]
130.90x50.113._*	SOPL-R-90x50	G1/4-female	NR (bg)	5	72
9.120x65.088._*	SOPL-R-120x65	G1/4-female	NR (bg)	7	131
9.190x90.061._*	SOPL-R-190x90	G1/4-female	NR (bg)	5.5	295

Dimensions



Drawing A

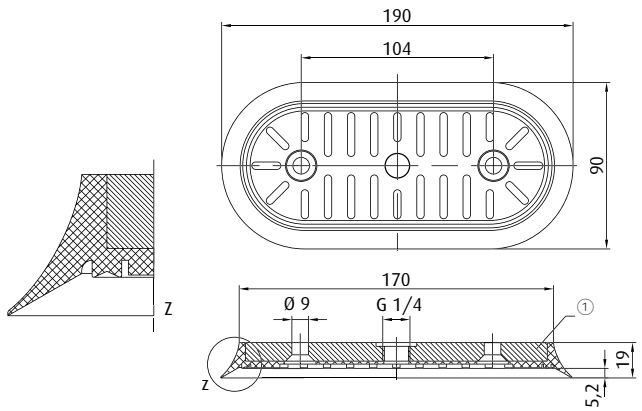


Drawing B

① = Aluminium

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing C

① = Aluminium

Item no.	Drawing
130.90x50.113._*	A
9.120x65.088._*	B
9.190x90.061._*	C

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Oval vacuum suction plates - SOPL-S and SOPL-A

Product Description	Advantage
Oval vacuum cups, vulcanised, on a carrier plate of steel/aluminium for the handling of long, narrow products such as strips, profiles or frames. Rubberised support surfaces prevent deformation of the product and increase lateral stability.	> High suction force on a small footprint > Low-marking > High process reliability due to vulcanised carrier plate > Individual machine connection possible

Ordering notes:

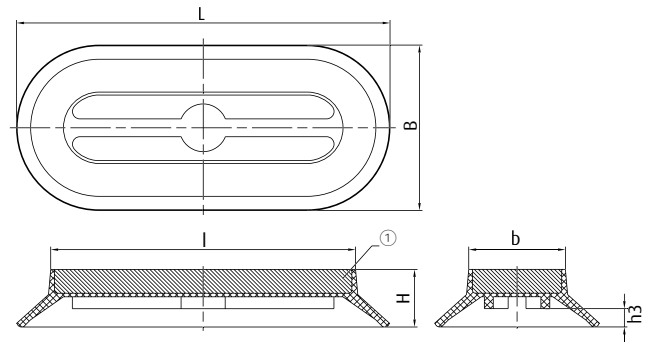
Customised drilling patterns available on request for Series SOPL-S

Technical data

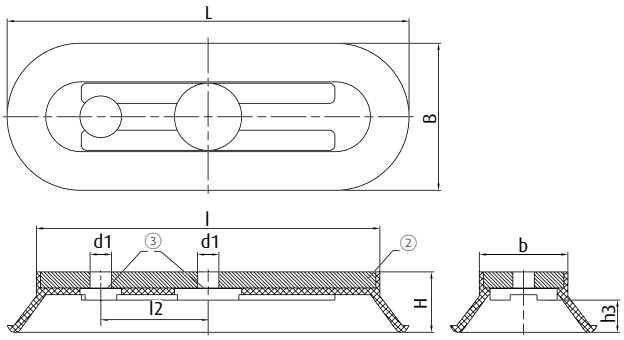
Item no.	Model / Lip dimensions	Material / Colour		Weight [g]	Support surfaces
SOPL-S: NBR material, grey, with steel carrier plate					
9.200x40.010._*	SOPL-S-200x40	NBR (gr)	9	140	lengthwise
9.110x40.009._*	SOPL-S-110x40	NBR (gr)	9	122	lengthwise
9.125x55.012._*	SOPL-S-125x55	NBR (gr)	9	320	lengthwise
9.150x55.013._*	SOPL-S-150x55	NBR (gr)	7	255	lengthwise
9.200x55.014._*	SOPL-S-200x55	NBR (gr)	7	538	lengthwise
9.250x55.016._*	SOPL-S-250x55	NBR (gr)	8	770	lengthwise
9.300x55.019._*	SOPL-S-300x55	NBR (gr)	8	902	lengthwise
9.370x70.022._*	SOPL-S-370x70	NBR (gr)	10	1,895	lengthwise
9.200x100.015._*	SOPL-S-200x100	NBR (gr)	8	595	lengthwise
9.280x100.017._*	SOPL-S-280x100	NBR (gr)	10	1,880	lengthwise
9.450x130.025._*	SOPL-S-450x130	NBR (gr)	6	2,660	crosswise
9.430x180.024._*	SOPL-S-430x180	NBR (gr)	6	3,720	selective
9.580x180.029._*	SOPL-S-580x180	NBR (gr)	10	3,500	lengthwise
SOPL-A: NR material, orange, with aluminium carrier plate					
9.100x55.020._*	SOPL-A-100x55	NR (or)	8	65	lengthwise
9.150x55.083._*	SOPL-A-150x55	NR (or)	8	114	lengthwise
9.200x55.020._*	SOPL-A-200x55	NR (or)	8	159	lengthwise
9.300x55.046._*	SOPL-A-300x55	NR (or)	8	300	lengthwise

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



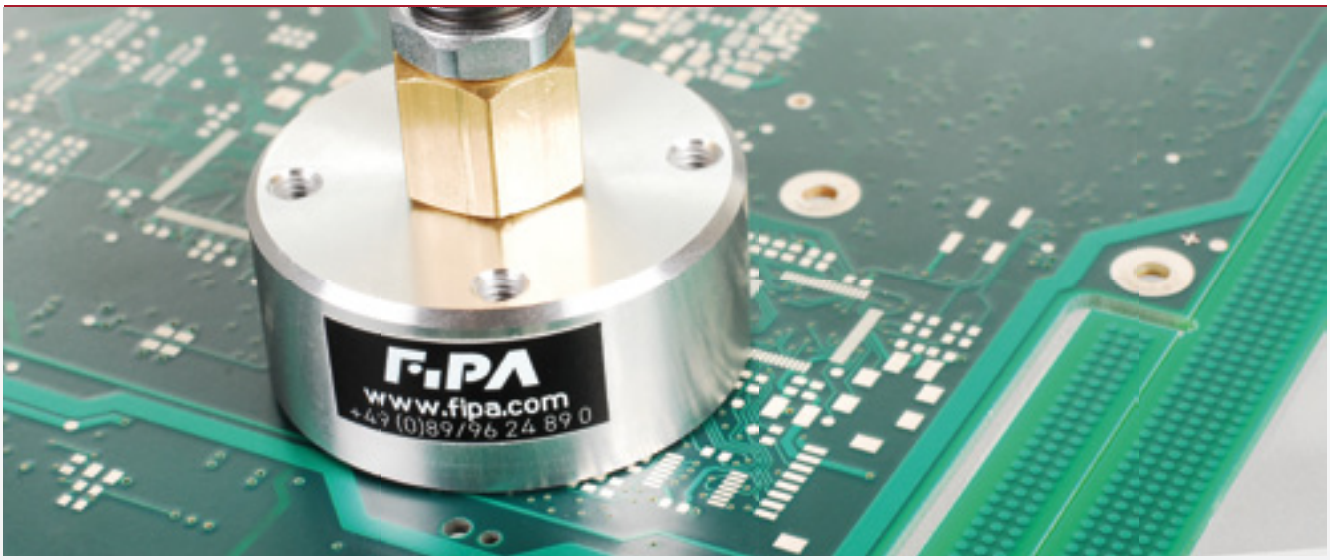
Drawing B

① = Steel ② = Aluminium ③ = Sealed with rubber

Item no.	Drawing	L [mm]	B [mm]	l [mm]	l2 [mm]	b [mm]	Ø d1 [mm]	H [mm]	h3 [mm]
SOPL-S: NBR material, grey, with steel carrier plate									
9.200x40.010._*	A	195	36	176	--	15	--	19	6
9.110x40.009._*	A	113	43	87	--	17	--	19	8.5
9.125x55.012._*	A	126	56	103	--	33	--	19	6
9.150x55.013._*	A	151	56	128	--	33	--	19	6
9.200x55.014._*	A	200	55	178	--	33	--	19	6.3
9.250x55.016._*	A	250	55	228	--	33	--	19	6
9.300x55.019._*	A	300	55	227	--	33	--	19	6
9.370x70.022._*	A	378	82	349	--	53	--	26	9
9.200x100.015._*	A	190	90	161	--	61	--	22	8.5
9.280x100.017._*	A	278	100	250	--	72	--	25	9
9.450x130.025._*	A	449	131	420	--	102	--	20	6.5
9.430x180.024._*	A	430	180	402	--	158	--	20	6
9.580x180.029._*	A	579	179	570	--	150	--	25	9
SOPL-A: NR material, orange, with aluminium carrier plate									
9.100x55.020._*	B	99	54	78	25	33	8	22.5	9
9.150x55.083._*	B	150	55	128	40	33	8	22.5	9
9.200x55.020._*	B	201	56	178	50	33	8	22.5	9
9.300x55.046._*	B	300	55	278	100	33	8	22.5	9

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

FIPA Special vacuum cups SX



Temperature-resistant, felt coated vacuum cups - SX-F

> Virtually mark-free special vacuum cups for high temperature requirements, e.g. in the glass industry
> Highest temperature resistance (FKM briefly up to 300 °C; special silicone with an evaporated silicone lock made of aluminium briefly up to 500 °C)
> Special felt pad vulcanised inseparably to elastomer carrier
> Diameter: 25 - 160 mm

> See page 164

Vacuum cups with sponge pad - SX-SH

> Flat vacuum cups with contact surface made from special silicone sponge
> Very low-marking on polished surfaces
> Flat sealing prevents leakage for rough, porous surfaces
> Diameter: 8 - 40 mm

> See page 166

Bernoulli vacuum cups - SX-B

> Non-contact, deformation-resistant transport of thin and sensitive products
> No ejector, requires compressed air only
> High holding force: Bernoulli vacuum cups can move up to 1,200 g of mass
> Perfectly suited for porous products thanks to high volume flow at low vacuum level
> Series made of PEEK (approval according to FDA / EC 1935 / 2004) for direct contact with food and ease of cleaning

> See page 498

Foam grippers

> Handling of individual products or layers without the need to change the gripper and regardless of workpiece positioning
> Integrated vacuum generation or external compressor for use with particularly air-permeable workpieces
> Versions available with leakage reduction or flow valves

> See page 477

FIPA Special vacuum cups SX

Hand grippers - SX-G

> Sturdy gripper for the manual handling of flat, smooth products
> No vacuum source required
> Simple handling - release of the product via a release button

> See page 168

Sealing cords - SX-D

> Long-length version for DIY production of individual vacuum suction plates
> Ideal adaptation to special product shapes

> See page 169

High temperature vacuum cups with felt pad - SX-F

HEAT RESISTANT & LOW MARKING

Product Description

Almost mark-free special vacuum cup for high temperature requirements, e.g. in the glass industry.
Special felt pad vulcanised to elastomer carrier. Migration of silicone particles is prevented by vapour-deposited aluminium layer.
Connection up to Ø 70 mm by means of plug-in nipple, from Ø 90 mm with bolted bracket plate.

Advantage

> Temperature-resistant up to 500 °C (SI)
> Almost mark-free
> Cost-effective replacement of worn seals

Notes:

There is a small leak at first use resulting from the texture of the special felt, but after a brief period of use this will be significantly reduced by the thickening of the felt layer.

Technical data

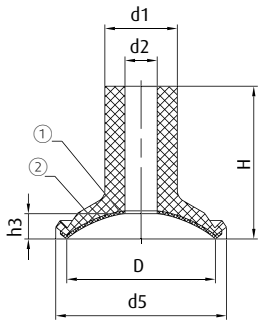
Item no.	Model / Lip dimensions		Weight [g]	Max. operating temperature [°C]	Material / Colour	Number of bellows
26.025.009._*	SX-F-25	2	6	500	SI (tr/ge)	--
26.037.010._*	SX-F-40	3	10	500	SI (tr/ge)	--
26.070.011._*	SX-F-70	7	24	500	SI (tr/ge)	--
26.090.001._*	SX-F-90	17	80	500, 300	SI (tr/ge), FKM (sw/ge)	1.5
26.120.002._*	SX-F-120	18	140	300	FKM (sw/ge)	1.5
26.160.003._*	SX-F-160	18	205	300	FKM (sw/ge)	1.5

Accessories

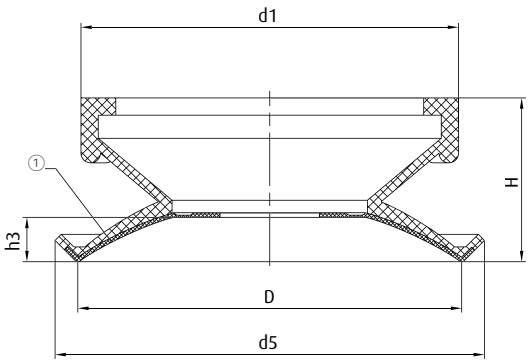
	Suitable fittings				
Item no.	G1/8-male	G1/8-female	G1/4-male	G1/4-female	G3/8-female
26.025.009._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.037.010._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.070.011._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.090.001._*	--	--	--	--	270.400 (p.436)
26.120.002._*	--	--	--	--	270.402 (p.436)
26.160.003._*	--	--	--	--	270.404 (p.436)

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

① = Felt pads ② = For silicone vacuum cups: Silicone membrane by evaporated aluminium layer

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d5** [mm]	**H** [mm]	**h3** [mm]
26.025.009._*	A	24	16	8	29	36	3.3
26.037.010._*	A	37	18	8	42	38	6.5
26.070.011._*	A	67	21	8	71	36	8
26.090.001._*	B	89	87	--	99	38	10.5
26.120.002._*	B	120	108	--	129	45	17.5
26.160.003._*	B	150	130	--	161	48	16.5

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Vacuum cups with sponge pad - SX-SH

Product Description

Low-marking flat vacuum cup with contact surface of special silicone sponge.
Soft sponge coating compensates for unevenness.
Connection via an interlocking snap-in plug-in nipple.

Advantage

> Very low-marking on polished surfaces
> Flat sealing prevents leakage
> Cost-effective replacement of worn seals

Technical data

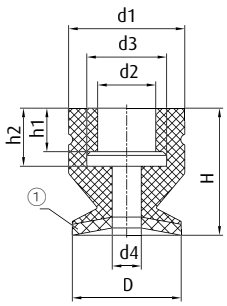
Item no.	Model / Lip dimensions		Max. operating temperature [°C]	Material / Colour
104.008.082._*	SX-SH-8	0.5	200	SI (bl/r)
104.009.083._*	SX-SH-9	0.5	200	SI (bl/r)
104.013.084._*	SX-SH-13	0.5	200	SI (bl/r)
104.015.085._*	SX-SH-15	1	200	SI (bl/r)
104.020.086._*	SX-SH-20	1.5	200	SI (bl/r)
104.030.087._*	SX-SH-30	1.5	200	SI (bl/r)
104.040.088._*	SX-SH-40	2.5	200	SI (bl/r)

Accessories

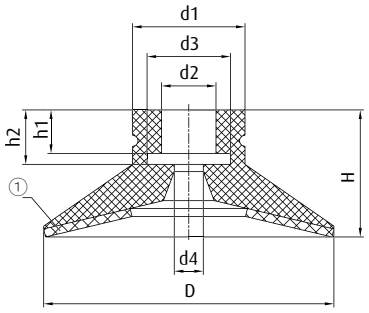
	Suitable fittings					Suitable spring levelers (Snap-In)					
Item no.	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler		Spring leveler		Spring leveler	
104.008.082._*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.009.083._*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.013.084._*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.015.085._*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.020.086._*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.030.087._*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.040.088._*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Dimensions



Drawing A



Drawing B

① = Silicone sponge

Item no.	Drawing	Ø **D** [mm]	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	Ø **d4** [mm]	**H** [mm]	**h1** [mm]	**h2** [mm]
104.008.082._*	A	8	10.5	5	7	3	14	3	5
104.009.083._*	A	9	10.5	5	7	3	14	3	5
104.013.084._*	A	13	10.5	5	7	3	14	3	5
104.015.085._*	A	15	15.5	7.5	11.5	4	17.5	6	8
104.020.086._*	A	20	15.5	7.5	11.5	4	17.5	6	8
104.030.087._*	B	30	15.5	7.5	11.5	4	17.5	6	8
104.040.088._*	B	40	15.5	7.5	11.5	4	17.5	6	8

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Hand grippers - SX-G

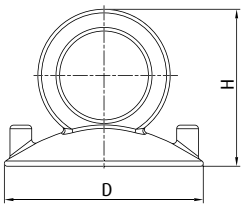
Product Description

Sturdy gripper for the manual handling of flat, smooth products.
No vacuum source required. Simple handling.
Release of the product via a release button.

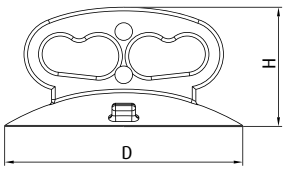
Technical data

Item no.	Model / Lip dimensions	Tearing force [kg]	Material / Colour
64.001._*	SX-G-55	14	Vinyl (sw)
64.002._*	SX-G-65	19	Vinyl (sw)
64.003._*	SX-G-75	22	Vinyl (sw)
64.004._*	SX-G-125	25	NBR (sw)
64.005._*	SX-G-130	28	Vinyl (sw)

Dimensions



Drawing A

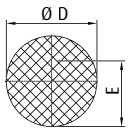


Drawing B

Item no.	Drawing	Ø D [mm]	H [mm]
64.001._*	A	54	42
64.002._*	A	66	48
64.003._*	B	82	42
64.004._*	B	115	63
64.005._*	B	121	65

Sealing cord, round - SX-D

Long-length version for production of individual vacuum suction plates



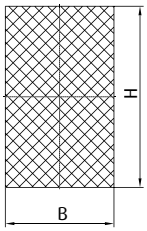
Technical data				Dimensions
Item no.	Model / Lip dimensions	Recommended installation depth E [mm]	Material / Colour	Ø D [mm]
231.05.026.12	SX-D-5	3.7	CR (sw)	5
231.06.011.12	SX-D-6	4.5	CR (sw)	6
231.08.012.12	SX-D-8	6	CR (sw)	8
231.10.013.12	SX-D-10	7	CR (sw)	10
231.12.014.12	SX-D-12	8.5	CR (sw)	12

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, rectangular - SX-D

Long-length version for production of individual vacuum suction plates



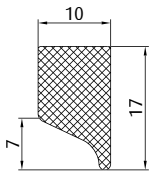
Technical data			Dimensions	
Item no.	Model / Lip dimensions	Material / Colour	B [mm]	H [mm]
231.10x6.006.12	SX-D-10x6	CR (gr)	6	10
231.20x10.027.12	SX-D-20x10	EPDM (sw)	10	20

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

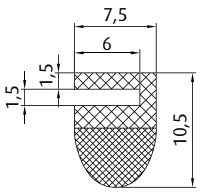
Item no.	Material / Colour
231.17x10.025.12	NR (gr)

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

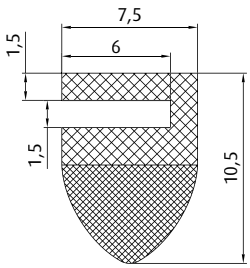
Item no.	Material / Colour
231.10,5x7,5.001.12	EPDM (sw) - 80°/30° Shore A

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

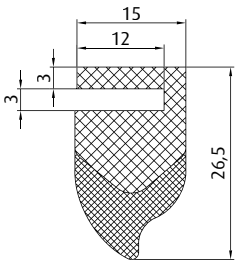
Item no.	Material / Colour
231.10,5x7,5.002.12	EPDM (sw) - 80°/30° Shore A

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

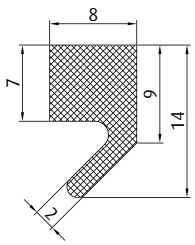
Item no.	Material / Colour
231.26,5x15.003.12	EPDM (sw) - 80°/30° Shore A

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

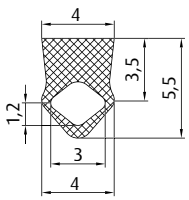
Item no.	Material / Colour
231.14x8x2.009.12	Sponge rubber (gr)

Ordering notes:

Minimum standard length: 1,000 mm

Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



Technical data

Item no.	Material / Colour
231.5,5x4.015.2tr	SI (tr)

Ordering notes:

1 packaging unit = 25 m

Notes:

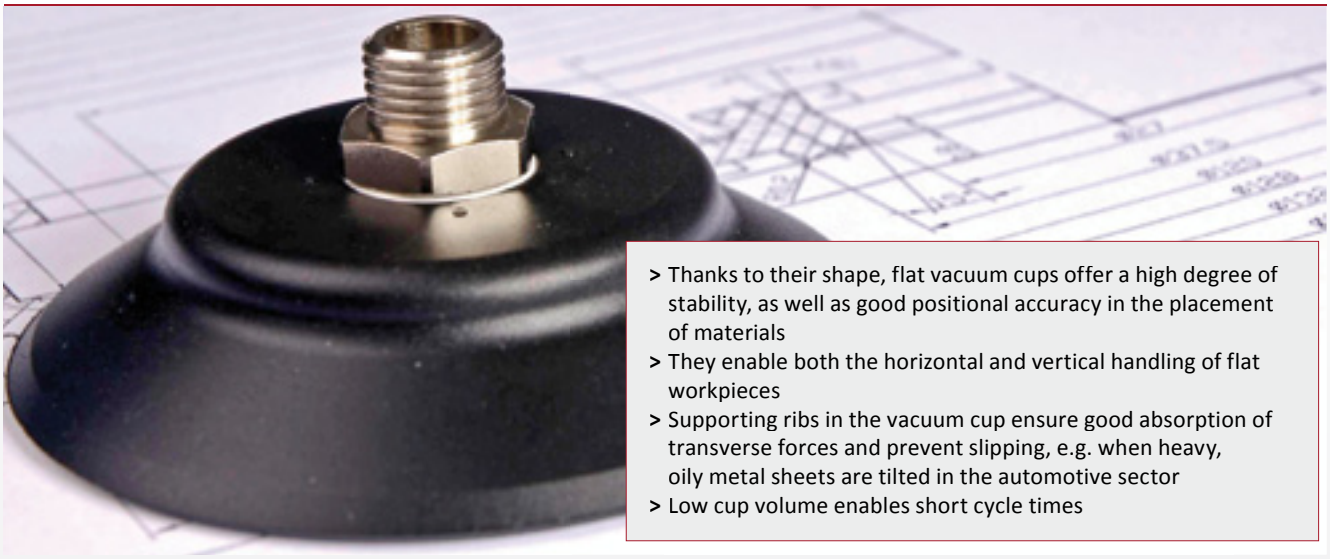
Flat vacuum cups by Ø 174

Bellows vacuum cups by Ø 283

Oval vacuum cups by size 363

Ring and segment vacuum cups 404

Application / Uses



> Thanks to their shape, flat vacuum cups offer a high degree of stability, as well as good positional accuracy in the placement of materials
> They enable both the horizontal and vertical handling of flat workpieces
> Supporting ribs in the vacuum cup ensure good absorption of transverse forces and prevent slipping, e.g. when heavy, oily metal sheets are tilted in the automotive sector
> Low cup volume enables short cycle times

Designs

> FIPA flat vacuum cups are available with or without supporting ribs
> Support ribs in the vacuum cup ensure significantly better suction by enlarging the active suction surface
> They prevent the sucking in and deformation of flexible workpieces
> Support ribs are especially recommended for:
- flexible products
- rapid acceleration of the machine

Methods of connection

Vacuum cups for attaching to the fittings (plug-in)

> Secure hold
> Quick replacement
> Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced

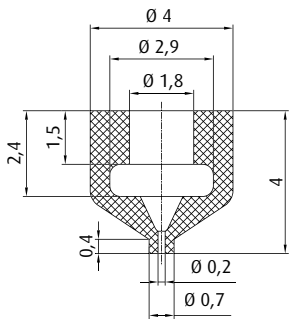
Bolted fittings

> Vacuum cups are bolted from below into a threaded counterpart using a hollow bolt
> Extremely secure hold
> Eliminates twisting of the vacuum cups
> Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced

Vulcanised fittings / retainer plate

> Very secure hold
> Secured against rotation
> High degree of dimensional stability

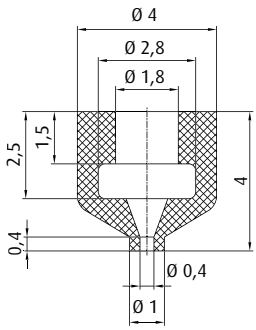
	Connection	see page
270.524	M3-male	408



Item no.	Material	
102.001.425._*	NBR (sw), SI-AS (sw)	0 mm

Additional sizes available are found on p. 38.

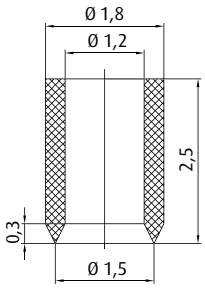
	Connection	see page
270.524	M3-male	408



Item no.	Material	
102.001.463._*	NBR (sw), SI-AS (sw)	0 mm

Additional sizes available are found on p. 38.

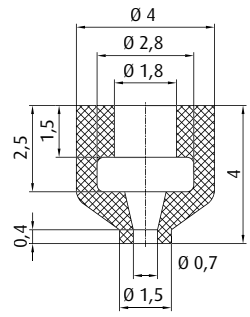
	Connection	see page
270.011	M3-male	408



Item no.	Material	
102.001.002._*	NBR (sw), SI (tr)	0.3 mm

Additional sizes available are found on p. 32.
Ordering notes: Packing unit = 10 pieces

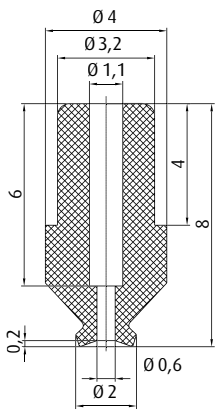
	Connection	see page
270.524	M3-male	408



Item no.	Material	
102.002.464._*	NBR (sw), SI-AS (sw)	0 mm

Additional sizes available are found on p. 38.

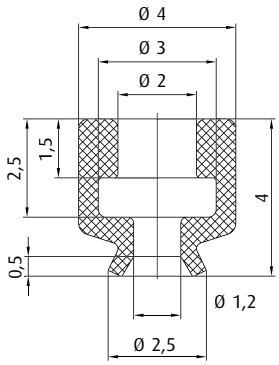
	Connection	see page
270.427	M3-male	408



Item no.	Material	
102.002.279._*	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.2 mm

Additional sizes available are found on p. 38.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



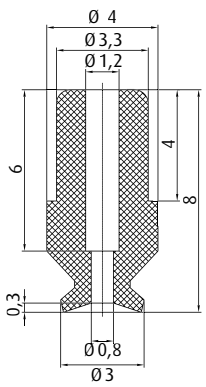
	Connection	see page
270.014	M3-male	408
270.300	M5-male	411

Item no. 102.002.004._*

Material NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)

0.4 mm

Additional sizes available are found on p. 32.
Ordering notes: Packing unit = 10 pieces



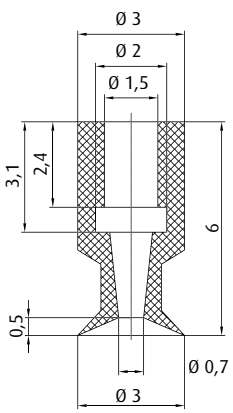
	Connection	see page
270.427	M3-male	408

Item no. 102.003.280._*

Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)

0.3 mm

Additional sizes available are found on p. 38.

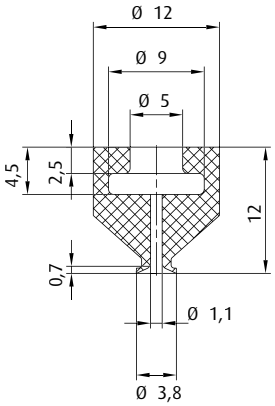


	Connection	see page
270.025	M3-male	408

Item no. 102.003.480._*

Material NBR (sw)

0.3 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

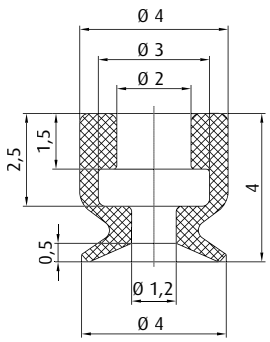
		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no. 102.004.216._*

Material NBR (sw), SI (tr)

1 mm

Additional sizes available are found on p. 50.



BESTSELLER

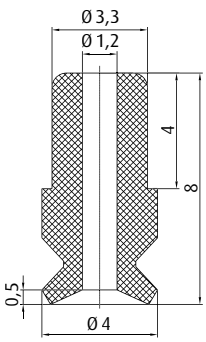
	Connection	see page
270.014	M3-male	408
270.300	M5-male	411

Item no. 102.003.005._*

Material NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)

0.5 mm

Additional sizes available are found on p. 32.
Ordering notes: Packing unit = 10 pieces



	Connection	see page
270.427	M3-male	408

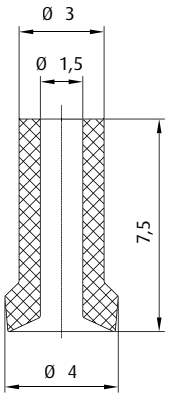
Item no. 102.004.281._*

Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)

0.3 mm

Additional sizes available are found on p. 38.

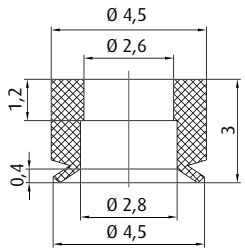
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.025	M3-male	408

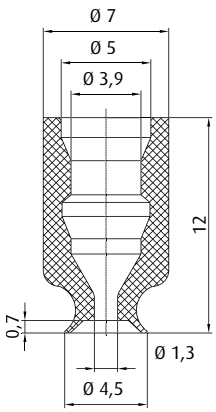
Item no.	Material	
112.004.001._*	NBR (sw), SI (r)	0.5 mm

Additional sizes available are found on p. 52.



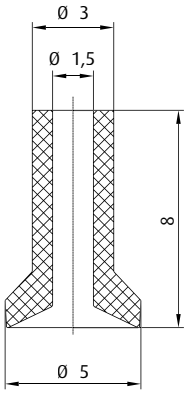
	Connection	see page
270.014	M3-male	408
270.111	M4-male	408

Item no.	Material	
102.005.115._*	NBR (sw), SI (tr)	0.5 mm



	Connection	see page
270.399	M5-male	410

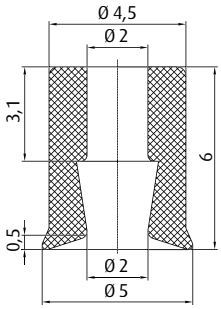
Item no.	Material	
102.005.391._*	SI (tr)	0.5 mm



	Connection	see page
270.025	M3-male	408

Item no.	Material	
112.005.002._*	NBR (sw), SI (r)	0.7 mm

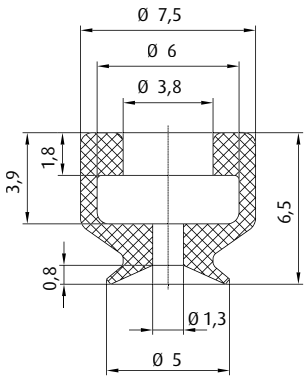
Additional sizes available are found on p. 52.



	Connection	see page
270.153	M5-male	409

Item no.	Material	
102.005.090._*	SI (tr), CR (sw)	0.5 mm

Additional sizes available are found on p. 42.



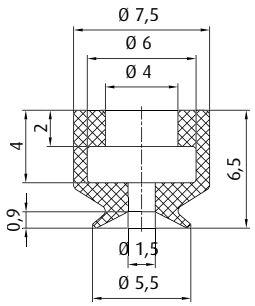
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

Item no.	Material	
102.005.009._*	NBR (sw), SI (tr), SI-AS (sw), FKM (sw)	0.9 mm

Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

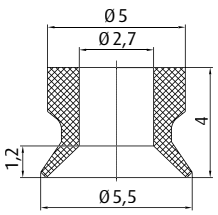


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

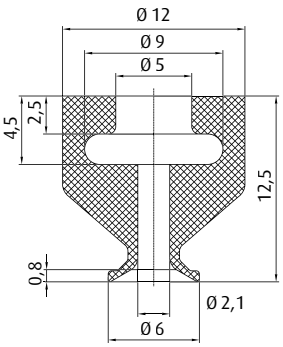
Item no. 102.005.496._*
Material Thermalon® (bl)
0.9 mm

Additional sizes available are found on p. 36.



	Connection	see page
270.014	M3-male	408

Item no. 102.005.081._*
Material NBR (sw), SI (tr), SI-AS (sw)
0.9 mm

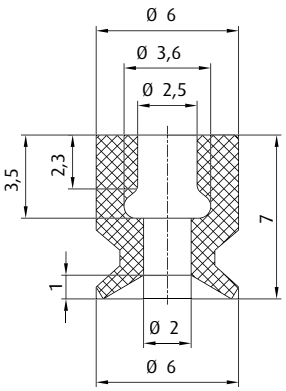


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no. 102.006.217._*
Material NBR (sw), SI (tr)
1 mm

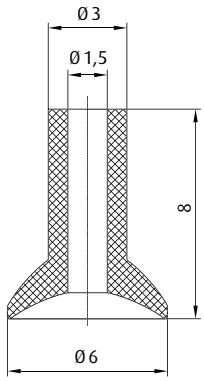
Additional sizes available are found on p. 50.



	Connection	see page
270.283	M5-male	409

Item no. 102.006.282._*
Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)
0.5 mm

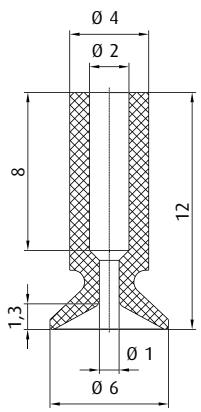
Additional sizes available are found on p. 38.



	Connection	see page
270.025	M3-male	408

Item no. 112.006.003._*
Material NBR (sw), SI (r)
1 mm

Additional sizes available are found on p. 52.

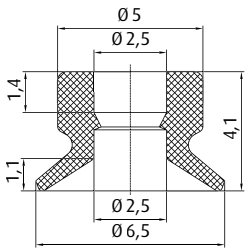


	Connection	see page
270.001	M5-male	409

Item no. 122.006.002._*
Material NBR (sw), SI (tr), Vulkollan® (br)
1.5 mm

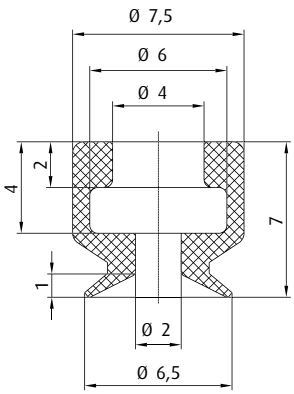
Additional sizes available are found on p. 56.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.111	M4-male	408
270.300	M5-male	411

Item no. **102.006.297._***
Material NBR (sw)
0.8 mm



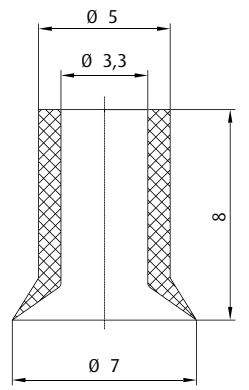
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

BESTSELLER

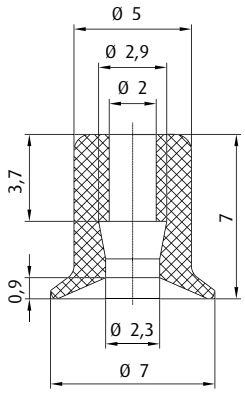
Item no. **102.006.013._***
Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)
1 mm

Additional sizes available are found on p. 32.



	Connection	see page
270.536	M5-male	409

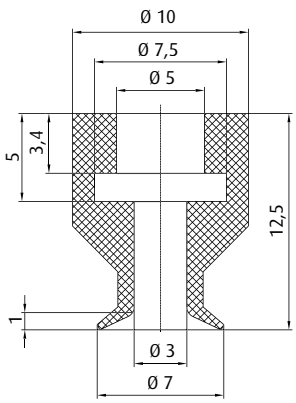
Item no. **112.006.004._***
Material NBR (sw), SI (tr)
1 mm



	Connection	see page
270.153	M5-male	409

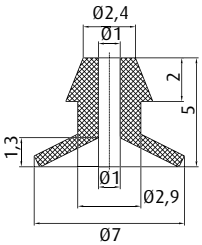
Item no. **102.007.091._***
Material SI (tr), CR (sw)
1 mm

Additional sizes available are found on p. 42.



	Connection	see page
270.037	M5-male	411
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. **102.007.109._***
Material SI (r), SI-AS (sw)
1.6 mm

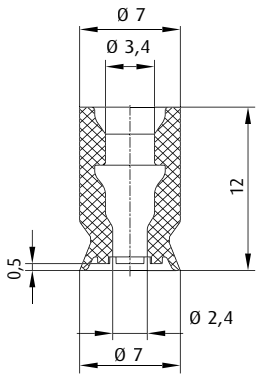


	Connection	see page
270.025	M3-male	408

Item no. **102.007.266._***
Material SI (tr)
1.5 mm

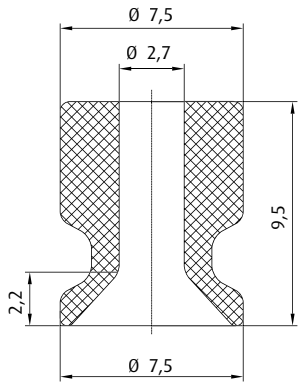
Additional sizes available are found on p. 22.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



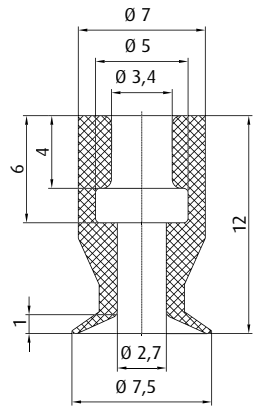
	Connection	see page
270.399	M5-male	410

Item no.	Material	
102.007.484._*	Sl (tr)	0.8 mm



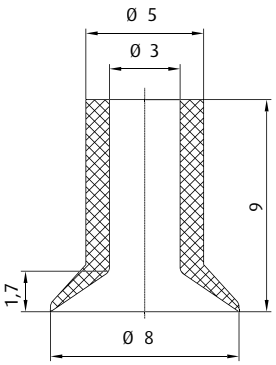
	Connection	see page
270.536	M5-male	409

Item no.	Material	
102.008.187._*	NR (sw)	1.5 mm



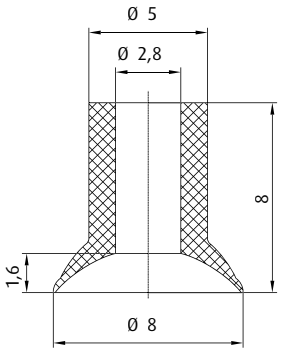
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

Item no.	Material	
102.008.392._*	Sl (tr)	0.5 mm



	Connection	see page
270.536	M5-male	409

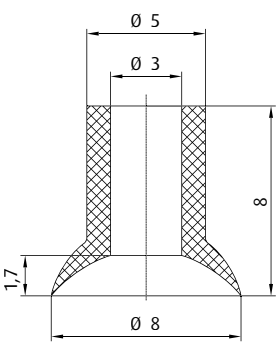
Item no.	Material	
102.008.395._*	NBR (sw)	0.9 mm



	Connection	see page
270.536	M5-male	409

Item no.	Material	
112.008.007._*	NBR (sw), Sl (w), NR (sw)	1.5 mm

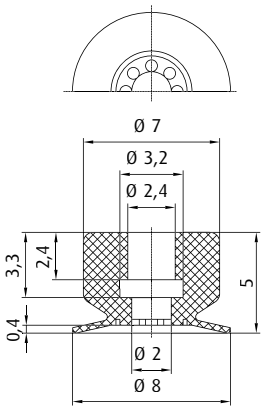
Additional sizes available are found on p. 52.



	Connection	see page
270.536	M5-male	409

Item no.	Material	
112.008.009._*	Sl (tr), NR (sw), NR (br)	1 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

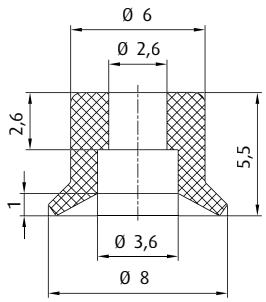


	Connection	see page
270.283	M5-male	409

VERY FLEXIBLE

Item no.	Material	
104.008.070._*	NBR (sw), SI-FS (r)	0.5 mm

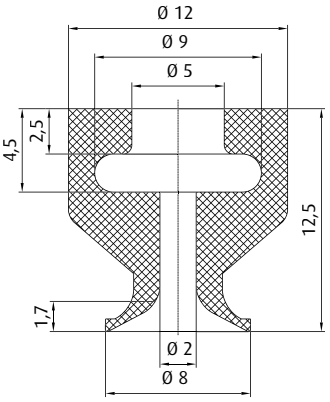
Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 20 mm



	Connection	see page
270.283	M5-male	409

Item no.	Material	
102.008.283._*	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1 mm

Additional sizes available are found on p. 38.

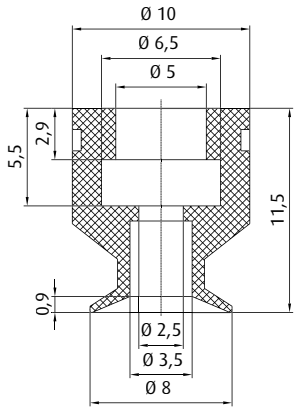


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

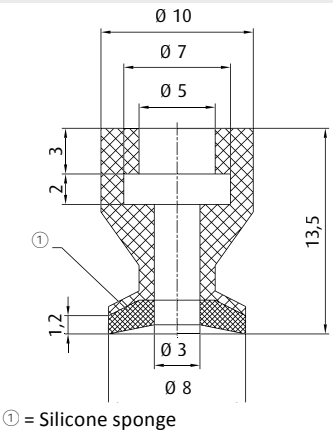
Item no.	Material	
102.008.218._*	NBR (sw), SI (tr)	1 mm

Additional sizes available are found on p. 50.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

Item no.	Material	
102.008.227._*	SI (tr)	0.5 mm



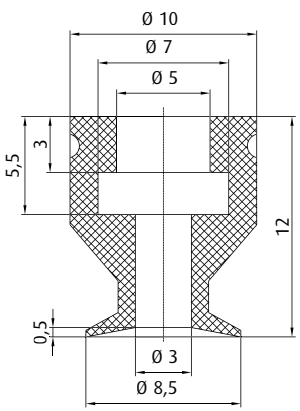
① = Silicone sponge

	Connection	see page
270.094	M5-male	411
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.141	10 mm	456

Item no.	Material	
104.008.082._*	SI (bl/r)	0.5 mm

Additional sizes available are found on p. 166.

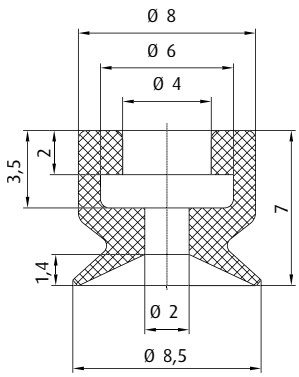


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.141	10 mm	456

Item no.	Material	
102.008.362._*	SI (bl)	0.6 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

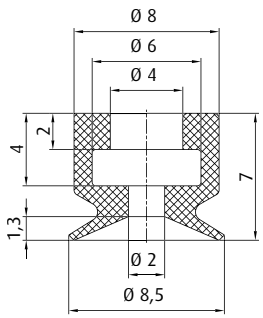
BESTSELLER

Item no. 102.008.017._*

Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)

1.4 mm

Additional sizes available are found on p. 32.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

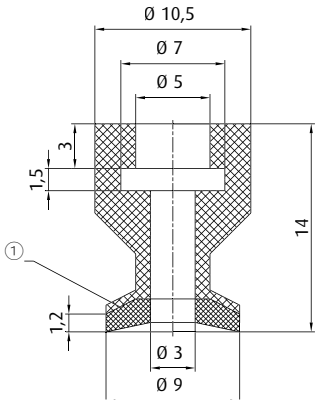
		see page
50.330	10 mm	454

Item no. 102.008.497._*

Material Thermalon® (bl)

1.3 mm

Additional sizes available are found on p. 36.



① = Silicone sponge

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

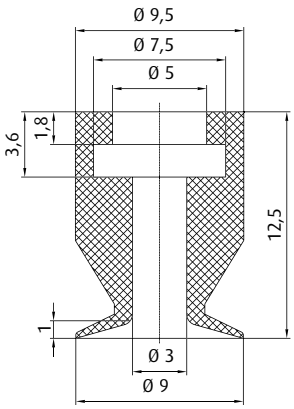
		see page
50.141	10 mm	456
50.018	8.5 mm	454

Item no. 104.009.083._*

Material SI (bl/r)

0.5 mm

Additional sizes available are found on p. 166.



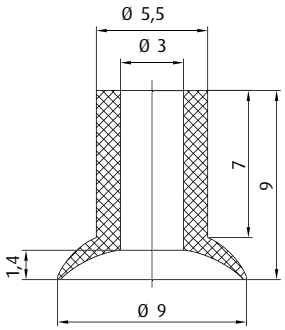
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.141	10 mm	456

Item no. 102.009.111._*

Material SI (tr)

1 mm

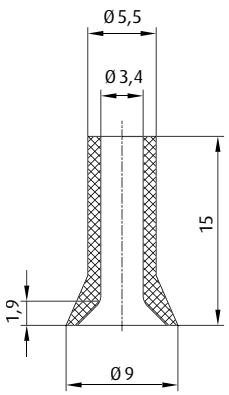


	Connection	see page
270.536	M5-male	409

Item no. 102.009.174._*

Material Vinyl (bl)

1 mm



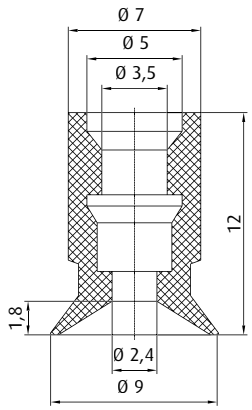
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 107.009.001._*

Material SI (tr), NR (br)

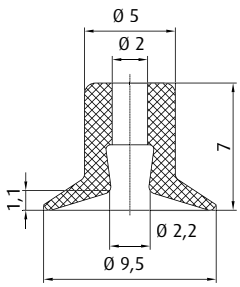
1.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.399	M5-male	410

Item no. **102.008.228._***
Material SI (tr)
0.8 mm

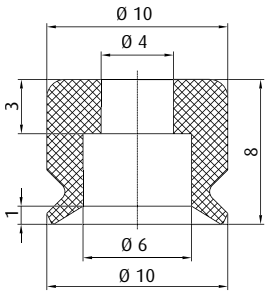


	Connection	see page
270.153	M5-male	409

BESTSELLER

Item no. **102.009.092._***
Material SI (tr), CR (sw)
1.5 mm

Additional sizes available are found on p. 42.

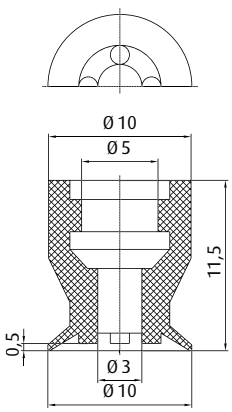


	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

Item no. **102.010.284._***
Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)
1 mm

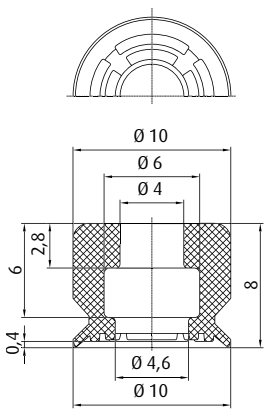
Additional sizes available are found on p. 38.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. **104.010.001._***
Material NBR (sw), SI (bl)
1.5 mm

This vacuum cup is also available in the following dimensions: 15 mm, 18 mm, 24 mm, 30 mm, 40 mm, 50 mm

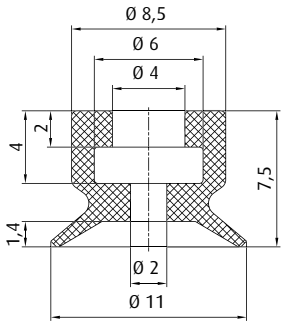


	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

Item no. **104.010.065._***
Material NBR (sw)
0.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

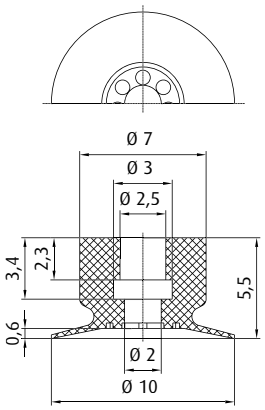


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

Item no. 102.010.498._*
Material Thermalon® (bl)
1.5 mm

Additional sizes available are found on p. 36.

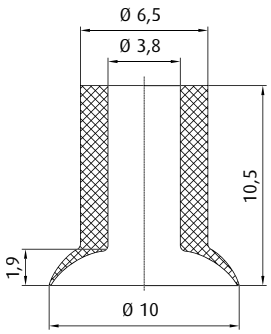


	Connection	see page
270.283	M5-male	409

VERY FLEXIBLE

Item no. 104.010.071._*
Material NBR (sw), SI-FS (r)
0.7 mm

Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 8 mm, 15 mm, 20 mm

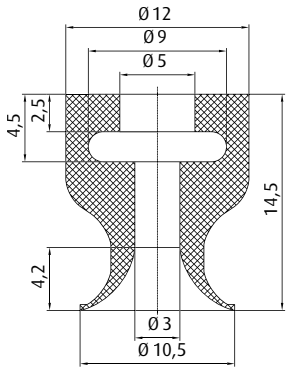


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

Item no. 112.010.011._*
Material NBR (sw), SI (w)
2 mm

Additional sizes available are found on p. 52.

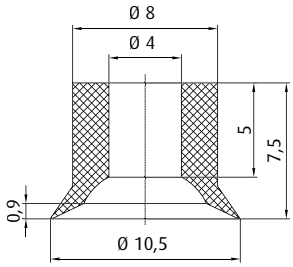


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

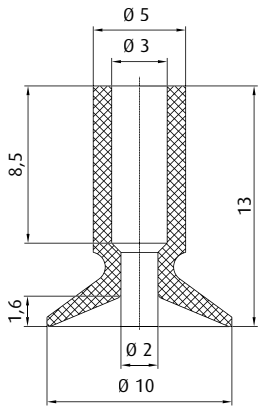
Item no. 102.010.219._*
Material NBR (sw), SI (tr)
1 mm

Additional sizes available are found on p. 50.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

Item no. 112.010.027._*
Material NBR (sw), SI (bl)
1.5 mm

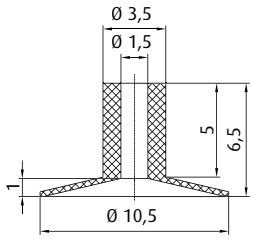


	Connection	see page
270.022	M5-male	409

Item no. 122.010.005._*
Material NBR (sw), SI (tr), Vulkollan® (br)
1.5 mm

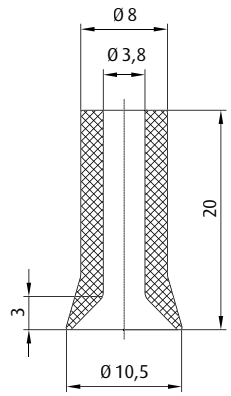
Additional sizes available are found on p. 56.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



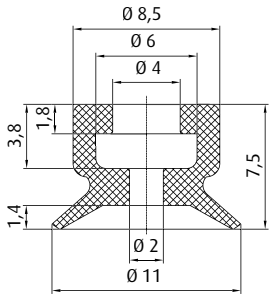
	Connection	see page
270.025	M3-male	408
270.001	M5-male	409

Item no. 102.011.172._*
Material Vinyl (bl)
0.5 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 102.011.173._*
Material Vinyl (bl)
1.5 mm

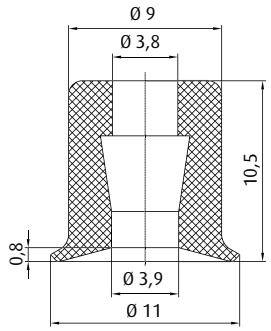


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

Item no. 102.010.024._*
Material NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)
1.2 mm

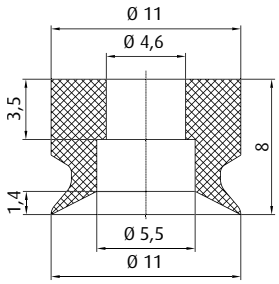
Additional sizes available are found on p. 32.



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

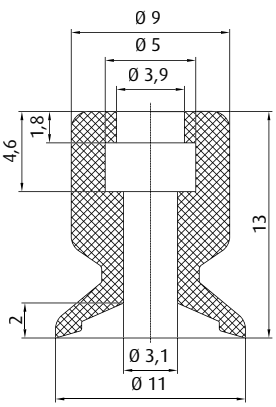
Item no. 102.011.093._*
Material SI (tr), CR (sw)
1 mm

Additional sizes available are found on p. 42.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

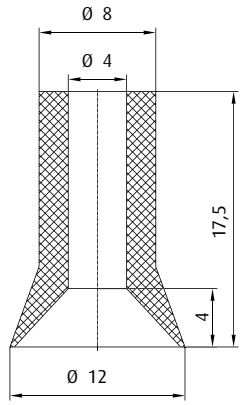
Item no. 102.011.181._*
Material NBR (sw), SI (tr)
1 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

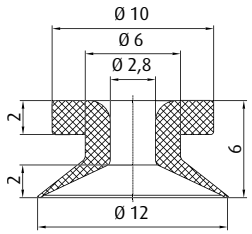
Item no. 102.011.171._*
Material Vinyl (bl)
0.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

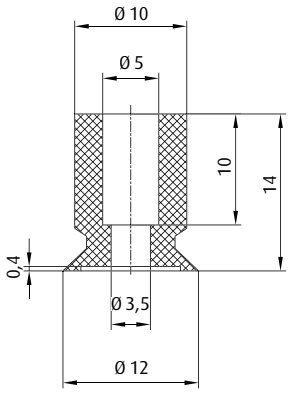
Item no.	Material	
102.012.101._*	NR (br)	2.5 mm



	Connection	see page
270.283	M5-male	409

Item no.	Material	
102.012.267._*	NR (bg)	2.5 mm

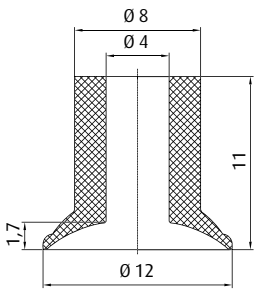
Additional sizes available are found on p. 22.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

Item no.	Material	
107.012.002._*	NBR (sw), SI (tr), NR (bg)	0.4 mm

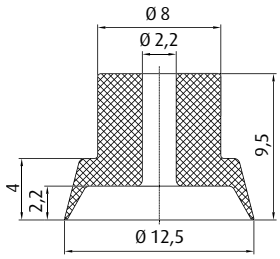


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

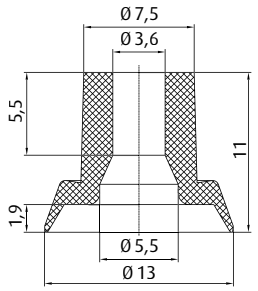
Item no.	Material	
112.012.015._*	NBR (sw), SI (w), NR (sw)	2 mm

Additional sizes available are found on p. 52.



	Connection	see page
270.153	M5-male	409

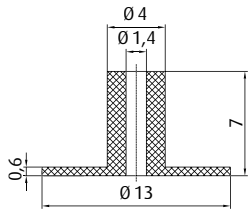
Item no.	Material	
102.013.070._*	NR (bg)	2 mm



	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

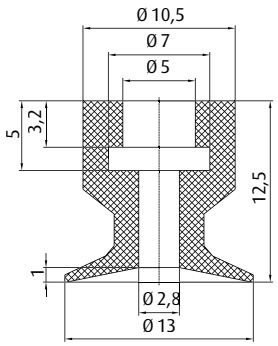
Item no.	Material	
102.013.077._*	NR (bl)	2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.025	M3-male	408

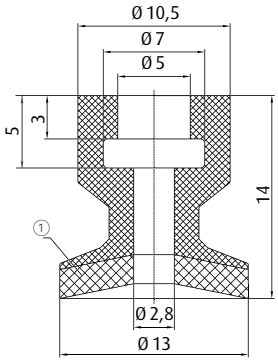
Item no. 102.013.012._*
Material SI (tr)
0 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.141	10 mm	456

Item no. 102.013.363._*
Material SI (bl)
0.8 mm



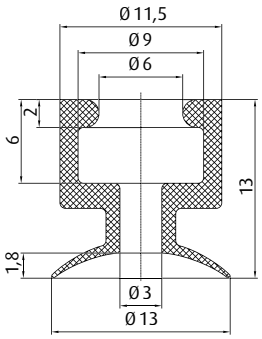
① = Silicone sponge

	Connection	see page
270.200	M5-male	411
270.094	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.141	10 mm	456

Item no. 104.013.084._*
Material SI (bl/r)
0.5 mm

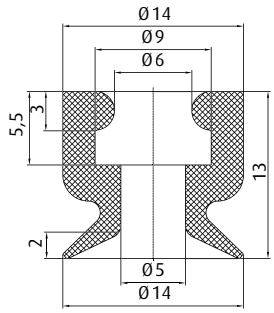
Additional sizes available are found on p. 166.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. 102.012.332._*
Material NR (or)
1.5 mm

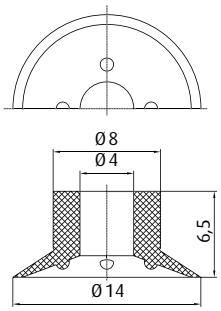
Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. 102.014.333._*
Material NR (or)
2 mm

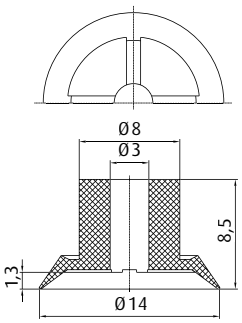
Additional sizes available are found on p. 24.



	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 104.014.020._*
Material NBR (sw)
1.5 mm

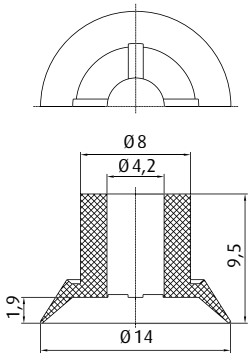
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.536	M5-male	409

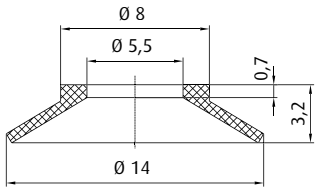
Item no. 102.014.089._*
Material NBR (sw)
1.5 mm

Additional sizes available are found on p. 20.



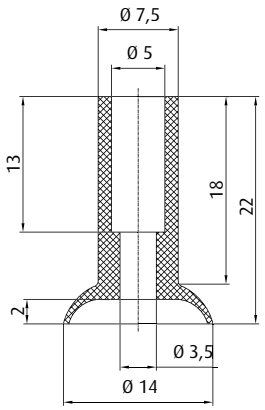
	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 104.014.025._*
Material SI (tr), NR (sw)
2 mm



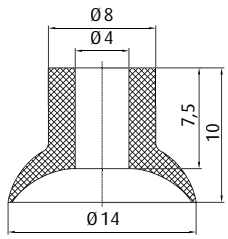
	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no. 107.014.005._*
Material PU (tr)
1.5 mm



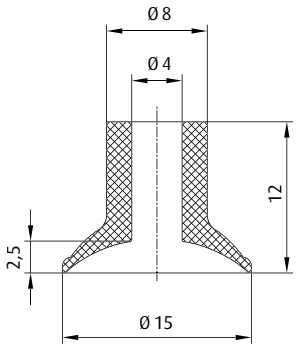
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 115.015.002._*
Material NR (bg)
3 mm



	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 112.015.021._*
Material NBR (sw), SI (tr)
2 mm



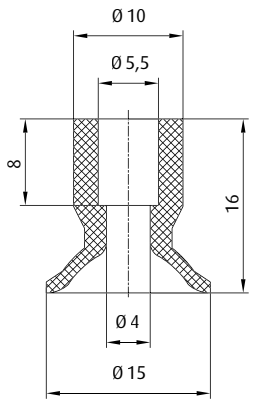
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

Item no. 112.015.022._*
Material NBR (sw), SI (w), NR (sw)
2 mm

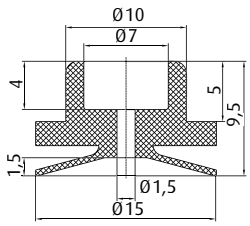
Additional sizes available are found on p. 52.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 122.015.004._*
Material CR (sw)
2 mm

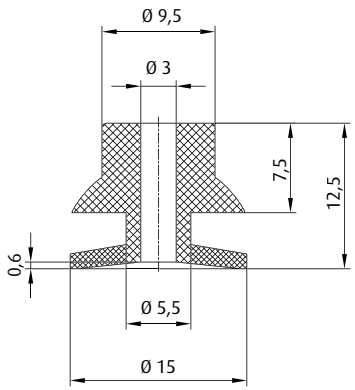


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

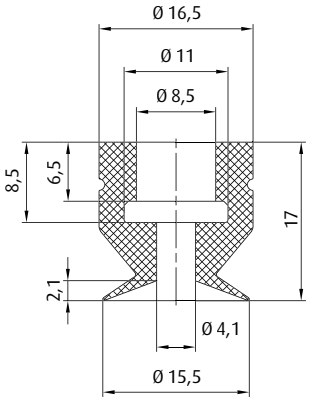
Item no. 102.015.339._*
Material Vinyl (bl)
1.5 mm

Additional sizes available are found on p. 22.



	Connection	see page
270.022	M5-male	409

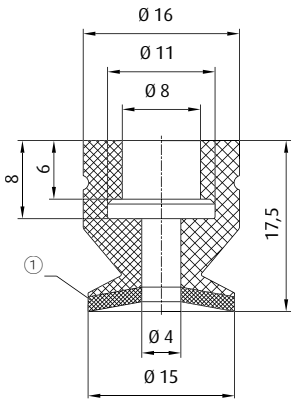
Item no. 107.015.062._*
Material NR (sw)
1.5 mm



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 102.015.414._*
Material SI (bl)
2 mm



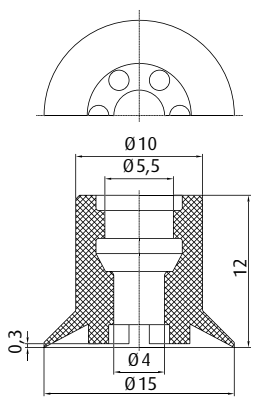
① = Silicone sponge

	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 104.015.085._*
Material SI (bl/r)
1 mm

Additional sizes available are found on p. 166.

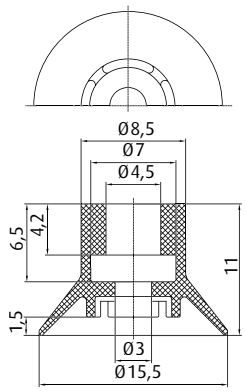


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 104.015.002._*
Material NBR (sw), SI (bl)
1 mm

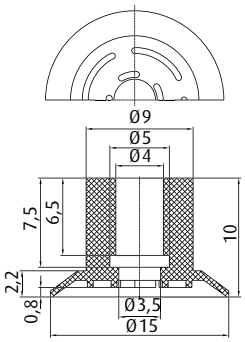
This vacuum cup is also available in the following dimensions: 10 mm, 18 mm, 24 mm, 30 mm, 40 mm, 50 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421

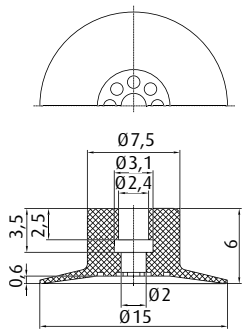
Item no. 102.015.367._*
Material Vulkollan® (br)
2 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 102.015.431._*
Material SI (tr), NR (bg)
0.5 mm

Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 24 mm, 28 mm, 30 mm, 40 mm

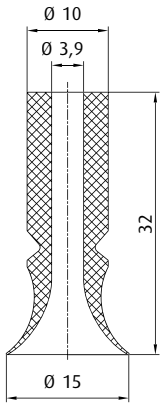


	Connection	see page
270.283	M5-male	409

VERY FLEXIBLE

Item no. 104.015.072._*
Material NBR (sw), SI-FS (r)
1.1 mm

Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 8 mm, 10 mm, 20 mm

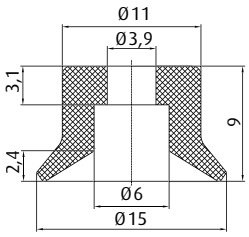


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

FOR HIGHLY STRUCTURED SURFACES (3D)

Item no. 126.015.002._*
Material NR (sw), NR (bg)
6 mm

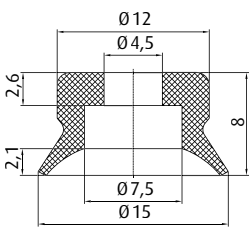


	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

Item no. 102.015.285._*
Material NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)
1.5 mm

Additional sizes available are found on p. 38.

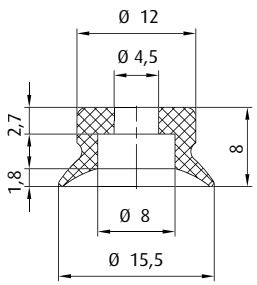


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no. 102.015.030._*
Material NBR (sw), SI (tr), PU (bl)
2 mm

Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

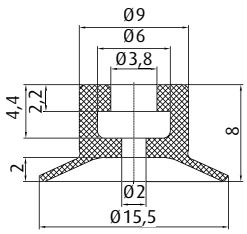


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.330	10 mm	454

Item no. **102.015.499._ ***
Material Thermalon® (bl)
1.9 mm

Additional sizes available are found on p. 36.

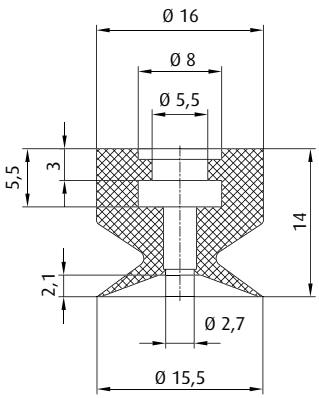


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

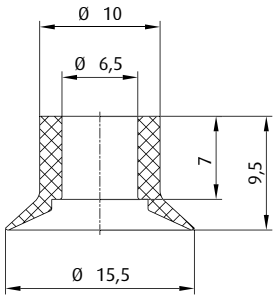
Item no. **102.015.309._ ***
Material NBR (sw), SI (tr), PU (bl)
1.9 mm

Additional sizes available are found on p. 32.



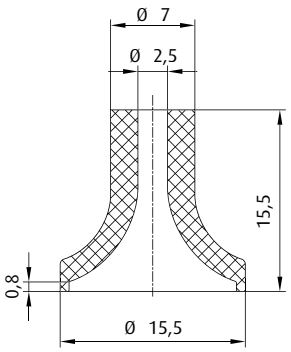
	Connection	see page
270.037	M5-male	411
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. **102.016.319._ ***
Material PU (bl)
2 mm



	Connection	see page
270.250	G1/8-male	418

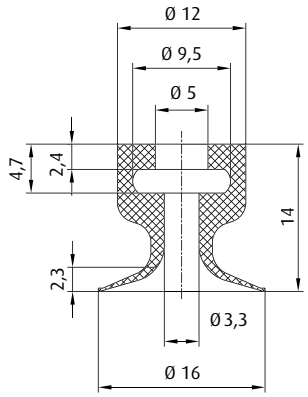
Item no. **102.016.146._ ***
Material NR (gr)
2 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. **102.016.138._ ***
Material NR (bg)
3.2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

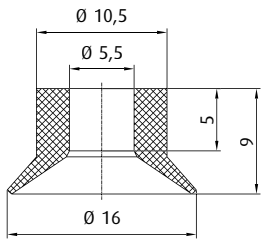


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

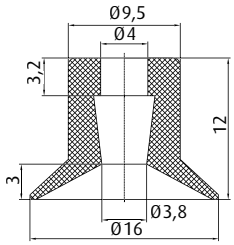
Item no. **102.015.220._***
Material NBR (sw), SI (tr)
2 mm

Additional sizes available are found on p. 50.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

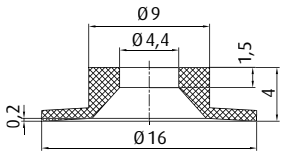
Item no. **126.016.003._***
Material NR (bg)
3 mm



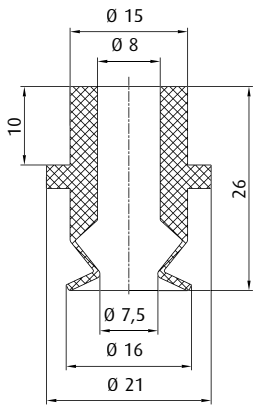
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

Item no. **102.016.098._***
Material SI (tr), CR (sw)
2 mm

Additional sizes available are found on p. 42.



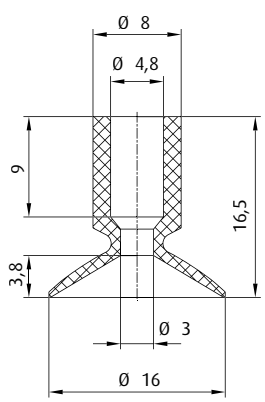
Item no. **102.016.145._***
Material NR (bg)
0.5 mm



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. **107.016.008._***
Material SI (tr)
2.4 mm

Additional sizes available are found on p. 58.

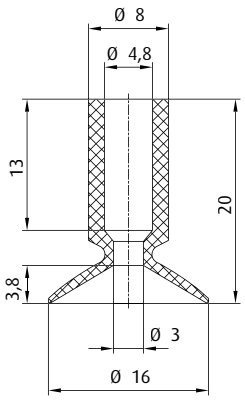


	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

Item no. **122.016.006._***
Material NBR (sw)
5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

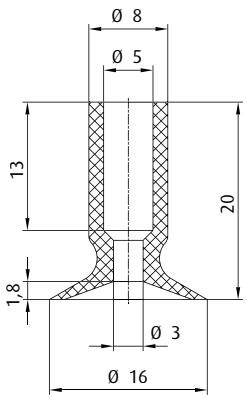


	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

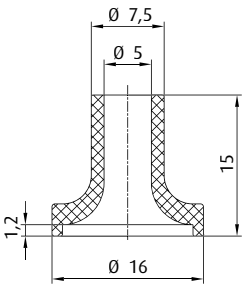
Item no. **122.016.009._ *** | **Material** NBR (sw), SI (tr), NR (sw) | 5 mm

Additional sizes available are found on p. 56.



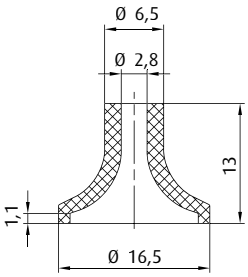
	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. **122.016.076._ *** | **Material** Vulkollan® (br) | 2.5 mm



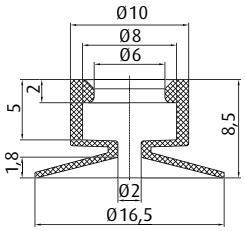
	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. **102.016.122._ *** | **Material** NR (bg) | 3 mm



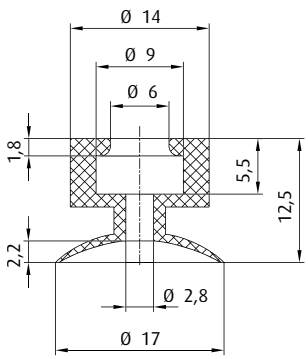
	Connection	see page
270.536	M5-male	409

Item no. **102.017.420._ *** | **Material** NR (br) | 3.5 mm



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. **102.016.151._ *** | **Material** NR (gr) | 0.5 mm

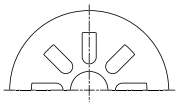


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

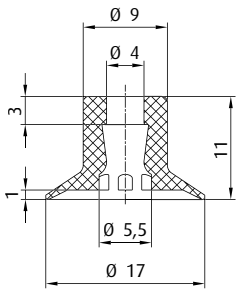
Item no. **102.016.255._ *** | **Material** SI (r) | 3 mm

Additional sizes available are found on p. 24.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



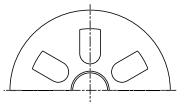
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413



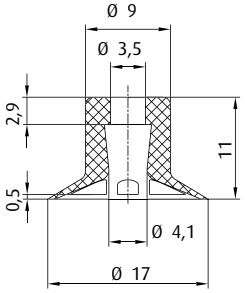
BESTSELLER

Item no. 104.016.003._*
Material Sl (tr), CR (sw)
0.5 mm

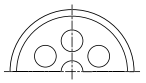
Additional sizes available are found on p. 42.



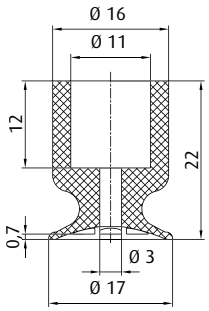
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413



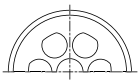
Item no. 104.017.026._*
Material NR (sw)
1 mm



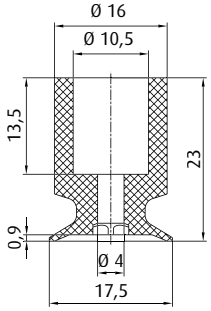
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no. 102.017.193._*
Material Vulkollan® (br)
0.7 mm

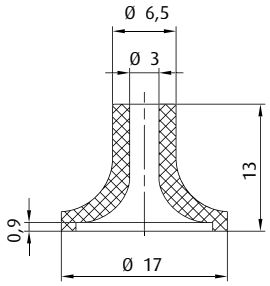


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



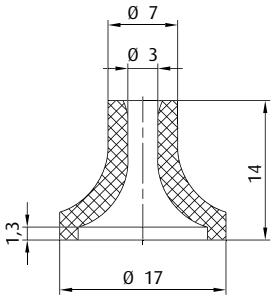
Item no. 104.018.049._*
Material Vinyl (bl)
2 mm

	Connection	see page
270.536	M5-male	409



Item no. 102.017.132._*
Material NR (bl)
3 mm

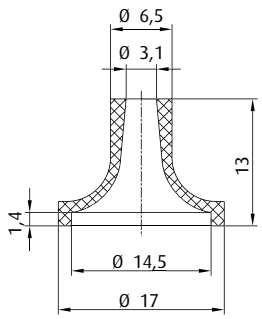
	Connection	see page
270.536	M5-male	409



Item no. 102.017.133._*
Material NR (g)
2.4 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

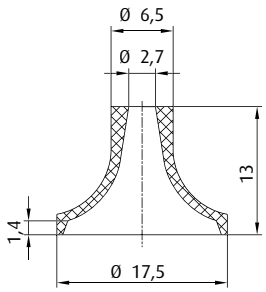
	Connection	see page
270.536	M5-male	409



Item no.	Material	
102.017.276._*	NR (br)	3 mm

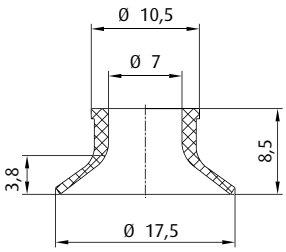
Additional sizes available are found on p. 22.

	Connection	see page
270.024	M5-male	410
270.347	M5-female	412
270.033	G1/8-male	416



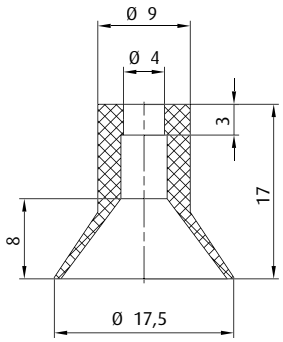
Item no.	Material	
102.018.277._*	NR (bl)	0.6 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418



Item no.	Material	
102.019.139._*	NR (bg)	1 mm

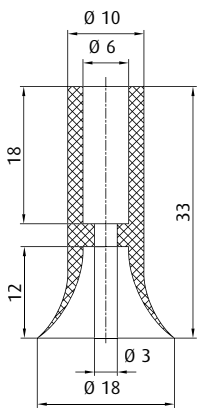
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413



Item no.	Material	
122.016.012._*	SI (tr), CR (sw)	1.5 mm

Additional sizes available are found on p. 42.

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

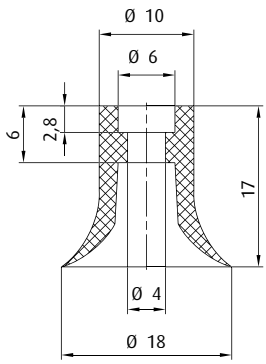


FLEXIBLE LIP

Item no.	Material	
102.018.345._*	SI (tr)	--

Additional sizes available are found on p. 58.

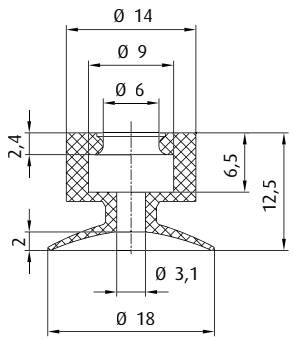
	Connection	see page
270.399	M5-male	410
270.033	G1/8-male	416
270.478	G1/8-female	421



Item no.	Material	
107.018.004._*	SI (tr)	--

Additional sizes available are found on p. 58.

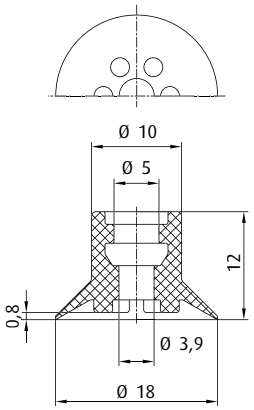
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. **102.018.442._***
Material NR (or)
2 mm

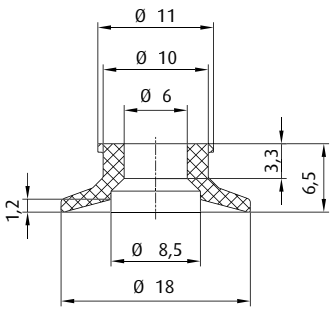
Additional sizes available are found on p. 24.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. **104.018.005._***
Material NBR (sw), SI (bl)
1 mm

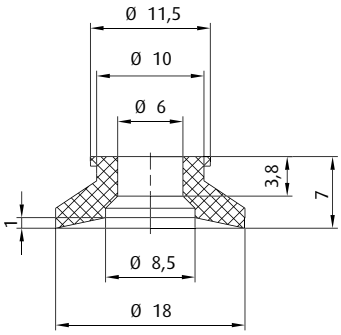
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 24 mm, 30 mm, 40 mm, 50 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

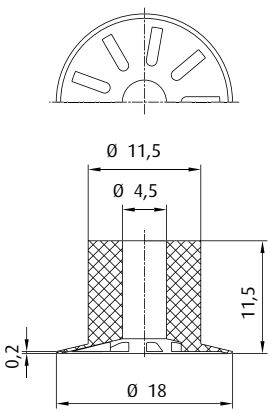
Item no. **102.018.143._***
Material NR (bg)
0.5 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

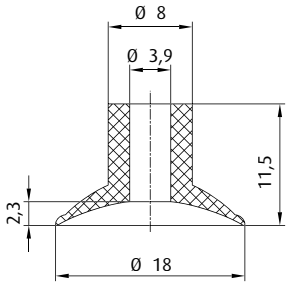
Item no. **102.018.144._***
Material NR (bg)
0.5 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

		see page
50.037	25 mm	456

Item no. **104.018.051._***
Material Vinyl (bl)
0.5 mm



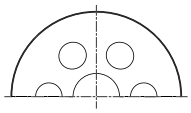
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

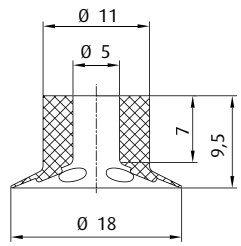
Item no. **112.018.024._***
Material NBR (sw), SI (w), NR (sw)
2.3 mm

Additional sizes available are found on p. 52.

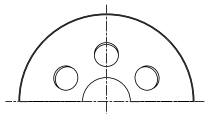
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



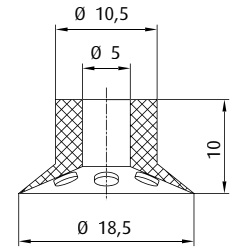
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421



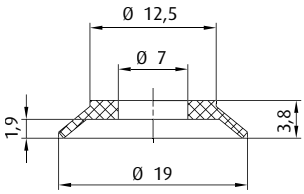
Item no. 112.018.111._*
Material SI (tr), NR (sw)
1 mm



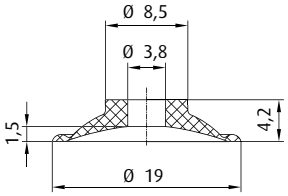
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421



Item no. 127.018.001._*
Material NBR (sw), SI (tr), NR (bg)
1.5 mm

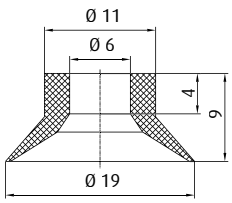


Item no. 107.019.054._*
Material NR (bl)
0.5 mm



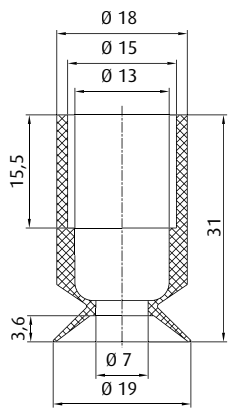
Item no. 112.019.073._*
Material NR (sw)
2 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418
270.534	G1/4-male	425



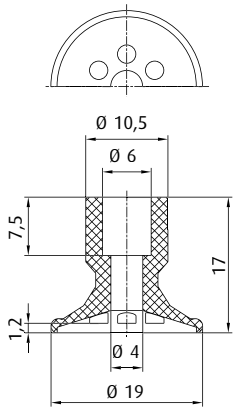
Item no. 122.019.014._*
Material SI (tr), NR (bg)
3 mm

	Connection	see page
270.207	G1/4-male	426



Item no. 102.019.036._*
Material NR (sw)
5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

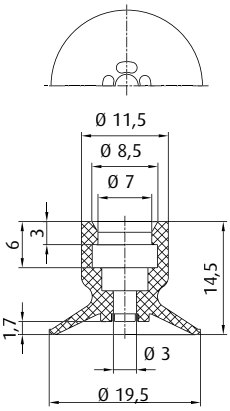


	Connection	see page
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 104.020.042._*

Material Vinyl (bl)

0.5 mm



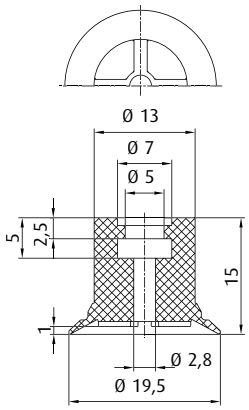
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no. 102.020.355._*

Material NBR (sw)

3 mm

This vacuum cup is also available in the following dimensions: 28 mm



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

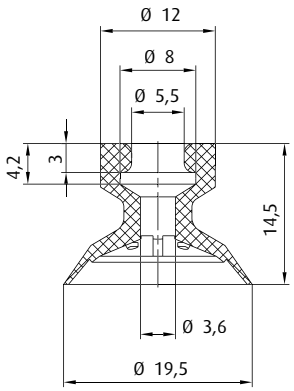
BESTSELLER

Item no. 102.020.083._*

Material NBR (sw), SI (tr), SI (r)

1 mm

Additional sizes available are found on p. 20.

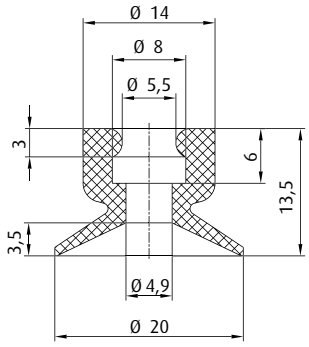


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. 102.020.272._*

Material NR (sw)

1 mm



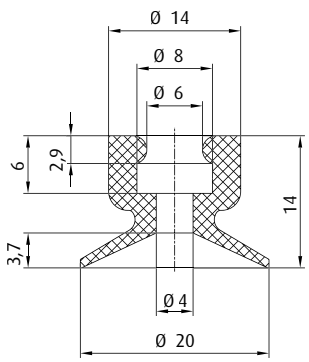
	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. 102.020.140._*

Material NR (sw), NR (or)

3 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

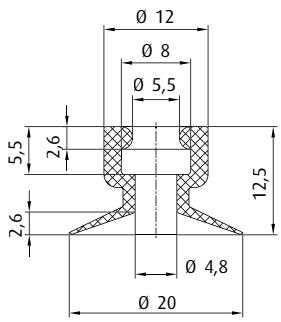
Item no. 126.020.004._*

Material SI (tr), NR (or), NR (br)

3.5 mm

Additional sizes available are found on p. 24.

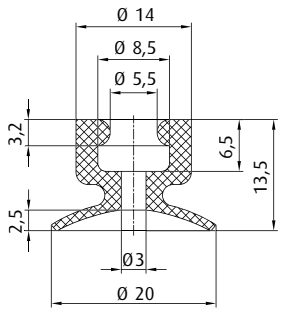
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no. 126.020.005._*
Material NBR (sw), SI (tr), NR (sw)
1 mm

Additional sizes available are found on p. 24.

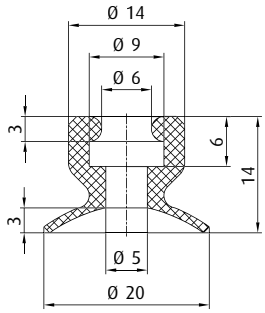


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

WEAR-RESISTANT

Item no. 102.020.299._*
Material Vulkollan® (br)
3.5 mm

Additional sizes available are found on p. 24.

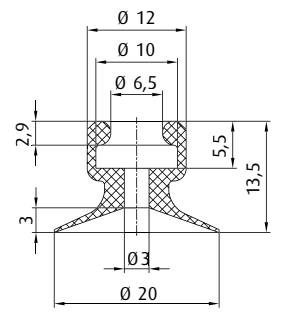


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

WEAR-RESISTANT

Item no. 102.020.300._*
Material Vulkollan® (br)
3 mm

Additional sizes available are found on p. 24.

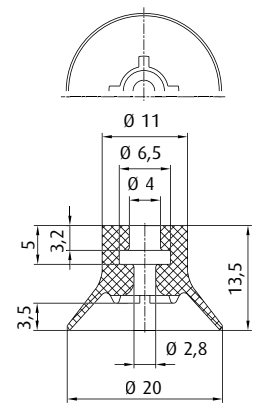


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

WEAR-RESISTANT

Item no. 102.020.308._*
Material Vulkollan® (br)
1 mm

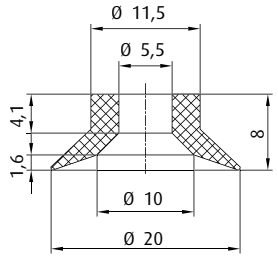
Additional sizes available are found on p. 24.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

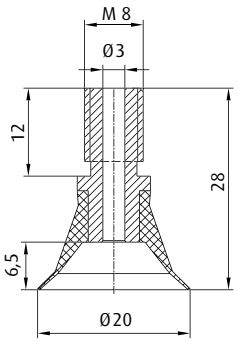
Item no. 102.020.321._*
Material Vulkollan® (br)
3.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

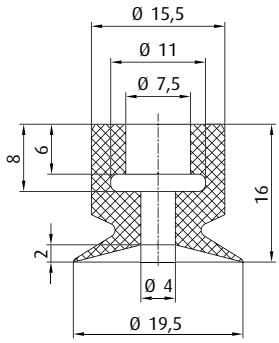


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 102.019.110._*
Material NR (bg)
2 mm



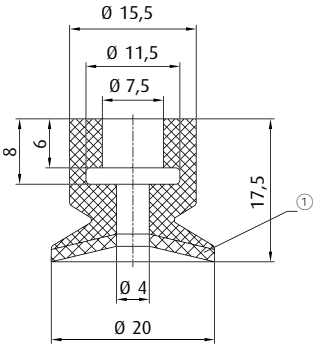
Item no. 120.019.003._*
Material NBR (sw), SI (tr), NR (sw)
2 mm



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 102.020.365._*
Material SI (bl)
1.5 mm



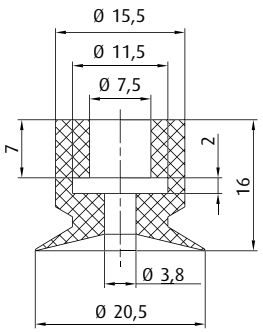
① = Silicone sponge

	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 104.020.086._*
Material SI (bl/r)
1.5 mm

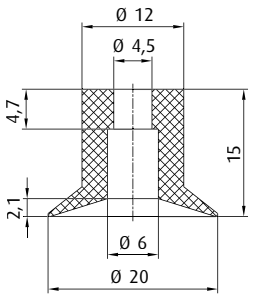
Additional sizes available are found on p. 166.



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 107.020.014._*
Material SI (tr)
1 mm



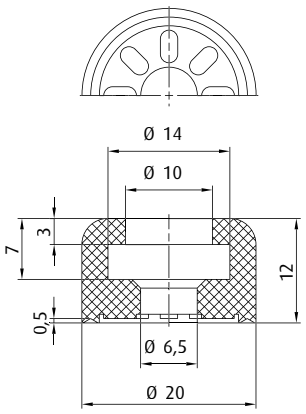
	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

		see page
50.020	8.5 mm	454

Item no. 102.020.221._*
Material NBR (sw), SI (tr)
2 mm

Additional sizes available are found on p. 50.

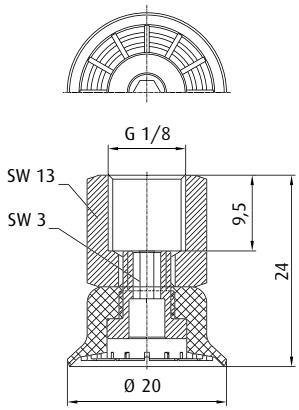
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.521	M5-male	412

Item no.	Material	
102.020.458._*	HNBR (ge), NR (br)	0.5 mm

Additional sizes available are found on p. 70.

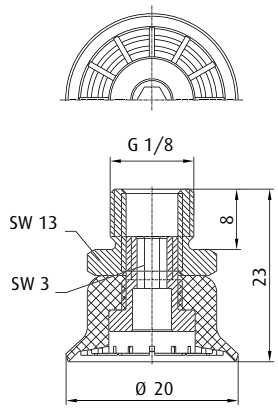


NON-SLIP

Item no.	Material	
100.020.101._*	NBR (sw)	1.1 mm

Additional sizes available are found on p. 62.

Spare cup

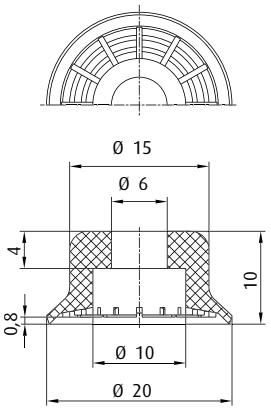


NON-SLIP

Item no.	Material	
100.020.111._*	NBR (sw)	1.1 mm

Additional sizes available are found on p. 62.

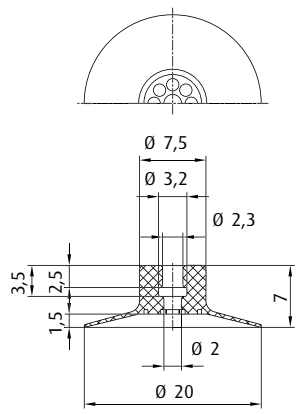
Spare cup



	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no.	Material	
104.020.066._*	NBR (sw)	1.1 mm

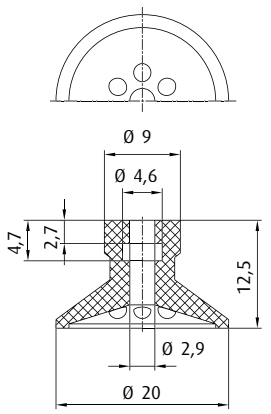


VERY FLEXIBLE

	Connection	see page
270.283	M5-male	409

Item no.	Material	
104.020.073._*	NBR (sw), SI-FS (r)	1.6 mm

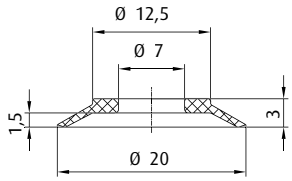
Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 8 mm, 10 mm, 15 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413

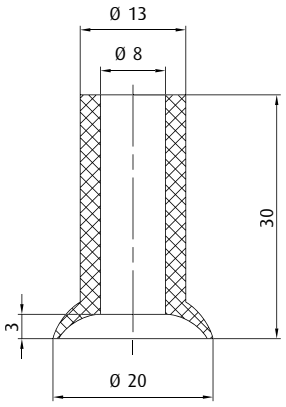
Item no.	Material	
104.020.075._*	Vinyl (bl)	2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



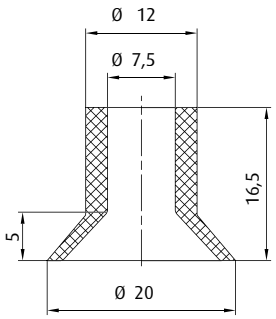
	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.	Material	
102.020.271._*	NR (sw)	1 mm



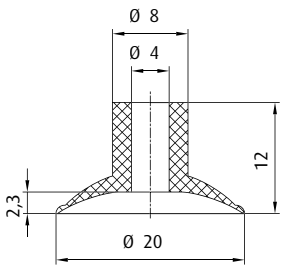
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
107.020.013._*	SI (tr), NR (br)	4 mm



	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
107.020.015._*	SI (tr), NR (sw), NR (br)	3 mm

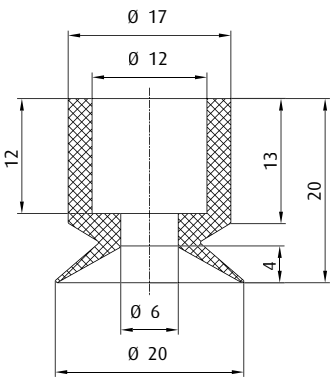


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

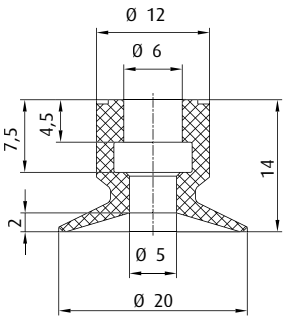
Item no.	Material	
112.020.031._*	NBR (sw), SI (w), NR (sw)	2.3 mm

Additional sizes available are found on p. 52.



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

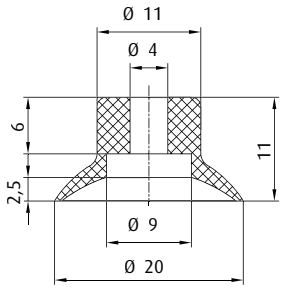
Item no.	Material	
122.020.017._*	SI (tr), NR (bg)	3 mm



	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

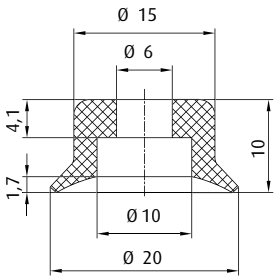
Item no.	Material	
102.021.179._*	Vinyl (bl)	0.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
102.020.312._*	SI (tr)	2.5 mm

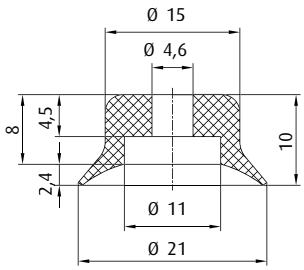


	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no.	Material	
102.020.286._*	NBR (sw), SI (tr), PU (bl), FKM (gr)	2 mm

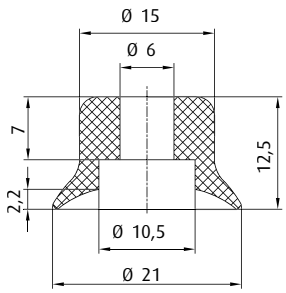
Additional sizes available are found on p. 38.



	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

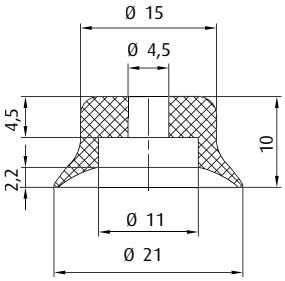
Item no.	Material	
102.020.041._*	NBR (sw), SI (tr), PU (bl)	2 mm

Additional sizes available are found on p. 32.



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
102.020.330._*	NBR (sw), SI (tr)	3 mm

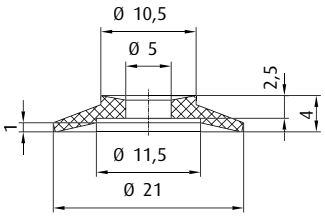


	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no.	Material	
102.020.500._*	Thermalon® (bl)	2.3 mm

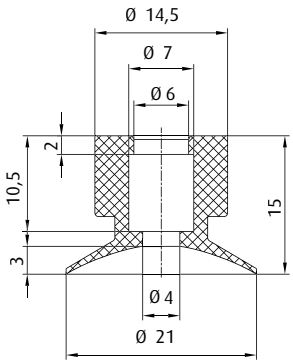
Additional sizes available are found on p. 36.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
102.021.063._*	NR (sw)	1 mm

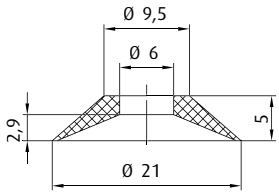
Additional sizes available are found on p. 22.



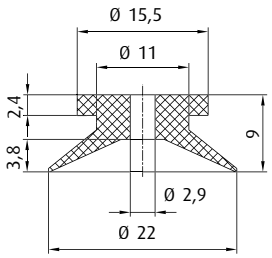
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

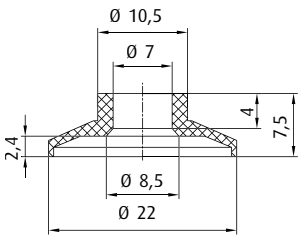
Item no.	Material	
102.021.399._*	Vinyl (bl)	2.5 mm



Item no.	Material	
107.021.049._*	NR (bg)	1.5 mm



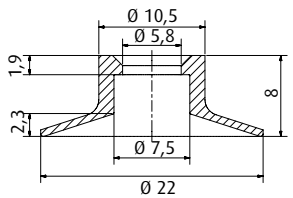
Item no.	Material	
102.022.150._*	Vinyl (bl)	2.5 mm



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no.	Material	
102.022.185._*	NR (gr)	0.5 mm

Additional sizes available are found on p. 22.



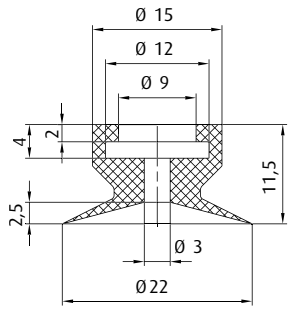
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	
102.022.526._*	NR (bl)	2 mm

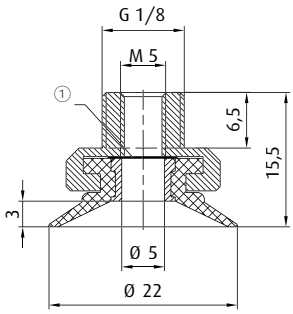
Additional sizes available are found on p. 22.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.541	G1/8-male	421



Item no.	Material	
102.022.406._*	SI (r)	2 mm



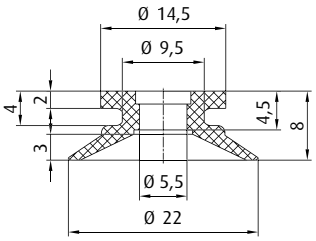
① = Filter screen

Item no.	Material	
120.020.006._*	SI (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 47.

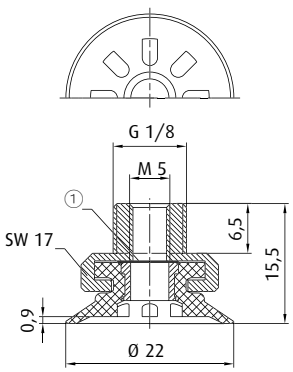
Spare cup

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418



Item no.	Material	
102.020.095._*	SI (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 42.



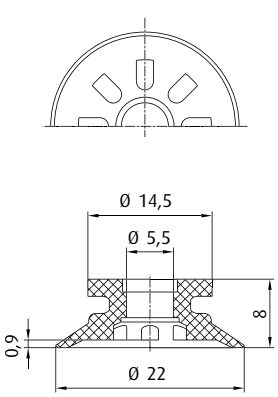
① = Filter screen

Item no.	Material	
123.020.003._*	Tepuflex® (or), SI (tr), CR (sw)	1 mm

Additional sizes available are found on p. 47.

Spare cup

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

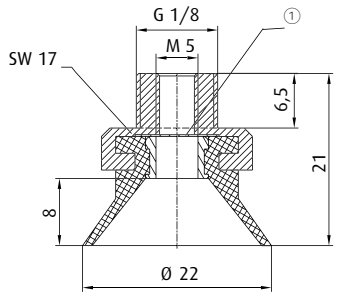


BESTSELLER

Item no.	Material	
125.020.004._*	Tepuflex® (or), SI (tr), CR (sw)	1 mm

Additional sizes available are found on p. 42.

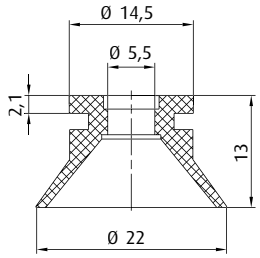
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material	
120.022.011._*	SI (tr), CR (sw)	2.5 mm

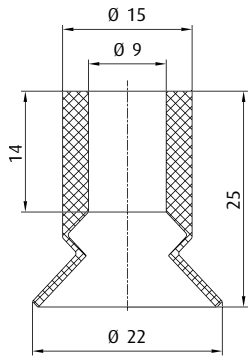
Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no.	Material	
122.022.022._*	SI (tr), CR (sw)	2.5 mm

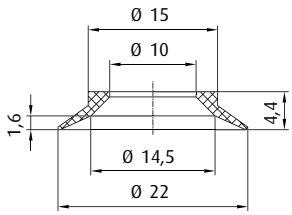
Additional sizes available are found on p. 42.



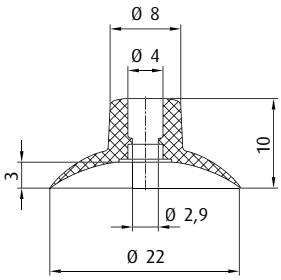
	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
102.022.043._*	NBR (sw), SI (tr), NR (sw)	5 mm

Additional sizes available are found on p. 58.



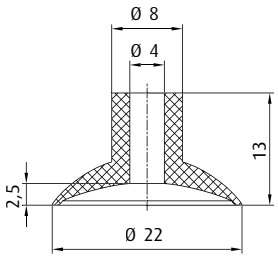
Item no.	Material	
107.022.016._*	NR (sw)	1 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
102.022.071._*	PU (bl)	3 mm

This vacuum cup is also available in the following dimensions: 25 mm, 30 mm



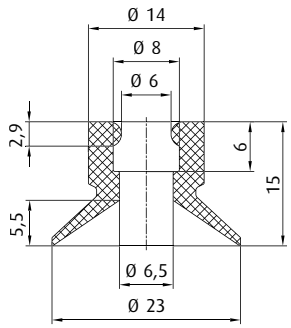
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

Item no.	Material	
112.022.037._*	NBR (sw), SI (w)	2.5 mm

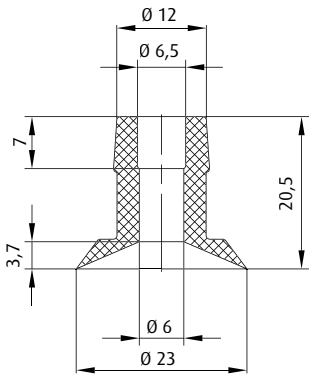
Additional sizes available are found on p. 52.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



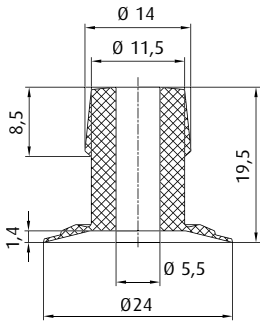
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	
102.023.356._*	Vinyl (bl)	3.8 mm



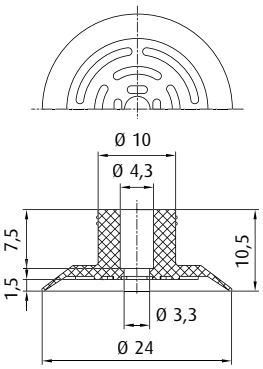
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425
270.043	G1/4-male	425

Item no.	Material	
102.023.331._*	Vinyl (tr)	2.5 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

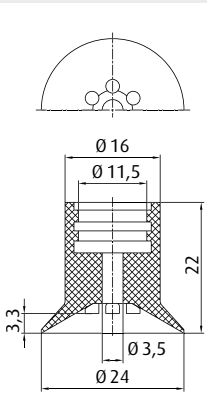
Item no.	Material	
102.023.149._*	Vinyl (tr)	0.5 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.	Material	
102.024.457._*	SI (tr), NR (bg)	1.8 mm

Additional sizes available are found on p. 20.
This vacuum cup is also available in the following dimensions: 15 mm, 28 mm, 30 mm, 40 mm

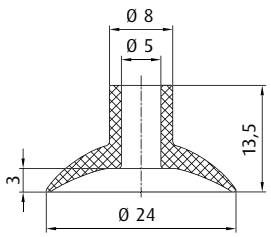


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
104.024.006._*	NBR (sw)	1 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 30 mm, 40 mm, 50 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

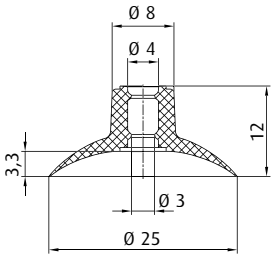


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 102.024.123._*

Material NR (sw), NR (bg)

4 mm



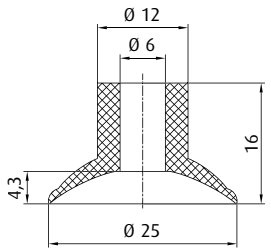
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 102.025.085._*

Material PU (r)

4 mm

This vacuum cup is also available in the following dimensions: 22 mm, 30 mm



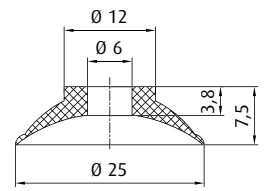
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 112.025.042._*

Material NBR (sw), SI (w), NR (sw)

4.5 mm

Additional sizes available are found on p. 52.

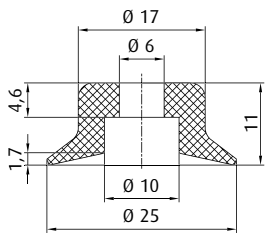


	Connection	see page
270.039	M6-male	414

Item no. 112.025.043._*

Material NBR (sw), SI (w), NR (sw)

2.5 mm



	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

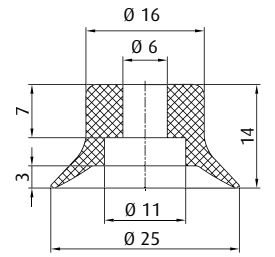
		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. 102.025.287._*

Material NBR (sw), SI (tr), PU (bl), FKM (gr)

2 mm

Additional sizes available are found on p. 38.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 102.025.047._*

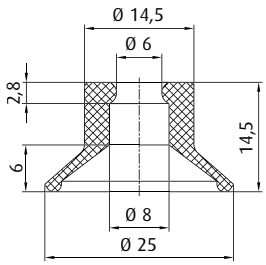
Material NBR (sw), SI (tr), PU (bl)

2.5 mm

Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

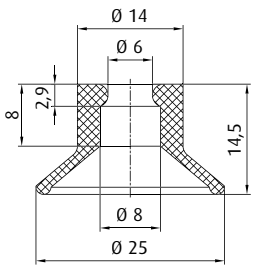
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422



Item no.	Material	
102.025.102._*	NR (g), NR (sw)	4 mm

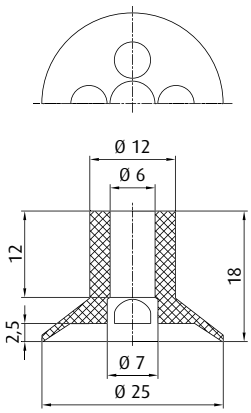
Additional sizes available are found on p. 24.

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422



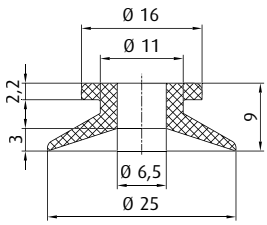
Item no.	Material	
126.025.010._*	FKM (sw)	5 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

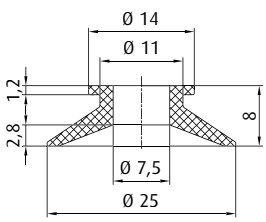


Item no.	Material	
102.025.113._*	NBR (sw), SI (tr)	3.5 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

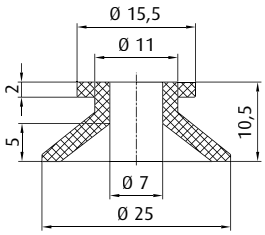


Item no.	Material	
102.025.103._*	NR (sw)	2.5 mm

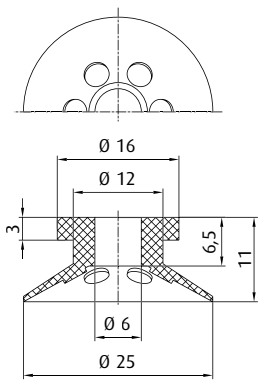


Item no.	Material	
102.025.119._*	NR (bg)	1.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

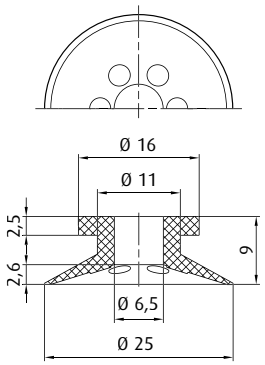


Item no.	Material	
102.026.128._*	NR (bg)	2.5 mm



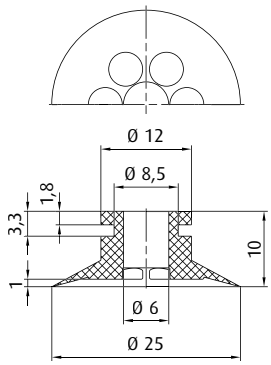
	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.	Material	
104.025.027._*	NR (bg)	3.5 mm



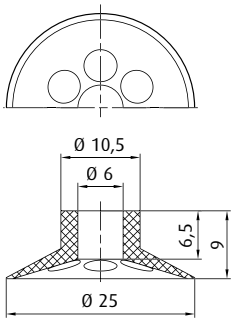
	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no.	Material	
104.025.031._*	NR (bg), PU (sw)	1 mm



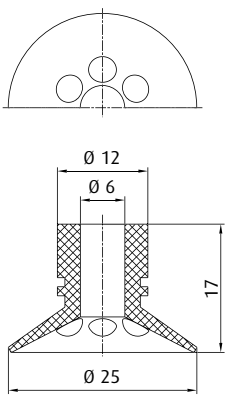
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.	Material	
102.025.225._*	NR (br)	1.5 mm



	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

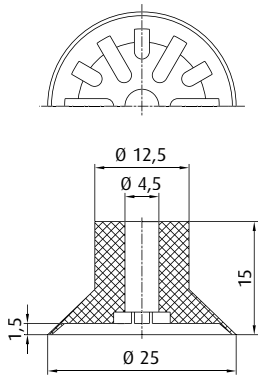
Item no.	Material	
104.025.030._*	NR (bg)	1 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.	Material	
104.025.040._*	Vinyl (bl)	2.5 mm

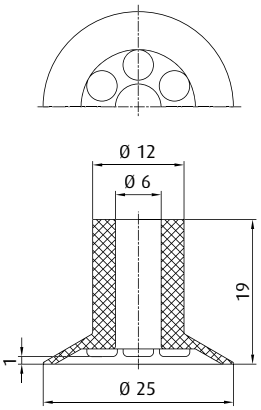
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. 104.025.043._*
Material Vinyl (bl)
1.5 mm

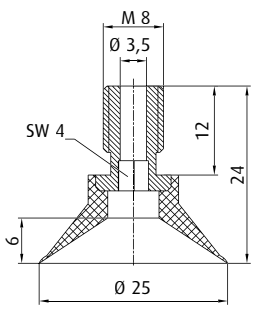
Additional sizes available are found on p. 20.



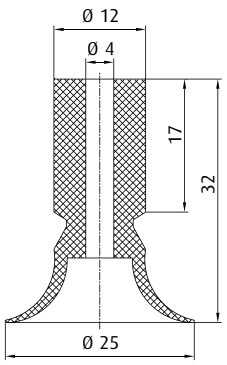
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 104.025.094._*
Material NR (br)
1 mm

Additional sizes available are found on p. 20.



Item no. 120.025.086._*
Material SI (w), NR (sw)
3.5 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 126.025.009._*
Material NR (bg)
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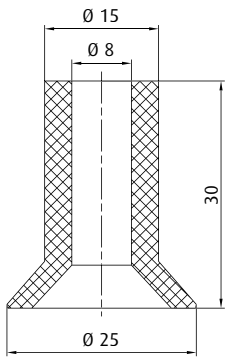
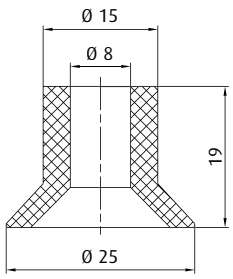


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

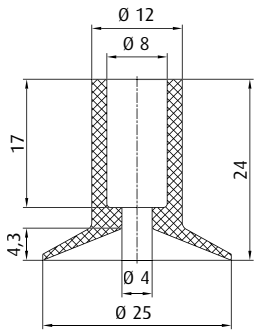
Item no. 107.025.019._*
Material NR (br)
2 mm



	Connection	see page
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

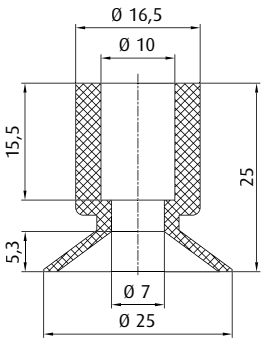
Item no. 107.025.020._*
Material NR (br)
1 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



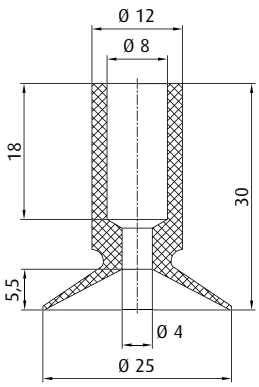
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 102.025.417._*
Material SI (r)
3 mm



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

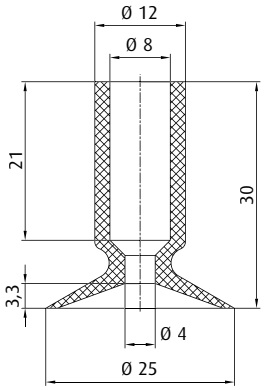
Item no. 102.025.126._*
Material NR (bg)
4 mm



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 122.025.025._*
Material NBR (sw), SI (tr), NR (sw)
5 mm

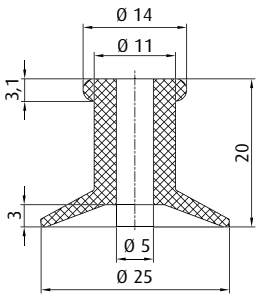
Additional sizes available are found on p. 56.



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

WEAR-RESISTANT

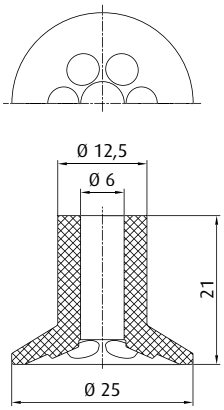
Item no. 122.025.077._*
Material Vulkollan® (br)
4 mm



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

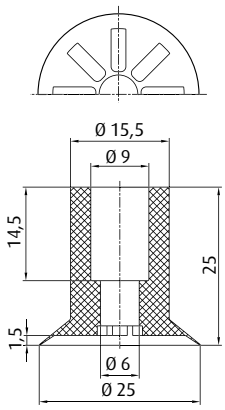
Item no. 102.027.124._*
Material NR (bg)
4 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



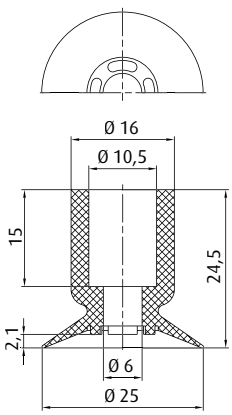
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 104.026.033._*
Material NR (bg)
2 mm



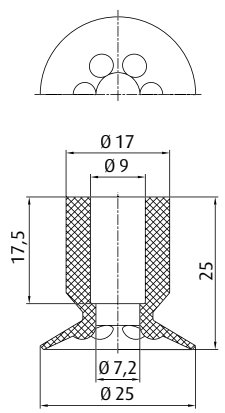
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

Item no. 102.025.373._*
Material Vinyl (bl)
1.5 mm



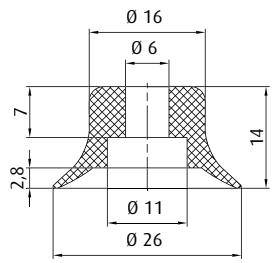
	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 104.025.037._*
Material NR (bg)
2 mm



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

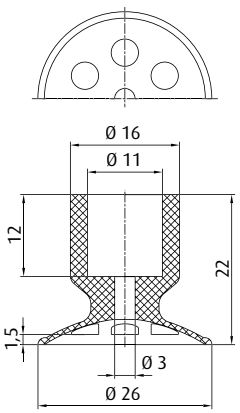
Item no. 104.025.056._*
Material Vinyl (bl)
2.5 mm



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 102.025.501._*
Material Thermalon® (bl)
3 mm

Additional sizes available are found on p. 36.

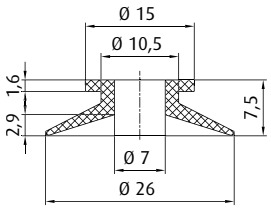


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

WEAR-RESISTANT

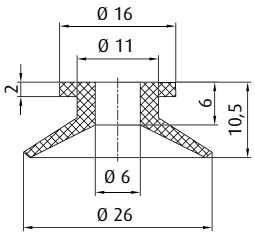
Item no. 102.025.192._*
Material Vulkollan® (br)
3 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



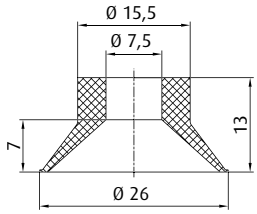
Item no.	Material	
102.026.121._*	NR (bg)	3 mm

	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425



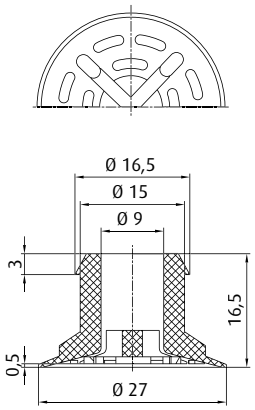
Item no.	Material	
102.026.180._*	Vinyl (bl)	4 mm

	Connection	see page
270.043	G1/4-male	425
270.038	G1/4-female	432



Item no.	Material	
102.027.167._*	Vinyl (bl)	5 mm

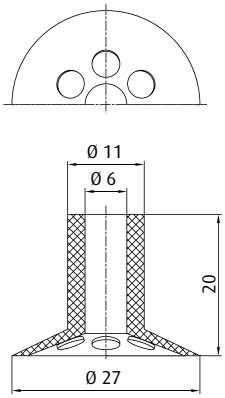
	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no.	Material	
102.027.298._*	SI (tr)	0.5 mm

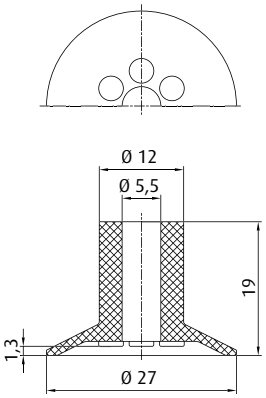
Additional sizes available are found on p. 20.
Notes: Especially well-suited for foils
This vacuum cup is also available in the following dimensions: 36 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425



Item no.	Material	
104.027.032._*	NR (bg)	2 mm

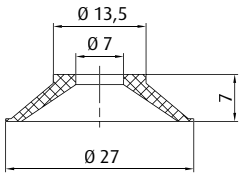
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425



Item no.	Material	
104.027.055._*	Vinyl (bl)	2.5 mm

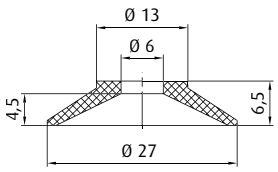
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419



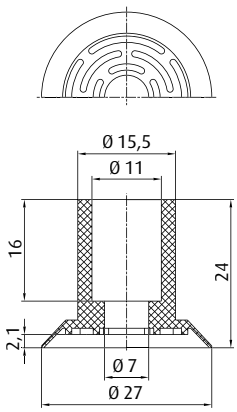
Item no. 107.027.022._*
Material NBR (sw), SI (tr)
4 mm

	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419



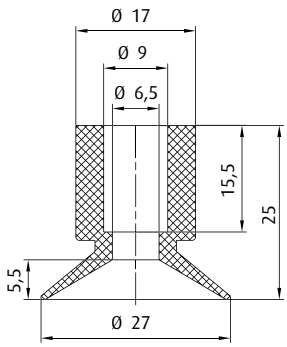
Item no. 107.027.052._*
Material NR (gr)
3 mm

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

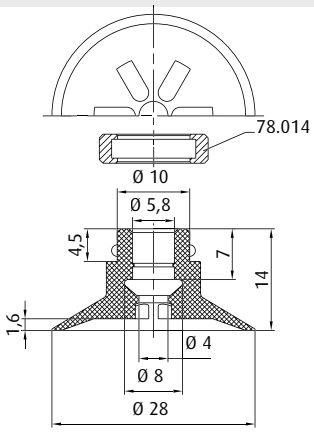


Item no. 104.027.062._*
Material NR (sw)
2 mm

	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



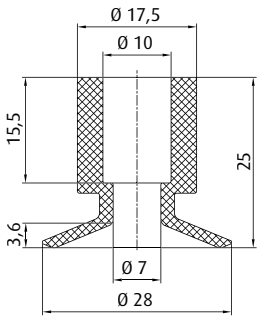
Item no. 102.028.164._*
Material Vinyl (bl)
5 mm



Item no. 102.028.461._*
Material SI (tr)
2 mm

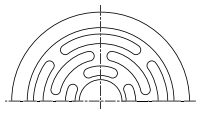
Ordering notes: The retaining ring Item. No. 78.014 (stainless steel) must be ordered separately

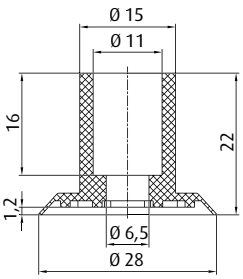
	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no. 102.028.163._*
Material Vinyl (bl)
4 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

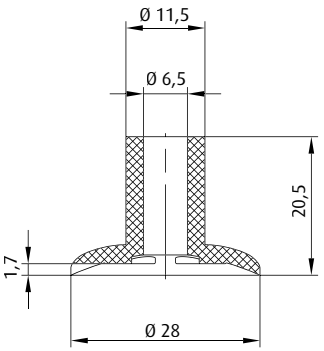




	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

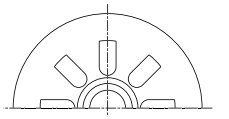
Item no. 104.029.093._*
Material NR (sw)
1 mm

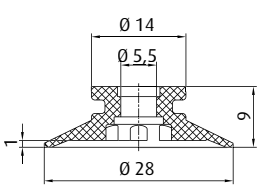
Additional sizes available are found on p. 21.
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 30 mm, 40 mm



	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no. 102.027.246._*
Material NR (br)
2 mm



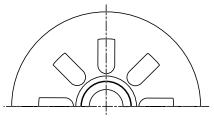


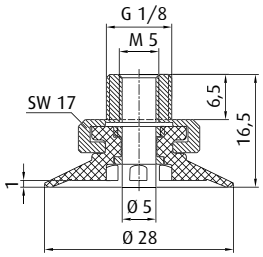
	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no. 125.025.007._*
Material Tepuflex® (or), SI (tr), CR (sw)
1 mm

Additional sizes available are found on p. 42.

Spare cup

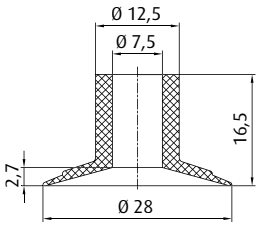




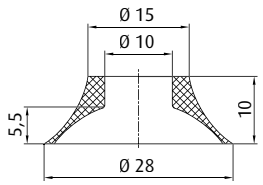
Item no. 123.025.010._*
Material Tepuflex® (or), SI (tr), CR (sw)
1 mm

Additional sizes available are found on p. 47.

	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

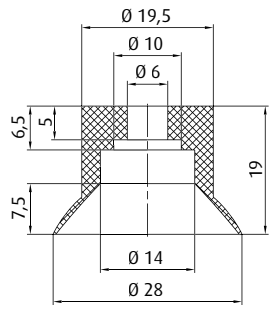


Item no. 102.028.175._*
Material Vinyl (bl)
2 mm



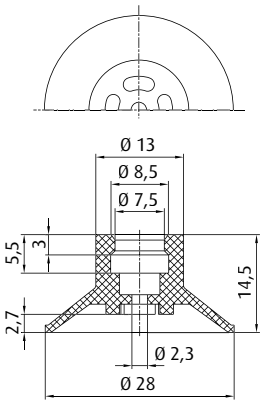
Item no. 102.028.375._*
Material SI (tr)
2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

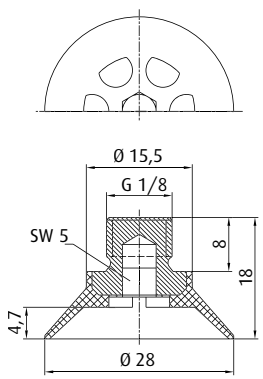
Item no. 102.028.159._ *
Material Vinyl (bl)
4 mm



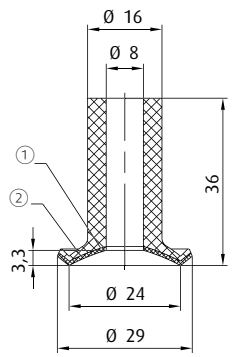
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no. 102.028.194._ *
Material NBR (sw)
3 mm

This vacuum cup is also available in the following dimensions: 20 mm



Item no. 103.030.024._ *
Material NBR (gr), NR (br)
4.5 mm



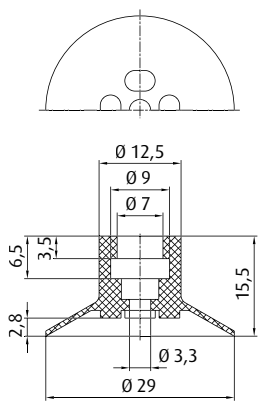
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

NON-MARKING!
TEMP. MAX. 500 °C

① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

Item no. 26.025.009._ *
Material SI (tr/ge)
2 mm

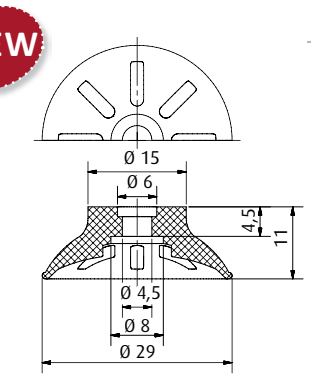
Additional sizes available are found on p. 164.



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423

Item no. 104.029.053._ *
Material Vinyl (bl)
4 mm

NEW

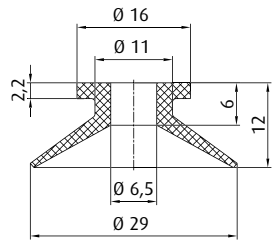


	Connection	see page
270.063	G1/8-male	419

Item no. 102.029.509._ *
Material NR (br)
4 mm

Additional sizes available are found on p. 20.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

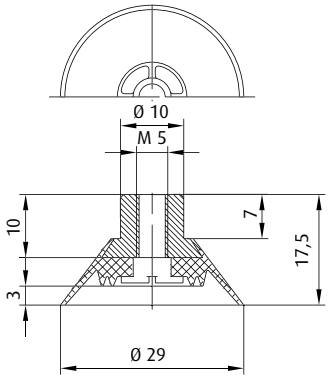


	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 102.029.160._*

Material Vinyl (bl)

4.5 mm

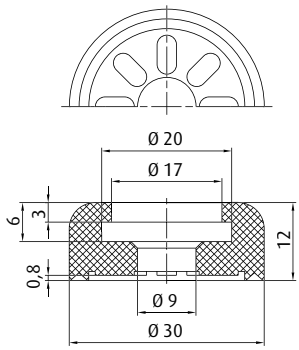


Item no. 150.030.031._*

Material SI (r), CR (sw)

3 mm

Additional sizes available are found on p. 68.



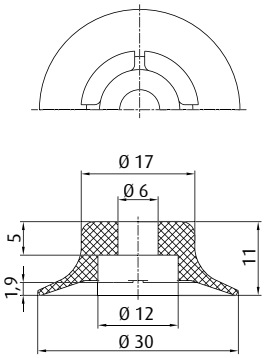
	Connection	see page
270.234	G1/8-female	438

Item no. 102.030.459._*

Material HNBR (ge), NR (br)

0.8 mm

Additional sizes available are found on p. 70.



	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

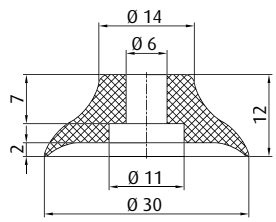
		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. 102.030.288._*

Material NBR (sw), SI (tr), PU (bl), FKM (gr)

2 mm

Additional sizes available are found on p. 38.



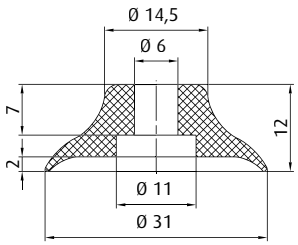
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 102.030.053._*

Material NBR (sw), SI (tr), PU (bl)

2 mm

Additional sizes available are found on p. 32.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

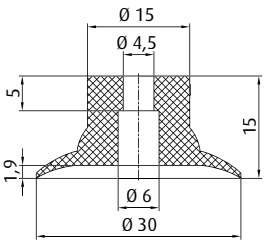
Item no. 102.030.502._*

Material Thermalon® (bl)

2 mm

Additional sizes available are found on p. 36.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



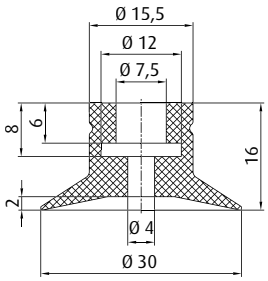
	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

		see page
50.020	8.5 mm	454

BESTSELLER

Item no. 102.030.222._*
Material NBR (sw), SI (tr)
2 mm

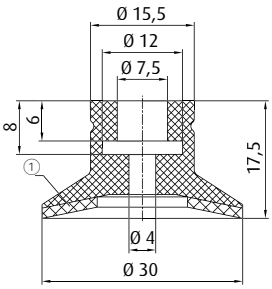
Additional sizes available are found on p. 50.



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. 126.030.013._*
Material SI (bl), SI (r)
1.5 mm



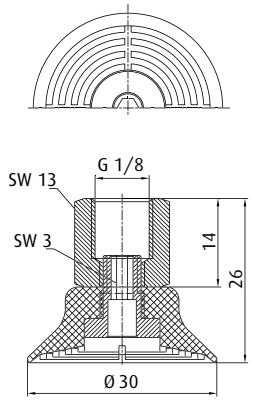
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

① = Silicone sponge

Item no. 104.030.087._*
Material SI (bl/r)
1.5 mm

Additional sizes available are found on p. 166.

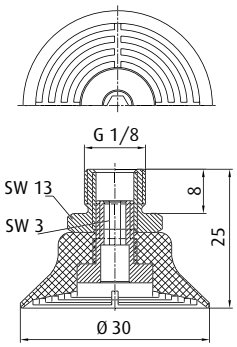


NON-SLIP

Item no. 100.030.102._*
Material NBR (sw)
1.8 mm

Additional sizes available are found on p. 62.

Spare cup

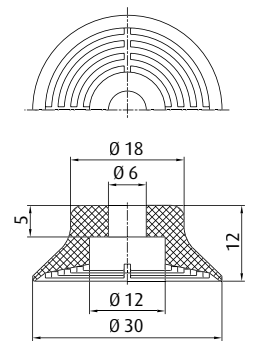


NON-SLIP

Item no. 100.030.112._*
Material NBR (sw)
1.8 mm

Additional sizes available are found on p. 62.

Spare cup

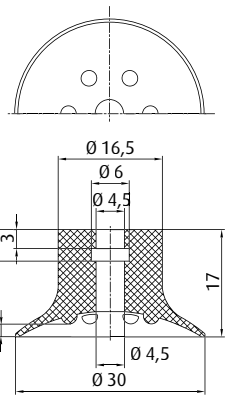


	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

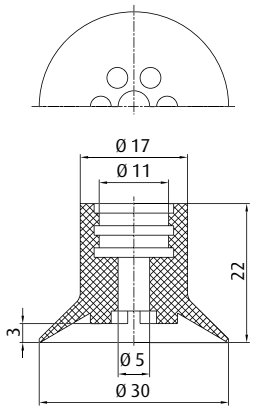
Item no. 104.030.067._*
Material NBR (sw)
1.8 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

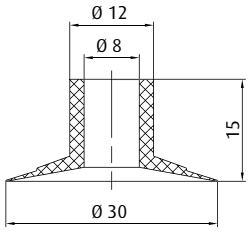
Item no. 102.030.322._*
Material Vulkollan® (br)
2 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

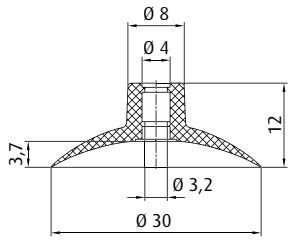
Item no. 104.030.008._*
Material NBR (sw), SI (bl)
3 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 40 mm, 50 mm



	Connection	see page
270.112	G1/8-male	419
270.113	G1/4-male	425
270.043	G1/4-male	425
270.178	G1/4-female	431

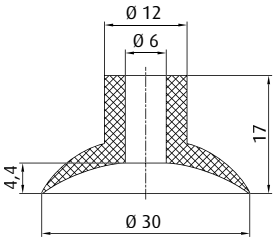
Item no. 107.030.023._*
Material NBR (sw), NR (bg)
1 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 102.030.086._*
Material PU (g)
4.5 mm

This vacuum cup is also available in the following dimensions: 22 mm, 25 mm

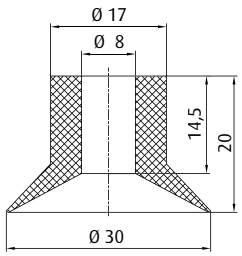


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 112.030.052._*
Material NBR (sw), SI (w)
4.5 mm

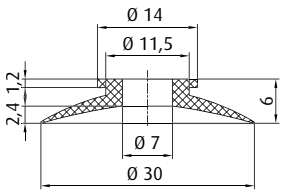
Additional sizes available are found on p. 52.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

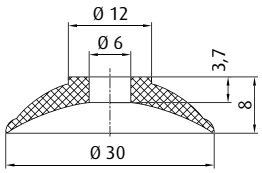


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
115.030.005._*	NBR (sw), SI (tr), NR (sw), NR (bg)	3 mm

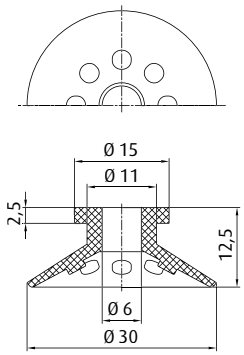


Item no.	Material	
102.030.178._*	Vinyl (bl)	3 mm



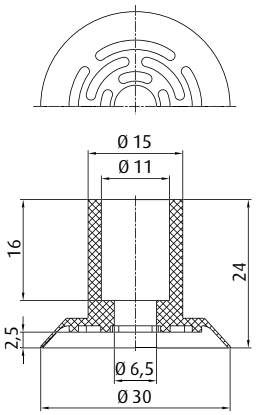
	Connection	see page
270.255	M8-male	415

Item no.	Material	
112.030.051._*	NBR (sw), SI (w)	4 mm



	Connection	see page
270.039	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
104.030.059._*	Vinyl (bl)	3 mm

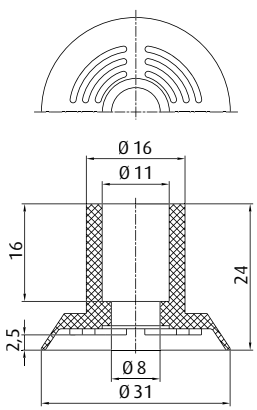


	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

BESTSELLER

Item no.	Material	
104.030.009._*	NBR (sw), SI (w), SI (tr), NR (sw)	3 mm

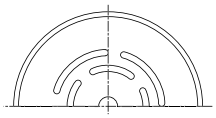
Additional sizes available are found on p. 21.
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 28 mm, 40 mm

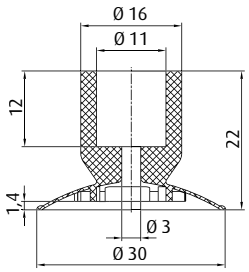


	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
104.030.007._*	SI (tr), NR (sw)	3 mm

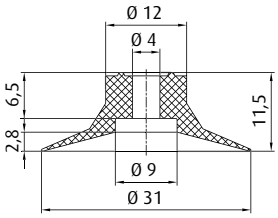
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760





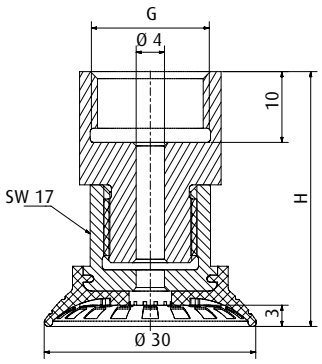
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
102.030.215._*	Vulkollan® (br)	2 mm



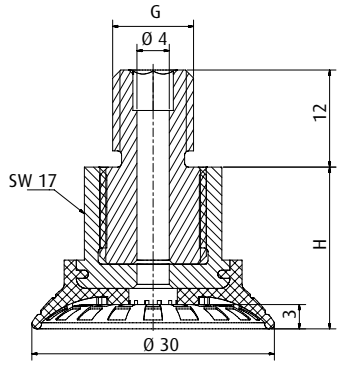
	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

Item no.	Material	
102.031.313._*	SI (tr)	3 mm



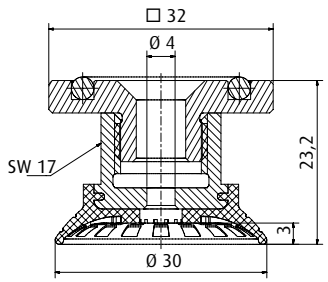
Item no.	Material	[mm]	Connection thread	H [mm]
103.030.031._*	NBR (bl)	3	G1/4-female	20
103.030.032._*	NBR (bl)	3	G3/8-female	36

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.030.030._*	NBR (bl)	3	G1/4-male	20
103.030.033._*	NBR (bl)	3	M10-male	20
103.030.034._*	NBR (bl)	3	M14x1.5-male	20

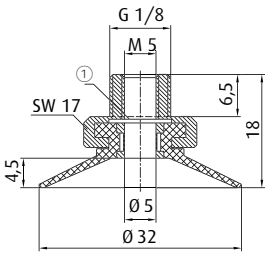
Additional sizes available are found on p. 64.



Item no.	Material	
103.030.035._*	NBR (bl)	3 mm

Additional sizes available are found on p. 64.

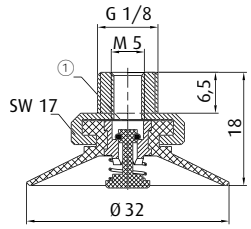
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material	
120.030.013._*	SI (tr), CR (sw)	3.5 mm

Additional sizes available are found on p. 47.



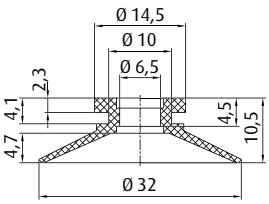
① = Filter screen

Item no.	Material	
121.030.006._*	SI (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 47.

Spare cup

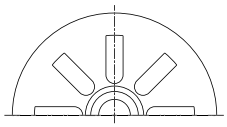
	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

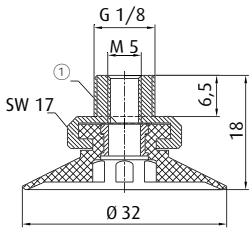


Item no.	Material	
102.030.096._*	SI (tr), CR (sw)	3.5 mm

Additional sizes available are found on p. 42.

Spare cup

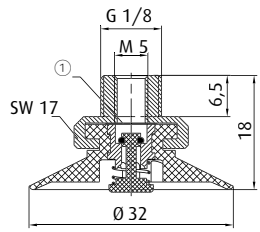




① = Filter screen

Item no.	Material	
123.030.019._*	Tepuflex® (or), SI (tr), CR (sw)	2 mm

Additional sizes available are found on p. 47.



① = Filter screen

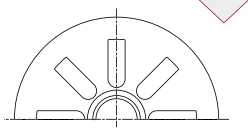
Item no.	Material	
124.030.002._*	SI (tr), CR (sw)	2 mm

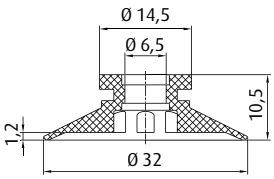
Additional sizes available are found on p. 47.

Spare cup

Spare cup

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418



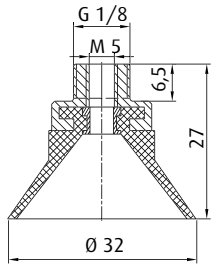


BESTSELLER

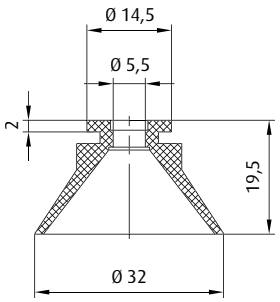
Item no.	Material	
125.030.010._*	Tepuflex® (or), SI (tr), CR (sw)	2 mm

Additional sizes available are found on p. 42.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Spare cup

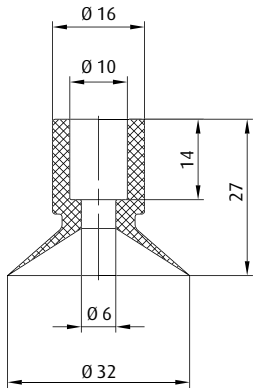


	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no.	Material	
120.032.025._*	Sl (tr), CR (sw)	5 mm

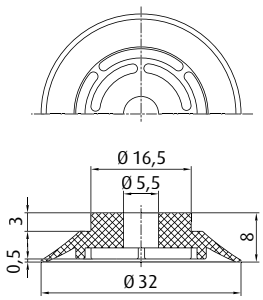
Item no.	Material	
122.032.036._*	Sl (tr), CR (sw)	5 mm

Additional sizes available are found on p. 42.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

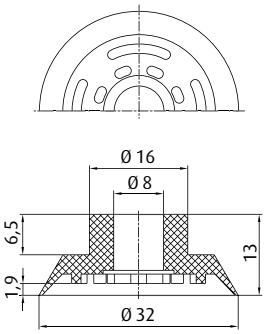
Item no.	Material	
122.030.034._*	Sl (tr), NR (sw)	6.5 mm



	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

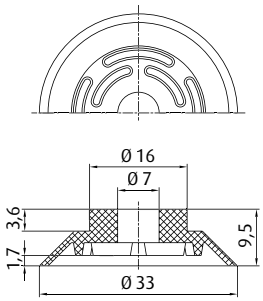
Item no.	Material	
102.032.104._*	NR (bg)	1.8 mm

Additional sizes available are found on p. 21.



	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
108.032.002._*	Sl (tr), NR (bg)	2 mm

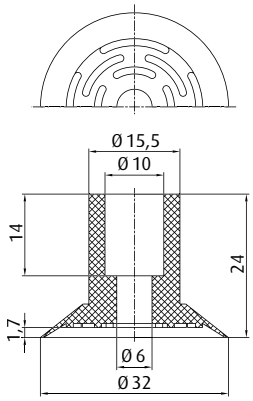


	Connection	see page
270.039	M6-male	414

Item no.	Material	
102.033.398._*	Vinyl (bl)	2 mm

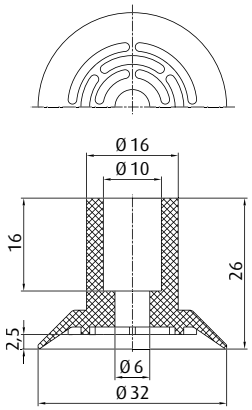
Additional sizes available are found on p. 21.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

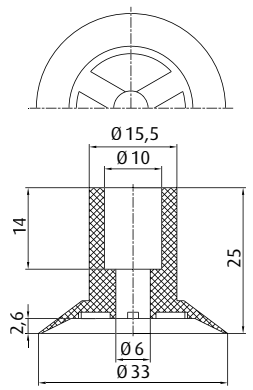
Item no. 104.032.044._*
Material Vinyl (bl)
2 mm



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

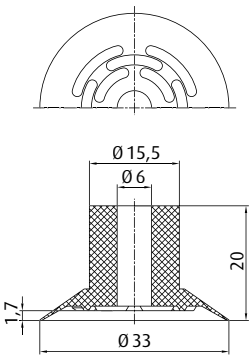
Item no. 104.033.034._*
Material NR (bg), CR (r)
2.5 mm

Notes: Especially well-suited for flexible products (foils, leather, veneer)



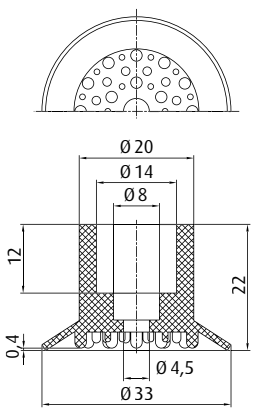
	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 102.033.226._*
Material Vinyl (bl)
3 mm



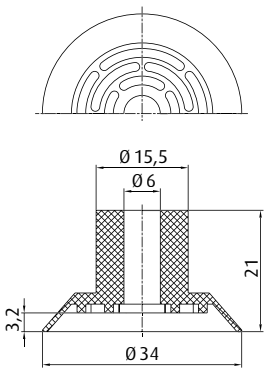
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 104.033.057._*
Material Vinyl (bl)
1.5 mm



Item no. 102.033.112._*
Material NBR (sw), SI (tr)
0.5 mm

Notes: Especially well-suited for foils

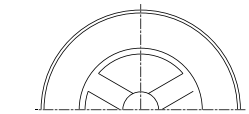


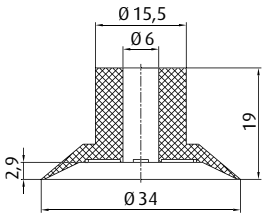
	Connection	see page
270.030	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 104.034.036._*
Material NR (bg)
3 mm

Additional sizes available are found on p. 21.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



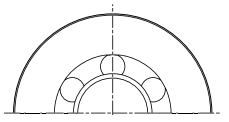


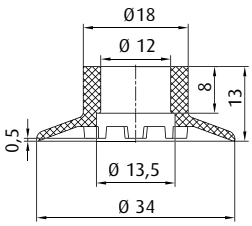
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

BESTSELLER

Item no. 104.034.054._*
Material Vinyl (bl)
3 mm

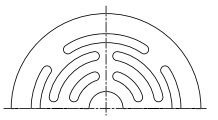
Additional sizes available are found on p. 21.

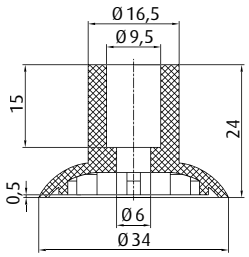




	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. 108.034.003._*
Material NR (bg)
1 mm

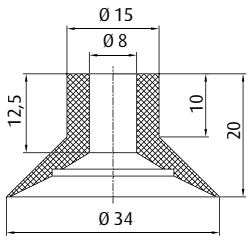




	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

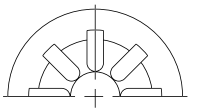
Item no. 116.034.001._*
Material NR (sw), NR (bg)
0.5 mm

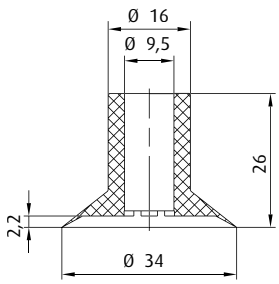
Additional sizes available are found on p. 21.
Notes: Especially well-suited for flexible products (foils, leather, veneer)



	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

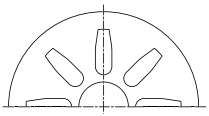
Item no. 122.034.038._*
Material NR (sw), NR (br)
3 mm

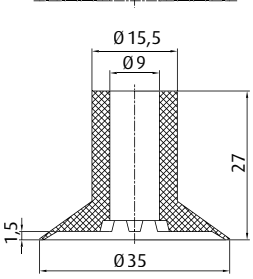




	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.452	G1/4-female	431

Item no. 104.035.048._*
Material Vinyl (bl)
2 mm

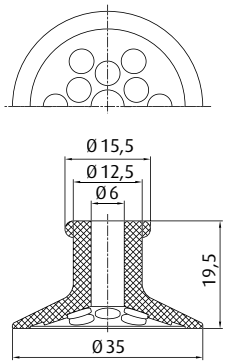




	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.452	G1/4-female	431

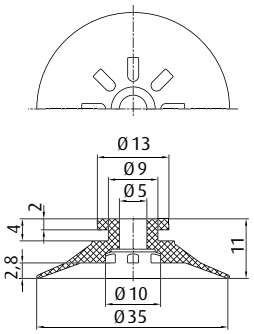
Item no. 104.035.050._*
Material Vinyl (bl)
2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



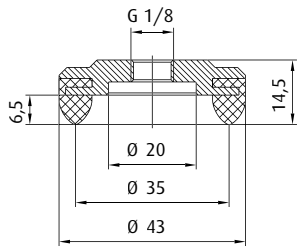
	Connection	see page
270.030	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
104.035.038._*	NR (bg)	1 mm



	Connection	see page
270.310	M5-male	411
270.250	G1/8-male	418

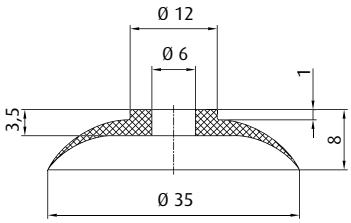
Item no.	Material	
102.035.320._*	NR (sw)	2.8 mm



Item no.	Material	
160.042.001._*	EPDM (sw)	1 mm

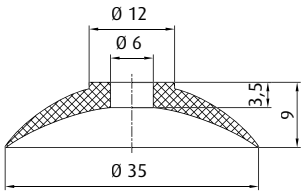
Additional sizes available are found on p. 72.
Notes: Foam sealing lip equalises product unevenness

	Connection	see page
270.250	G1/8-male	418



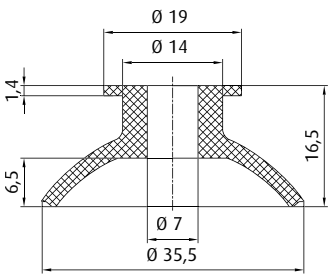
Item no.	Material	
112.035.059._*	SI (tr), NR (sw)	3 mm

	Connection	see page
270.039	M6-male	414



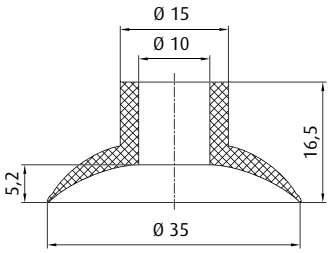
Item no.	Material	
112.035.065._*	SI (tr)	5.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427

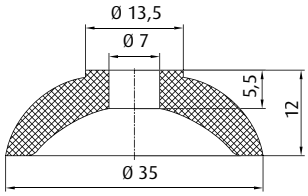
Item no.	Material	
102.035.176._*	Vinyl (bl)	6 mm



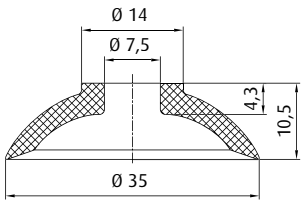
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
112.035.060._*	NBR (sw), SI (w), NR (sw)	5 mm

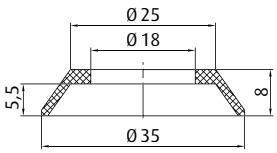
Additional sizes available are found on p. 52.



Item no.	Material	
112.035.064._*	NR (sw), NR (bg)	5 mm

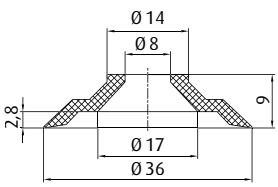


Item no.	Material	
115.035.007._*	NBR (sw), SI (tr), NR (sw)	5 mm



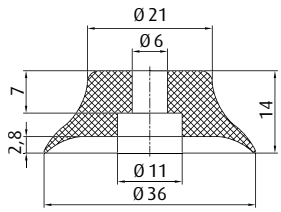
Item no.	Material	
107.035.055._*	NR (bg)	4 mm

	Connection	see page
270.255	M8-male	415



Item no.	Material	
102.036.106._*	SI (gr)	3 mm

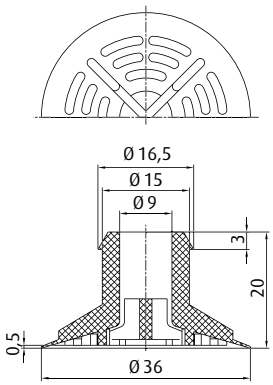
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 102.035.056._*
Material NBR (sw), SI (tr)
3 mm

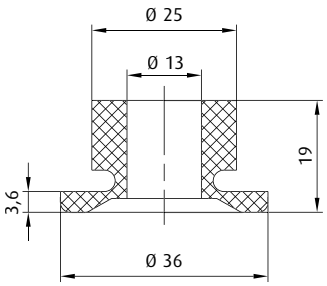
Additional sizes available are found on p. 32.



	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

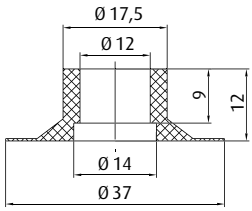
Item no. 102.036.342._*
Material SI (tr)
0.5 mm

Additional sizes available are found on p. 21.
Notes: Especially well-suited for foils
This vacuum cup is also available in the following dimensions: 27 mm



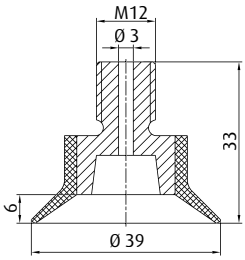
	Connection	see page
270.207	G1/4-male	426

Item no. 107.036.037._*
Material NR (br)
1.5 mm

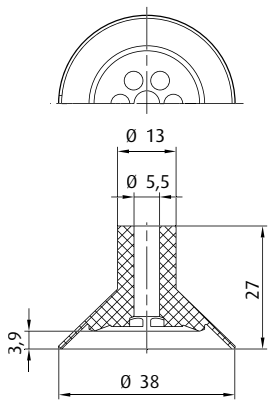


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. 107.037.027._*
Material NR (br)
0 mm



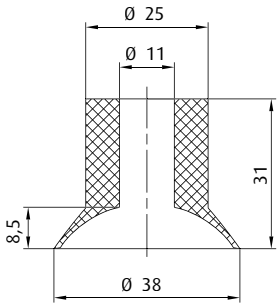
Item no. 120.038.021._*
Material NR (sw)
3 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

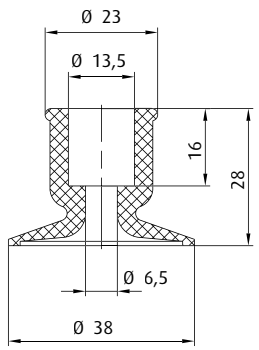
Item no. 104.038.039._*
Material PU (br), Vinyl (bl)
3.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



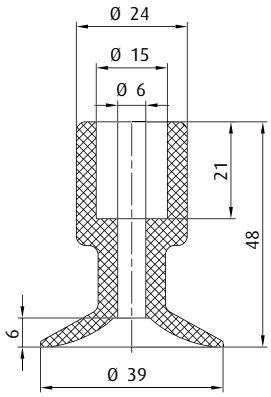
	Connection	see page
270.049-1	G1/4-male	426

Item no.	Material	
102.038.157._*	Vinyl (bl)	6 mm



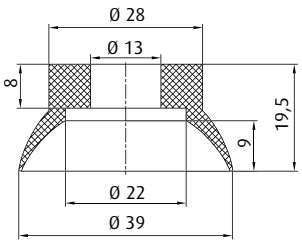
	Connection	see page
270.207	G1/4-male	426

Item no.	Material	
102.038.136._*	NR (bg)	2.5 mm



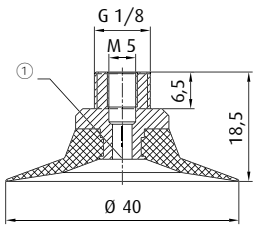
	Connection	see page
270.116	G1/4-female	432

Item no.	Material	
102.039.154._*	NR (bg)	2 mm



	Connection	see page
270.210	G1/4-male	430

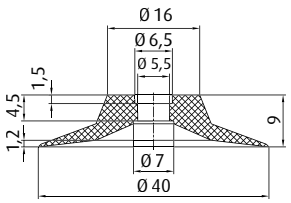
Item no.	Material	
112.039.069._*	NR (bg)	5 mm



① = Filter screen

Item no.	Material	
120.040.084._*	CR (sw)	2.5 mm

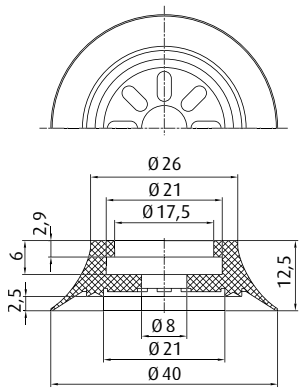
Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no.	Material	
102.040.310._*	CR (sw)	2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

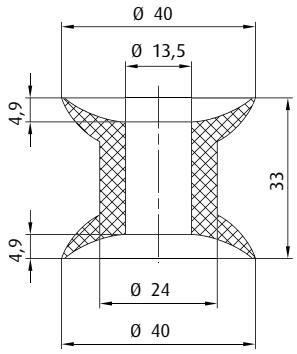


	Connection	see page
270.234	G1/8-female	438

FLEXIBLE LIP

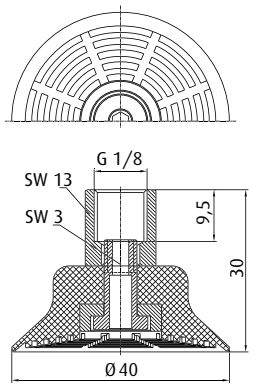
Item no.	Material	
102.040.357._*	Sl (tr), NR (br)	3 mm

Additional sizes available are found on p. 66.



	Connection	see page
270.116	G1/4-female	432

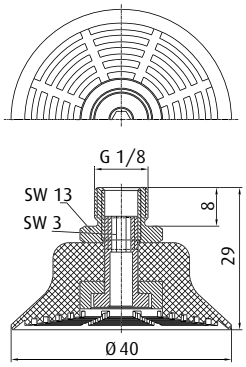
Item no.	Material	
102.039.235._*	NR (br)	5 mm



NON-SLIP

Item no.	Material	
100.040.103._*	NBR (sw)	2.5 mm

Additional sizes available are found on p. 62.

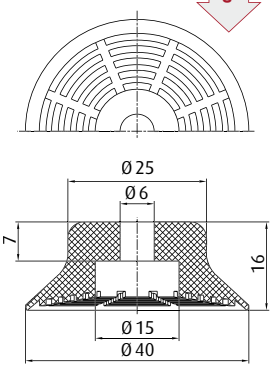


NON-SLIP

Item no.	Material	
100.040.113._*	NBR (sw)	2.5 mm

Additional sizes available are found on p. 62.

Spare cup



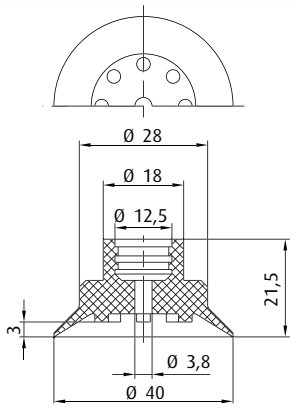
	Connection	see page
270.498	M6-male	414
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

Spare cup

		see page
50.170	20 mm	456
50.171	30 mm	456
50.172	40 mm	456
50.173	50 mm	456

Item no.	Material	
104.040.068._*	NBR (sw)	2.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



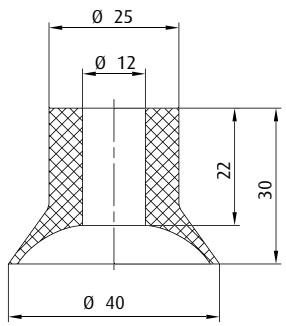
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. 104.040.014._*

Material NBR (sw)

2.5 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm, 50 mm

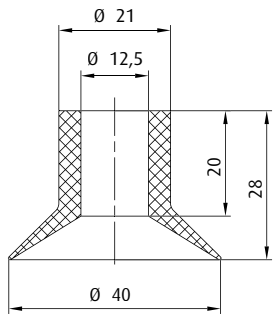


	Connection	see page
270.049-1	G1/4-male	426

Item no. 122.040.001._*

Material NBR (sw), SI (tr), NR (bg)

5 mm

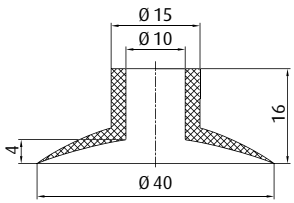


	Connection	see page
270.049-1	G1/4-male	426

Item no. 122.040.044._*

Material SI (tr), NR (bg)

4.5 mm



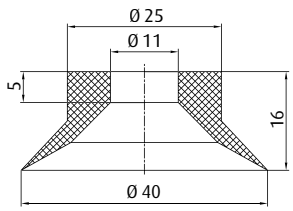
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 112.040.071._*

Material NBR (sw), SI (tr)

4 mm

Additional sizes available are found on p. 52.

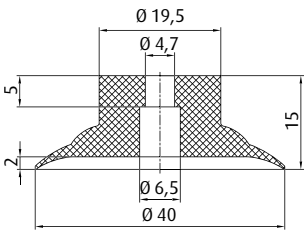


	Connection	see page
270.256	M8-male	415
270.252	G1/8-female	424

Item no. 126.040.016._*

Material SI (tr), NR (bg), PU (bl)

5 mm



	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

		see page
50.020	8.5 mm	454

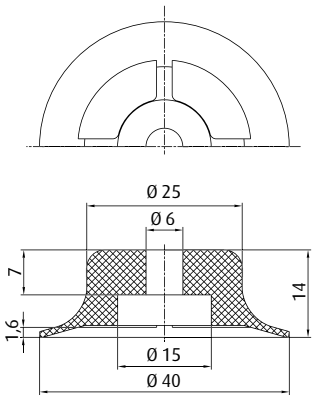
Item no. 102.040.223._*

Material NBR (sw), SI (tr)

2 mm

Additional sizes available are found on p. 50.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

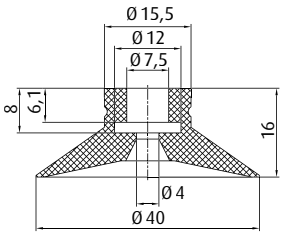


	Connection	see page
270.498	M6-male	414
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

		see page
50.170	20 mm	456
50.171	30 mm	456
50.172	40 mm	456
50.173	50 mm	456

Item no. **102.040.289._***
Material NBR (sw), SI (tr), PU (bl), FKM (gr)
2 mm

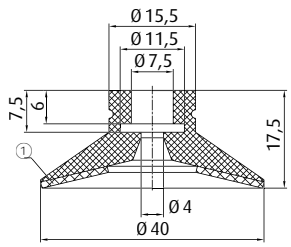
Additional sizes available are found on p. 38.



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. **102.040.364._***
Material SI (bl)
3 mm



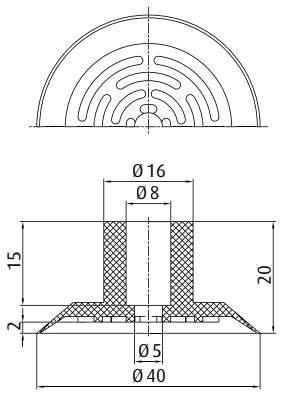
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

① = Silicone sponge

Item no. **104.040.088._***
Material SI (bl/r)
2.5 mm

Additional sizes available are found on p. 166.



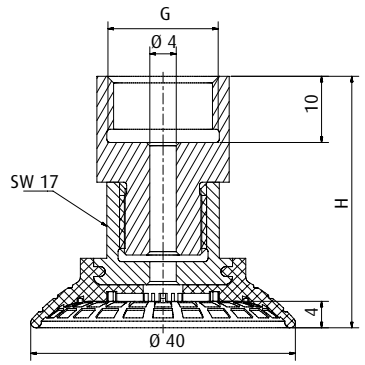
	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

BESTSELLER

Item no. **104.040.018._***
Material SI (tr), NR (sw), NR (br)
2 mm

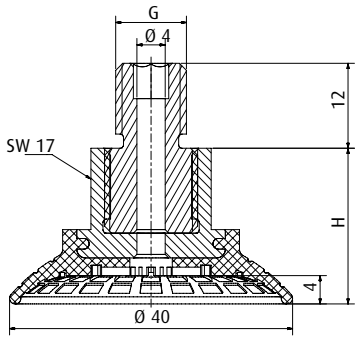
Additional sizes available are found on p. 21.
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 28 mm, 30 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



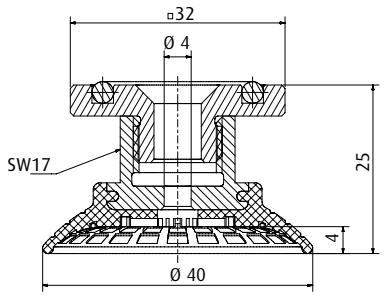
Item no.	Material	[mm]	Connection thread	H [mm]
103.040.037._*	NBR (bl)	4	G1/4-female	22
103.040.038._*	NBR (bl)	4	G3/8-female	38

Additional sizes available are found on p. 64.



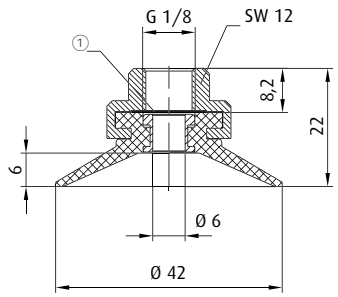
Item no.	Material	[mm]	Connection thread	H [mm]
103.040.036._*	NBR (bl)	4	G1/4-male	22
103.040.039._*	NBR (bl)	4	M10-male	22
103.040.040._*	NBR (bl)	4	M14x1.5-male	22

Additional sizes available are found on p. 64.



Item no.	Material	
103.040.041._*	NBR (bl)	4 mm

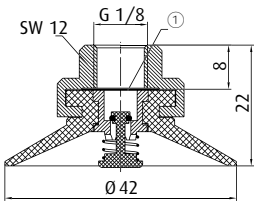
Additional sizes available are found on p. 64.



① = Filter screen

Item no.	Material	
120.040.076._*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 47.

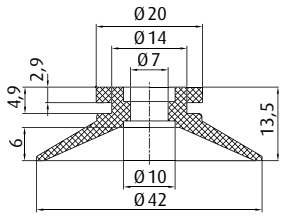


① = Filter screen

Item no.	Material	
121.040.007._*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 47.

Spare cup

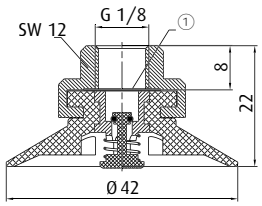


	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no.	Material	
102.040.094._*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 42.

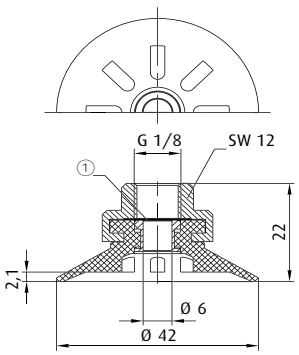
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material	
124.040.006._*	SI (tr), CR (sw)	2 mm

Additional sizes available are found on p. 47.

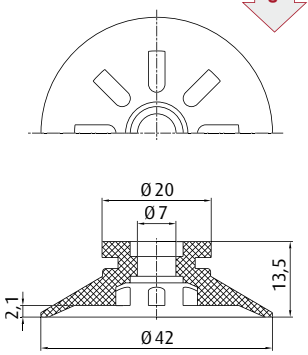


① = Filter screen

Item no.	Material	
123.040.028._*	Tepuflex® (or), SI (tr), CR (sw)	2 mm

Additional sizes available are found on p. 47.

Spare cup



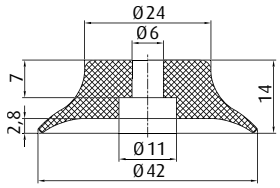
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

BESTSELLER

Item no.	Material	
125.040.013._*	Tepuflex® (or), SI (tr), CR (sw)	2 mm

Additional sizes available are found on p. 42.

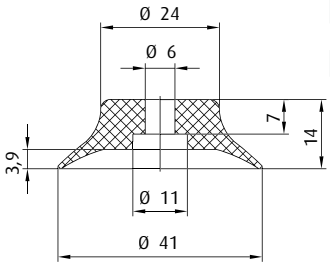
Spare cup



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
102.040.061._*	NBR (sw), SI (tr), PU (bl)	3.5 mm

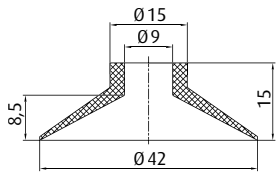
Additional sizes available are found on p. 32.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
102.040.503._*	Thermalon® (bl)	3.9 mm

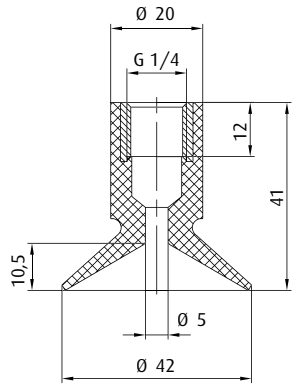
Additional sizes available are found on p. 36.



	Connection	see page
270.034	G1/4-male	428
270.038	G1/4-female	432

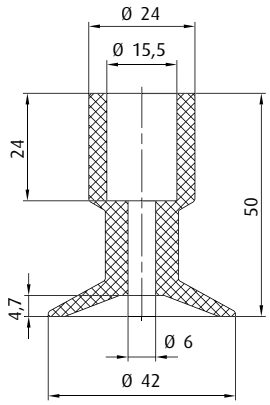
Item no.	Material	
102.042.232._*	NR (sw)	7 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



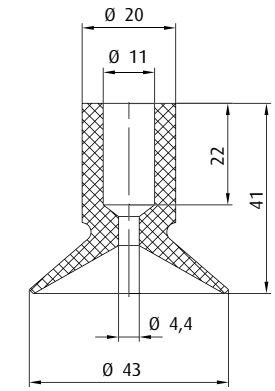
Item no.	Material	
120.040.032._*	Sl (tr), NR (sw)	6 mm

This vacuum cup is also available in the following dimensions: 53 mm, 62 mm, 83 mm



	Connection	see page
270.116	G1/4-female	432

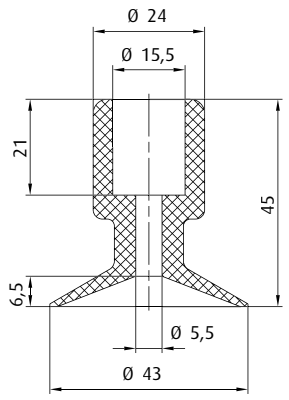
Item no.	Material	
102.042.184._*	Vinyl (bl)	4 mm



	Connection	see page
270.049-1	G1/4-male	426

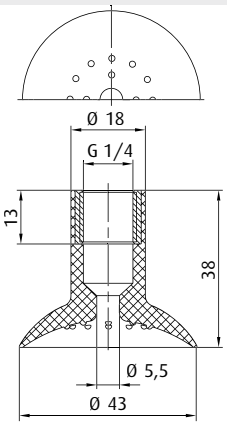
Item no.	Material	
122.040.043._*	Sl (tr), NR (sw)	4 mm

Additional sizes available are found on p. 56.



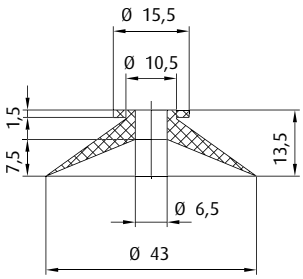
	Connection	see page
270.116	G1/4-female	432

Item no.	Material	
102.043.252._*	NR (br)	7 mm



Item no.	Material	
110.042.068._*	Sl (tr), NR (sw)	5 mm

This vacuum cup is also available in the following dimensions: 50 mm, 62 mm, 81 mm, 100 mm

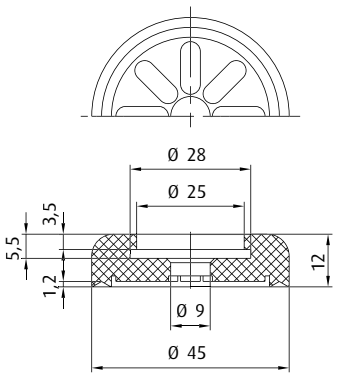


	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no.	Material	
102.043.170._*	Vinyl (bl)	5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

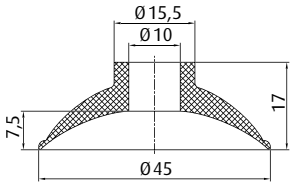
	Connection	see page
270.235	G1/8-female	438



Item no.	Material	
102.045.460._*	HNBR (ge), NR (br)	1.2 mm

Additional sizes available are found on p. 70.

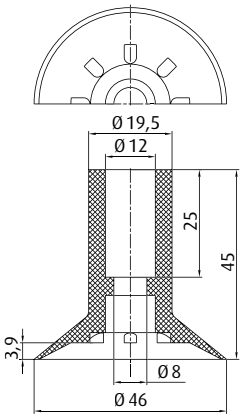
	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no.	Material	
112.045.077._*	NBR (sw), SI (w), NR (sw)	7 mm

Additional sizes available are found on p. 52.

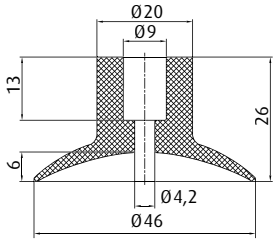
	Connection	see page
270.049-1	G1/4-male	426



Item no.	Material	
127.045.002._*	NR (sw)	5 mm

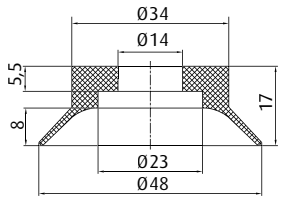
This vacuum cup is also available in the following dimensions: 65 mm

	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425

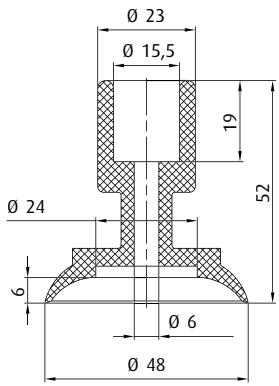


Item no.	Material	
102.046.046._*	NBR (sw)	6 mm

	Connection	see page
270.210	G1/4-male	430

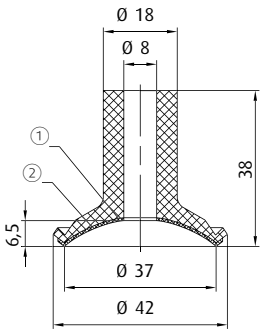


Item no.	Material	
107.048.031._*	SI (tr), NR (gr)	5 mm



Item no.	Material	
115.048.008._*	NR (sw)	8 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



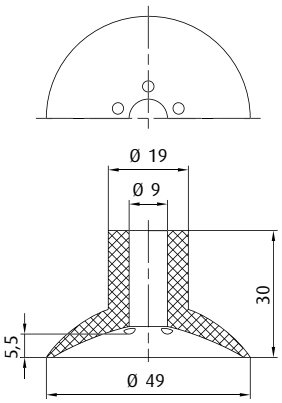
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

NON-MARKING!
TEMP. MAX. 500 °C

① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

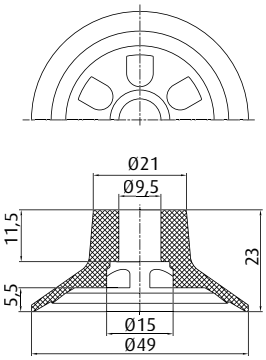
Item no.	Material	
26.037.010._*	SI (tr/ge)	3 mm

Additional sizes available are found on p. 164.



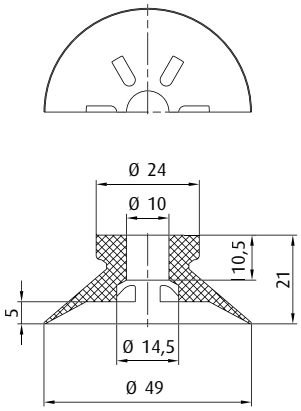
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
102.048.274._*	NR (sw)	6 mm



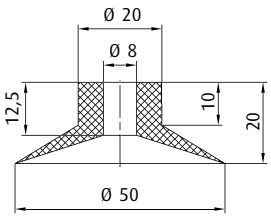
	Connection	see page
270.315	M6-male	414
270.177	M10-male	416
270.540	G1/4-male	429
270.539	G1/4-female	434

Item no.	Material	
104.050.022._*	NBR (gr), NR (bg)	4.5 mm



	Connection	see page
270.249	G1/4-male	427
270.248	G1/4-female	433

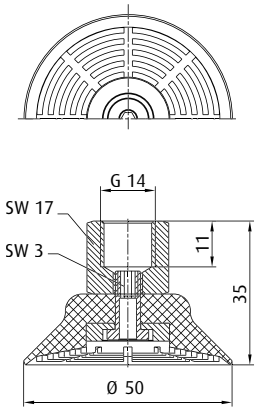
Item no.	Material	
127.050.004._*	SI (tr), NR (sw), NR (bg)	4 mm



	Connection	see page
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
126.050.017._*	SI (tr), NR (bg)	4 mm

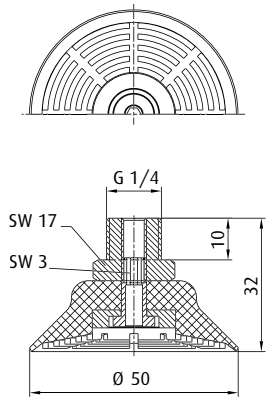
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



NON-SLIP

Item no.	Material	
100.050.104._*	NBR (sw)	3.1 mm

Additional sizes available are found on p. 62.

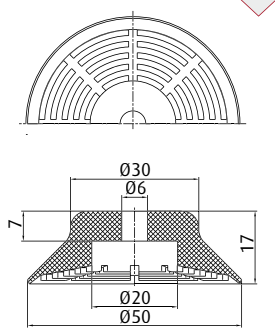


NON-SLIP

Item no.	Material	
100.050.114._*	NBR (sw)	3.1 mm

Additional sizes available are found on p. 62.

Spare cup

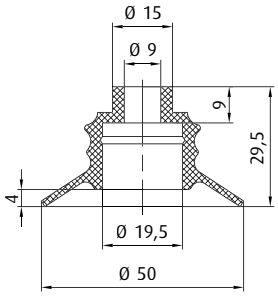


	Connection	see page
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

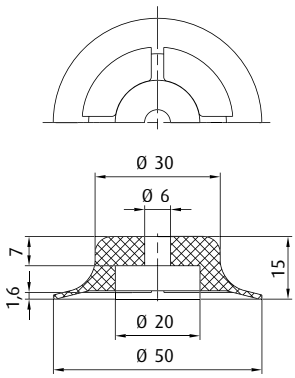
Item no.	Material	
104.050.069._*	NBR (sw)	3.1 mm

Spare cup



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423

Item no.	Material	
107.050.042._*	NR (sw), NR (br)	6 mm

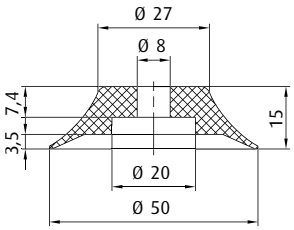


	Connection	see page
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

Item no.	Material	
102.050.290._*	NBR (sw), SI (tr), PU (bl), FKM (gr)	2 mm

Additional sizes available are found on p. 38.

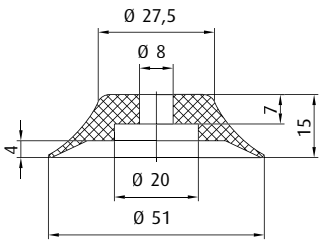


	Connection	see page
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

Item no.	Material	
102.050.065._*	NBR (sw), SI (tr), PU (bl)	4 mm

Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



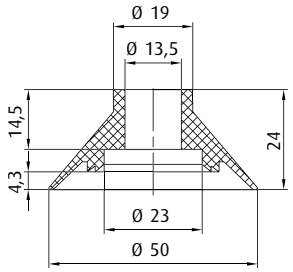
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

Item no. 102.050.504._*

Material Thermalon® (bl)

4 mm

Additional sizes available are found on p. 36.



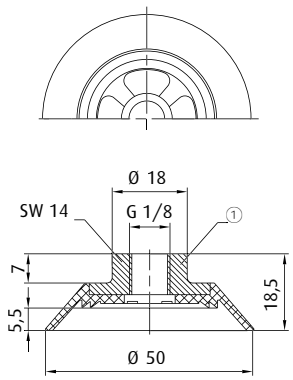
	Connection	see page
270.184	G1/4-male	431

BESTSELLER

Item no. 127.050.003._*

Material SI (r), CR (sw)

5 mm



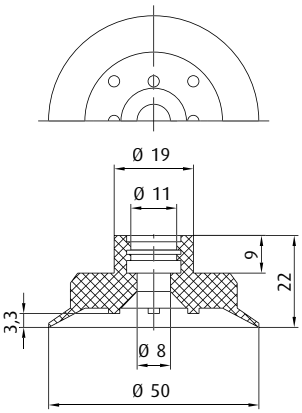
① = Aluminium

Item no. 150.050.032._*

Material SI (r), FKM (sw), CR (sw)

5.5 mm

Additional sizes available are found on p. 68.



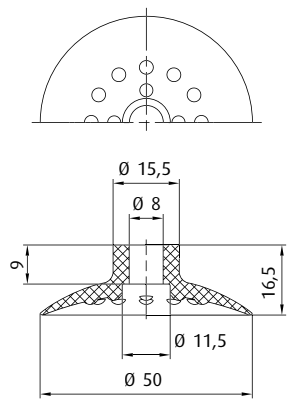
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. 104.050.064._*

Material NBR (sw), SI (tr)

5 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm, 40 mm

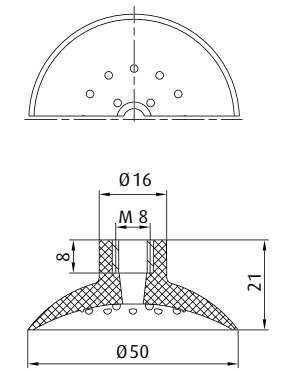


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 102.050.433._*

Material Vulkollan® (br)

3 mm

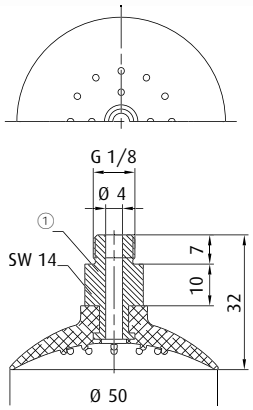


Item no. 110.050.080._*

Material NR (sw)

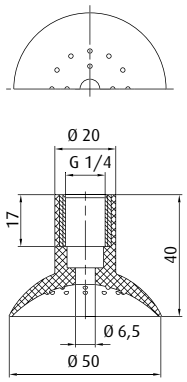
4 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



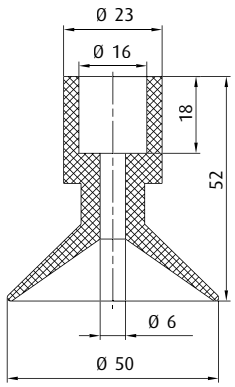
① = Aluminium

Item no.	Material	
113.050.014._*	NBR (sw)	5 mm

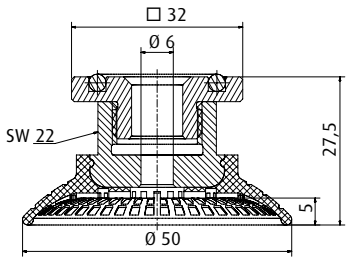


Item no.	Material	
110.050.078._*	SI (tr), NR (sw)	9 mm

This vacuum cup is also available in the following dimensions: 43 mm, 62 mm, 81 mm, 100 mm

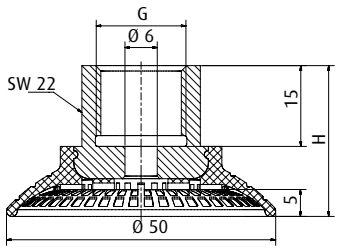


Item no.	Material	
126.050.018._*	NR (bg)	10 mm



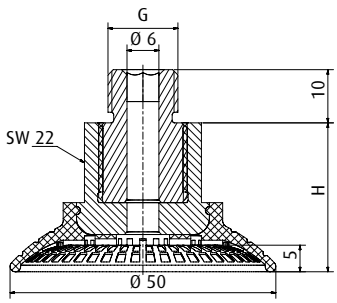
Item no.	Material	
103.050.047._*	NBR (bl)	5 mm

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.050.043._*	NBR (bl)	5	G1/4-female	33
103.050.044._*	NBR (bl)	5	G3/8-female	28

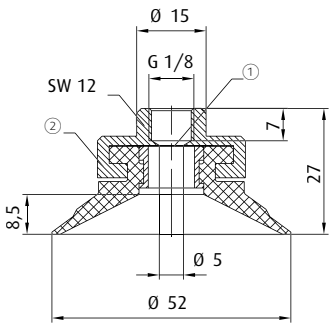
Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.050.042._*	NBR (bl)	5	G1/4-male	28
103.050.045._*	NBR (bl)	5	M10-male	28
103.050.046._*	NBR (bl)	5	M14x1.5-male	28

Additional sizes available are found on p. 64.

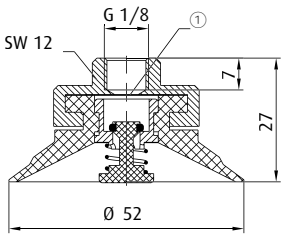
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen ② = Aluminium

Item no.	Material	
120.050.078._*	Sl (tr), CR (sw)	6.5 mm

Additional sizes available are found on p. 47.

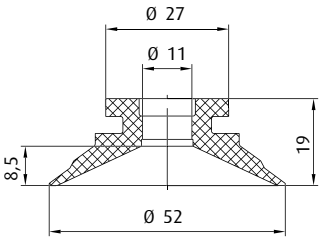


① = Filter screen

Item no.	Material	
121.050.008._*	Sl (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 47.

Spare cup

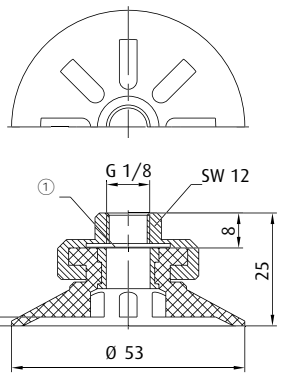


	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Item no.	Material	
102.050.097._*	Sl (tr), CR (sw)	6.5 mm

Additional sizes available are found on p. 42.

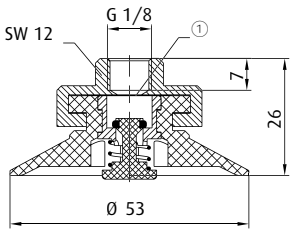
Spare cup



① = Filter screen

Item no.	Material	
123.050.034._*	Tepuflex® (or), Sl (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 47.

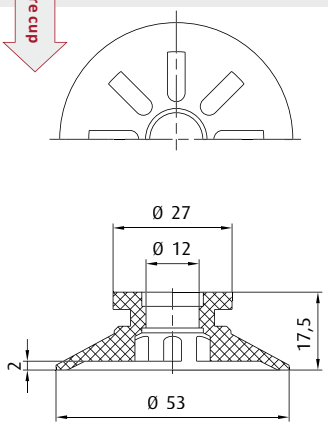


① = Filter screen

Item no.	Material	
124.050.009._*	Sl (tr), CR (sw)	2.5 mm

Additional sizes available are found on p. 47.

Spare cup

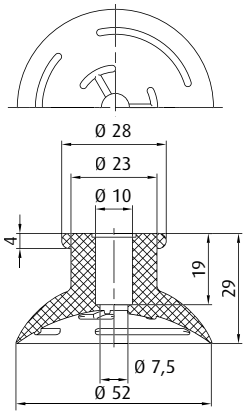


	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Item no.	Material	
125.050.017._*	Tepuflex® (or), Sl (tr), CR (sw)	2.5 mm

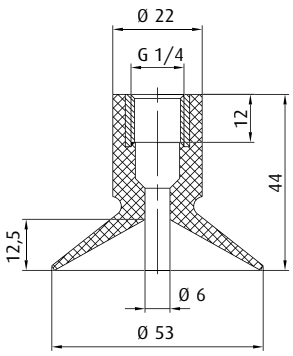
Additional sizes available are found on p. 42.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

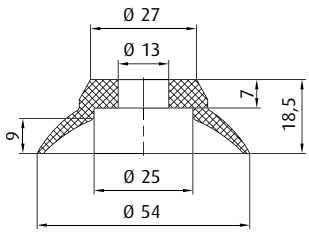
Item no. 114.052.008._*
Material NR (bg)
6 mm



Item no. 120.050.040._*
Material SI (tr), NR (sw)
11 mm

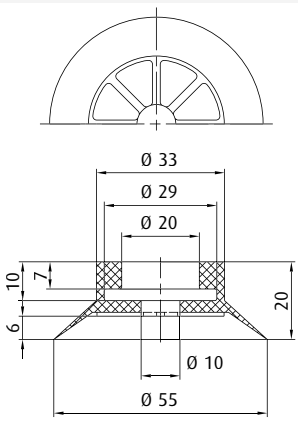
This vacuum cup is also available in the following dimensions: 42 mm, 62 mm, 83 mm

	Connection	see page
270.184	G1/4-male	431



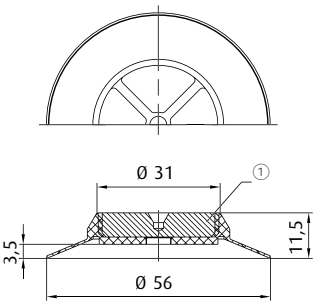
Item no. 112.055.086._*
Material PU (bl)
6 mm

	Connection	see page
270.289	G1/8-female	438



FLEXIBLE LIP

Item no. 154.055.060._*
Material NBR (gr)
6 mm

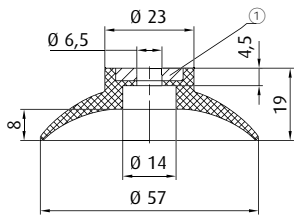


① = Steel

Item no. 152.055.092._*
Material NBR (gr)
4 mm

Ordering notes: Customised drilling patterns on request

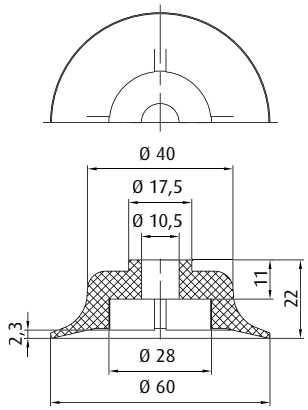
	Connection	see page
270.312/19	M6-male	414



① = Aluminium

Item no. 112.057.087._*
Material NR (sw)
6 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



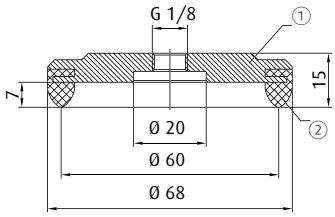
	Connection	see page
270.512	M10-male	416

Item no. 102.060.291._*

Material NBR (sw), SI (tr), PU (bl), FKM (gr)

2.5 mm

Additional sizes available are found on p. 38.



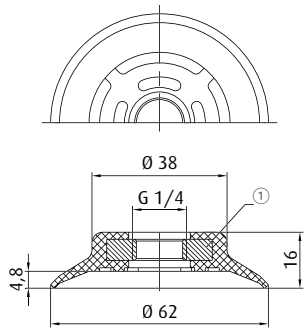
① = Aluminium ② = EPDM foamed

Item no. 160.067.003._*

Material EPDM (sw)

1 mm

Additional sizes available are found on p. 72.
Notes: Foam sealing lip equalises product unevenness



	Connection	see page
270.090	M10x1.25-female	752
270.120	G1/4-male	750

BESTSELLER

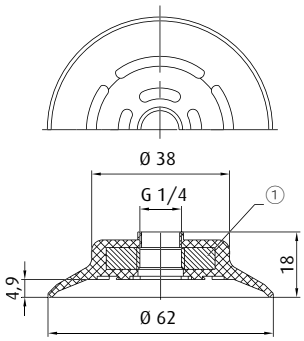
① = Aluminium

Item no. 102.060.303._*

Material NBR (sw), SI (tr), PU (bl)

5 mm

Additional sizes available are found on p. 32.



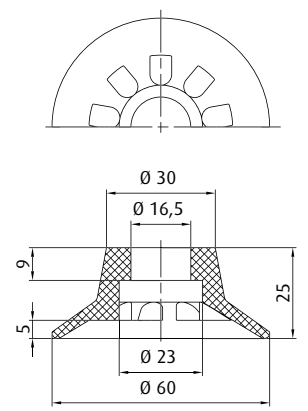
① = Aluminium

Item no. 102.060.505._*

Material Thermalon® (bl)

4.9 mm

Additional sizes available are found on p. 36.

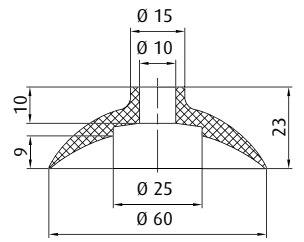


	Connection	see page
270.237	G1/4-male	430

Item no. 104.060.024._*

Material NBR (gr), SBR (br), NR (bg)

4 mm



	Connection	see page
270.042	G1/4-male	431

Item no. 112.060.091._*

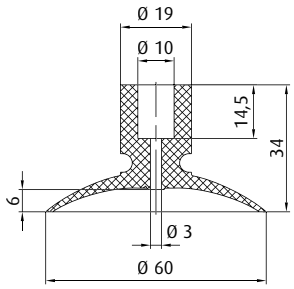
Material NBR (sw), SI (tr)

9 mm

Additional sizes available are found on p. 52.

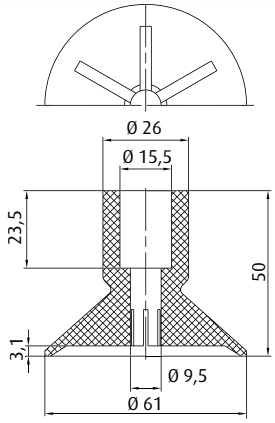
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



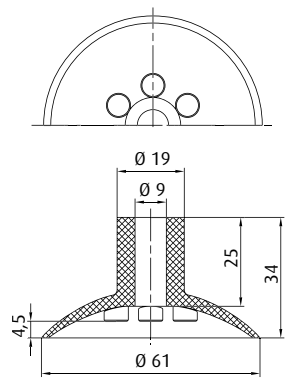
Item no. 115.060.009._*
Material NR (sw)
5 mm

	Connection	see page
270.116	G1/4-female	432

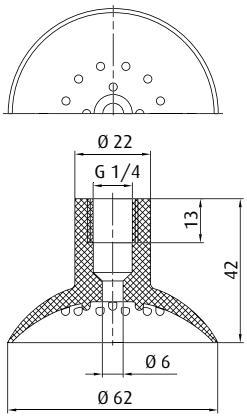


Item no. 104.061.060._*
Material Vinyl (bl)
2.5 mm

	Connection	see page
270.208	G1/4-male	425



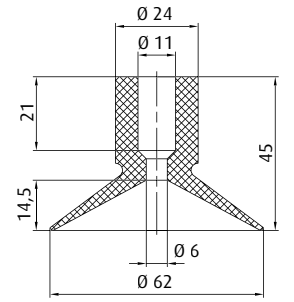
Item no. 114.061.010._*
Material SI (tr), NR (sw)
5 mm



Item no. 110.060.085._*
Material SI (tr), NR (sw)
9.5 mm

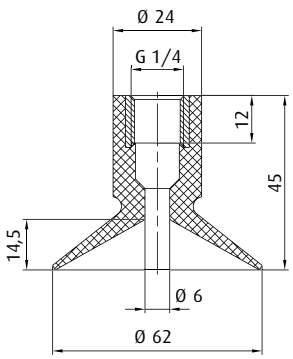
This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 81 mm, 100 mm

	Connection	see page
270.049-1	G1/4-male	426



Item no. 122.060.059._*
Material NBR (sw), SI (tr), NR (sw)
10 mm

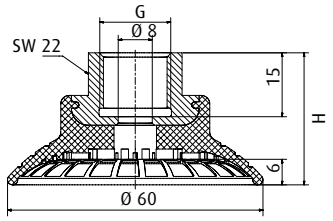
Additional sizes available are found on p. 56.



Item no. 120.060.045._*
Material SI (tr), NR (sw)
10 mm

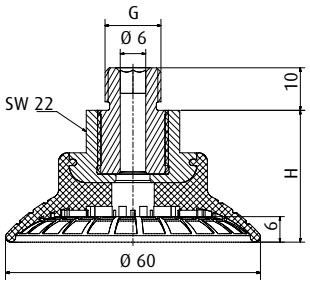
This vacuum cup is also available in the following dimensions: 42 mm, 53 mm, 83 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



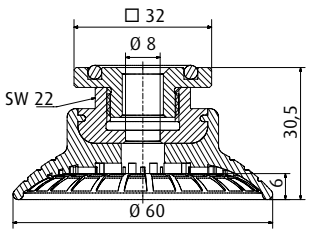
Item no.	Material	[mm]	Connection thread	H [mm]
103.060.049._*	NBR (bl)	6	G1/4-female	36
103.060.050._*	NBR (bl)	6	G3/8-female	31

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.060.048._*	NBR (bl)	6	G1/4-male	31
103.060.051._*	NBR (bl)	6	M10-male	31
103.060.052._*	NBR (bl)	6	M14x1.5-male	31

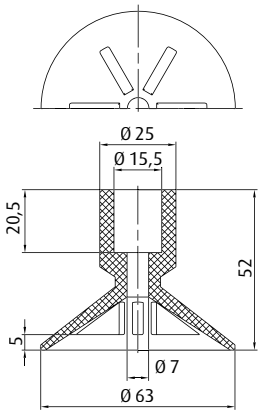
Additional sizes available are found on p. 64.



Item no.	Material	[mm]
103.060.053._*	NBR (bl)	6 mm

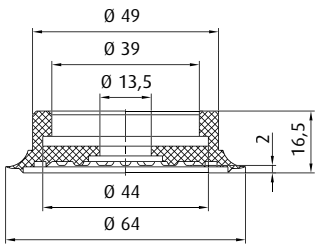
Additional sizes available are found on p. 64.

	Connection	see page
270.116	G1/4-female	432



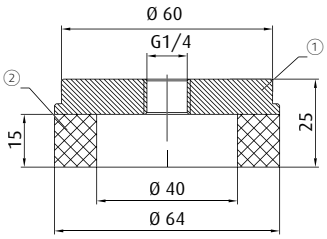
Item no.	Material	[mm]
104.063.041._*	NR (bg), CR (r)	6.5 mm

	Connection	see page
270.262	G1/8-female	438
270.284	G1/4-female	438



Item no.	Material	[mm]
154.065.002._*	Sl (tr), NR (sw), NR (br), Vinyl (bl)	1.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

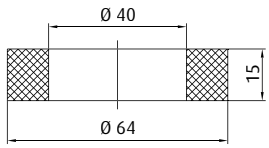


① = Aluminium ② = Sponge rubber NR

Item no.	Material	
206.064.006._*	Sponge rubber (or)	10 mm

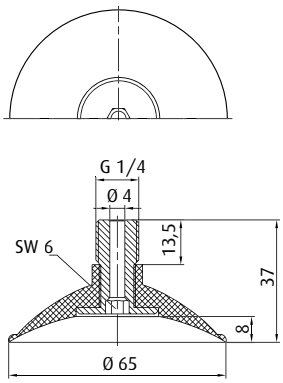
This vacuum cup is also available in the following dimensions: 91 mm

Spare cup



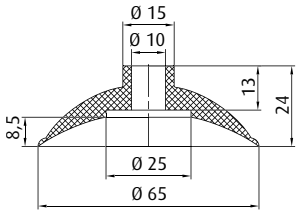
Item no.	Material	
208.064.001._*	Sponge rubber (or)	10 mm

This vacuum cup is also available in the following dimensions: 91 mm

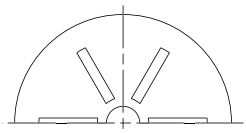


Item no.	Material	
110.065.091._*	NBR (sw), SI (tr), NR (sw), NR (bg), Vinyl (bl)	7 mm

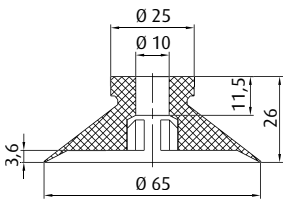
	Connection	see page
270.176	G1/4-male	430



Item no.	Material	
112.065.093._*	NBR (sw), SI (tr), NR (sw), NR (bg), Vinyl (bl)	7 mm

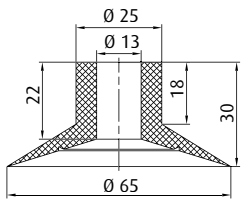


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no.	Material	
125.065.026._*	SI (tr), NR (sw), NR (bg)	5 mm

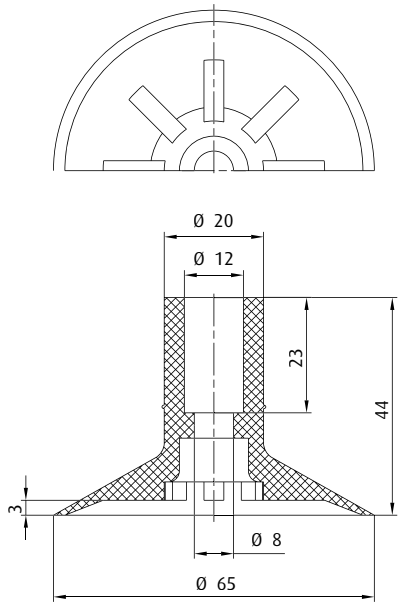
	Connection	see page
270.207	G1/4-male	426



Item no.	Material	
126.065.019._*	SI (tr), NR (sw)	5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.049-1	G1/4-male	426



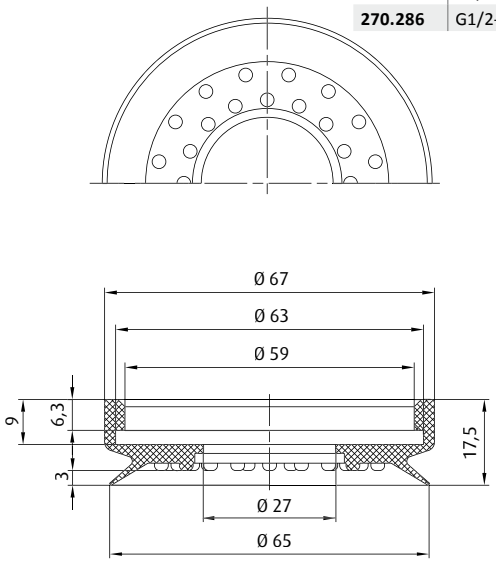
Item no. 127.065.006._*

Material SI (tr), NR (sw)

3 mm

This vacuum cup is also available in the following dimensions: 46 mm

	Connection	see page
270.158	G1/8-female	438
270.264	G1/4-female	438
270.161	G3/8-female	438
270.286	G1/2-female	438



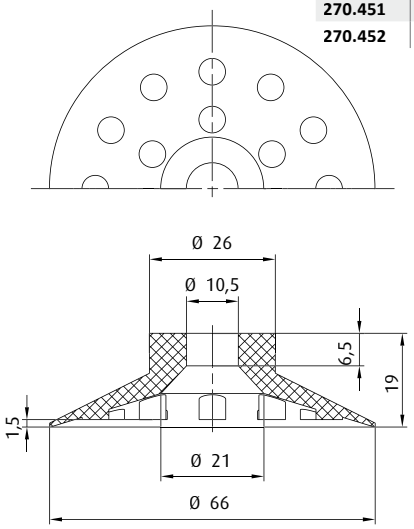
Item no. 154.065.003._*

Material NBR (sw), SI (w), NR (sw)

3 mm

Additional sizes available are found on p. 70.

	Connection	see page
270.256	M8-male	415
270.012	G1/8-male	421
270.020	G1/8-female	423
270.451	G1/4-male	426
270.452	G1/4-female	431

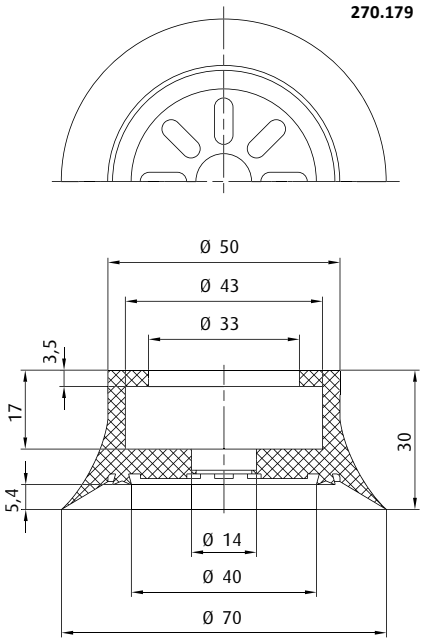


Item no. 125.066.027._*

Material NBR (sw), SI (tr), NR (sw)

0.5 mm

	Connection	see page
270.179	G1/4-female	438



BESTSELLER

Item no. 102.070.234._*

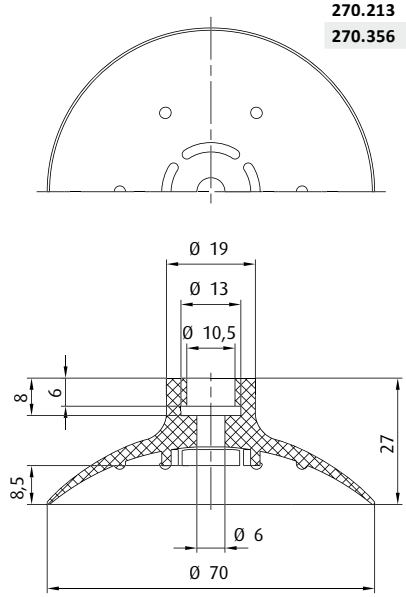
Material NBR (gr), SBR (br), SI (tr), NR (bg), NR (br)

6 mm

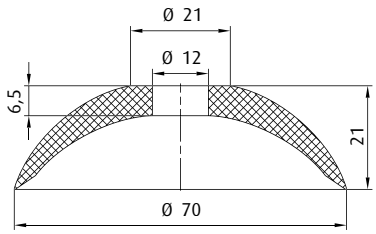
Additional sizes available are found on p. 66.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

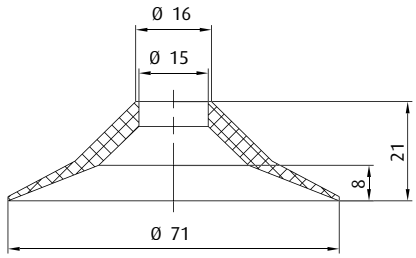
	Connection	see page
270.213	G1/4-male	428
270.356	G1/4-female	433



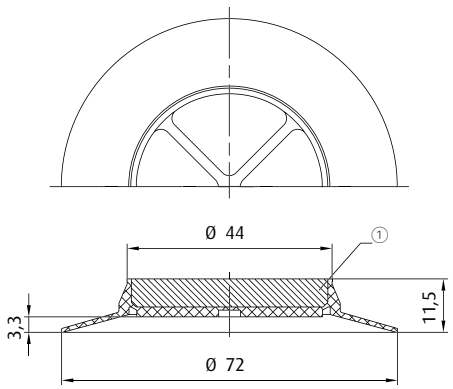
Item no.	Material	
102.070.325._*	Vulkollan® (br)	8.5 mm



Item no.	Material	
112.070.096._*	NR (bg)	12 mm



Item no.	Material	
107.070.029._*	NR (br)	6 mm



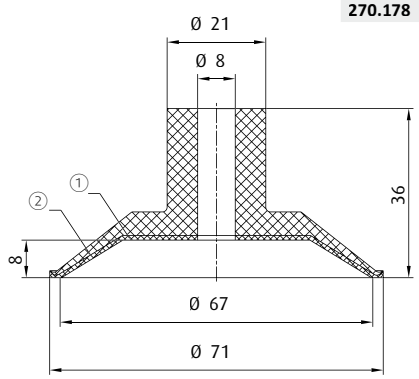
① = Steel

Item no.	Material	
152.070.093._*	NBR (gr)	4 mm

Ordering notes: Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431



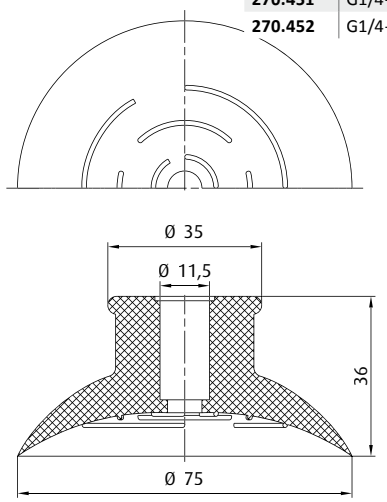
NON-MARKING!
TEMP. MAX. 500 °C

① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

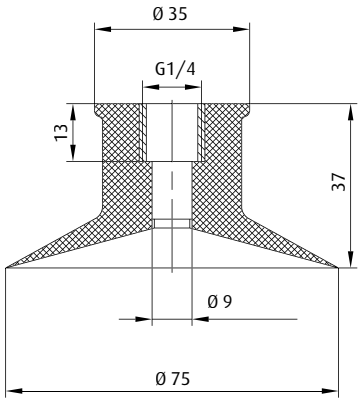
Item no.	Material	
26.070.011._*	Sl (tr/ge)	7 mm

Additional sizes available are found on p. 164.

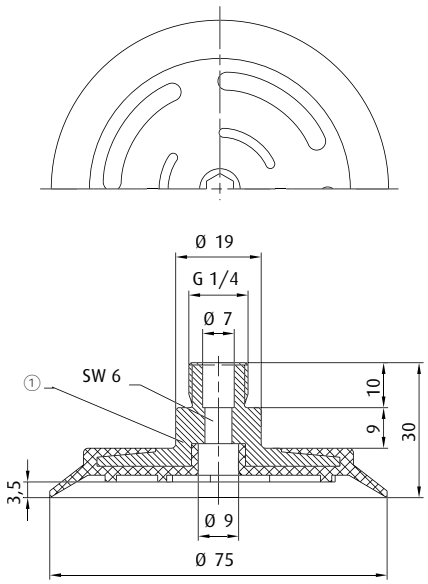
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



Item no.	Material	
114.075.012._*	NR (br)	3.5 mm



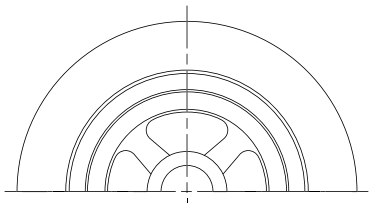
Item no.	Material	
120.075.075._*	NR (bg)	3 mm

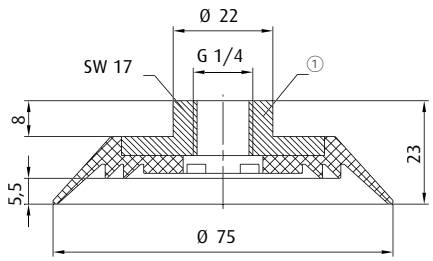


① = Aluminium

Item no.	Material	
103.075.025._*	Vulkollan® (br)	3.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



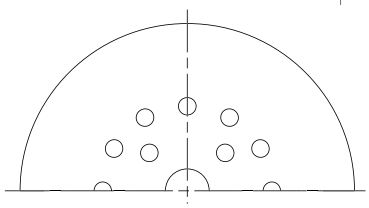


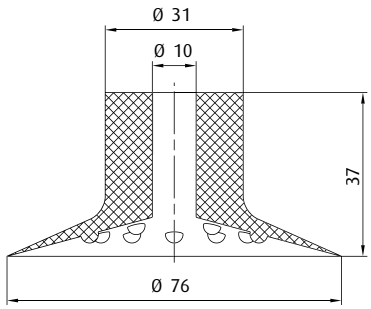
① = Aluminium

Item no.	Material	
150.075.033._*	SI (r), FKM (sw), CR (sw)	6 mm

Additional sizes available are found on p. 68.

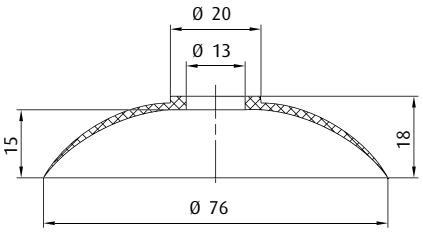
	Connection	see page
270.044	G1/4-male	426





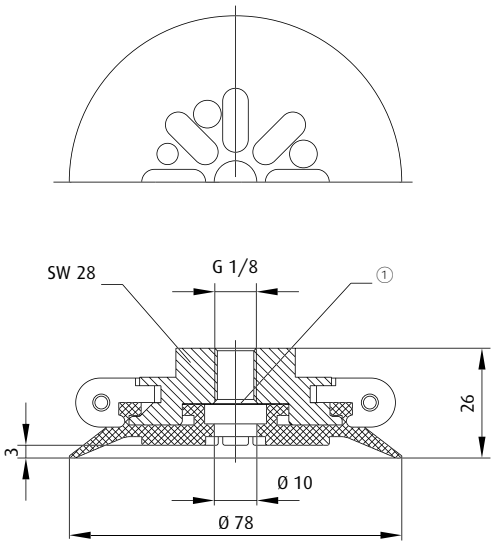
Item no.	Material	
102.075.275._*	NR (br)	3 mm

	Connection	see page
270.183	G1/4-male	431



Item no.	Material	
102.076.263._*	Vinyl (bl)	9 mm

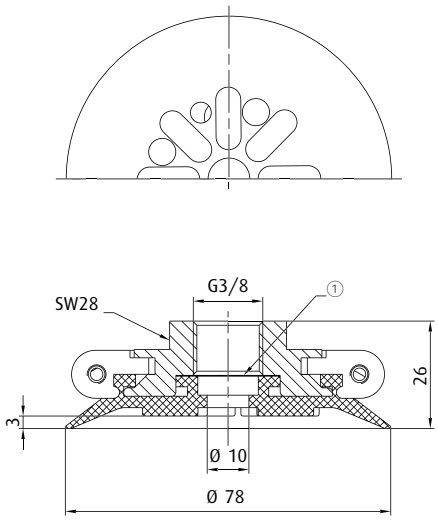
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material	
152.078.133._*	Tepuflex® (or), SI (tr), CR (sw)	3 mm

Additional sizes available are found on p. 47.

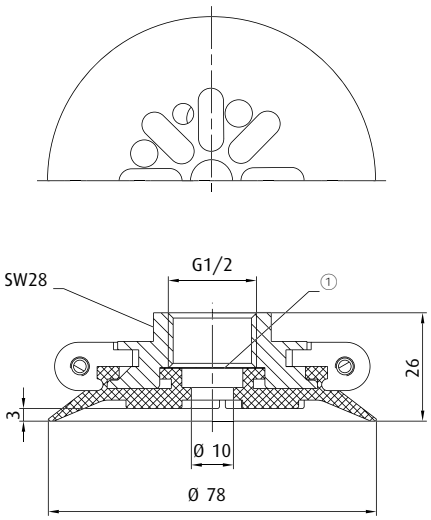


① = Filter screen

Item no.	Material	
152.078.136._*	Tepuflex® (or), SI (tr), CR (sw)	3 mm

Additional sizes available are found on p. 47.

Spare cup



① = Filter screen

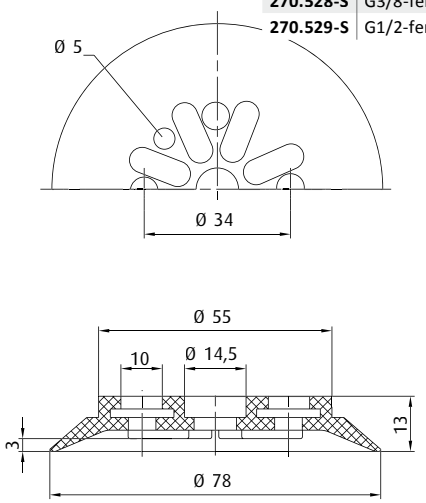
Item no.	Material	
152.078.139._*	Tepuflex® (or), SI (tr), CR (sw)	3 mm

Additional sizes available are found on p. 47.

Spare cup

Spare cup

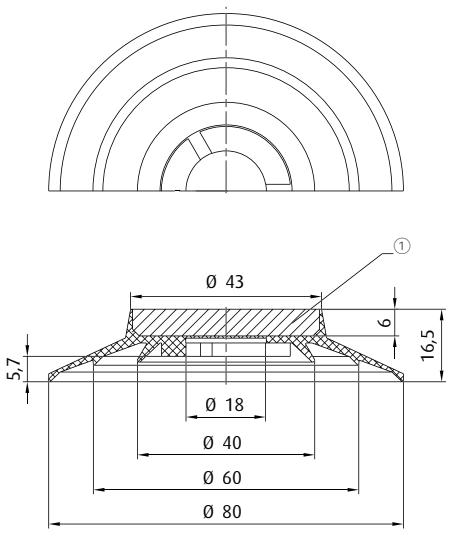
	Connection	see page
270.527-S	G1/8-female	424
270.528-S	G3/8-female	436
270.529-S	G1/2-female	436



Item no.	Material	
154.078.027._*	Tepuflex® (or), SI (tr), CR (sw)	3 mm

Additional sizes available are found on p. 42.

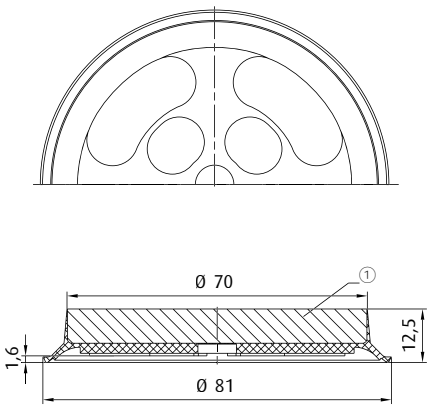
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

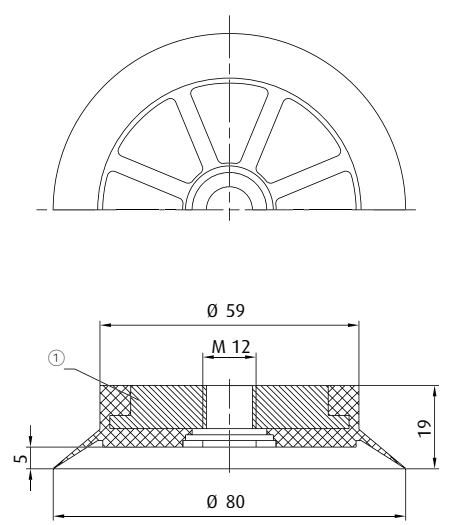
Item no.	Material	
104.080.078._*	SBR (br)	4.5 mm

Notes: Use: Picking up products of varying sizes



① = Steel

Item no.	Material	
152.080.069._*	SBR (sw)	1 mm

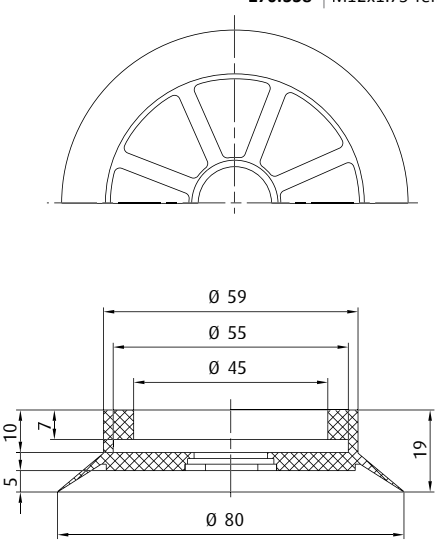


① = Aluminium

Item no.	Material	
152.080.083._*	NBR (sw), SI (tr), NR (sw)	6 mm

Spare cup

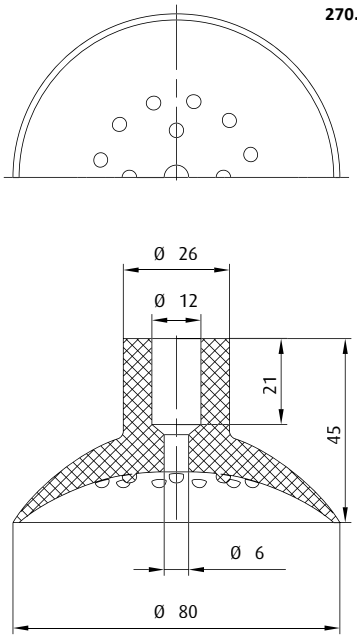
	Connection	see page
270.338	M12x1.75-female	438



Item no.	Material	
154.080.055._*	NBR (sw), SI (tr), NR (sw)	6 mm

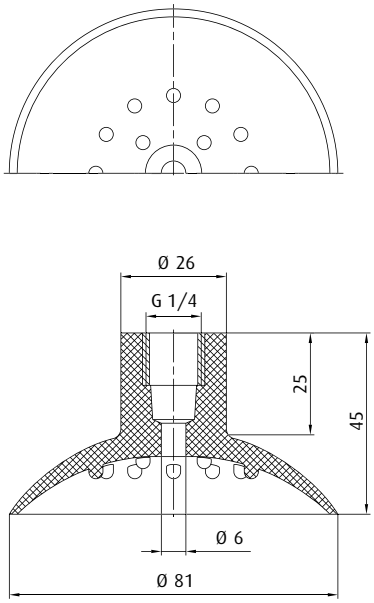
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.049-1	G1/4-male	426



Item no.	Material	
114.080.020._*	NR (sw)	9 mm

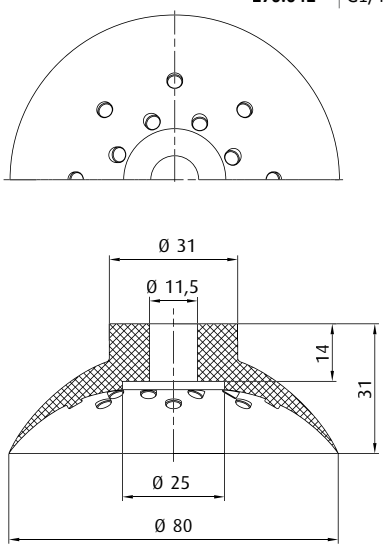
This vacuum cup is also available in the following dimensions: 100 mm



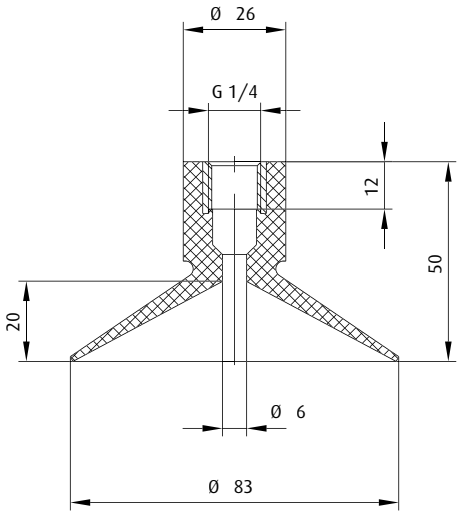
Item no.	Material	
110.080.095._*	SI (tr), NR (sw)	10 mm

This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 62 mm, 100 mm

	Connection	see page
270.042	G1/4-male	431



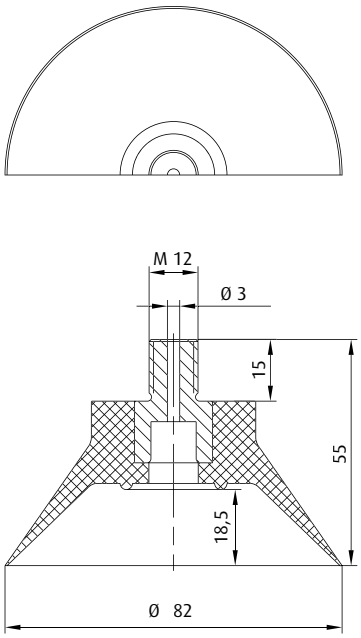
Item no.	Material	
114.080.021._*	NR (br)	9 mm



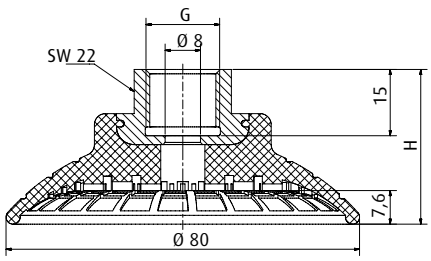
Item no.	Material	
120.080.052._*	SI (tr), NR (sw)	12 mm

This vacuum cup is also available in the following dimensions: 42 mm, 53 mm, 62 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

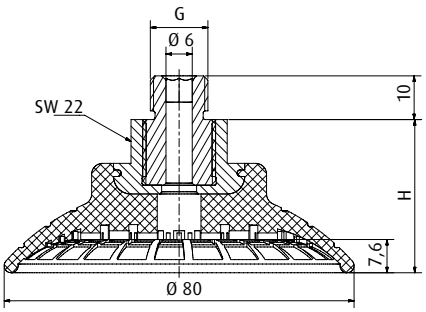


Item no.	Material	
120.082.063._*	NR (sw)	18.5 mm



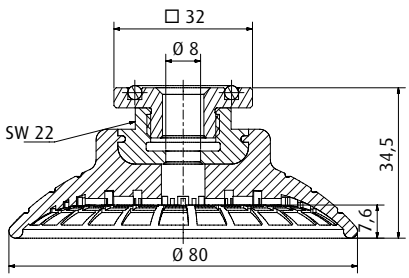
Item no.	Material	[mm]	Connection thread	H [mm]
103.080.055._*	NBR (bl)	7.6	G1/4-female	40
103.080.056._*	NBR (bl)	7.6	G3/8-female	35

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.080.054._*	NBR (bl)	7.6	G1/4-male	35
103.080.057._*	NBR (bl)	7.6	M10-male	35
103.080.058._*	NBR (bl)	7.6	M14x1.5-male	35

Additional sizes available are found on p. 64.

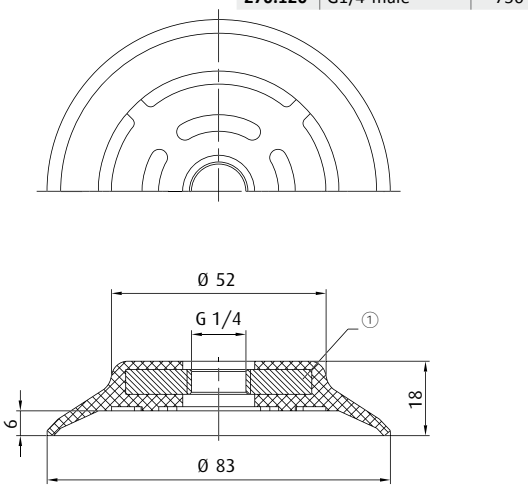


Item no.	Material	
103.080.059._*	NBR (bl)	7.6 mm

Additional sizes available are found on p. 64.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

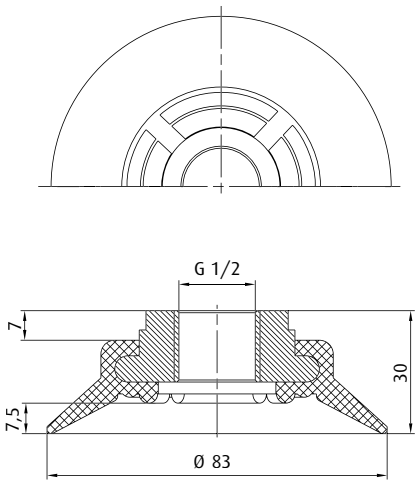
	Connection	see page
270.090	M10x1.25-female	752
270.120	G1/4-male	750



① = Aluminium

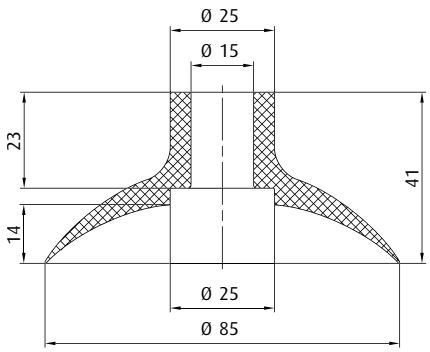
Item no.	Material	
102.080.304._*	NBR (sw), SI (tr), PU (bl)	6 mm

Additional sizes available are found on p. 32.



Item no.	Material	
100.083.060._*	Vinyl (bl)	7.5 mm

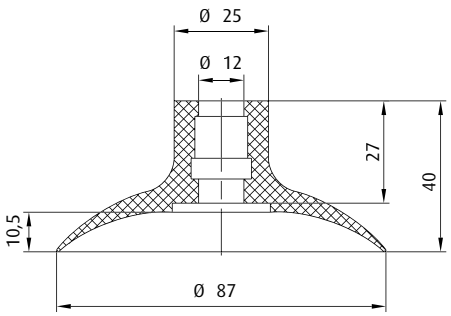
	Connection	see page
270.216	G1/4-male	431



Item no.	Material	
112.085.102._*	NBR (sw), SI (tr), NR (sw)	12 mm

Additional sizes available are found on p. 52.

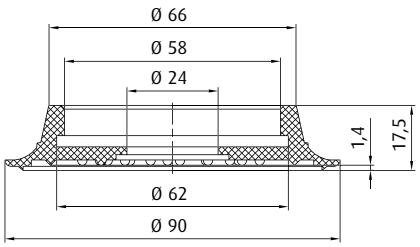
	Connection	see page
270.338	M12x1.75-female	438
270.207	G1/4-male	426



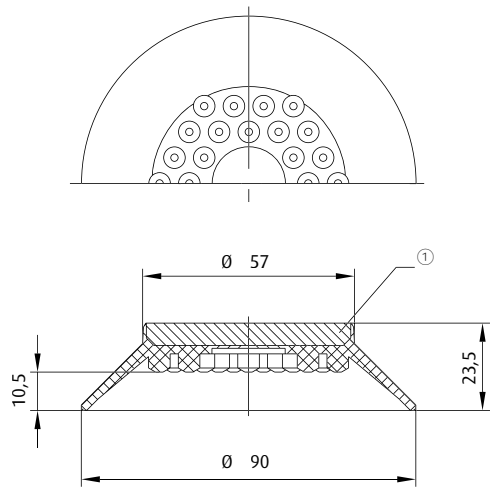
Item no.	Material	
112.087.089._*	NR (sw)	9 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.158	G1/8-female	438
270.264	G1/4-female	438
270.161	G3/8-female	438
270.286	G1/2-female	438

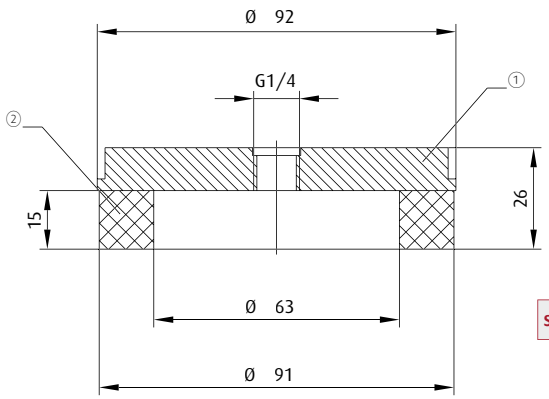


Item no.	Material	
154.090.010._*	Sl (tr), NR (sw)	1.5 mm



① = Steel

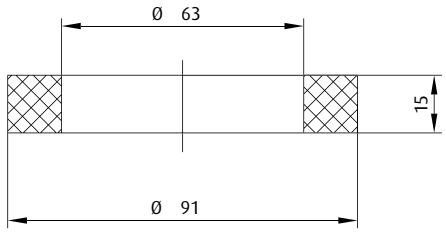
Item no.	Material	
152.090.089._*	SBR (br)	11 mm



① = Aluminium ② = Sponge rubber NR

Item no.	Material	
206.092.007._*	Sponge rubber (or)	10 mm

Spare cup

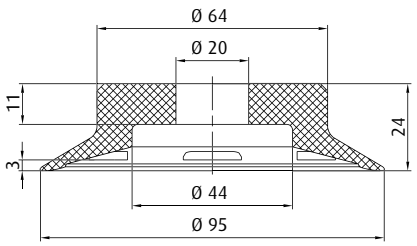


Item no.	Material	
208.092.002._*	Sponge rubber (or)	10 mm

This vacuum cup is also available in the following dimensions: 64 mm

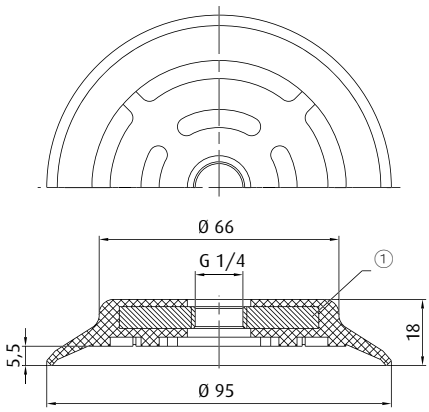
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.100	G1/4-male	431



Item no.	Material	
102.095.182._*	NR (bg)	2.5 mm

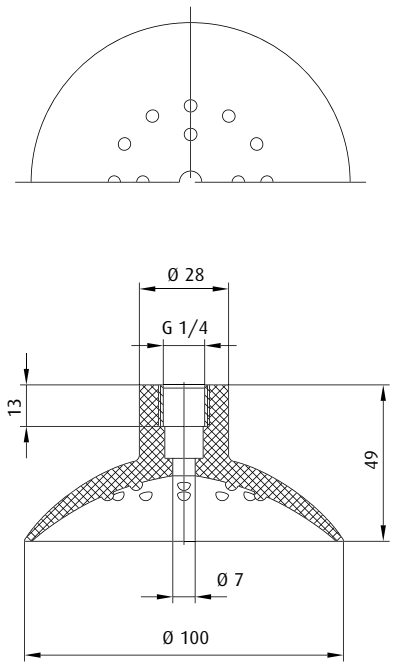
	Connection	see page
270.090	M10x1.25-female	752
270.120	G1/4-male	750



① = Aluminium

Item no.	Material	
102.095.305._*	NBR (sw), SI (tr), PU (bl)	6 mm

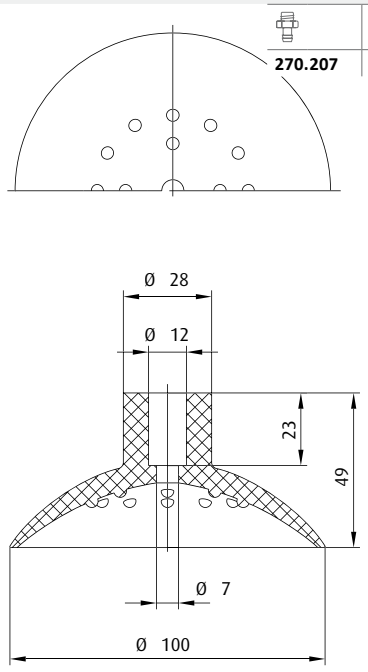
Additional sizes available are found on p. 32.



Item no.	Material	
110.100.103._*	NBR (sw)	13 mm

This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 62 mm, 81 mm

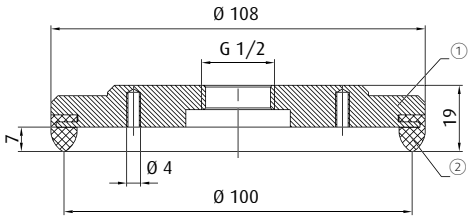
	Connection	see page
270.207	G1/4-male	426



Item no.	Material	
114.100.022._*	NR (sw)	13 mm

This vacuum cup is also available in the following dimensions: 80 mm

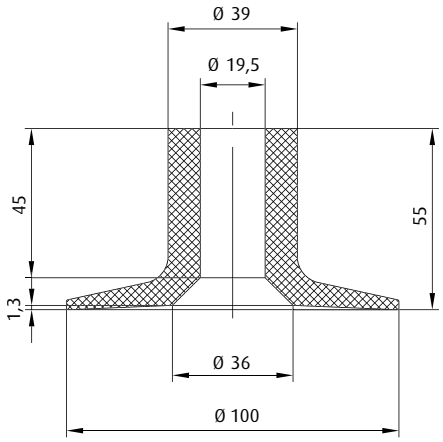
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium ② = EPDM foamed

Item no.	Material	
160.107.006._*	EPDM (sw)	1 mm

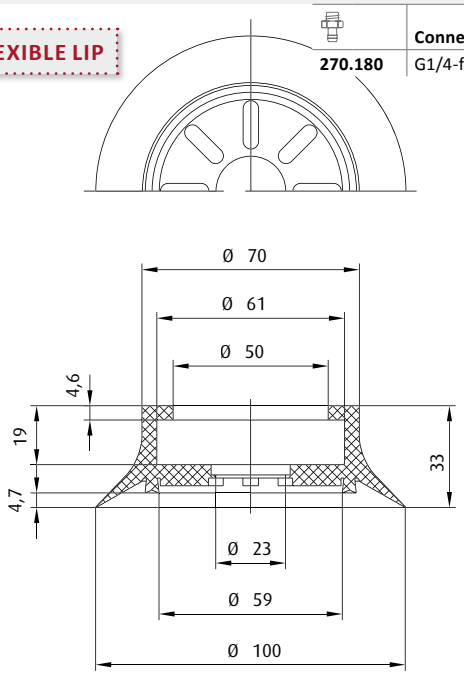
Additional sizes available are found on p. 72.
Notes: Foam sealing lip equalises product unevenness



Item no.	Material	
102.100.100._*	NR (bg)	0.5 mm

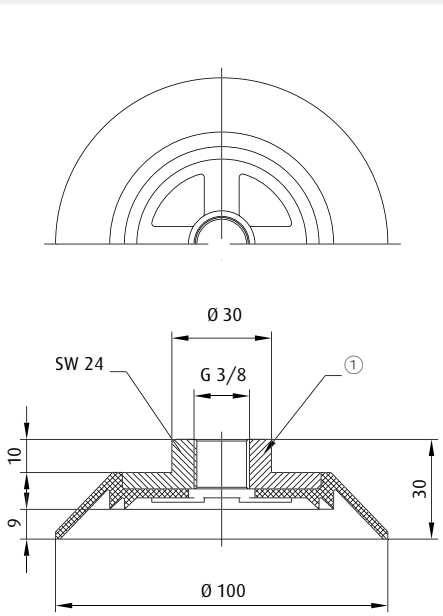
FLEXIBLE LIP

	Connection	see page
270.180	G1/4-female	438



Item no.	Material	
102.100.269._*	SBR (br), NBR (gr), NR (br)	5 mm

Additional sizes available are found on p. 66.

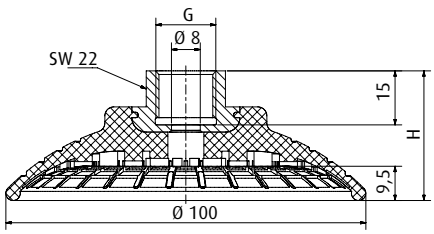


① = Aluminium

Item no.	Material	
150.100.034._*	NBR (sw), SI (tr), NR (w)	9 mm

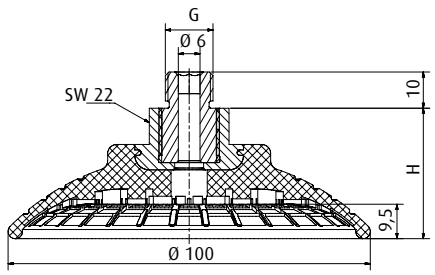
Additional sizes available are found on p. 68.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



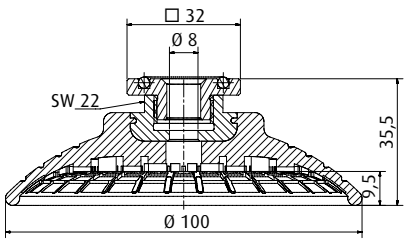
Item no.	Material	[mm]	Connection thread	H [mm]
103.100.061._*	NBR (bl)	9.5	G1/4-female	41
103.100.062._*	NBR (bl)	9.5	G3/8-female	36

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.100.060._*	NBR (bl)	9.5	G1/4-male	36
103.100.063._*	NBR (bl)	9.5	M10-male	36
103.100.064._*	NBR (bl)	9.5	M14x1.5-male	36

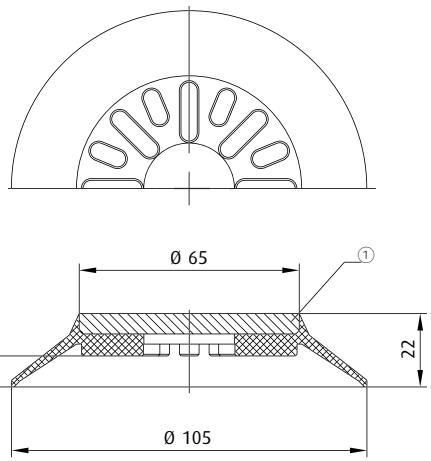
Additional sizes available are found on p. 64.



Item no.	Material	
103.100.065._*	NBR (bl)	9.5 mm

Additional sizes available are found on p. 64.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

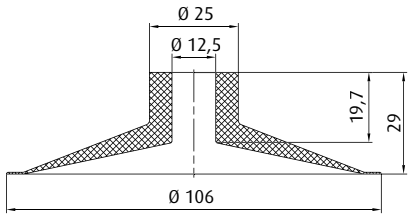


① = Steel

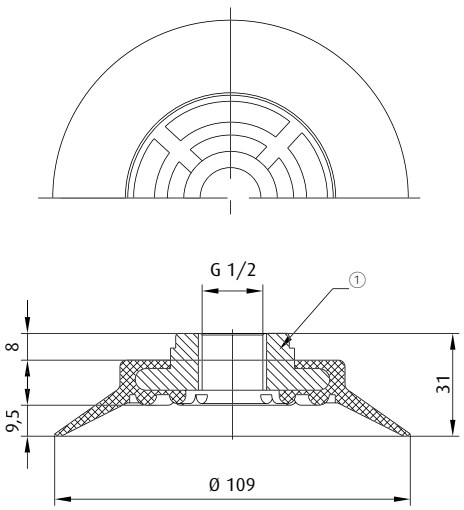
Item no.	Material	
152.105.094._*	NBR (gr)	9 mm

Ordering notes: Customised drilling patterns on request

	Connection	see page
270.141	G1/4-male	430



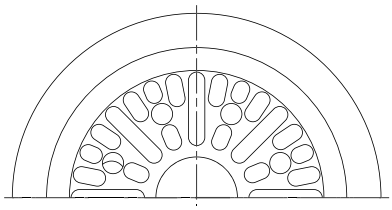
Item no.	Material	
107.105.035._*	NR (br)	8.5 mm

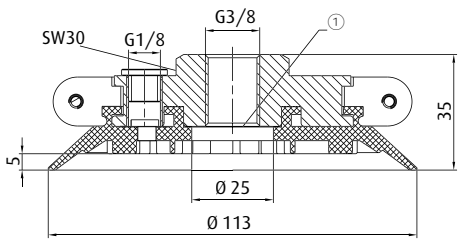


① = Aluminium

Item no.	Material	
100.109.059._*	Vinyl (bl)	9.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760





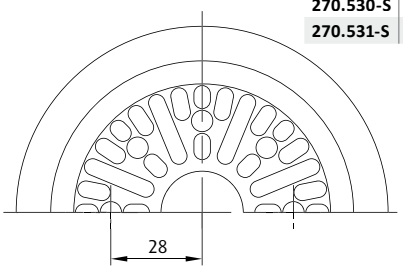
① = Filter screen

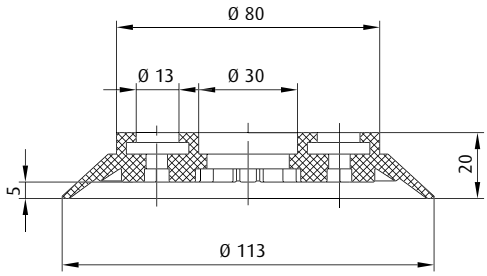
Item no.	Material	
152.113.134._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 47.

Spare cup

	Connection	see page
270.530-S	G3/8-female	437
270.531-S	G1/2-female	437

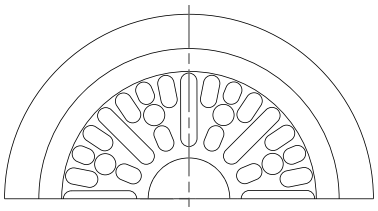


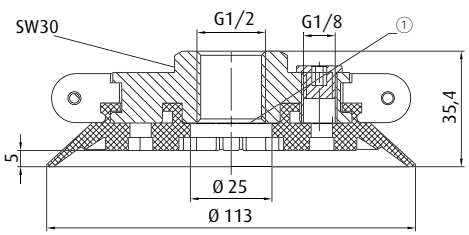


Item no.	Material	
154.113.028._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 42.

Spare cup



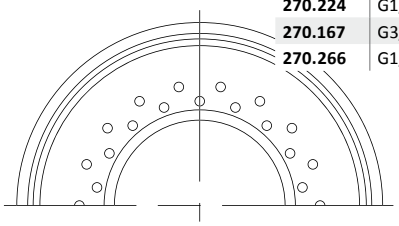


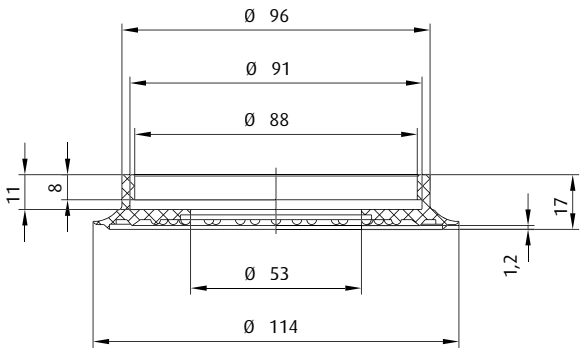
① = Filter screen

Item no.	Material	
152.113.137._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 47.

	Connection	see page
270.224	G1/4-female	438
270.167	G3/8-female	438
270.266	G1/2-female	438





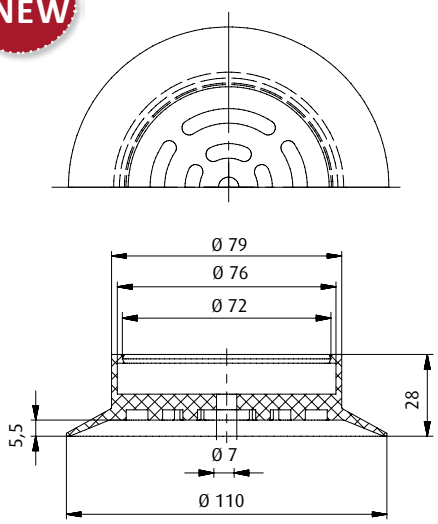
Item no.	Material	
154.110.014._*	NBR (sw), SI (w)	1.5 mm

Additional sizes available are found on p. 70.

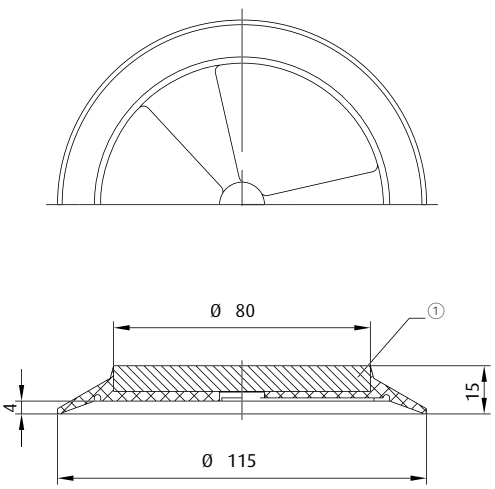
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.554	G1/4-female	434

NEW



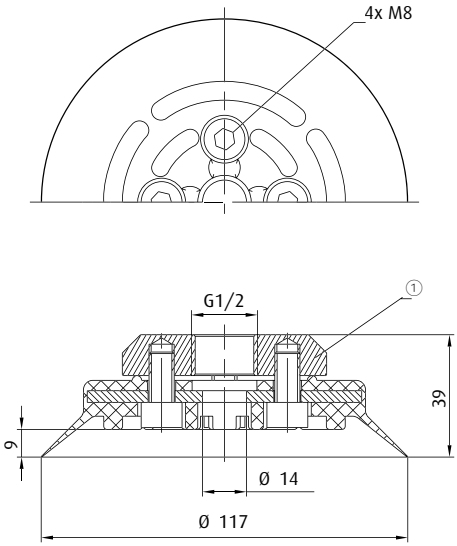
Item no.	Material	
102.110.483._*	NBR (sw)	5.5 mm



① = Steel

Item no.	Material	
152.115.095._*	NBR (gr)	4 mm

Ordering notes: Customised drilling patterns on request

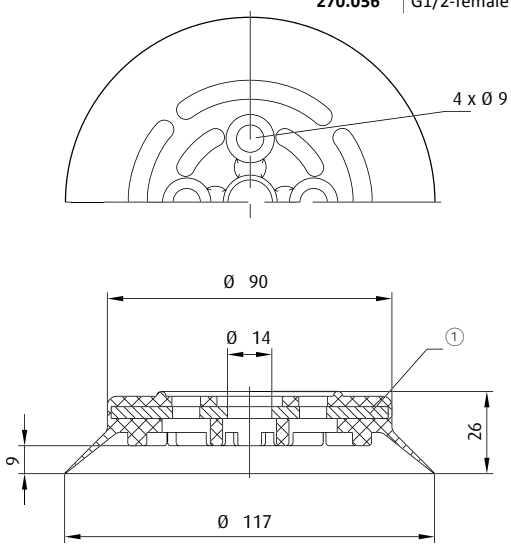


① = Aluminium

Item no.	Material	
152.120.017._*	NBR (sw), SI (tr)	7 mm

Spare cup

	Connection	see page
270.056	G1/2-female	437



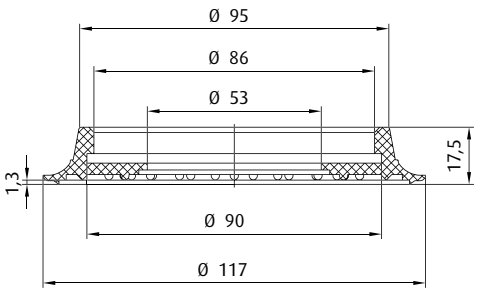
① = Steel

Item no.	Material	
154.120.018._*	NBR (sw), SI (tr)	7 mm

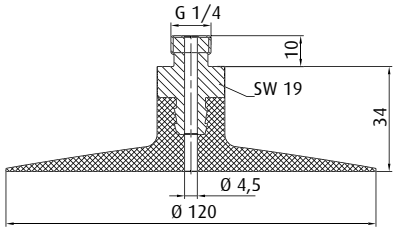
Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

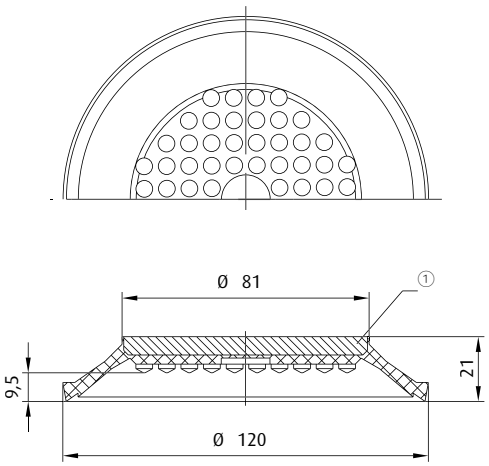
	Connection	see page
270.164	G1/8-female	438
270.224	G1/4-female	438
270.167	G3/8-female	438
270.266	G1/2-female	438



Item no. 154.120.017._*
Material Sl (tr), NR (sw), Vinyl (bl)
1.5 mm



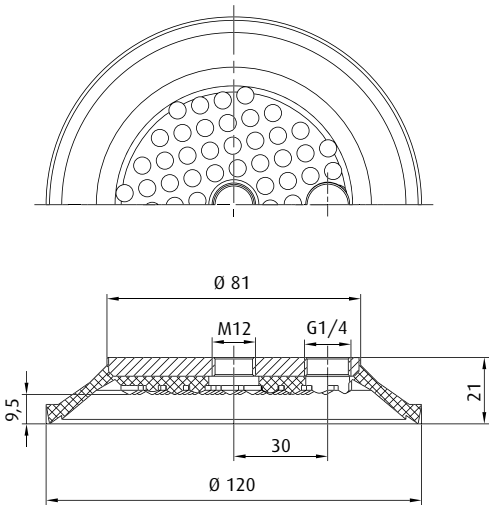
Item no. 100.120.036._*
Material NBR (sw)
0.5 mm



① = Steel

Item no. 152.120.064._*
Material NBR (gr), NR (br)
11 mm

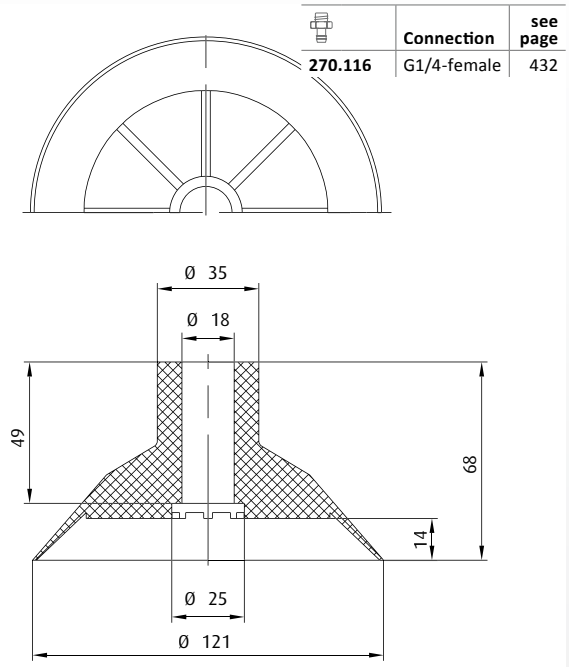
Ordering notes: Customised drilling patterns on request



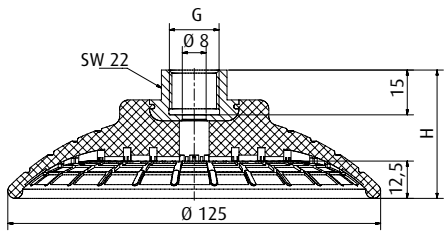
Item no. 152.120.115._*
Material NBR (gr)
9.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.116	G1/4-female	432

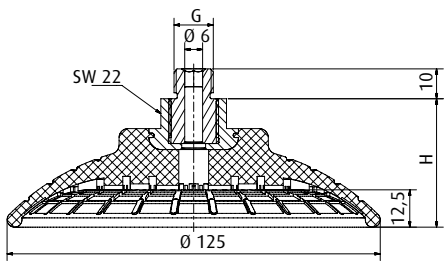


Item no.	Material	
108.120.006._*	NR (sw)	14 mm



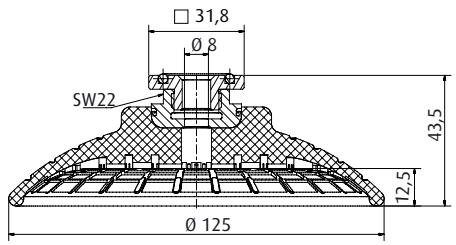
Item no.	Material	[mm]	Connection thread	H [mm]
103.125.067._*	NBR (bl)	12.5	G1/4-female	48
103.125.068._*	NBR (bl)	12.5	G3/8-female	43

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.125.066._*	NBR (bl)	12.5	G1/4-male	43
103.125.069._*	NBR (bl)	12.5	M10-male	43
103.125.070._*	NBR (bl)	12.5	M14x1.5-male	43

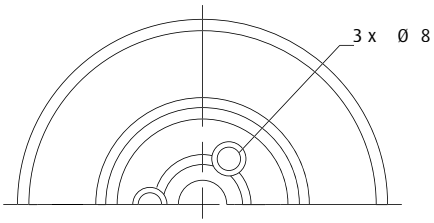
Additional sizes available are found on p. 64.

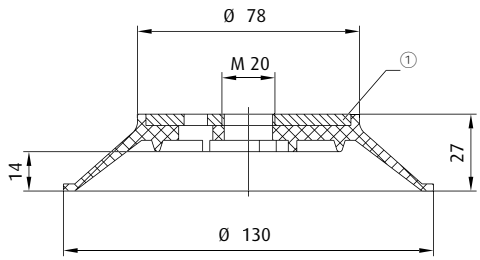


Item no.	Material	
103.125.071._*	NBR (bl)	12.5 mm

Additional sizes available are found on p. 64.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

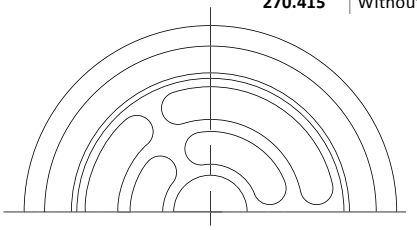


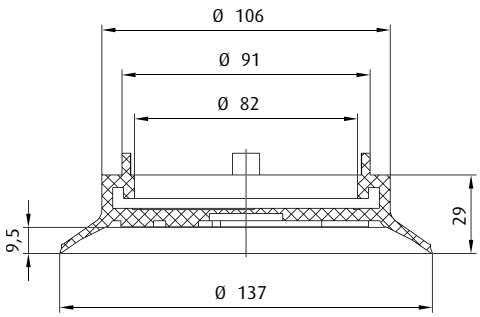


① = Steel

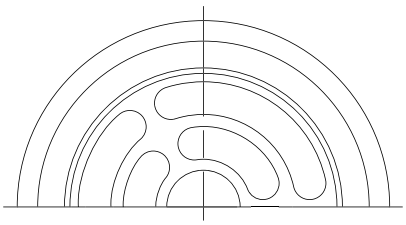
Item no.	Material	
100.130.058._*	NR (sw)	14 mm

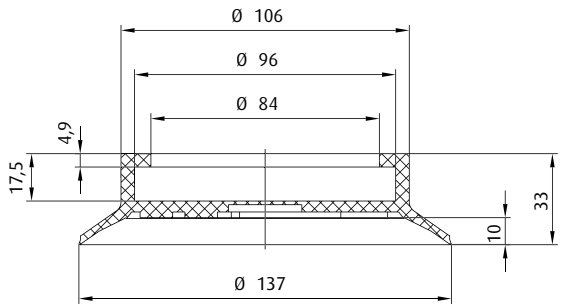
	Connection	see page
270.415	Without	440



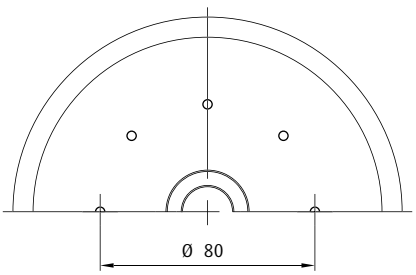


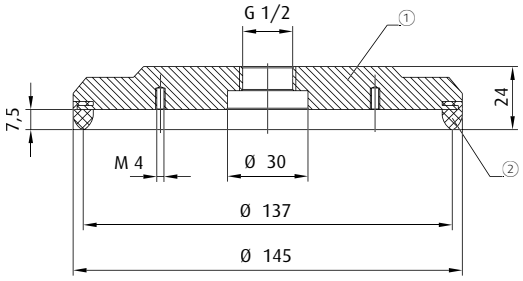
Item no.	Material	
102.130.258._*	SBR (sw)	10 mm





Item no.	Material	
102.135.256._*	NBR (gr), SBR (sw)	11 mm



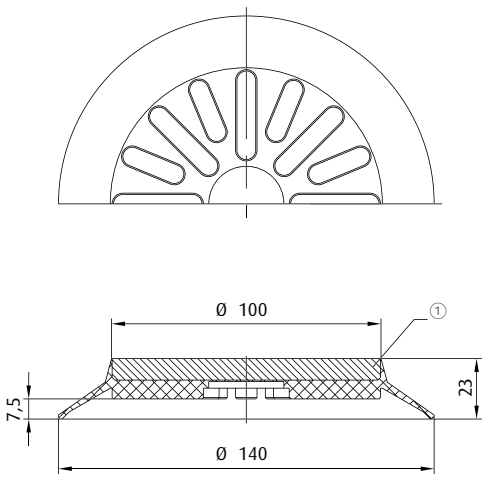


① = Aluminium ② = EPDM foamed

Item no.	Material	
160.145.014._*	EPDM (sw)	1 mm

Additional sizes available are found on p. 72.
Notes: Foam sealing lip equalises product unevenness

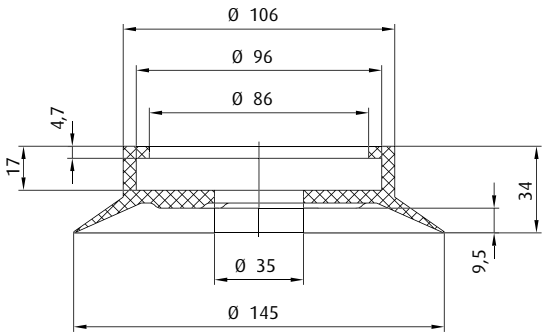
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



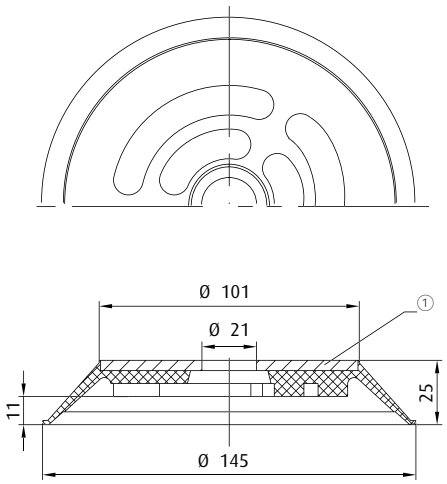
① = Steel

Item no.	Material	
152.140.096._*	NBR (gr)	8 mm

Ordering notes: Customised drilling patterns on request

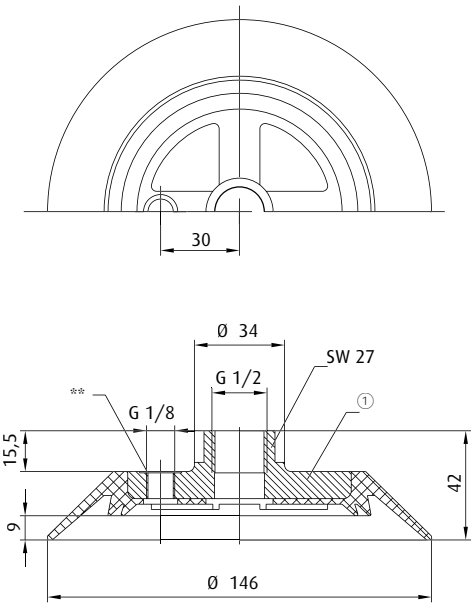


Item no.	Material	
102.145.257._*	NBR (gr), SBR (sw)	9 mm



① = Aluminium

Item no.	Material	
152.145.045._*	NBR (sw), SI (tr)	11 mm

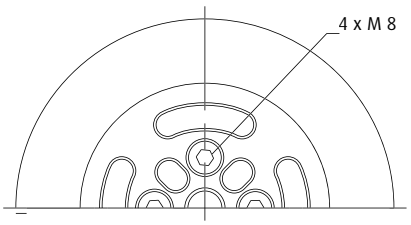


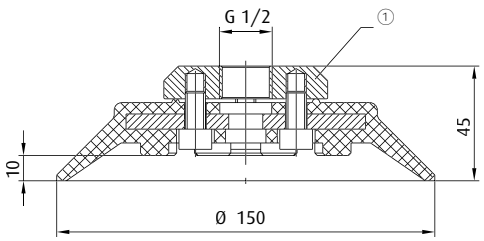
① = Aluminium ** = Vacuum connection at the side possible

Item no.	Material	
150.150.010._*	SI (gr), CR (gr)	9 mm

Additional sizes available are found on p. 68.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



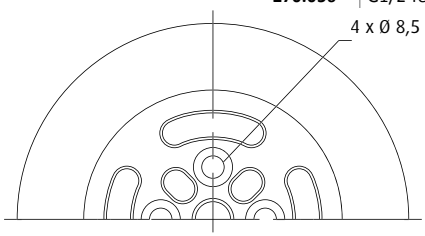


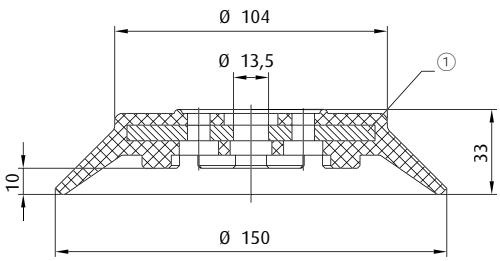
① = Aluminium

Item no.	Material	
152.150.019._*	NBR (sw), SI (tr)	9 mm

Spare cup

	Connection	see page
270.056	G1/2-female	437



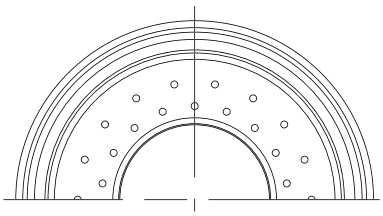


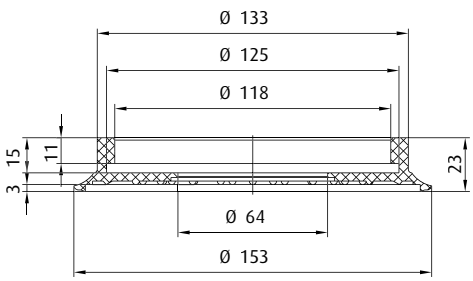
① = Steel

Item no.	Material	
154.150.020._*	NBR (sw), SI (tr)	9 mm

Additional sizes available are found on p. 32.

	Connection	see page
270.171	G1/4-female	438
270.173	G3/8-female	438
270.268	G1/2-female	438

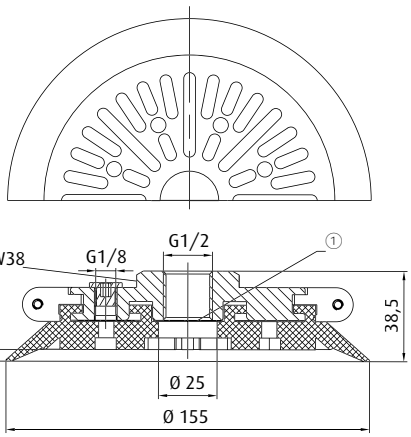




Item no.	Material	
154.150.021._*	NBR (sw), SI (w)	2 mm

Additional sizes available are found on p. 70.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



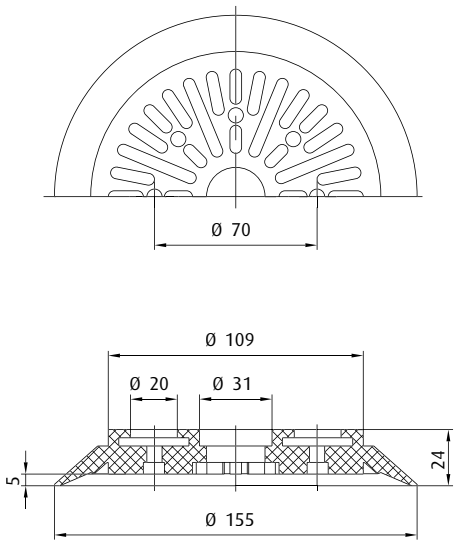
① = Filter screen

Item no.	Material	
152.155.135._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 47.

Spare cup

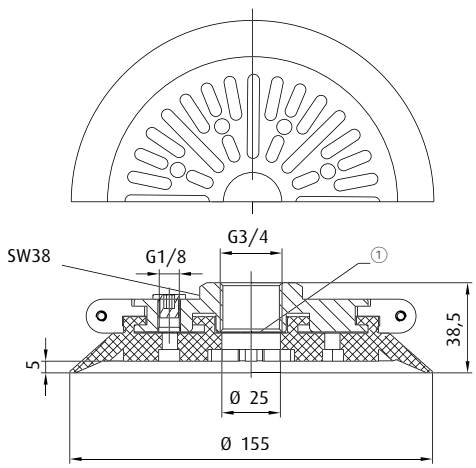
	Connection	see page
270.532-S	G1/2-female	437
270.533-S	G3/4-female	437



Item no.	Material	
154.155.026._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 42.

Spare cup

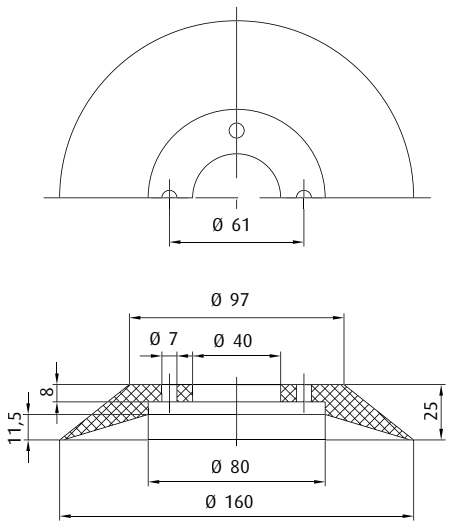


① = Filter screen

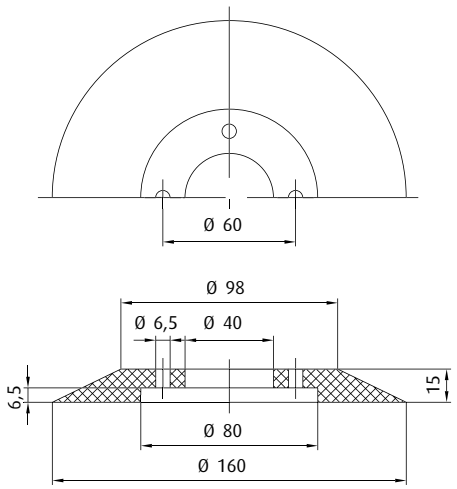
Item no.	Material	
152.155.138._*	Tepuflex® (or), SI (tr), CR (sw)	5 mm

Additional sizes available are found on p. 47.

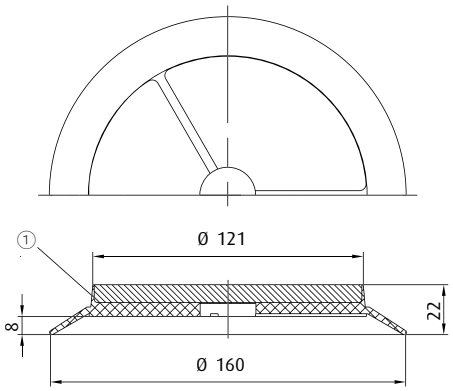
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
102.160.031._*	SI (r), NR (gr)	10 mm



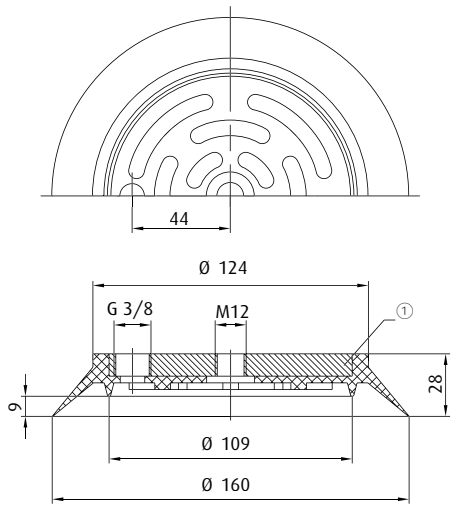
Item no.	Material	
102.160.195._*	SI (gr)	0 mm



① = Steel

Item no.	Material	
152.160.097._*	NBR (gr)	8 mm

Ordering notes: Customised drilling patterns on request



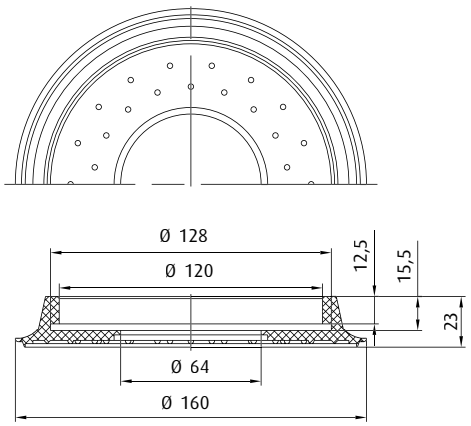
① = Steel

Item no.	Material	
152.160.127._*	CR (sw)	9 mm

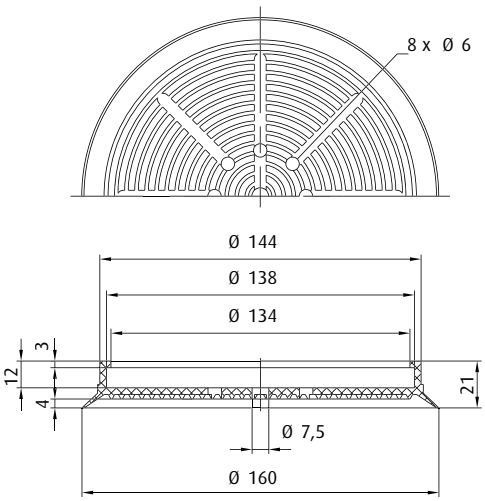
Additional sizes available are found on p. 73.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

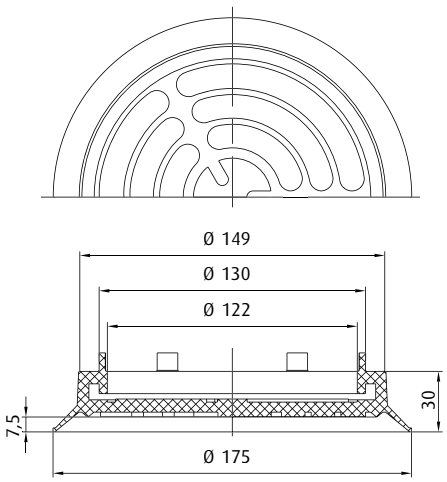
	Connection	see page
270.171	G1/4-female	438
270.173	G3/8-female	438
270.268	G1/2-female	438



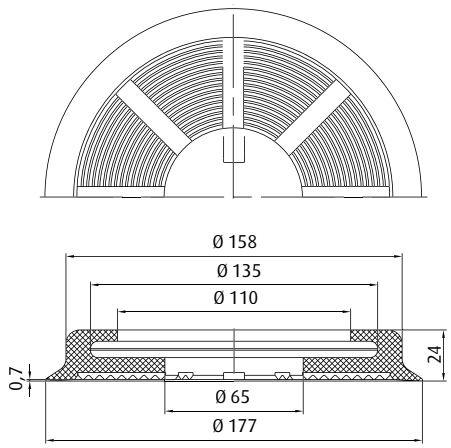
Item no.	Material	
154.160.024._*	SI (tr), NR (sw)	3 mm



Item no.	Material	
154.160.049._*	NBR (gr), SI (tr)	4.7 mm

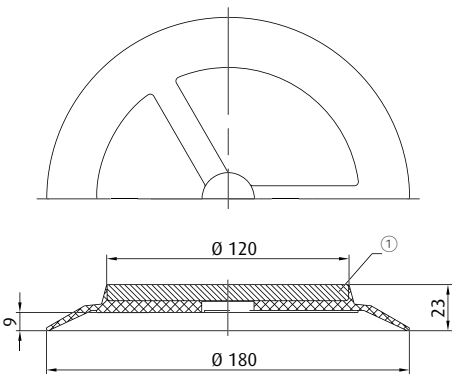


Item no.	Material	
102.170.259._*	SBR (sw), NR (bg)	7 mm



Item no.	Material	
154.177.053._*	SI (tr)	0.5 mm

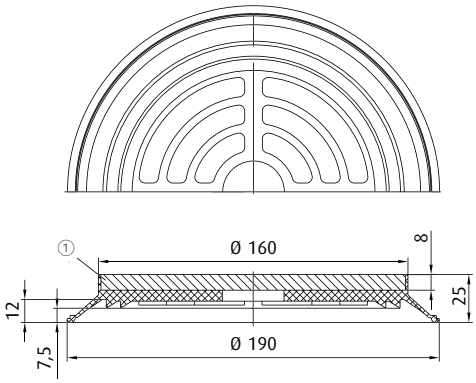
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

Item no.	Material	
152.180.067._*	NBR (gr)	9 mm

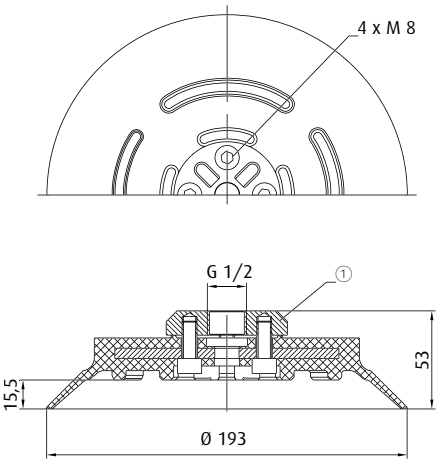
Ordering notes: Customised drilling patterns on request



① = Steel

Item no.	Material	
152.190.080._*	SBR (br), NBR (gr)	10 mm

Ordering notes: Customised drilling patterns on request

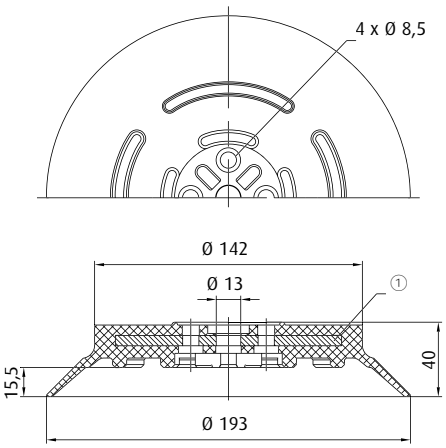


① = Aluminium

Item no.	Material	
152.191.025._*	NBR (sw), SI (tr), PU (bl)	13 mm

Spare cup

	Connection	see page
270.056	G1/2-female	437

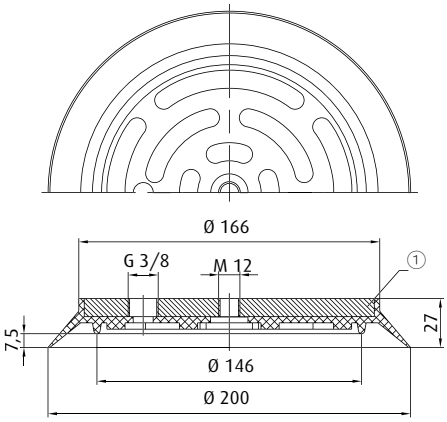


① = Steel

Item no.	Material	
154.191.025._*	NBR (sw), SI (tr), PU (bl)	13 mm

Additional sizes available are found on p. 32.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

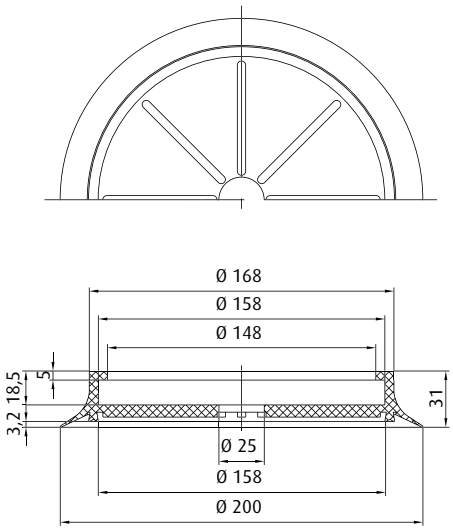


① = Steel

Item no.	Material	
152.200.128._*	CR (sw)	9 mm

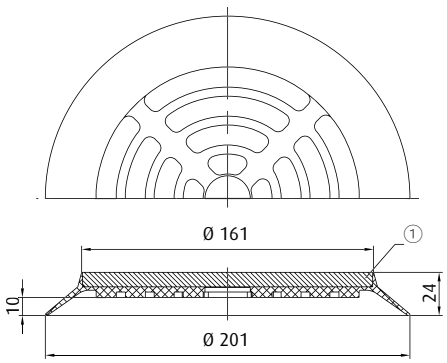
Additional sizes available are found on p. 73.

	Connection	see page
270.335	G1/2-female	438



Item no.	Material	
102.200.350._*	NR (w)	5 mm

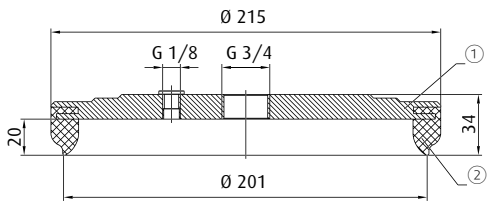
Additional sizes available are found on p. 66.



① = Steel

Item no.	Material	
150.190.015._*	NBR (gr)	11 mm

Ordering notes: Customised drilling patterns on request



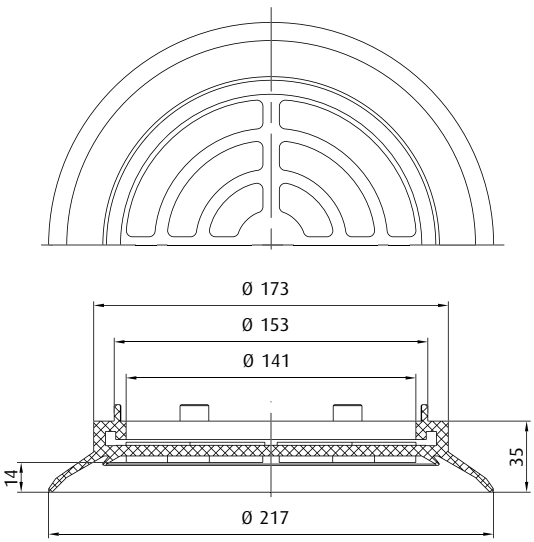
① = Aluminium ② = EPDM foamed

Item no.	Material	
160.215.009._*	EPDM (sw)	2.5 mm

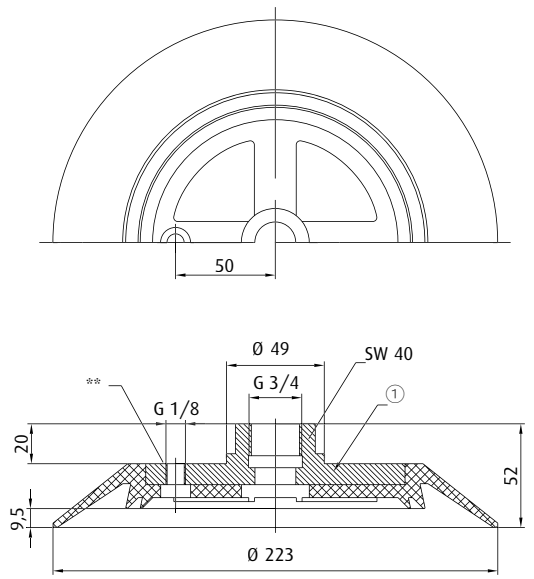
Additional sizes available are found on p. 72.
Notes: Foam sealing lip equalises product unevenness

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.155	Without	440



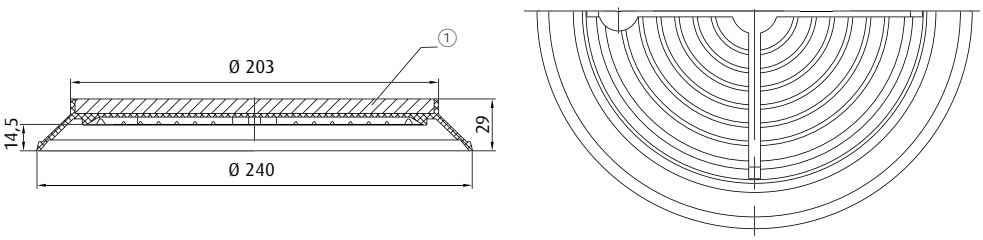
Item no.	Material		
102.210.260._*	SBR (sw)	14 mm	



① = Aluminium ** = Vacuum connection at the side possible

Item no.	Material		
150.225.018._*	SI (gr), CR (gr)	9.5 mm	Additional sizes available are found on p. 68.

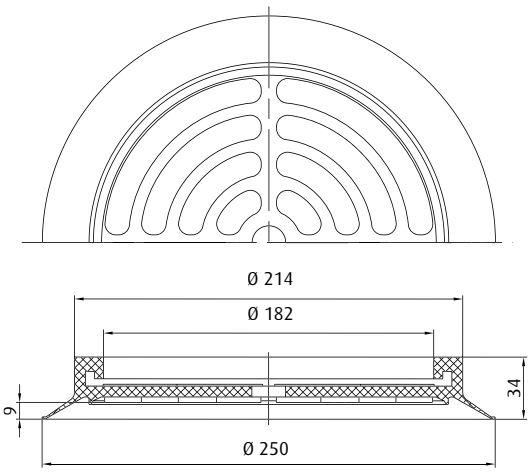
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

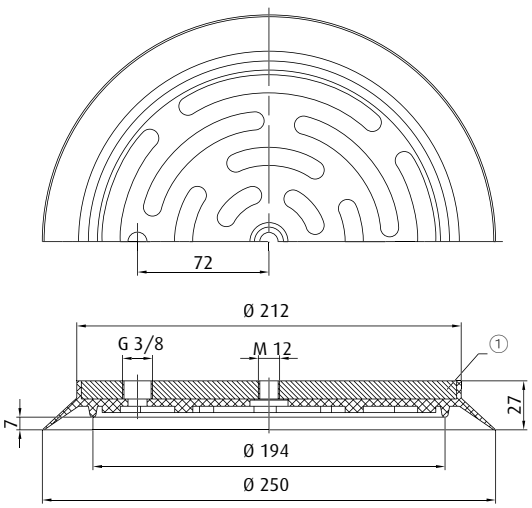
Item no.	Material		
152.240.046._*	NBR (gr), SBR (sw)	14 mm	**Ordering notes:** Customised drilling patterns on request

	Connection	see page
270.236	G1/2-female	440



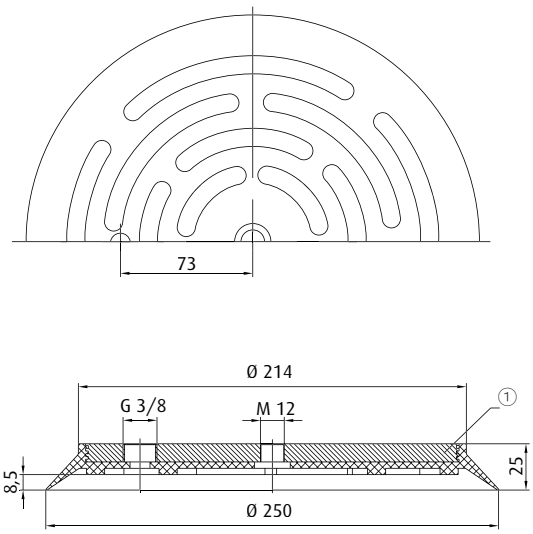
Item no.	Material		
102.250.261._*	SBR (sw)	8.5 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

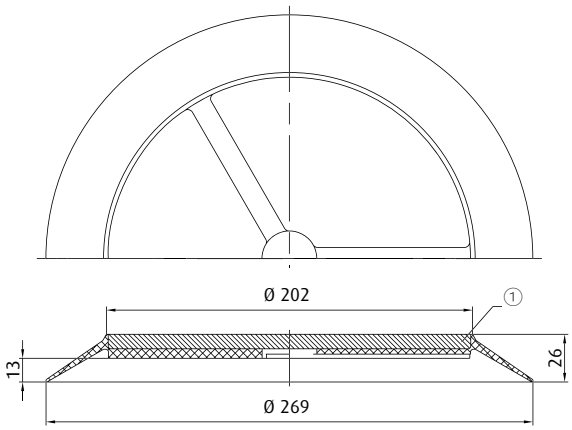
Item no.	Material		
152.250.129._*	CR (sw)	9 mm	Additional sizes available are found on p. 73.



① = Steel

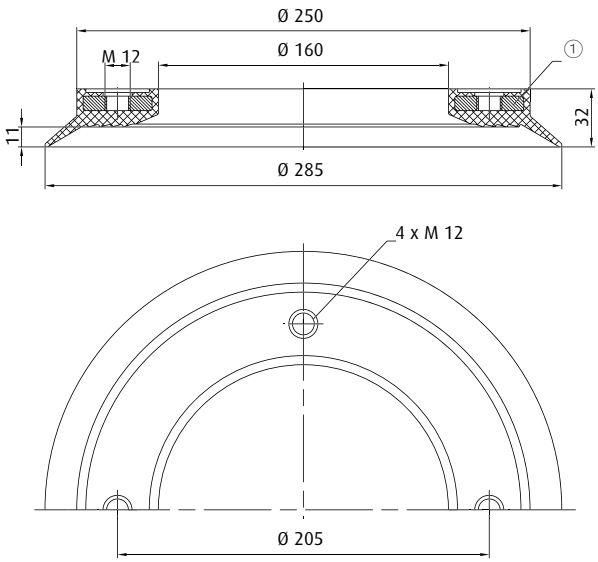
Item no.	Material		
152.250.031._*	NBR (sw)	11 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

Item no.	Material		
152.260.068._*	NBR (gr)	13 mm	**Ordering notes:** Customised drilling patterns on request

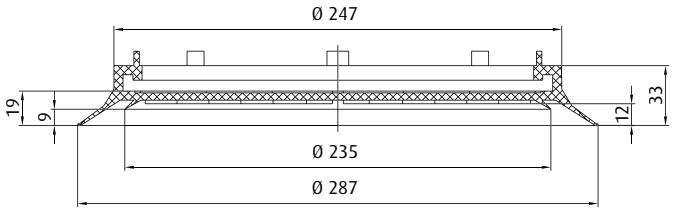


① = Ring made of vulcanised ST37

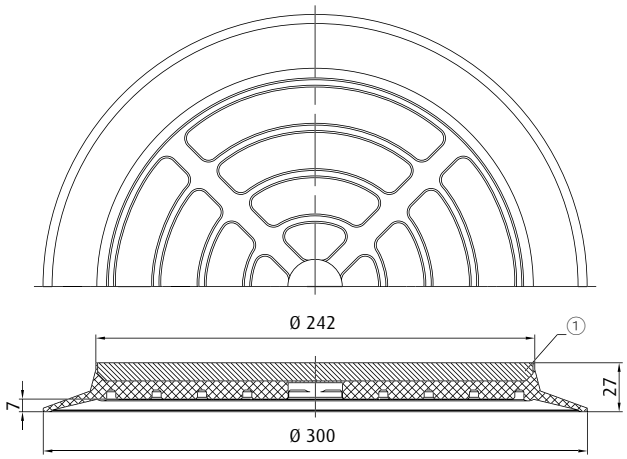
Item no.	Material		
152.285.099._*	NBR (sw)	11 mm	Additional sizes available are found on p. 74.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.535	Without	440



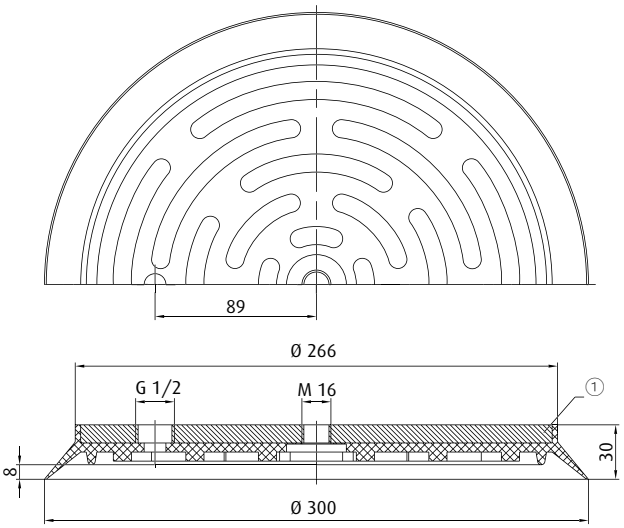
Item no.	Material		
102.290.262._*	SBR (sw)	15 mm	



① = Steel

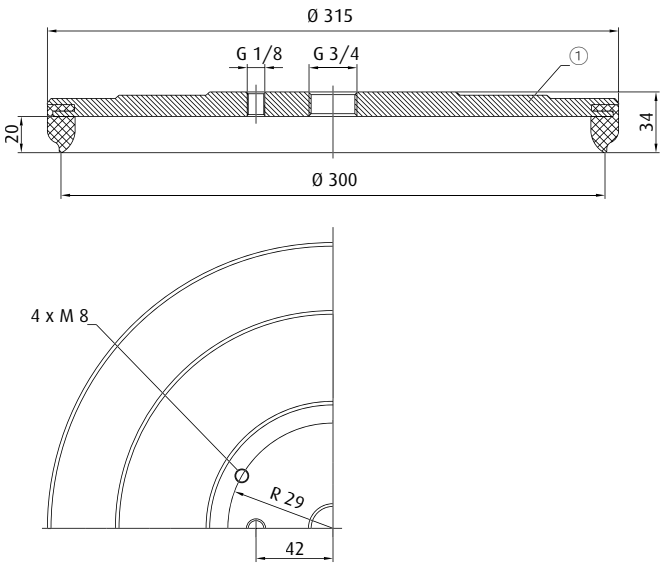
Item no.	Material		
152.300.098._*	NBR (gr)	7 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

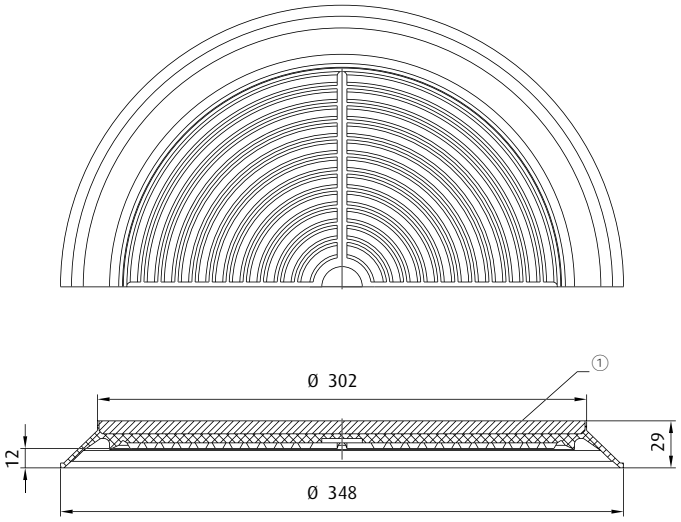
Item no.	Material		
152.300.130._*	NBR (sw)	12 mm	Additional sizes available are found on p. 73.



① = Aluminium

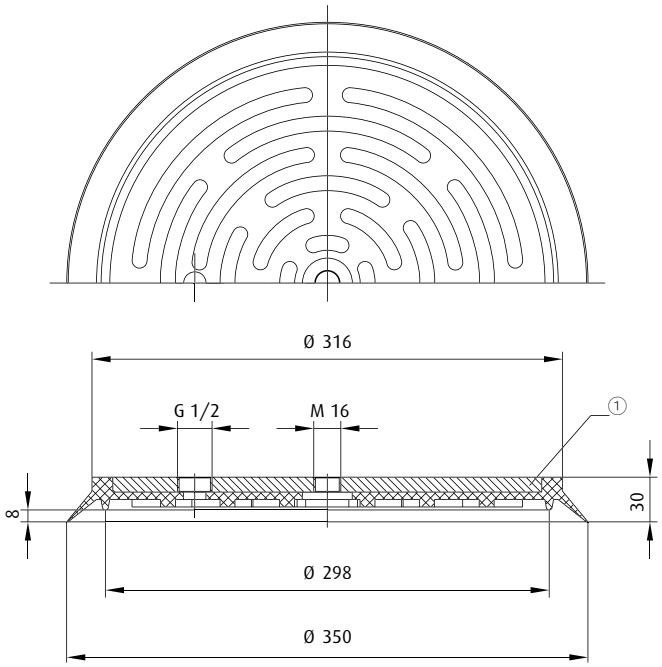
Item no.	Material		
160.315.012._*	EPDM (sw)	2.5 mm	Additional sizes available are found on p. 72. **Notes:** Foam sealing lip equalises product unevenness

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

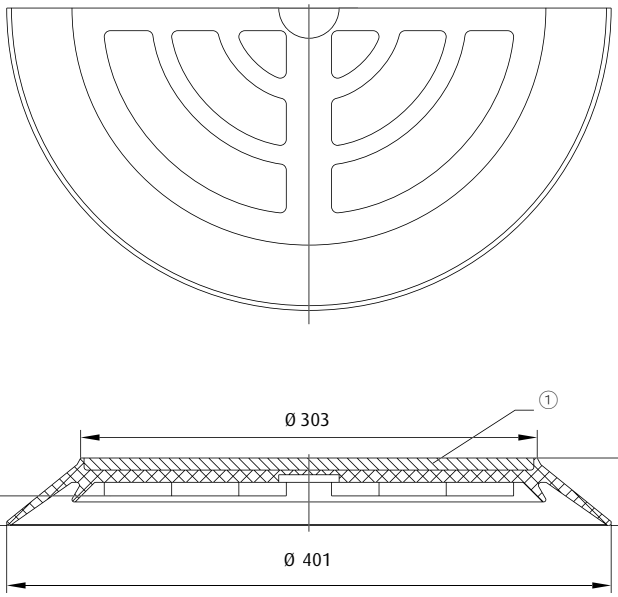
Item no.	Material		Ordering notes
150.340.030._*	NBR (gr)	15 mm	**Ordering notes:** Customised drilling patterns on request



① = Steel

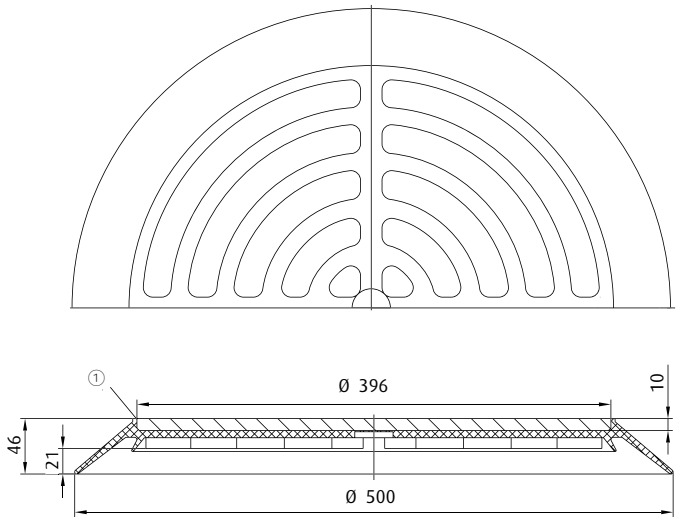
Item no.	Material		
152.350.131._*	NBR (sw)	13 mm	Additional sizes available are found on p. 73.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

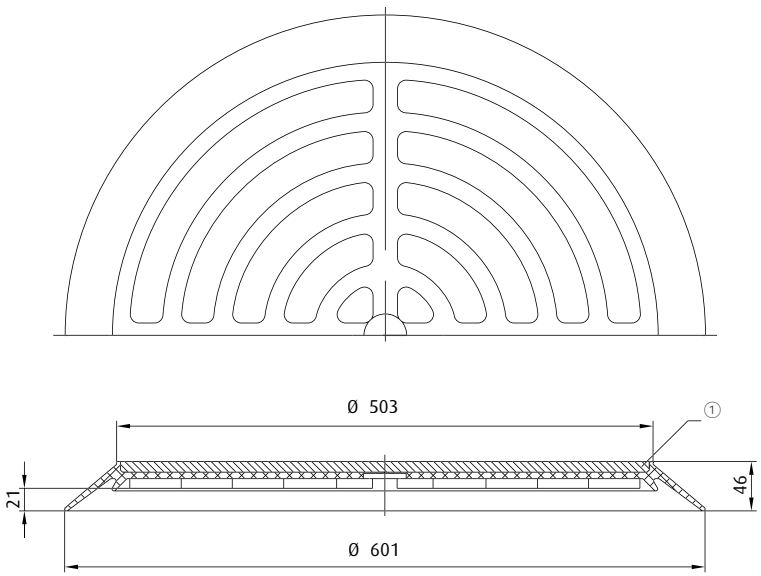
Item no.	Material		
152.400.085._*	NBR (gr), SBR (br), NR (sw)	25 mm	**Ordering notes:** Customised drilling patterns on request



① = Steel

Item no.	Material		
152.500.086._*	NBR (gr), SBR (br), NR (sw)	25 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

Item no.	Material		Ordering notes:
152.600.087._*	NBR (gr), SBR (br), NR (sw)	25 mm	Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

Application / Uses

> Bellows vacuum cups are especially suited to the gentle handling of sensitive products.
> They allow for easy height and angle compensation for variable surfaces and lift the product up as soon as the vacuum is turned on.
> The more folds the vacuum cup has, the greater the lifting movement and thus the height compensation. However, lateral stability is reduced by the number of folds. Bellows vacuum cups are therefore only recommended for vertical handling tasks.

Designs

FIPA bellows vacuum cups are available in various different versions (generally 1.5 - 4.5 folds) They are available with supporting ribs towards the product, with supporting ribs between the folds and without supporting ribs.

Supporting ribs towards the product (supporting ribs make contact with the object being handled):
> Increased stability and suction power
> Prevent flexible product parts from being sucked in
> Avoid slipping of the product while suction is being applied

Supporting ribs between the folds:
> Improve lateral stability
> Accelerate the depositing process, as the folds are prevented from sticking together

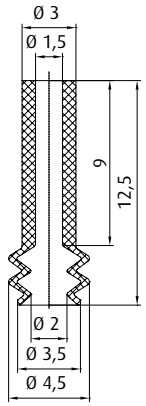
Methods of connection

Vacuum cups for attaching to the fittings (plug-in)
> Secure hold
> Quick replacement
> Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced

Bolted fittings
> Vacuum cups are bolted from below into a threaded counterpart using a hollow bolt
> Extremely secure hold
> Eliminates twisting of the vacuum cups
> Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced

Vulcanised fittings / retainer plates
> Very secure hold
> Secured against rotation
> High degree of dimensional stability

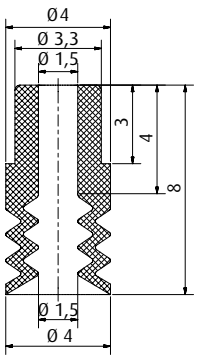
Notes:



	Connection	see page
270.195	M5-male	409

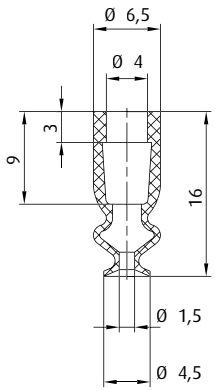
Item no. **21.004.142._***
Material Vinyl (bl)
1.3 mm

Additional sizes available are found on p. 116.



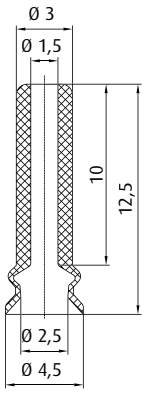
	Connection	see page
270.427	M3-male	408

Item no. **21.018.068._***
Material NBR (bl)
1 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

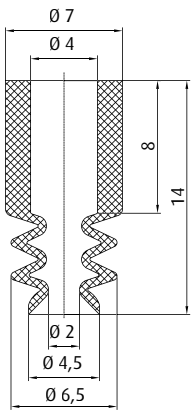
Item no. **23.004.189._***
Material NBR (sw), SI (tr)
4 mm



	Connection	see page
270.195	M5-male	409

Item no. **23.005.095._***
Material Vinyl (bl)
2 mm

Additional sizes available are found on p. 113.

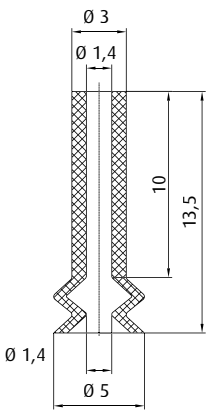


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

BESTSELLER

Item no. **21.004.083._***
Material SI (tr)
3 mm

Additional sizes available are found on p. 89.

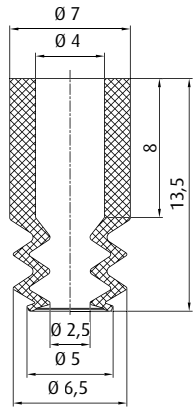


	Connection	see page
270.195	M5-male	409

Item no. **23.005.181._***
Material NBR (sw), SI (tr)
2 mm

Additional sizes available are found on p. 81.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

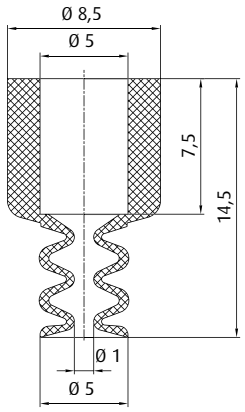


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 21.005.058._*

Material NBR (sw), SI (tr)

3 mm

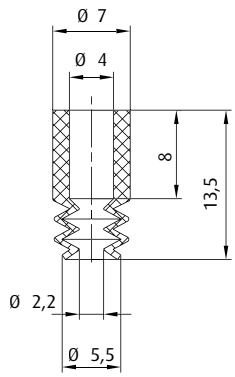


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 21.005.086._*

Material SI (tr)

3.5 mm



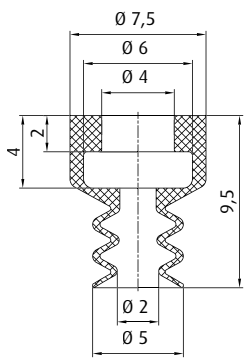
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. 21.005.146._*

Material Thermalon® (bl)

3 mm



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

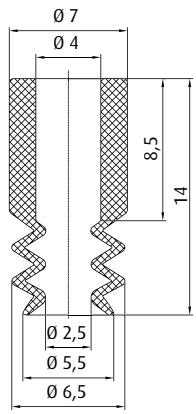
Item no. 21.005.088._*

Material NBR (sw), SI (tr)

3 mm

Additional sizes available are found on p. 92.

This vacuum cup is also available in the following dimensions: 7 mm

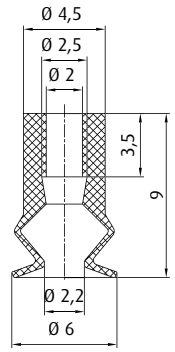


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 21.005.057._*

Material NBR (g), HNBR (ge), EPDM (gr), SI (g), SI-AS (sw)

3 mm



	Connection	see page
270.153	M5-male	409

BESTSELLER

Item no. 23.005.178._*

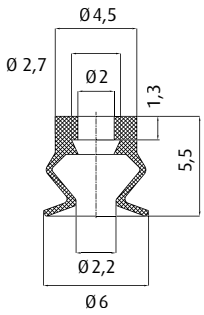
Material SI (r), SI-AS (sw), CR (sw), HNBR (ge)

2 mm

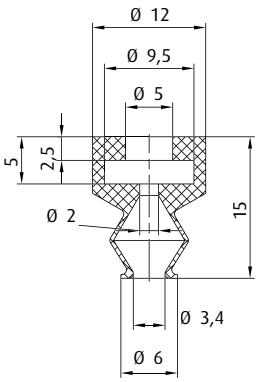
Additional sizes available are found on p. 89.

Additional sizes available are found on p. 100.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
23.005.231._*	Sl (r)	2 mm

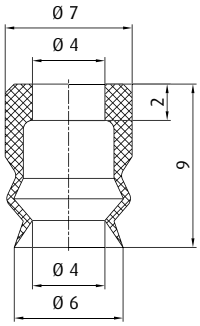


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no.	Material	
23.006.145._*	NBR (sw), Sl (tr)	5 mm

Additional sizes available are found on p. 122.

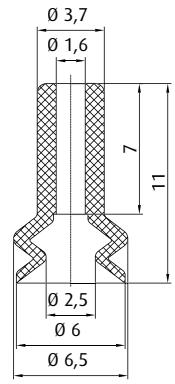


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

Item no.	Material	
23.006.161._*	Sl (tr)	2 mm

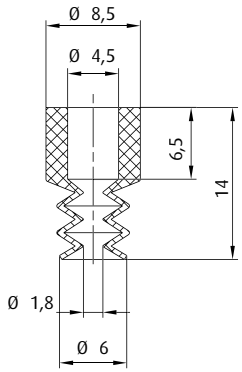
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 20 mm, 30 mm



	Connection	see page
270.001	M5-male	409

Item no.	Material	
23.007.112._*	Vinyl (bl)	2 mm

Additional sizes available are found on p. 113.

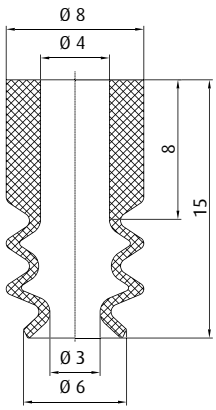


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
21.007.147._*	Thermalon® (bl)	3 mm

Additional sizes available are found on p. 92.

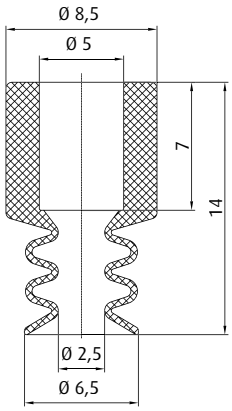


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.	Material	
21.006.093._*	NBR (sw), Sl (tr)	3 mm

Additional sizes available are found on p. 89.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



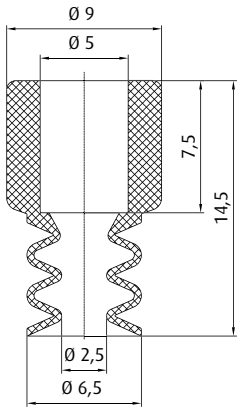
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 21.006.001._*

Material NBR (sw), EPDM (gr), NBR-AS (sw), SI (tr), Vinyl (bl)

3.5 mm

Additional sizes available are found on p. 116.



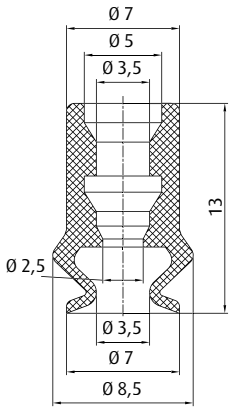
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 21.006.087._*

Material NBR (sw), SI (tr)

3.5 mm

Additional sizes available are found on p. 89.

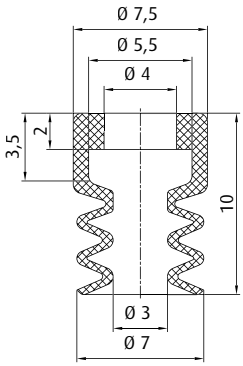


	Connection	see page
270.399	M5-male	410

Item no. 21.007.096._*

Material NBR (sw), SI (tr)

2 mm



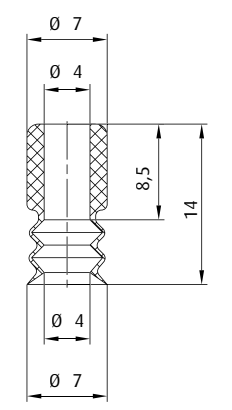
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

Item no. 21.007.089._*

Material NBR (sw), HNBR (ge), SI (tr), SI-AS (sw), PU (bl)

3 mm

Additional sizes available are found on p. 94.
This vacuum cup is also available in the following dimensions: 5 mm

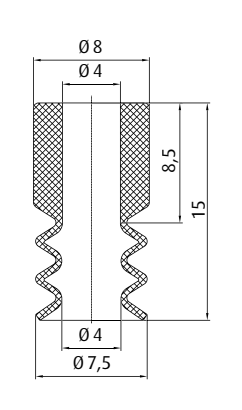


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 21.007.120._*

Material SI (tr)

4 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

BESTSELLER

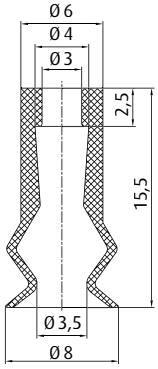
Item no. 21.008.094._*

Material NBR (sw), SI (tr)

4 mm

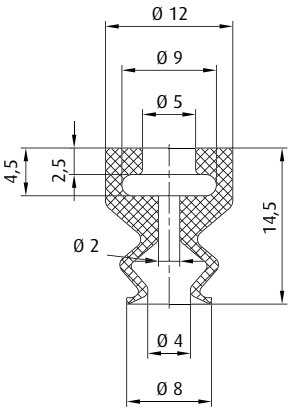
Additional sizes available are found on p. 89.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413

Item no.	Material	
23.008.057._*	Si (tr), SI-AS (sw)	3.5 mm

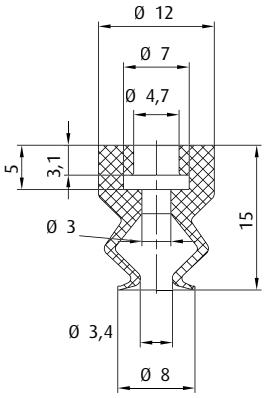


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no.	Material	
23.008.146._*	NBR (sw), SI (tr)	5 mm

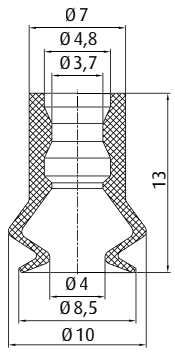
Additional sizes available are found on p. 122.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

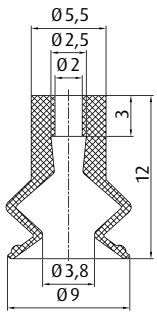
		see page
50.141	10 mm	456
50.018	8.5 mm	454

Item no.	Material	
21.008.126._*	SI (r)	8 mm



	Connection	see page
270.399	M5-male	410

Item no.	Material	
23.008.225._*	SI (tr)	3 mm

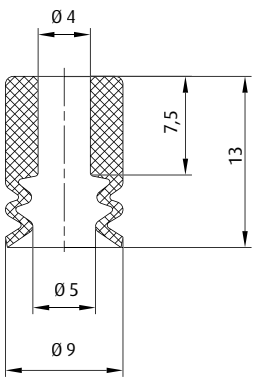


	Connection	see page
270.153	M5-male	409

BESTSELLER

Item no.	Material	
23.008.166._*	SI (r), SI-AS (sw), CR (sw), HNBR (ge)	3.5 mm

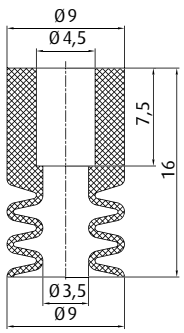
Additional sizes available are found on p. 100.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

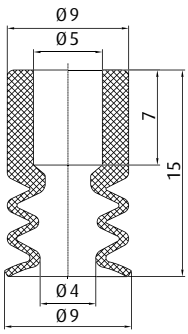
Item no.	Material	
21.009.029._*	PU (bl)	1.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
21.009.100._*	NBR (sw)	3.5 mm

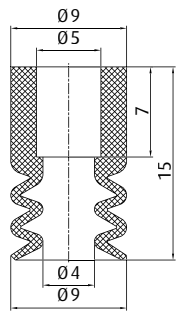


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

BESTSELLER

Item no.	Material	
21.009.002._*	NBR (sw), HNBR (ge), SI (tr), SI-AS (sw), NR (gr), PU (bl)	2 mm

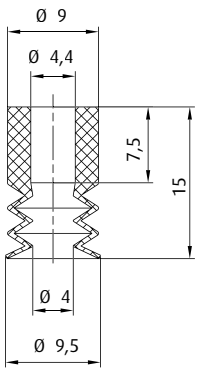
Additional sizes available are found on p. 89.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
21.009.106._*	Vulkollan® (br)	2 mm

Additional sizes available are found on p. 97.

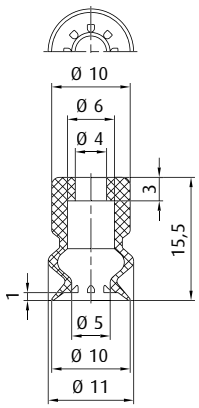


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
21.009.148._*	Thermalon® (bl)	3 mm

Additional sizes available are found on p. 92.

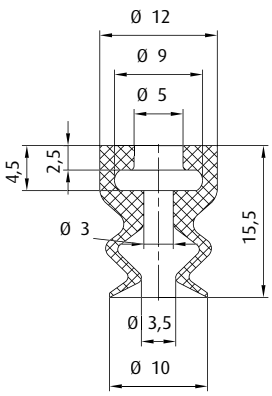


	Connection	see page
270.458	M4-male	408
270.134	M5-male	409
270.104	M6-male	413

		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

Item no.	Material	
23.010.139._*	NBR (sw), SI (tr)	4 mm

Additional sizes available are found on p. 119.



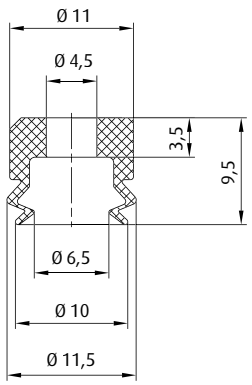
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no.	Material	
23.010.147._*	NBR (sw), SI (tr)	5 mm

Additional sizes available are found on p. 122.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

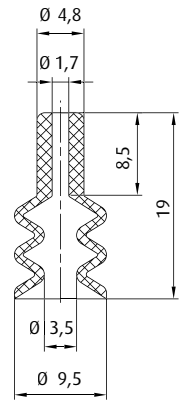


	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

		see page
50.330	10 mm	454

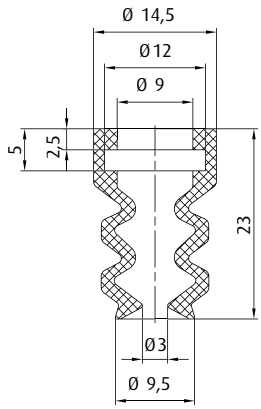
Item no. **23.010.163._***
Material SI (tr)
2.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 15 mm, 20 mm, 30 mm



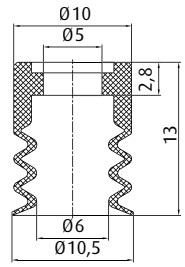
	Connection	see page
270.195	M5-male	409

Item no. **21.010.061._***
Material Vinyl (bl)
8 mm



	Connection	see page
270.541	G1/8-male	421

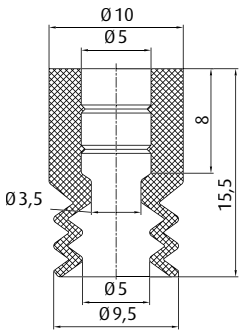
Item no. **21.010.071._***
Material Vinyl (bl)
8 mm



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

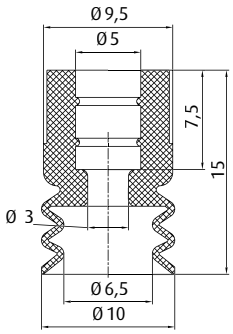
Item no. **21.010.005._***
Material NBR (sw), SI (bl)
4 mm

This vacuum cup is also available in the following dimensions: 15 mm, 18 mm, 24 mm, 30 mm, 40 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

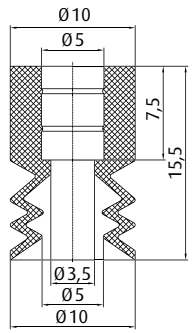
Item no. **21.010.004._***
Material NBR (sw), SI (r), PU (bg)
3 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. **21.010.056._***
Material SI (bl), SI (r)
4 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

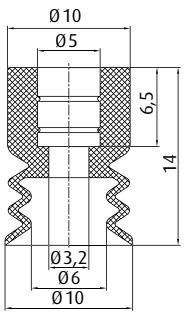


	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

BESTSELLER

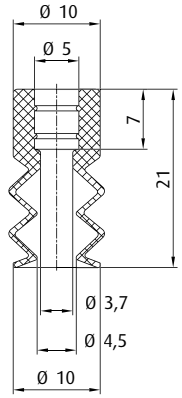
Item no. 21.010.070._*
Material Vinyl (bl)
5 mm

Additional sizes available are found on p. 116.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

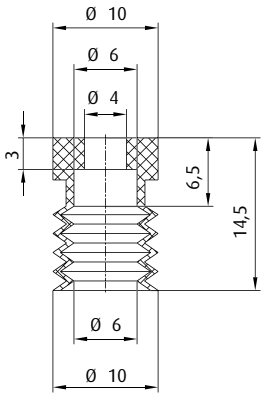
Item no. 21.010.078._*
Material SI (r), SI (tr), PU (bg)
4 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 21.010.119._*
Material NBR (sw), SI (tr)
8 mm

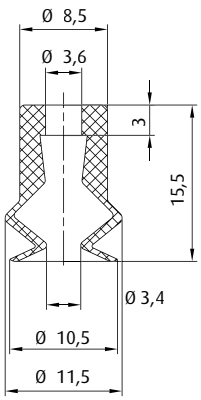
Additional sizes available are found on p. 89.



	Connection	see page
270.458	M4-male	408
270.009	G1/8-male	417
270.007	G1/8-female	422

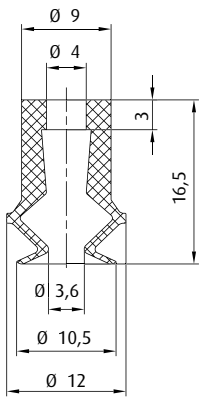
Item no. 25.010.044._*
Material NBR (sw), SI (tr)
4 mm

Additional sizes available are found on p. 124.



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

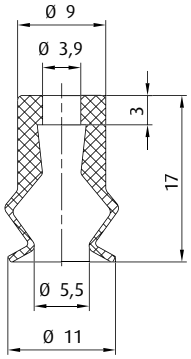
Item no. 23.011.138._*
Material SI (r)
4 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.015	G1/8-female	421

Item no. 23.011.173._*
Material SI (tr)
3.5 mm

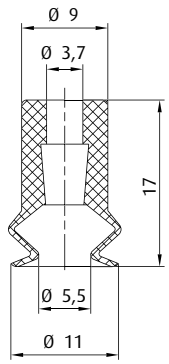
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

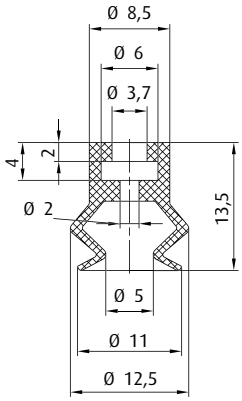
Item no.	Material	
23.011.007._*	SI (tr), SI-AS (sw), PU (bl), CR (sw)	5 mm

Additional sizes available are found on p. 100.



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.	Material	
23.011.131._*	NBR (sw), SI (r)	4 mm

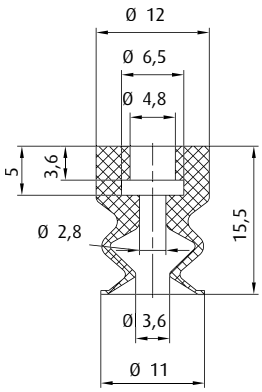


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

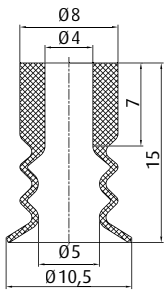
Item no.	Material	
23.010.123._*	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	4 mm

This vacuum cup is also available in the following dimensions: 15 mm, 21 mm, 32 mm, 42 mm, 54 mm



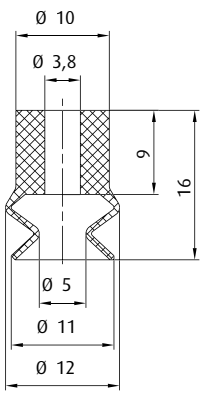
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	
21.010.127._*	SI (r)	6 mm



	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
21.011.095._*	NBR (sw), SI (tr)	5 mm



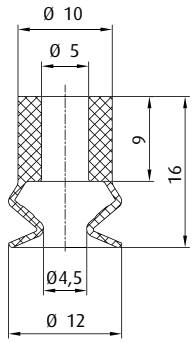
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
23.011.234._*	Thermalon® (bl)	5.5 mm

Additional sizes available are found on p. 84.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

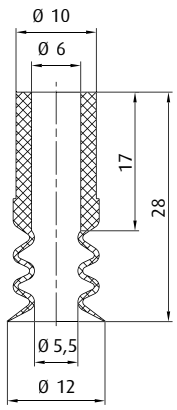
		see page
50.037	25 mm	456

Item no. 23.011.008._*

Material NBR (sw), HNBR (ge), SI (tr)

4.5 mm

Additional sizes available are found on p. 81.



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

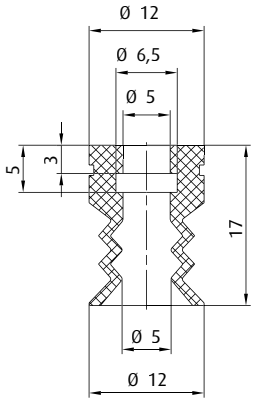
FOR HIGHLY STRUCTURED SURFACES (3D)

Item no. 21.012.079._*

Material NBR (sw), SI (w), SI (tr)

7 mm

Additional sizes available are found on p. 125.



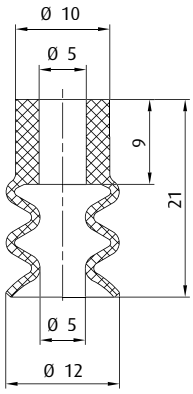
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.141	10 mm	456
50.018	8.5 mm	454

Item no. 21.012.108._*

Material SI (r)

5 mm



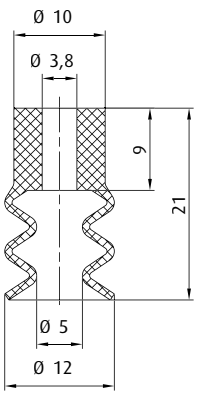
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. 21.012.135._*

Material NBR (sw), HNBR (ge), SI (tr), NR (gr), PU (bl)

7 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

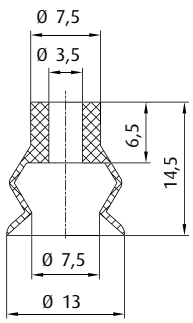
UP TO 160 °C & MINIMUM MARKING

Item no. 21.012.149._*

Material Thermalon® (bl)

7 mm

Additional sizes available are found on p. 92.



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

BESTSELLER

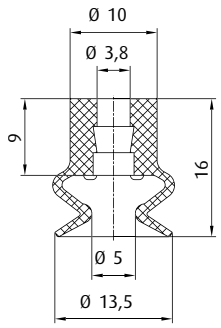
Item no. 23.013.097._*

Material Vinyl (bl)

5 mm

Additional sizes available are found on p. 113.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

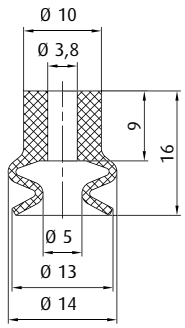


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

		see page
50.037	25 mm	456

Item no. **23.013.120._*** | **Material** NBR (sw), SI (tr), NR (gr) | 4 mm

Additional sizes available are found on p. 81.

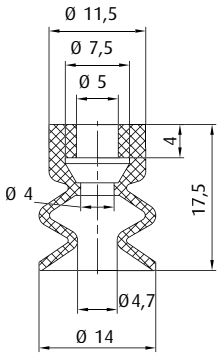


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. **23.014.235._*** | **Material** Thermalon® (bl) | 5 mm

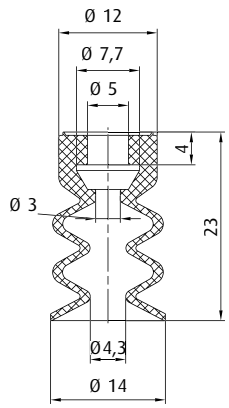
Additional sizes available are found on p. 84.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

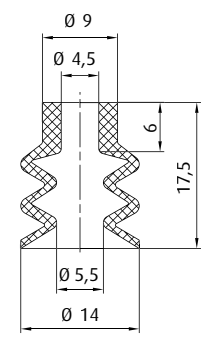
Item no. **23.014.010._*** | **Material** NBR (sw), SI (r), NR (bg), PU (bl) | 8 mm

This vacuum cup is also available in the following dimensions: 24 mm, 40 mm, 60 mm



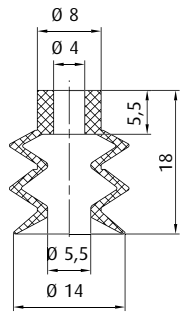
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. **21.014.006._*** | **Material** NBR (sw), SI (r), NR (bg), PU (bl) | 10 mm



	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. **21.014.046._*** | **Material** PU (r) | 7 mm



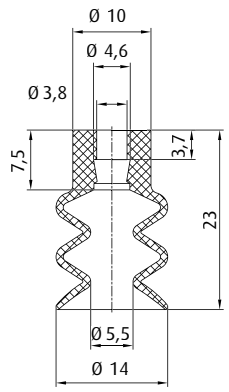
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

BESTSELLER

Item no. **21.014.053._*** | **Material** HNBR (ge), SI (tr), CR (sw) | 9 mm

Additional sizes available are found on p. 94.

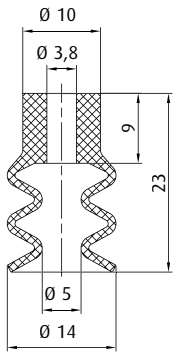
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 21.014.133._*
Material NBR (sw), SI (tr), NR (gr)
11 mm

Additional sizes available are found on p. 89.

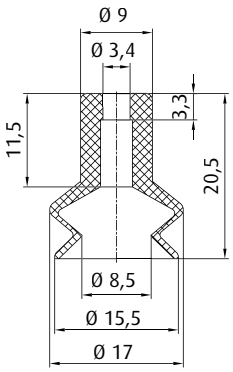


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. 21.014.150._*
Material Thermalon® (bl)
10 mm

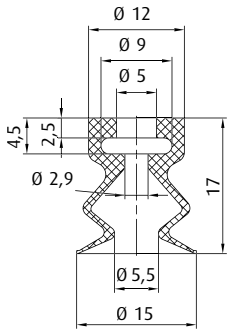
Additional sizes available are found on p. 92.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 23.015.098._*
Material Vinyl (bl)
5 mm

Additional sizes available are found on p. 113.

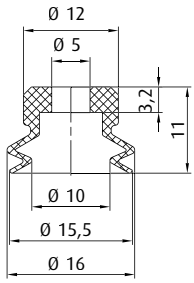


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Item no. 23.015.148._*
Material NBR (sw), SI (tr)
7 mm

Additional sizes available are found on p. 122.

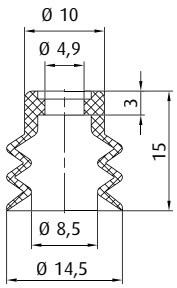


	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

		see page
50.330	10 mm	454

Item no. 23.015.164._*
Material NBR (sw), SI (tr)
3.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 20 mm, 30 mm

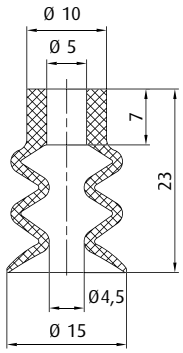


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 21.015.009._*
Material NBR (sw), SI (tr)
5 mm

This vacuum cup is also available in the following dimensions: 10 mm, 18 mm, 24 mm, 30 mm, 40 mm

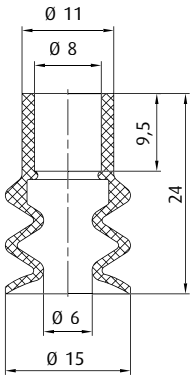
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-male	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. **21.014.007._*** | **Material** NBR (sw), SI (tr), PU (bl) | 12 mm

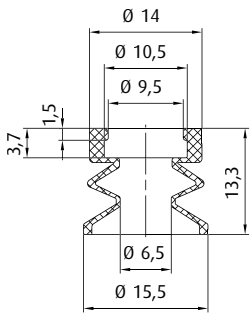
Additional sizes available are found on p. 89.



	Connection	see page
270.112	G1/8-male	419
270.113	G1/4-male	425

Item no. **21.015.008._*** | **Material** NBR (sw), SI (r) | 7 mm

This vacuum cup is also available in the following dimensions: 20 mm, 30 mm

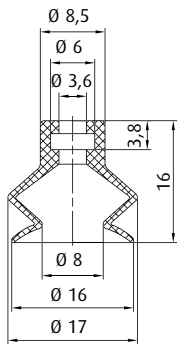


	Connection	see page
270.311	M5-male	411
270.312/19	M6-male	414

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. **23.016.232._*** | **Material** SI (tr) | 6 mm

Additional sizes available are found on p. 130.

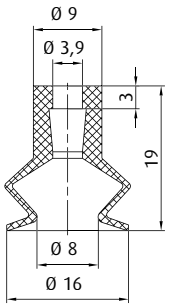


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

Item no. **23.015.122._*** | **Material** NBR (sw), SI (tr), PU (bl), HNBR (ge) | 5 mm

Additional sizes available are found on p. 86.
This vacuum cup is also available in the following dimensions: 11 mm, 21 mm, 32 mm, 42 mm, 54 mm

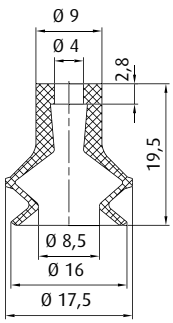


	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

BESTSELLER

Item no. **23.016.015._*** | **Material** SI (tr), SI-AS (sw), CR (sw) | 7 mm

Additional sizes available are found on p. 100.

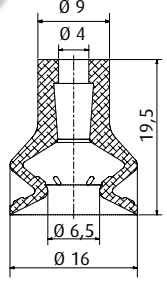


	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.015	G1/8-female	421

Item no. **23.016.174._*** | **Material** SI (tr) | 5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

NEW



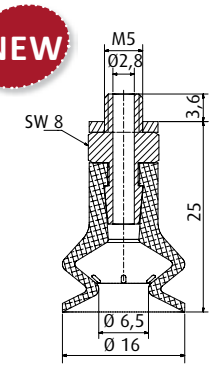
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

Item no. **23.016.263._***
Material Varioflex® 60/30° (sw/r)
4.5 mm

Additional sizes available are found on p. 107.

Spare cup

NEW

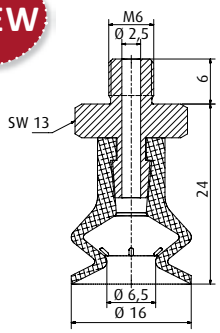


Item no. **22.016.253._***
Material Varioflex® 60/30° (sw/r)
4.5 mm

Additional sizes available are found on p. 107.

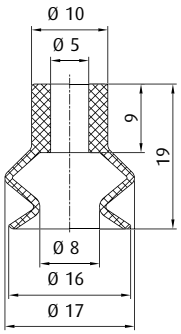
Spare cup

NEW



Item no. **22.016.254._***
Material Varioflex® 60/30° (sw/r)
4.5 mm

Additional sizes available are found on p. 107.

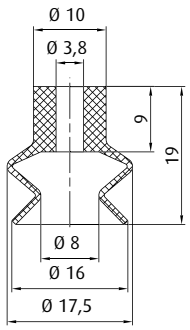


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

		see page
50.037	25 mm	456

Item no. **23.016.016._***
Material NBR (sw), HNBR (ge), SI (tr)
6 mm

Additional sizes available are found on p. 81.

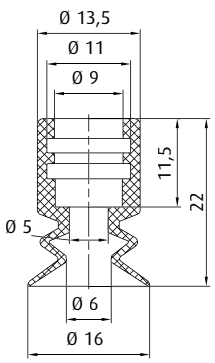


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. **23.016.236._***
Material Thermalon® (bl)
8.5 mm

Additional sizes available are found on p. 84.

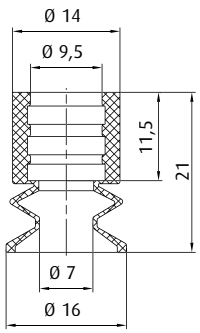


	Connection	see page
270.244	M5-male	410

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. **23.016.104._***
Material Vinyl (bl)
7 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

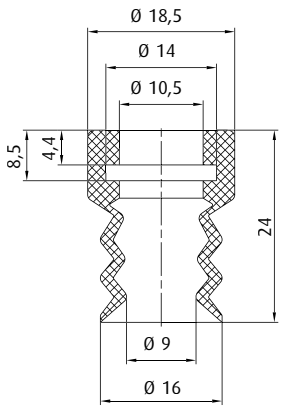


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no. **27.016.001._***
Material SI (tr), NR (sw)
6 mm

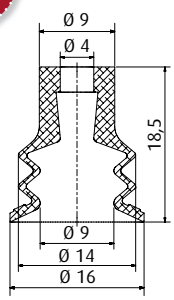
Additional sizes available are found on p. 125.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **21.016.072._***
Material Vinyl (bl)
9 mm

NEW



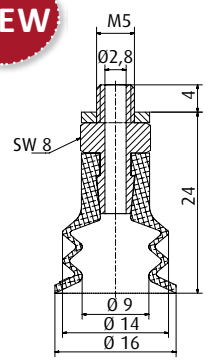
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

Item no. **21.016.175._***
Material Varioflex® 60/30° (sw/r)
5.5 mm

Additional sizes available are found on p. 110.

Spare cup

NEW

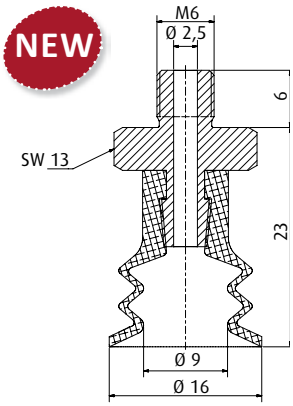


Item no. **20.016.145._***
Material Varioflex® 60/30° (sw/r)
5.5 mm

Additional sizes available are found on p. 110.

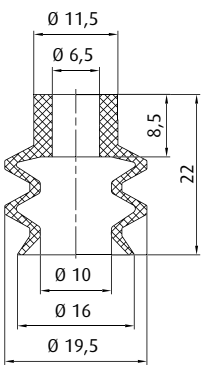
Spare cup

NEW



Item no. **20.016.146._***
Material Varioflex® 60/30° (sw/r)
5.5 mm

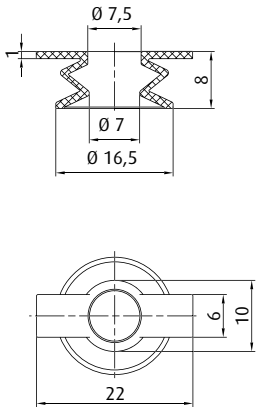
Additional sizes available are found on p. 110.



	Connection	see page
270.274	G1/4-male	427
270.275	G1/4-female	432

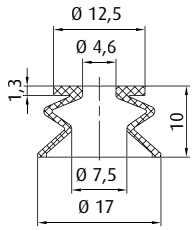
Item no. **21.015.050._***
Material SI (tr), NR (bg)
10 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

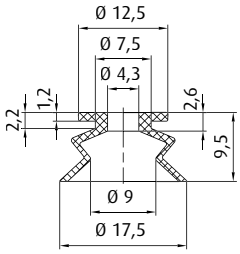


Item no.	Material	
23.017.102._*	NR (sw)	5.5 mm

Additional sizes available are found on p. 23.

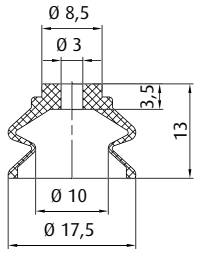


Item no.	Material	
23.017.100._*	NR (br)	6 mm

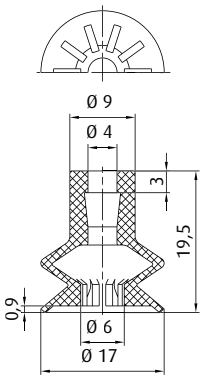


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

Item no.	Material	
23.016.086._*	SI (tr), PU (bg)	6 mm



Item no.	Material	
23.017.105._*	NR (sw)	7 mm

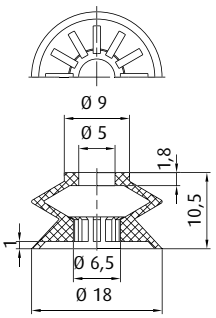


	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

BESTSELLER

Item no.	Material	
23.018.175._*	SI (tr), NR (bl)	5.5 mm

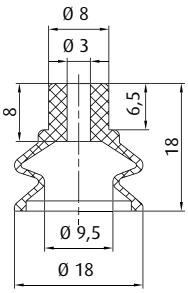
Additional sizes available are found on p. 23.



Item no.	Material	
23.018.183._*	NR (or)	5.5 mm

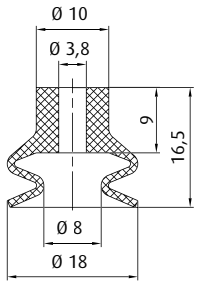
Additional sizes available are found on p. 25.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.022	M5-male	409
270.347	M5-female	412

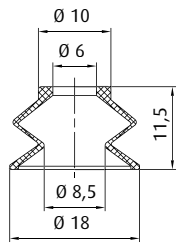
Item no. **23.018.101._*** | **Material** NR (sw) | 6 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

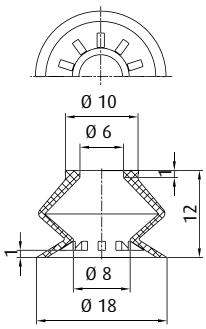
Item no. **23.018.237._*** | **Material** Thermalon® (bl) | 5 mm

Additional sizes available are found on p. 84.



	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

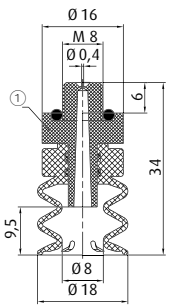
Item no. **23.018.019._*** | **Material** SI (tr), NR (sw), NR (bl) | 8 mm



	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no. **23.018.082._*** | **Material** SI (tr), NR (bl), CR (sw) | 5.5 mm

Additional sizes available are found on p. 23.

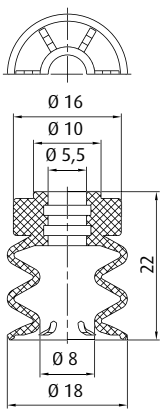


REDUCED LEAKAGE

① = Special fitting with installed orifice ø 0.4 mm.
Material: PA6/ O-ring NBR

Item no. **20.018.125._*** | **Material** NBR (gr) | 9.5 mm

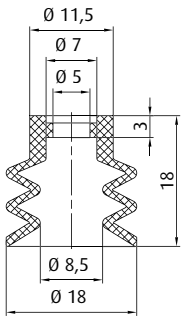
Spare cup



	Connection	see page
270.443	M5-male	410
270.378	M8-male	415
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. **21.018.118._*** | **Material** NBR (gr) | 10 mm

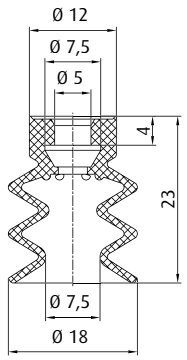
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

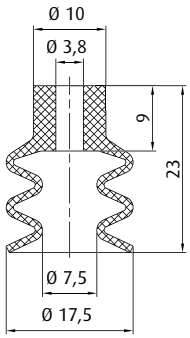
Item no. **21.018.012._***
Material NBR (sw), SI (bl)
7 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 24 mm, 30 mm, 40 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no. **21.018.011._***
Material NBR (sw), SI (r), NR (bg), PU (bl)
8 mm

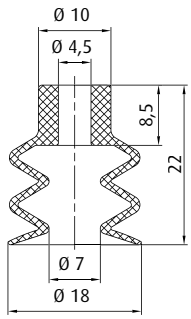


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. **21.018.151._***
Material Thermalon® (bl)
10 mm

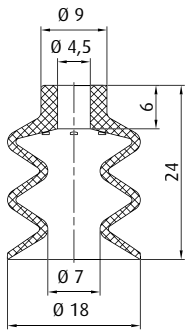
Additional sizes available are found on p. 92.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

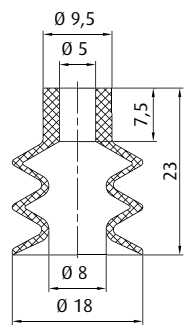
Item no. **21.018.010._***
Material NBR (sw), HNBR (ge), SI (tr), PU (bl)
8 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. **21.018.047._***
Material PU (g)
12 mm

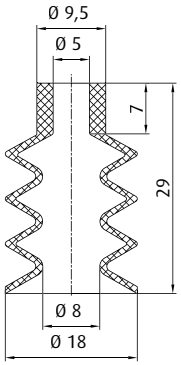


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

BESTSELLER

Item no. **21.018.013._***
Material NBR (sw), SI (tr), NR (sw)
9 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

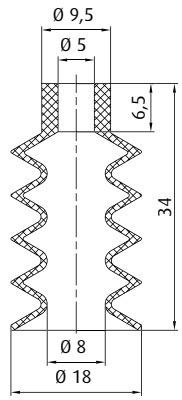


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

BESTSELLER

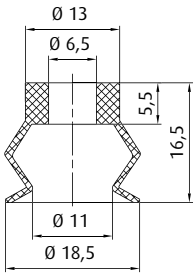
Item no.	Material	
25.018.031._*	NBR (sw), SI (tr)	12 mm

Additional sizes available are found on p. 96.



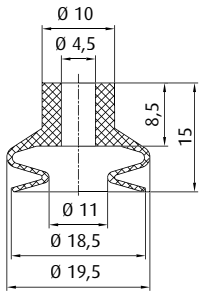
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.	Material	
25.018.032._*	SI (tr)	14 mm



	Connection	see page
270.039	M6-male	414
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no.	Material	
23.019.021._*	NBR (sw), SI (tr)	8 mm



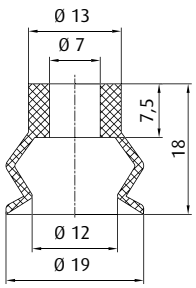
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

BESTSELLER

Item no.	Material	
23.019.119._*	NBR (sw), SI (tr)	4 mm

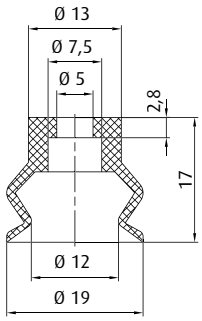
Additional sizes available are found on p. 81.



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
23.019.109._*	Vinyl (bl)	8 mm

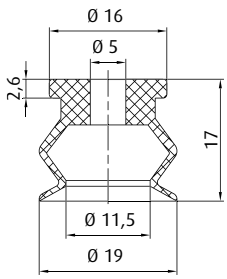
Additional sizes available are found on p. 113.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

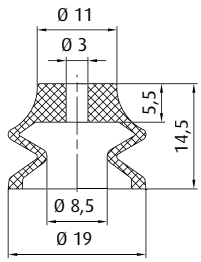
Item no.	Material	
23.019.179._*	Vinyl (bl)	7 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



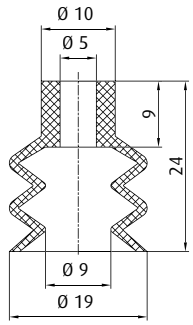
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	
23.019.110._*	Vinyl (bl)	8 mm



Item no.	Material	
23.019.168._*	NR (bl), NR (br)	5.5 mm

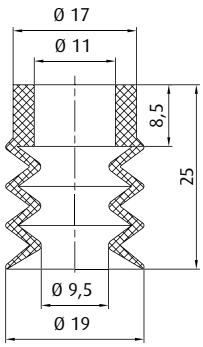
Additional sizes available are found on p. 23.



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.	Material	
21.018.068._*	Vinyl (bl)	11 mm

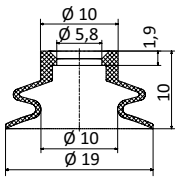
Additional sizes available are found on p. 116.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
25.019.037._*	Vinyl (bl)	10 mm

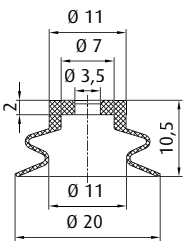
NEW



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	
23.019.254._*	SI (tr)	3.5 mm

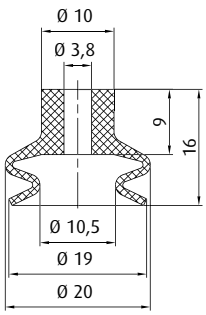
Additional sizes available are found on p. 23.



	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

Item no.	Material	
23.020.103._*	NR (bg)	2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

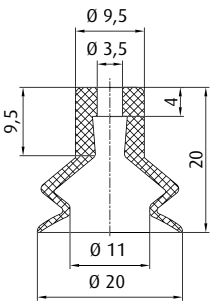


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
23.020.238._*	Thermalon® (bl)	5 mm

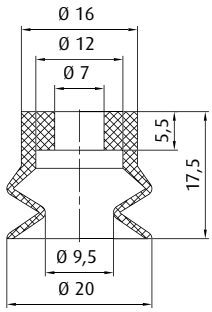
Additional sizes available are found on p. 84.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.	Material	
23.020.114._*	Vinyl (bl)	6 mm

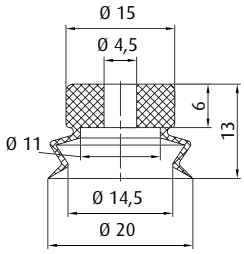
Additional sizes available are found on p. 113.



	Connection	see page
270.311	M5-male	411
270.312/19	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

WEAR-RESISTANT

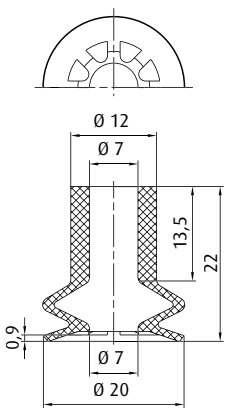
Item no.	Material	
23.020.121._*	Tepuflex® (or), Vulkollan® (br)	5 mm



	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no.	Material	
23.020.154._*	SI (tr)	4 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 15 mm, 30 mm

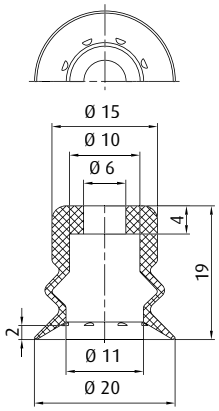


	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.113	G1/4-male	425
270.275	G1/4-female	432

Item no.	Material	
23.020.133._*	NBR (sw), SI (tr)	4 mm

Additional sizes available are found on p. 23.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

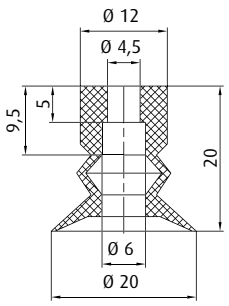


	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. 23.020.140._*
Material NBR (sw), SI (tr)
6 mm

Additional sizes available are found on p. 119.

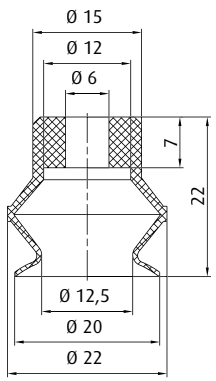


	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

		see page
50.020	8.5 mm	454

Item no. 23.020.149._*
Material NBR (sw), SI (tr)
6 mm

Additional sizes available are found on p. 122.

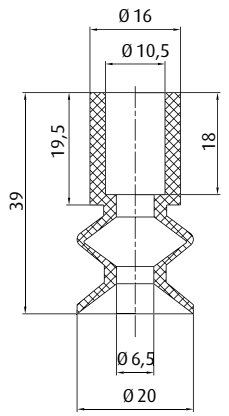


	Connection	see page
270.312/19	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

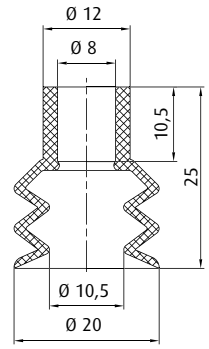
Item no. 23.020.169._*
Material Vulkollan® (br)
7 mm

Additional sizes available are found on p. 97.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

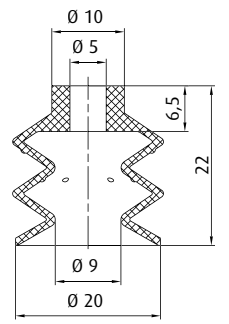
Item no. 23.020.027._*
Material SI (tr), NR (sw), NR (br)
10 mm



	Connection	see page
270.112	G1/8-male	419
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no. 21.020.014._*
Material NBR (sw), SI (tr)
10 mm

This vacuum cup is also available in the following dimensions: 15 mm, 30 mm

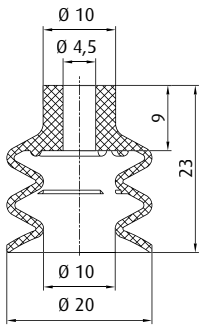


	Connection	see page
270.443	M5-male	410
270.238	G1/8-female	417
270.110	G1/8-female	422
270.534	G1/4-male	425

BESTSELLER

Item no. 21.020.015._*
Material NBR (sw), SI (tr), NR (sw)
11 mm

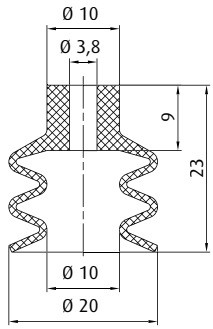
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.	Material	
21.020.016._*	NBR (sw), HNBR (ge), SI (tr)	9 mm

Additional sizes available are found on p. 89.

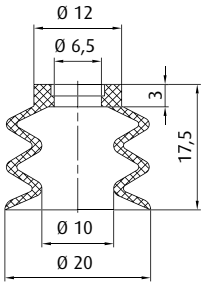


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

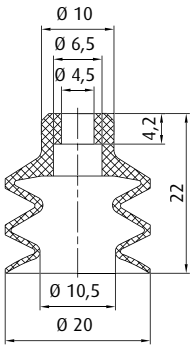
Item no.	Material	
21.020.152._*	Thermalon® (bl)	10 mm

Additional sizes available are found on p. 92.



	Connection	see page
270.039	M6-male	414
270.247	M8-male	415
270.543	G1/8-male	419

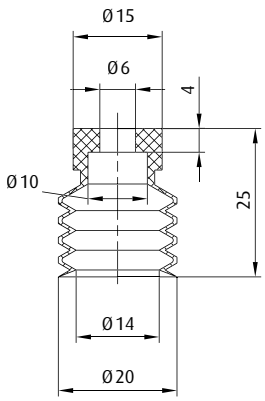
Item no.	Material	
21.020.073._*	SI (tr)	9 mm



	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.	Material	
21.020.090._*	Vulkollan® (br)	8 mm

Additional sizes available are found on p. 97.

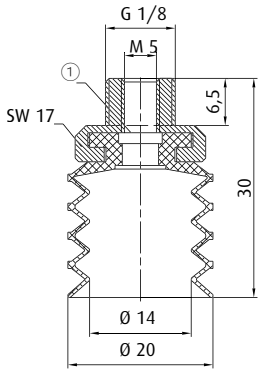


	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

Item no.	Material	
25.020.045._*	NBR (sw), SI (tr)	10 mm

Additional sizes available are found on p. 124.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

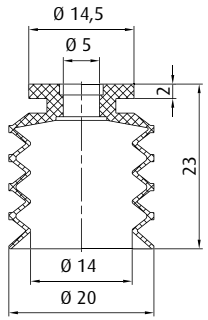


① = Filter screen

Item no.	Material	
24.020.033._*	Si (tr), CR (sw)	16 mm

Additional sizes available are found on p. 104.

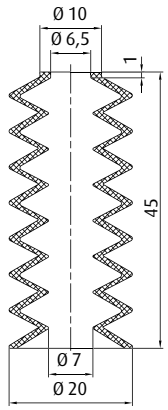
Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

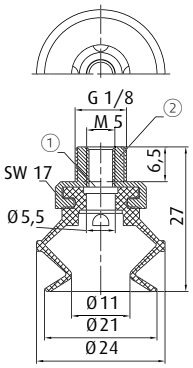
Item no.	Material	
25.020.025._*	Si (tr), CR (sw)	16 mm

Additional sizes available are found on p. 100.



	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.	Material	
25.020.002._*	Si (w)	26 mm

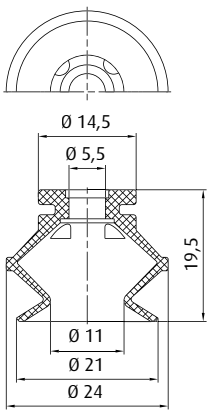


① = Filter screen ② = Aluminium

Item no.	Material	
22.020.020._*	Tepuflex® (or), Si (tr), CR (sw)	9 mm

Additional sizes available are found on p. 104.

Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

BESTSELLER

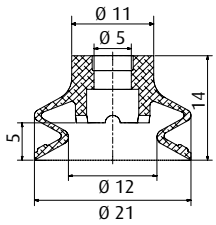
Item no.	Material	
23.020.026._*	Tepuflex® (or), Si (tr), CR (sw)	9 mm

Additional sizes available are found on p. 100.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

NEW

	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

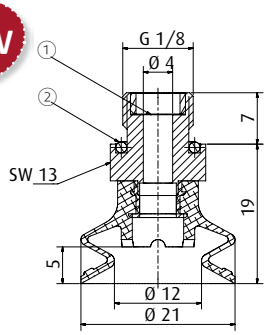


Item no.	Material	
23.021.264._*	Varioflex® 60/30° (sw/r)	5 mm

Additional sizes available are found on p. 107.

Spare cup

NEW



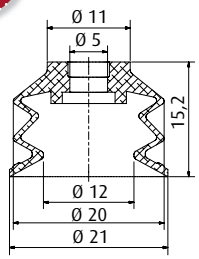
① = Filter screen ② = O-ring

Item no.	Material	
22.021.255._*	Varioflex® 60/30° (sw/r)	5 mm

Additional sizes available are found on p. 107.

NEW

	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

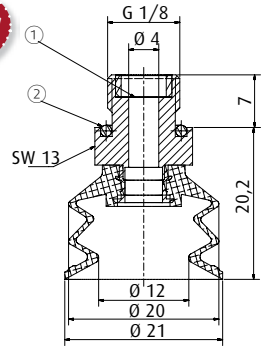


Item no.	Material	
21.021.176._*	Varioflex® 60/30° (sw/r)	6.5 mm

Additional sizes available are found on p. 110.

Spare cup

NEW

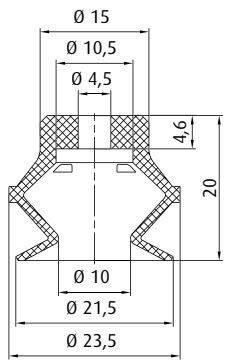


① = Filter screen ② = O-ring

Item no.	Material	
20.021.147._*	Varioflex® 60/30° (sw/r)	6.5 mm

Additional sizes available are found on p. 110.

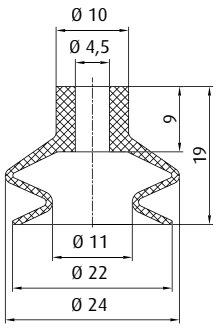
	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422



Item no.	Material	
23.020.124._*	NBR (sw), HNBR (ge), SI (tr), PU (bl)	8 mm

Additional sizes available are found on p. 86.
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 32 mm, 42 mm, 54 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

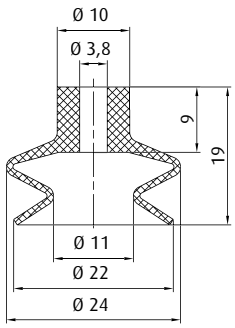
BESTSELLER

Item no. 23.022.028._*

Material NBR (sw), SI (tr), Vinyl (bl)

8 mm

Additional sizes available are found on p. 113.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

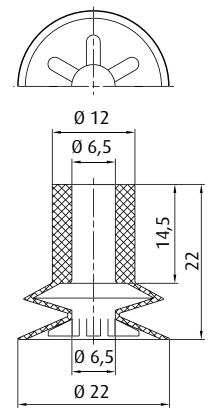
UP TO 160 °C & MINIMUM MARKING

Item no. 23.022.239._*

Material Thermalon® (bl)

8 mm

Additional sizes available are found on p. 84.



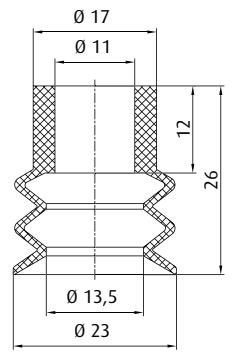
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 23.023.099._*

Material NR (br)

5 mm

Additional sizes available are found on p. 23.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

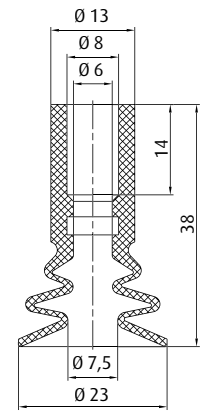
BESTSELLER

Item no. 21.023.066._*

Material Vinyl (bl)

9 mm

Additional sizes available are found on p. 116.

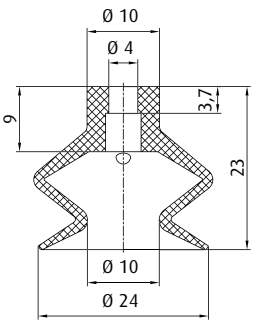


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no. 21.023.102._*

Material SI (g)

12 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

BESTSELLER

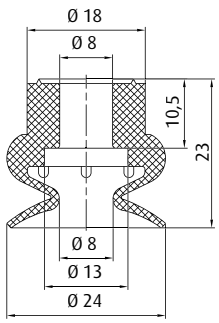
Item no. 23.025.137._*

Material NBR (sw), SI (tr), NR (gr)

9 mm

Additional sizes available are found on p. 81.

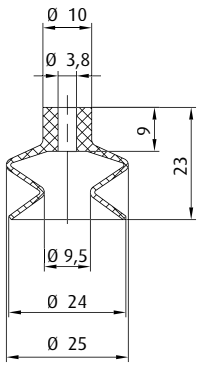
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no. **23.025.030._*** | **Material** NBR (sw), SI (r), NR (bg) | 5 mm

This vacuum cup is also available in the following dimensions: 14 mm, 40 mm, 60 mm

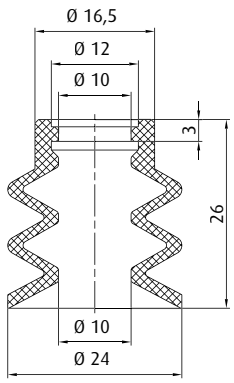


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

UP TO 160 °C & MINIMUM MARKING

Item no. **23.025.240._*** | **Material** Thermalon® (bl) | 12 mm

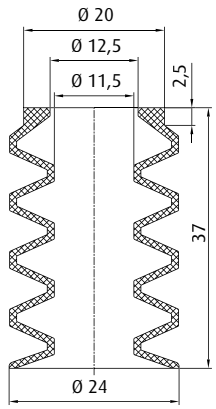
Additional sizes available are found on p. 84.



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

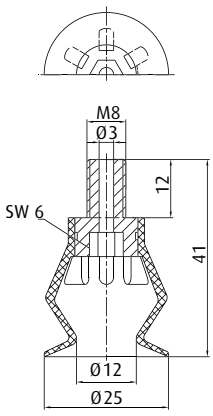
Item no. **21.024.017._*** | **Material** NBR (sw), SI (tr) | 10 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 30 mm, 40 mm



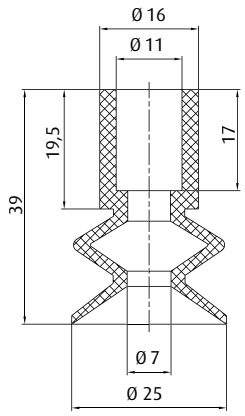
	Connection	see page
270.233	G1/8-female	438

Item no. **25.024.057._*** | **Material** SI (tr) | 20 mm



Item no. **22.025.029._*** | **Material** NBR (sw), SI (tr), NR (sw) | 11 mm

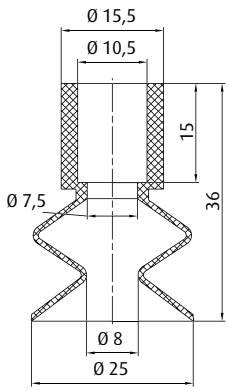
This vacuum cup is also available in the following dimensions: 31 mm, 44 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **23.025.032._*** | **Material** SI (tr), NR (sw), NR (br) | 12 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

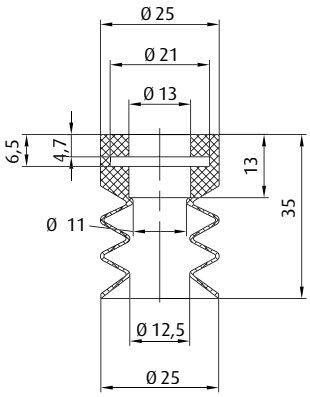


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 23.025.200._*

Material Vulkollan® (br)

13 mm

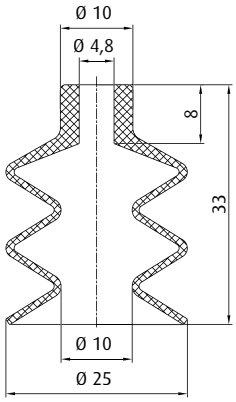


	Connection	see page
270.049-1	G1/4-male	426

Item no. 21.025.059._*

Material SI (tr)

16 mm



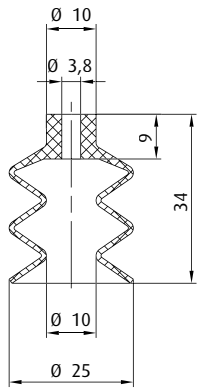
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. 21.025.060._*

Material NBR (sw), SI (tr)

19 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

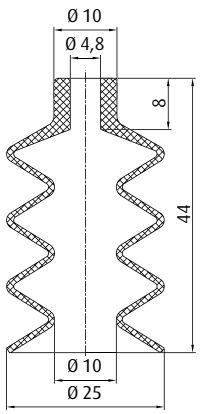
UP TO 160 °C & MINIMUM MARKING

Item no. 21.025.153._*

Material Thermalon® (bl)

20 mm

Additional sizes available are found on p. 92.



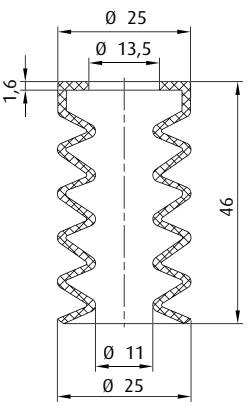
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. 25.025.005._*

Material NBR (sw), SI (tr)

24 mm

Additional sizes available are found on p. 96.



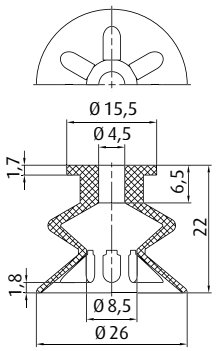
	Connection	see page
270.182.U	G1/4-male	431
270.182	G1/4-female	434

Item no. 25.025.004._*

Material SI (tr)

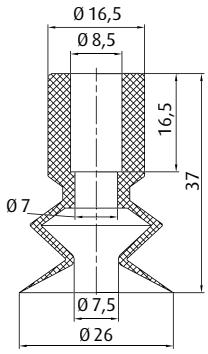
29 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

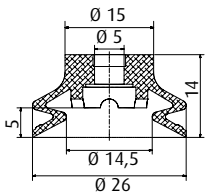
Item no. 23.026.115._*
Material Vinyl (bl)
8 mm



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 23.026.118._*
Material Vinyl (bl)
12.5 mm

NEW



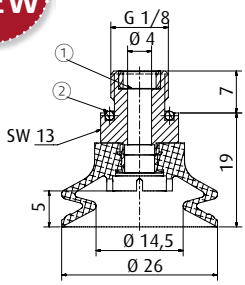
	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

Item no. 23.026.265._*
Material Varioflex® 60/30° (sw/r)
5 mm

Additional sizes available are found on p. 107.

Spare cup

NEW

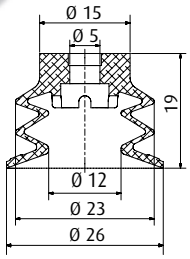


① = Filter screen ② = O-ring

Item no. 22.026.256._*
Material Varioflex® 60/30° (sw/r)
5 mm

Additional sizes available are found on p. 107.

NEW



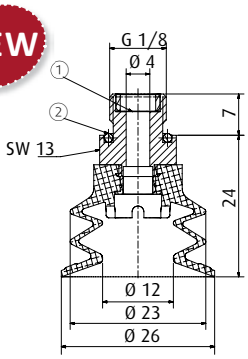
	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

Item no. 21.026.177._*
Material Varioflex® 60/30° (sw/r)
8 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

NEW



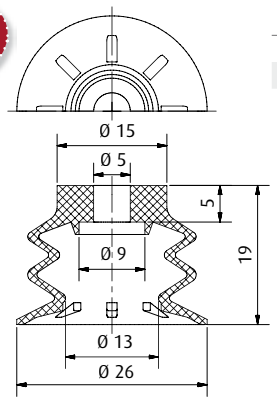
① = Filter screen ② = O-ring

Item no. 20.026.148._*
Material Varioflex® 60/30° (sw/r)
8 mm

Additional sizes available are found on p. 110.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

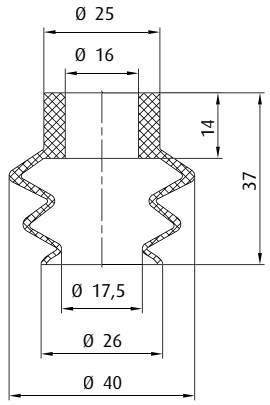
NEW



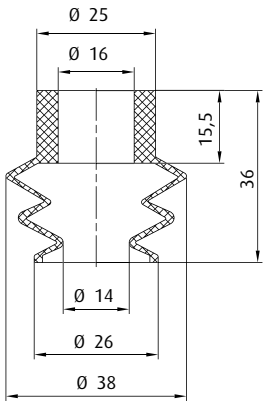
	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no. 21.026.162._*
Material NR (br)
9 mm

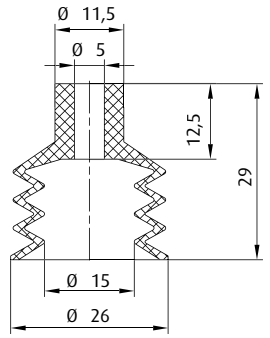
Additional sizes available are found on p. 23.



Item no. 27.026.005._*
Material SI (tr)
16 mm

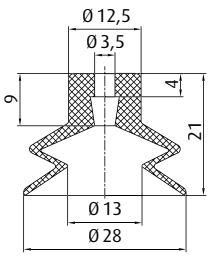


Item no. 27.026.015._*
Material SI (tr)
16 mm



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

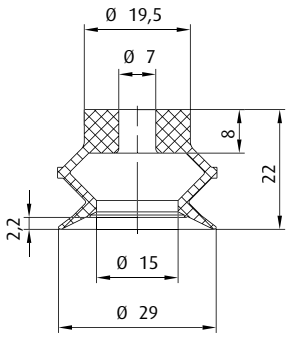
Item no. 25.025.003._*
Material SI (tr), NR (sw)
9 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 23.028.113._*
Material Vinyl (bl)
9 mm

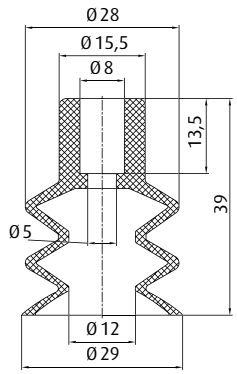
Additional sizes available are found on p. 113.



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 23.030.088._*
Material NBR (gr), SI (tr), PU (bg)
10 mm

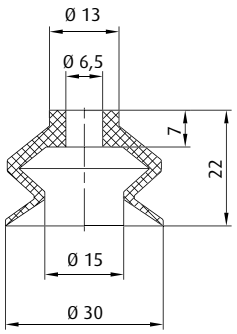
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 21.029.069._*
Material Vinyl (bl)
10 mm

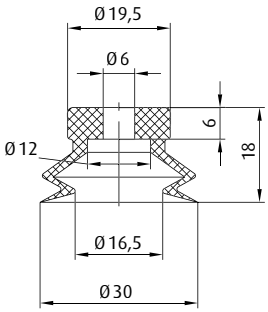
Additional sizes available are found on p. 116.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. 23.030.107._*
Material Vinyl (bl)
10.5 mm

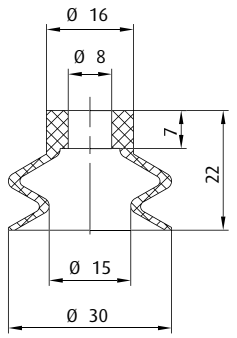
Additional sizes available are found on p. 113.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

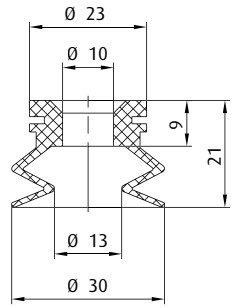
Item no. 23.030.155._*
Material SI (tr)
4.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 15 mm, 20 mm



	Connection	see page
270.255	M8-male	415
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

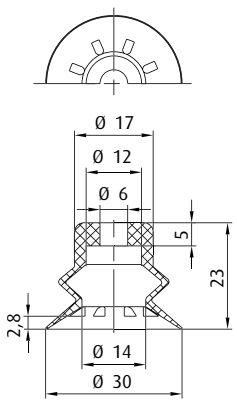
Item no. 23.030.193._*
Material Vulkollan® (br)
8 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 23.030.230._*
Material NR (gr)
7 mm

Additional sizes available are found on p. 130.



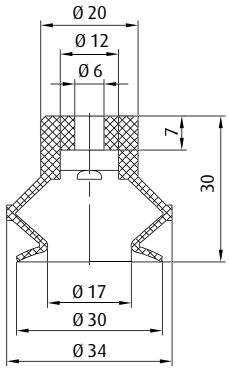
	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. 23.030.141._*
Material NBR (sw), SI (tr)
8 mm

Additional sizes available are found on p. 119.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

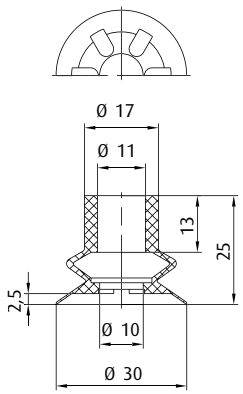


	Connection	see page
270.312/19	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

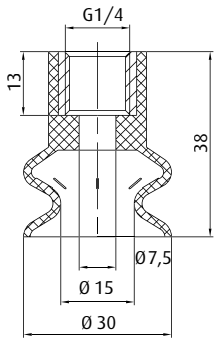
Item no. 23.030.170._*
Material Vulkollan® (br)
8 mm

Additional sizes available are found on p. 97.



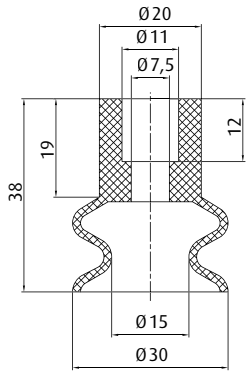
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 23.033.134._*
Material Vinyl (bl)
10 mm



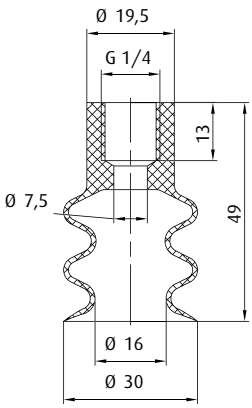
Item no. 22.030.035._*
Material SI (tr), NR (sw)
16 mm

This vacuum cup is also available in the following dimensions: 40 mm, 44 mm, 50 mm



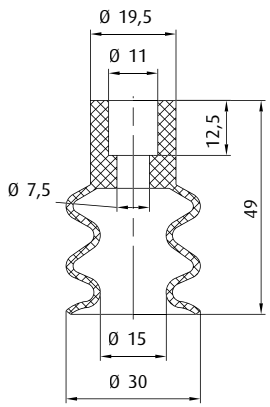
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 23.030.038._*
Material NBR (sw), SI (tr)
16 mm



Item no. 20.030.044._*
Material SI (tr), NR (sw)
19 mm

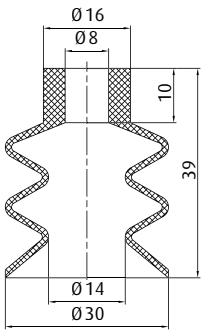
This vacuum cup is also available in the following dimensions: 40 mm, 50 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 21.030.021._*
Material SI (tr), NR (sw), NR (bg)
18 mm

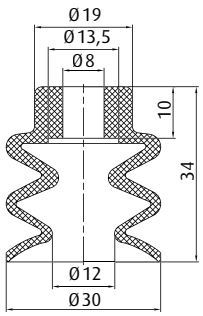
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.315	M6-male	414
270.132	G1/8-male	417
270.114	G1/8-female	422
270.540	G1/4-male	429
270.539	G1/4-female	434

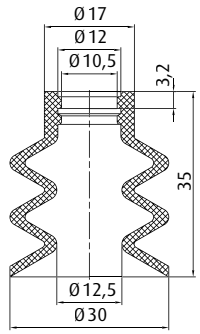
Item no. **21.030.018._***
Material NBR (sw), SI (r)
18 mm

This vacuum cup is also available in the following dimensions: 15 mm, 20 mm



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

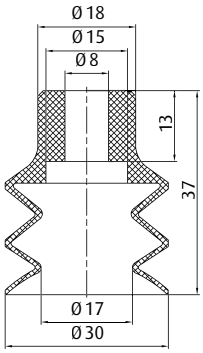
Item no. **21.030.019._***
Material NBR (sw), SI (r), NR (bg), PU (bl)
13 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. **21.030.022._***
Material NBR (sw), SI (bl)
14 mm

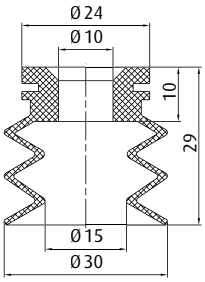
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 40 mm



	Connection	see page
270.315	M6-male	414
270.132	G1/8-male	417
270.114	G1/8-female	422
270.190	G1/4-male	428
270.540	G1/4-male	429
270.192	G1/4-female	432
270.539	G1/4-female	434

Item no. **21.032.091._***
Material Vulkollan® (br)
16 mm

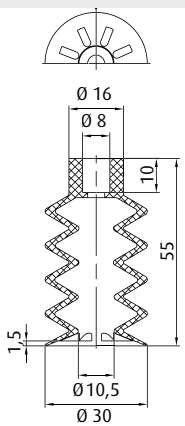
Additional sizes available are found on p. 97.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **21.030.030._***
Material SI (tr), NR (bl)
13 mm

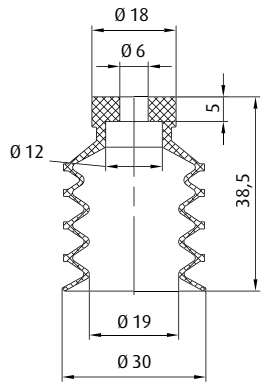
Additional sizes available are found on p. 130.



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. **25.030.030._***
Material NBR (sw), SI (tr)
27 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



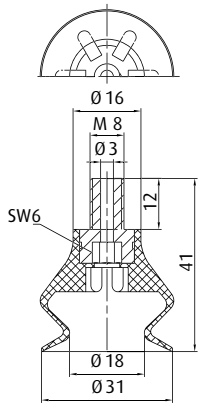
	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

Item no. **25.030.046._***

Material NBR (sw), SI (tr)

14 mm

Additional sizes available are found on p. 124.

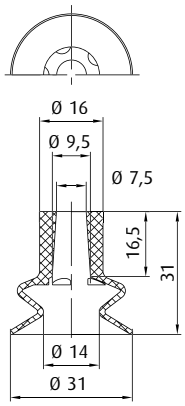


Item no. **22.030.036._***

Material NBR (sw), SI (tr), NR (sw)

9 mm

This vacuum cup is also available in the following dimensions: 25 mm, 44 mm



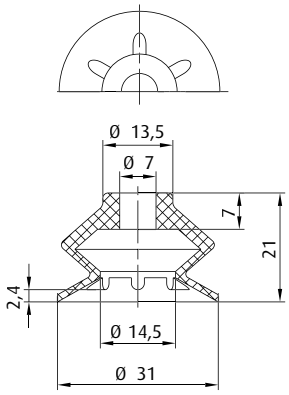
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

Item no. **23.030.035._***

Material NBR (sw), SI (r)

11 mm

This vacuum cup is also available in the following dimensions: 53 mm, 75 mm



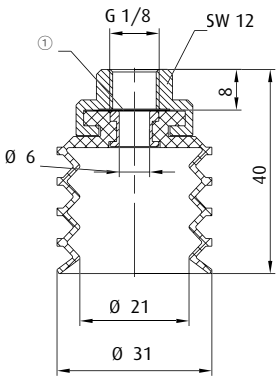
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no. **23.031.192._***

Material Vinyl (bl)

6 mm

Additional sizes available are found on p. 113.



① = Filter screen

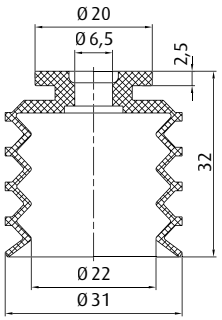
Item no. **24.030.039._***

Material SI (tr), CR (sw)

21 mm

Additional sizes available are found on p. 104.

Spare cup



	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

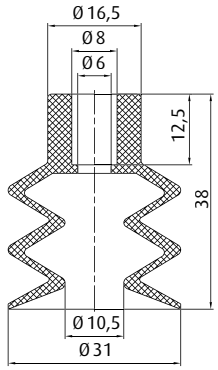
Item no. **25.030.026._***

Material SI (tr), CR (sw)

21 mm

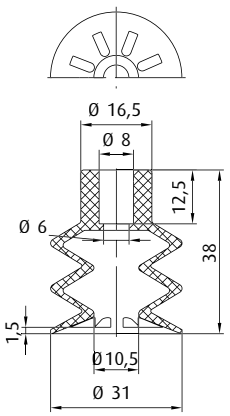
Additional sizes available are found on p. 100.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



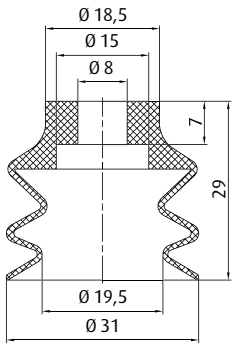
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
21.030.023._*	NBR (sw), SI (tr), NR (sw)	15 mm



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.	Material	
27.030.006._*	NBR (sw), SI (tr), NR (sw)	15 mm

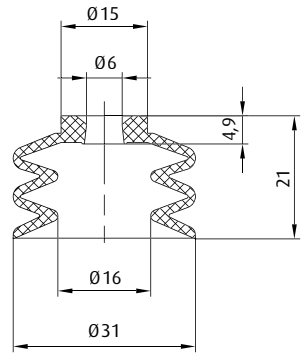


	Connection	see page
270.255	M8-male	415
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

WEAR-RESISTANT

Item no.	Material	
21.030.076._*	Vulkollan® (br)	14 mm

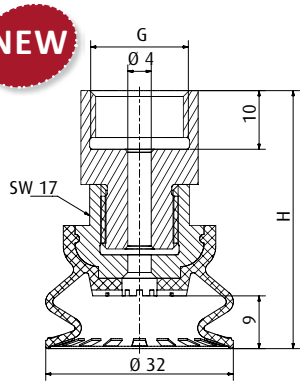
Additional sizes available are found on p. 97.



	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

Item no.	Material	
21.031.048._*	SI (tr), NR (sw)	6 mm

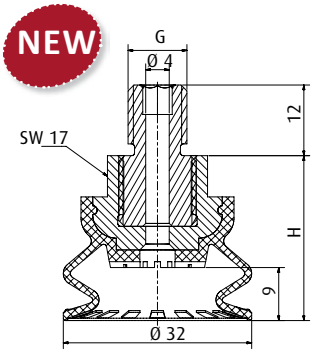
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.030.172._*	NBR (bl)	9	G1/4-female	28
22.030.173._*	NBR (bl)	9	G3/8-female	44

Additional sizes available are found on p. 133.

NEW

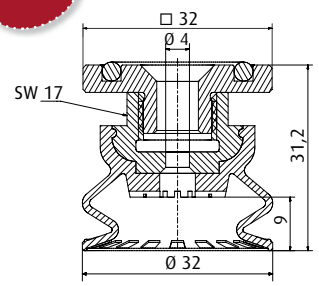


Item no.	Material	[mm]	Connection thread	H [mm]
22.030.171._*	NBR (bl)	9	G1/4-male	28
22.030.174._*	NBR (bl)	9	M10-male	28
22.030.175._*	NBR (bl)	9	M14x1.5-male	29

Additional sizes available are found on p. 133.

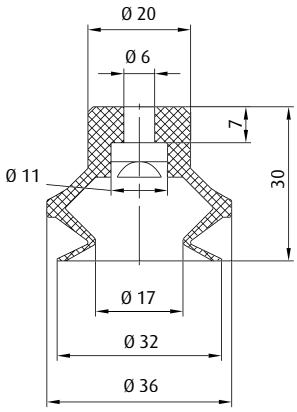
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

NEW



Item no.	Material	
22.030.176._*	NBR (bl)	9 mm

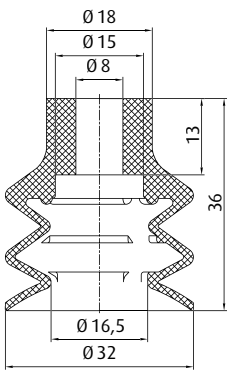
Additional sizes available are found on p. 133.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
23.030.125._*	NBR (sw), HNBR (ge), SI (tr), PU (bl)	9 mm

Additional sizes available are found on p. 86.
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 42 mm, 54 mm

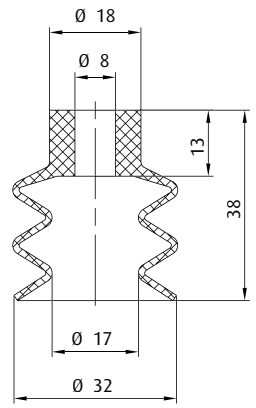


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

BESTSELLER

Item no.	Material	
21.032.075._*	NBR (sw), HNBR (ge), SI (tr), NR (gr), PU (bl)	13 mm

Additional sizes available are found on p. 89.

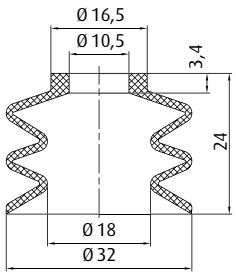


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

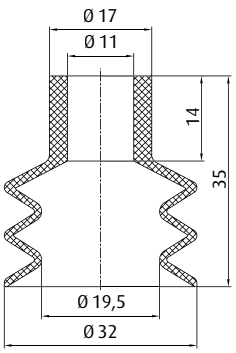
Item no.	Material	
21.032.154._*	Thermalon® (bl)	14.5 mm

Additional sizes available are found on p. 92.



	Connection	see page
270.521	M5-male	412
270.254	M6-male	415
270.256	M8-male	415

Item no.	Material	
21.032.067._*	Vinyl (bl)	10 mm

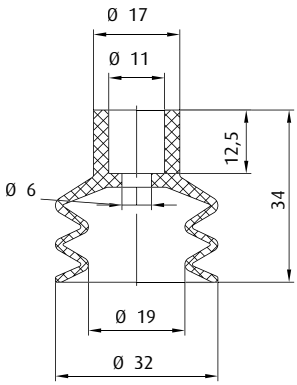


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
21.032.082._*	Vinyl (bl)	14 mm

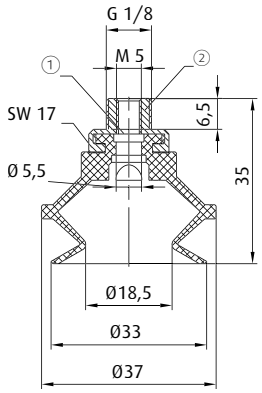
Additional sizes available are found on p. 116.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 21.032.081._*
Material NR (sw)
13 mm

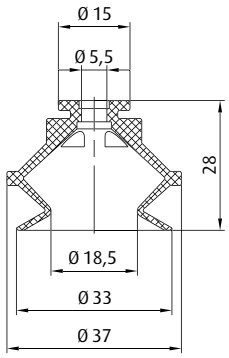


① = Filter screen ② = Aluminium

Item no. 22.030.033._*
Material Tepuflex® (or), SI (tr), CR (sw)
9 mm

Additional sizes available are found on p. 104.

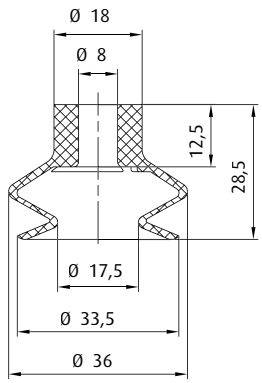
Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Item no. 23.030.037._*
Material Tepuflex® (or), SI (tr), CR (sw)
9 mm

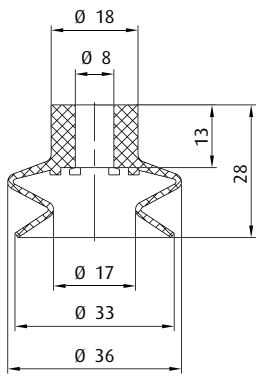
Additional sizes available are found on p. 100.



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

Item no. 23.033.039._*
Material NBR (sw), SI (tr), NR (gr)
12 mm

Additional sizes available are found on p. 81.

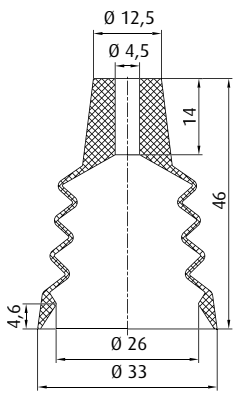


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

Item no. 23.033.241._*
Material Thermalon® (bl)
11 mm

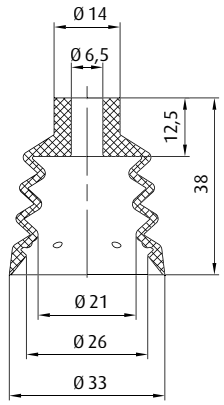
Additional sizes available are found on p. 84.



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 27.033.017._*
Material SI (tr)
25 mm

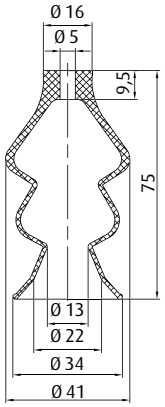
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

Item no. 27.033.008._*
Material SI (tr)
16 mm

Additional sizes available are found on p. 129.

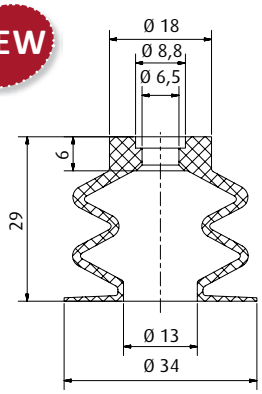


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no. 27.034.023._*
Material SI (r)
39 mm

Additional sizes available are found on p. 129.

NEW

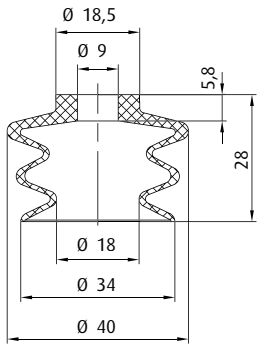


	Connection	see page
270.039	M6-male	414

IDEAL FOR WAFERS

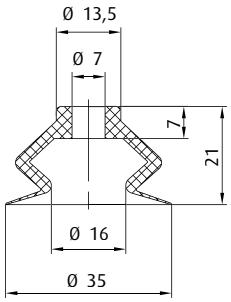
Item no. 21.034.179._*
Material SI (tr)
12 mm

Additional sizes available are found on p. 126.



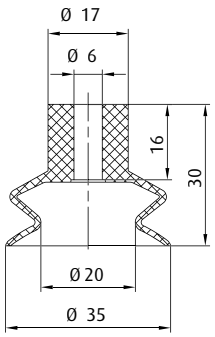
	Connection	see page
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

Item no. 27.034.003._*
Material Vulkollan® (br)
18 mm



	Connection	see page
270.312/19	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

Item no. 23.035.106._*
Material Vinyl (bl)
14 mm



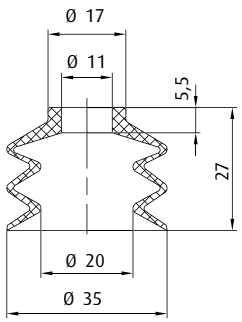
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

BESTSELLER

Item no. 23.035.111._*
Material Vinyl (bl)
12 mm

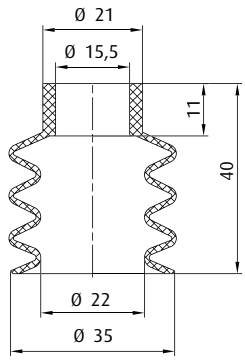
Additional sizes available are found on p. 113.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

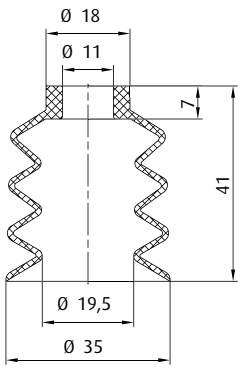


	Connection	see page
270.313	M8-male	415
270.177	M10-male	416
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no. 21.035.080._*
Material Vinyl (bl)
13 mm

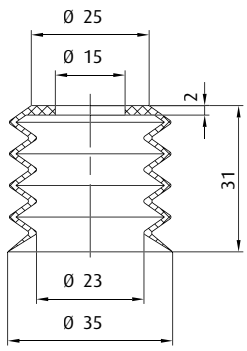


Item no. 25.035.011._*
Material NR (sw), SI (tr)
20 mm



	Connection	see page
270.313	M8-male	415
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 25.036.040._*
Material Vinyl (bl)
20 mm

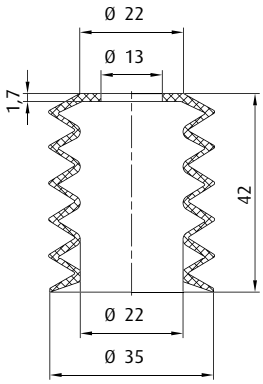


	Connection	see page
270.419	Without Thread	441

DETECTABLE

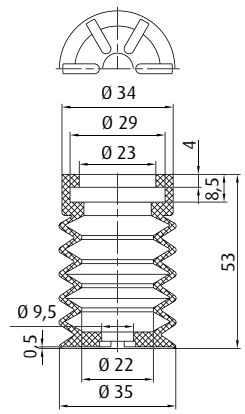
Item no. 25.035.069._*
Material SI (r)
25 mm

Additional sizes available are found on p. 128.



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

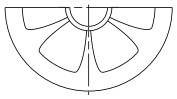
Item no. 25.035.010._*
Material SI (tr), NR (sw)
26.5 mm

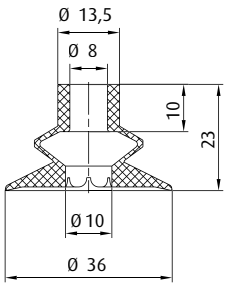


	Connection	see page
270.235	G1/8-female	438

Item no. 25.036.041._*
Material Vinyl (bl)
22 mm

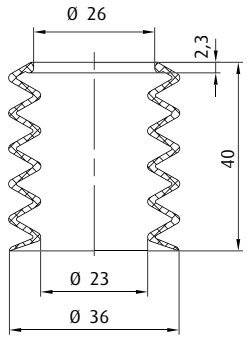
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760





	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

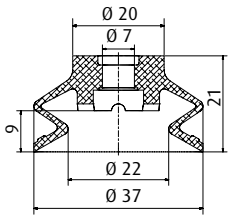
Item no.	Material	
27.036.011._*	SI (tr), NR (sw)	7 mm



Item no.	Material	
25.036.072._*	SI (tr)	24 mm

NEW

	Connection	see page
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

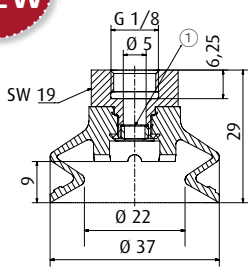


Item no.	Material	
23.037.266._*	Varioflex® 60/30° (sw/r)	9 mm

Additional sizes available are found on p. 107.

Spare cup

NEW



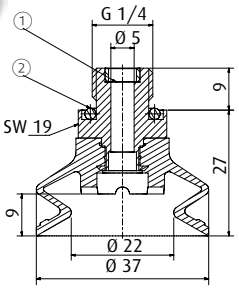
① = Filter screen

Item no.	Material	
22.037.257._*	Varioflex® 60/30° (sw/r)	9 mm

Additional sizes available are found on p. 107.

Spare cup

NEW



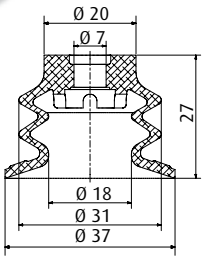
① = Filter screen ② = O-ring

Item no.	Material	
22.037.258._*	Varioflex® 60/30° (sw/r)	9 mm

Additional sizes available are found on p. 107.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

NEW



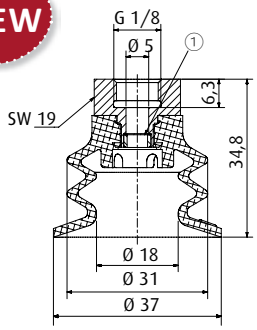
	Connection	see page
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no.	Material	
21.037.177._*	Varioflex® 60/30° (sw/r)	14 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

NEW



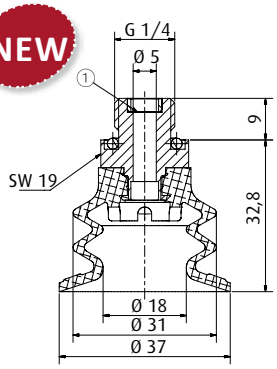
① = Filter screen

Item no.	Material	
20.037.149._*	Varioflex® 60/30° (sw/r)	14 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

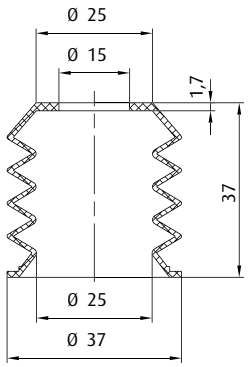
NEW



① = Filter screen

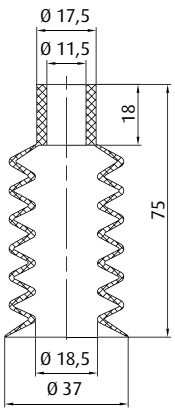
Item no.	Material	
20.037.150._*	Varioflex® 60/30° (sw/r)	14 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

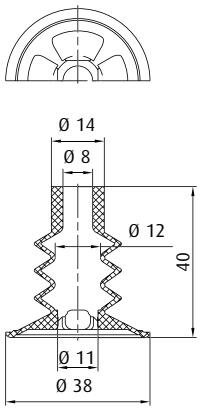
Item no.	Material	
25.037.012._*	SI (bl)	19 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

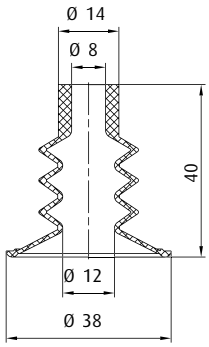
Item no.	Material	
25.038.039._*	Vinyl (bl)	35 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



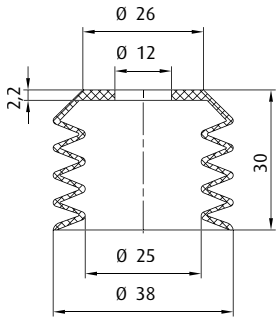
	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no. 27.038.012._*
Material SI (tr), NR (br)
16 mm



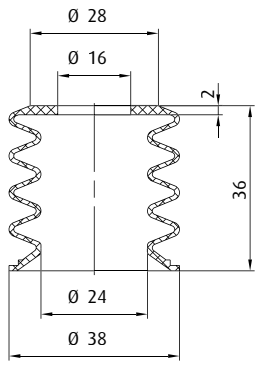
	Connection	see page
270.315	M6-male	414
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no. 27.038.020._*
Material SI (tr)
16 mm



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

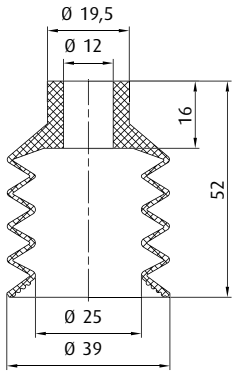
Item no. 25.038.014._*
Material SI (tr)
18 mm



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

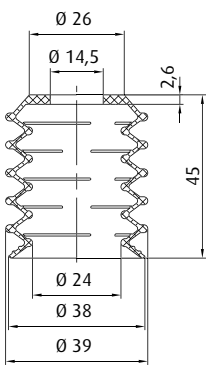
Item no. 25.038.016._*
Material SI (tr)
24 mm

Additional sizes available are found on p. 126.



	Connection	see page
270.049-1	G1/4-male	426

Item no. 25.038.015._*
Material NBR (sw), SI (tr)
23 mm

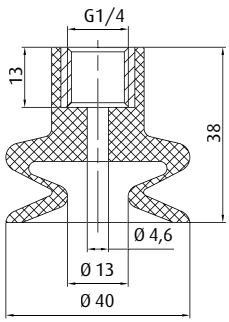


	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no. 27.039.017._*
Material SI (tr)
20 mm

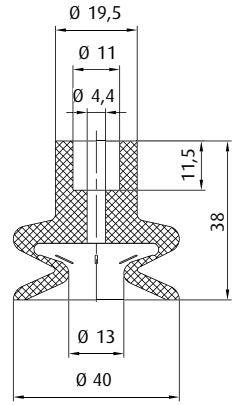
Additional sizes available are found on p. 126.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



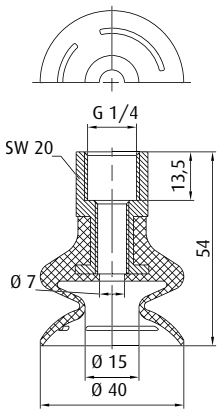
Item no.	Material	
22.040.046._*	SI (tr), NR (sw)	7 mm

This vacuum cup is also available in the following dimensions: 30 mm, 44 mm, 50 mm

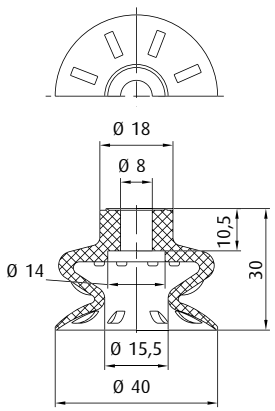


Connection	see page
270.177 M10-male	416
270.451 G1/4-male	426
270.452 G1/4-female	431

Item no.	Material	
23.040.044._*	SI (tr), NR (sw)	7 mm



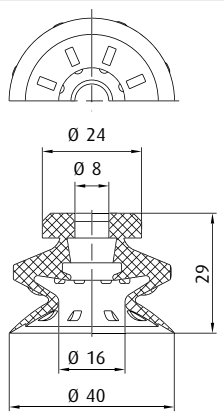
Item no.	Material	
22.040.048._*	NBR (sw), SI (tr)	12 mm



Connection	see page
270.093 G1/8-male	421
270.092 G1/8-female	424
270.249 G1/4-male	427
270.248 G1/4-female	433

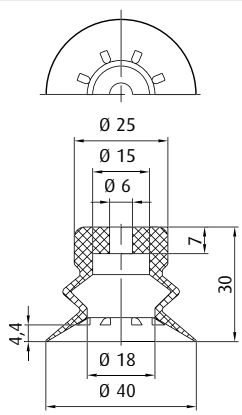
Item no.	Material	
23.040.042._*	NBR (sw), SI (r), NR (bg)	13 mm

This vacuum cup is also available in the following dimensions: 14 mm, 24 mm, 60 mm



Connection	see page
270.515 G1/4-male	425
270.434 G1/4-female	431

Item no.	Material	
23.040.223._*	NR (br)	7 mm



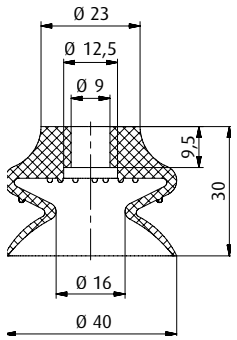
Connection	see page
270.498 M6-male	414
270.486 G1/8-male	420
270.485 G1/8-female	423
270.487 G1/4-male	429
270.488 G1/4-female	434

		see page
50.170	20 mm	456
50.171	30 mm	456
50.172	40 mm	456
50.173	50 mm	456

Item no.	Material	
23.040.142._*	NBR (sw), SI (tr)	9.5 mm

Additional sizes available are found on p. 119.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

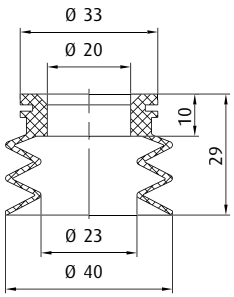


	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434

Item no. 23.040.176._*

Material Vulkollan® (br)

12 mm

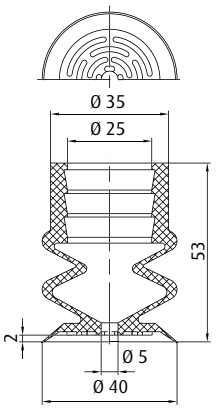


Item no. 21.040.132._*

Material SI (tr), SI (bl)

11 mm

Additional sizes available are found on p. 130.



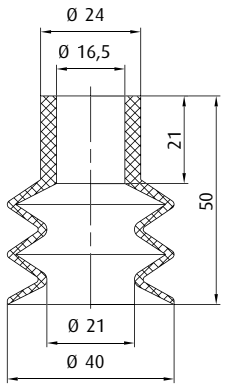
	Connection	see page
270.438	G1/4-male	427
270.442	G3/8-male	435

Item no. 21.040.141._*

Material NR (bg)

18 mm

Additional sizes available are found on p. 23.



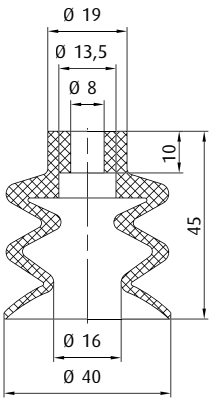
	Connection	see page
270.116	G1/4-female	432

Item no. 21.040.024._*

Material NBR (sw), SI (tr)

18 mm

This vacuum cup is also available in the following dimensions: 60 mm

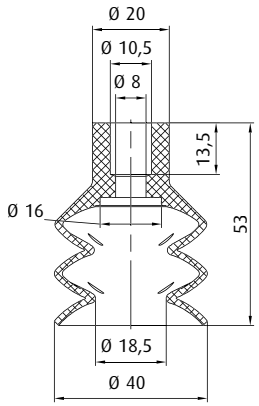


	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no. 21.040.025._*

Material NBR (sw), SI (r), NR (bg), PU (bl)

20 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

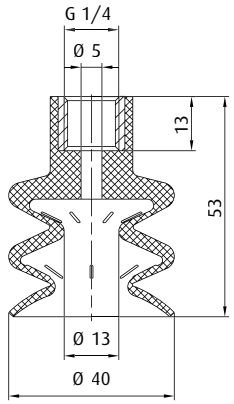
Item no. 21.040.027._*

Material NBR (sw), SI (tr), NR (br), Vinyl (bl)

16 mm

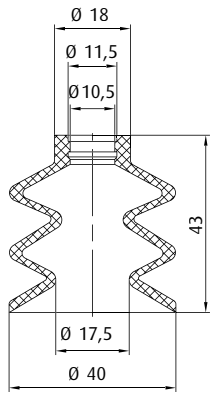
Additional sizes available are found on p. 116.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
20.040.054._*	NBR (sw), SI (tr), NR (sw), NR (bg)	16 mm

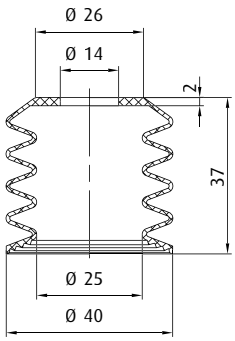
This vacuum cup is also available in the following dimensions: 30 mm, 50 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
21.040.028._*	NBR (sw), SI (bl)	20 mm

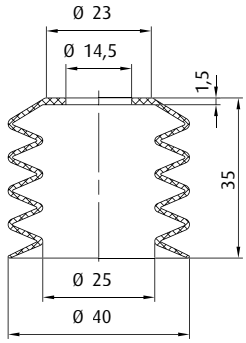
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no.	Material	
25.040.043._*	SI (tr)	24 mm

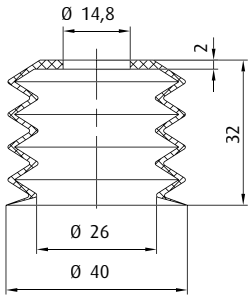
Additional sizes available are found on p. 126.



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no.	Material	
25.040.058._*	SI (bl)	25 mm

Additional sizes available are found on p. 126.

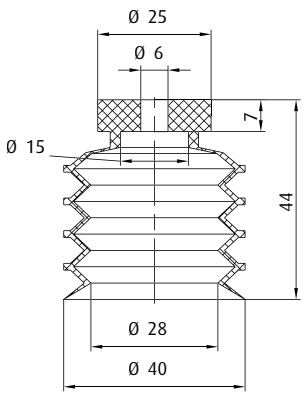


	Connection	see page
270.419	Without Thread	441

DETECTABLE

Item no.	Material	
25.040.066._*	SI (br), SI (bl)	28 mm

Additional sizes available are found on p. 128.

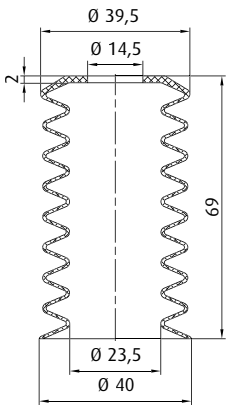


	Connection	see page
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

Item no.	Material	
25.040.047._*	NBR (sw), SI (tr)	19 mm

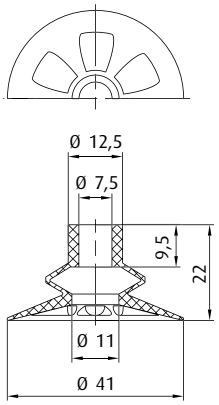
Additional sizes available are found on p. 124.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



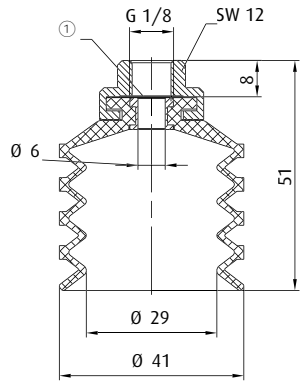
	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no. 25.040.019._*
Material SI (tr)
40 mm



	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no. 23.040.084._*
Material NBR (sw), SI (tr)
9 mm

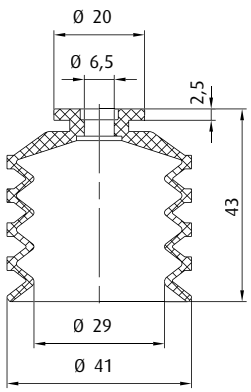


① = Filter screen

Item no. 24.040.074._*
Material SI (tr), CR (sw)
20 mm

Additional sizes available are found on p. 104.

Spare cup

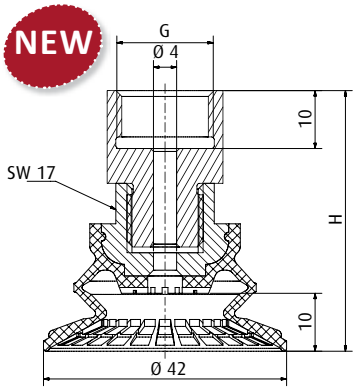


	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no. 25.040.027._*
Material SI (tr), CR (sw)
20 mm

Additional sizes available are found on p. 100.

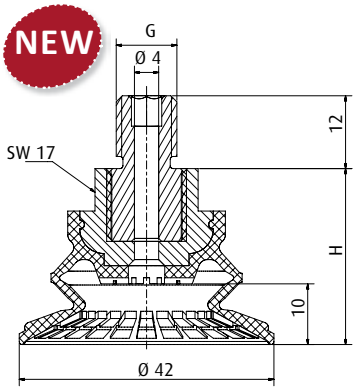
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.040.178._*	NBR (bl)	10	G1/4-female	29
22.040.179._*	NBR (bl)	10	G3/8-female	29

Additional sizes available are found on p. 133.

NEW

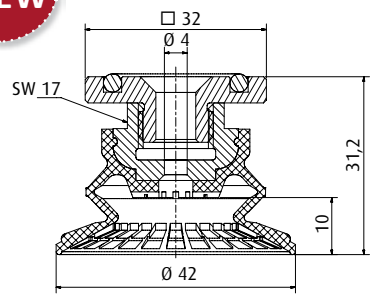


Item no.	Material	[mm]	Connection thread	H [mm]
22.040.177._*	NBR (bl)	10	G1/4-male	29
22.040.180._*	NBR (bl)	10	M10-male	29
22.040.181._*	NBR (bl)	10	M14x1.5-male	29

Additional sizes available are found on p. 133.

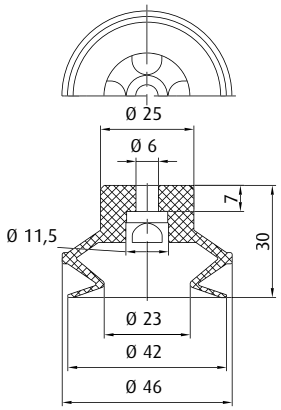
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

NEW



Item no.	Material	
22.040.182._*	NBR (bl)	10 mm

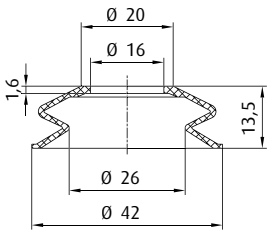
Additional sizes available are found on p. 133.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.	Material	
23.040.126._*	NBR (sw), SI (tr), PU (bl)	10 mm

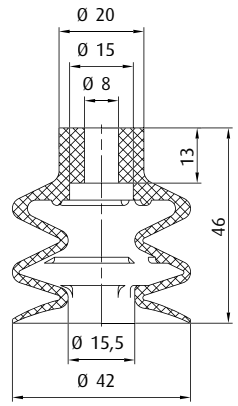
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 32 mm, 54 mm



	Connection	see page
270.419	Without Thread	441
270.182.U	G1/4-male	431
270.182	G1/4-female	434

Item no.	Material	
23.042.048._*	SI (tr), NR (sw), NR (br)	11 mm

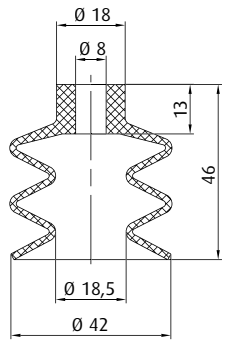
This vacuum cup is also available in the following dimensions: 47 mm



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

Item no.	Material	
21.043.049._*	NBR (sw), HNBR (ge), SI (tr), NR (gr)	19 mm

Additional sizes available are found on p. 89.



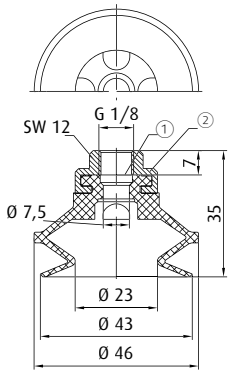
	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
21.042.155._*	Thermalon® (bl)	22 mm

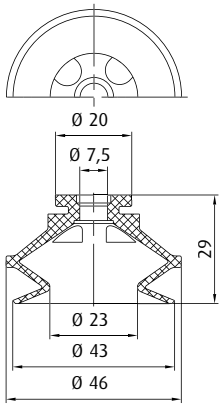
Additional sizes available are found on p. 92.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen ② = Aluminium

Spare cup



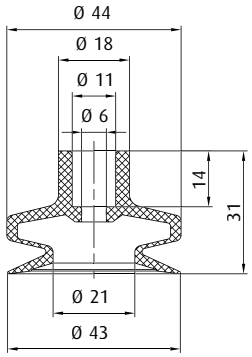
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no.	Material	
22.040.045._*	Tepuflex® (or), SI (tr), CR (sw)	9 mm

Additional sizes available are found on p. 104.

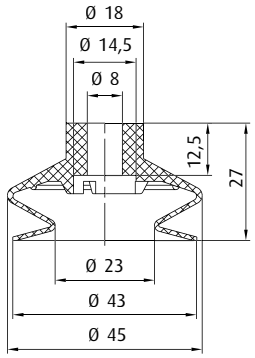
Item no.	Material	
23.040.045._*	Tepuflex® (or), SI (tr), CR (sw)	9 mm

Additional sizes available are found on p. 100.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

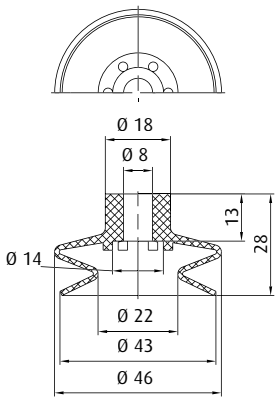
Item no.	Material	
23.042.049._*	SI (tr), NR (sw)	14 mm



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

Item no.	Material	
23.043.096._*	NBR (sw), HNBR (ge), SI (tr), NR (gr)	12 mm

Additional sizes available are found on p. 81.

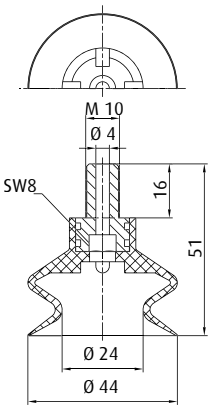


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
23.043.242._*	Thermalon® (bl)	12.5 mm

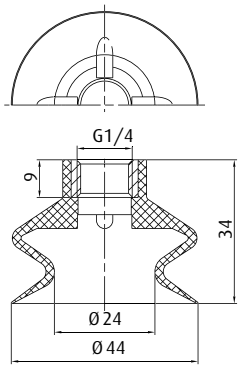
Additional sizes available are found on p. 84.



Item no.	Material	
22.044.054._*	SI (tr), NR (sw)	14 mm

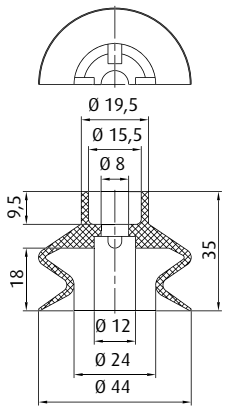
This vacuum cup is also available in the following dimensions: 25 mm, 31 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

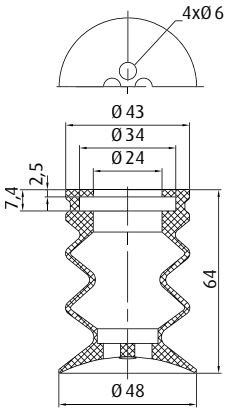


Item no.	Material	
22.044.034._*	SI (tr), NR (sw)	15 mm

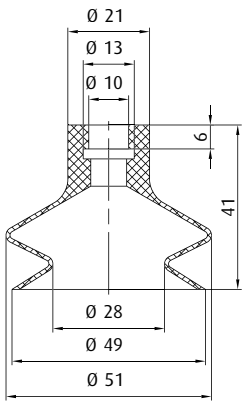
This vacuum cup is also available in the following dimensions: 30 mm, 40 mm, 50 mm



Item no.	Material	
23.044.091._*	SI (tr)	15 mm

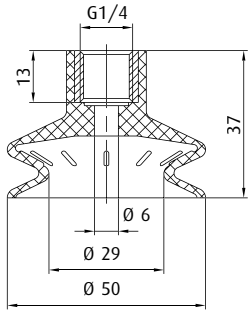


Item no.	Material	
25.048.056._*	SI (tr)	25 mm



	Connection	see page
270.213	G1/4-male	428
270.356	G1/4-female	433

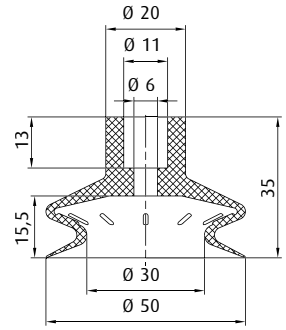
Item no.	Material	
23.049.199._*	Vulkollan® (br)	20 mm



Item no.	Material	
22.050.058._*	SI (tr), NR (br), NBR (sw)	12 mm

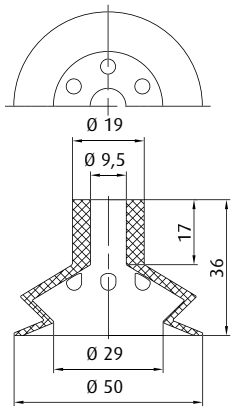
This vacuum cup is also available in the following dimensions: 30 mm, 40 mm, 44 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



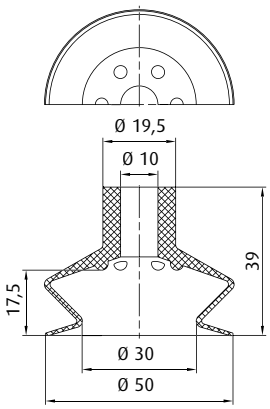
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **23.050.061._***
Material Sl (tr), NR (sw)
10 mm



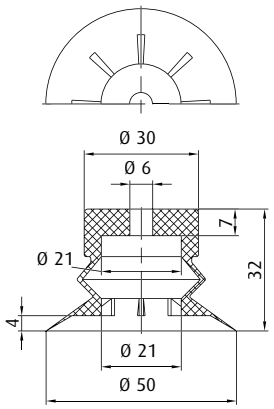
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **23.050.135._***
Material NBR (sw)
10 mm



	Connection	see page
270.177	M10-male	416
270.044	G1/4-male	426
270.452	G1/4-female	431

Item no. **23.050.188._***
Material NR (sw)
20 mm

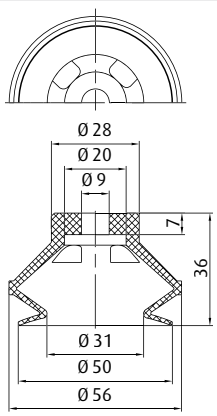


	Connection	see page
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

Item no. **23.050.143._***
Material NBR (sw), Sl (tr)
11 mm

Additional sizes available are found on p. 119.



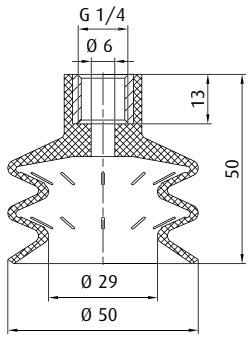
	Connection	see page
270.314	M6-male	415
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

Item no. **23.050.171._***
Material Vulkollan® (br)
10 mm

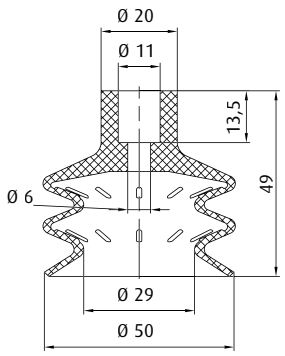
Additional sizes available are found on p. 97.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



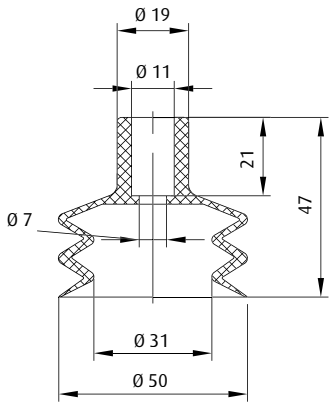
Item no.	Material	
20.050.064._*	Sl (tr), NR (sw), NR (bg)	18 mm

This vacuum cup is also available in the following dimensions: 30 mm, 40 mm



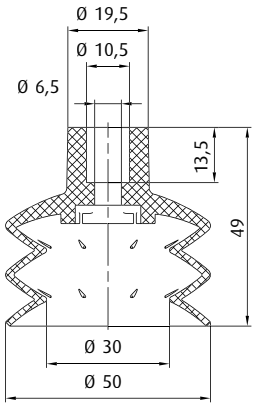
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
21.050.031._*	NBR (sw), Sl (tr), NR (sw), NR (br), PU (tr)	18 mm



	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

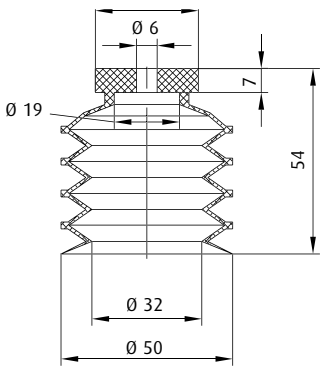
Item no.	Material	
21.050.065._*	Vinyl (bl)	25 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
21.050.084._*	Vinyl (bl)	20 mm

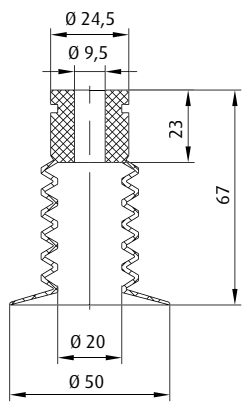
Additional sizes available are found on p. 116.



	Connection	see page
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

Item no.	Material	
25.050.048._*	NBR (sw), Sl (tr)	26 mm

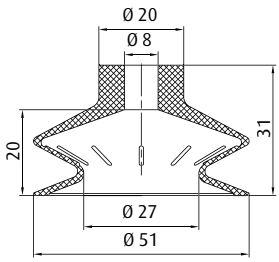
Additional sizes available are found on p. 124.



	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.044	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
25.050.054._*	NBR (sw), Sl (tr)	29 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

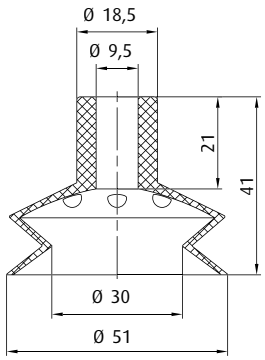


	Connection	see page
270.315	M6-male	414
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no. **23.050.029._***

Material Sl (tr), NR (sw)

10 mm



	Connection	see page
270.132	G1/8-male	417
270.208	G1/4-male	425
270.452	G1/4-female	431

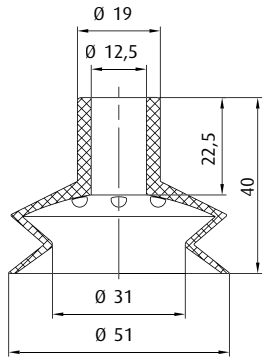
BESTSELLER

Item no. **23.052.116._***

Material Vinyl (bl)

6 mm

Additional sizes available are found on p. 113.

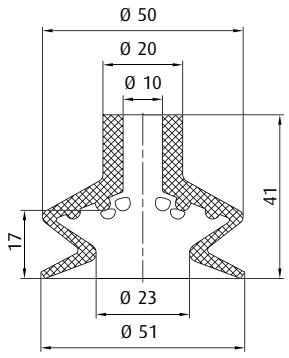


	Connection	see page
270.207	G1/4-male	426

Item no. **23.052.117._***

Material Sl (tr), Vinyl (bl)

6 mm

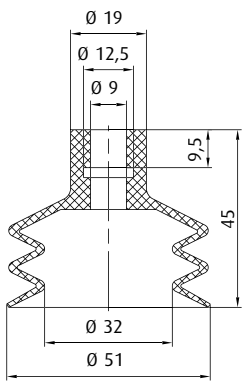


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. **23.050.056._***

Material NBR (sw), Sl (tr), NR (sw)

11 mm



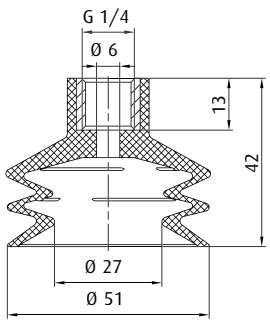
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.204	G1/4-male	427
270.324	G1/4-female	432

Item no. **21.051.097._***

Material Vulkollan® (br)

18 mm

Additional sizes available are found on p. 97.

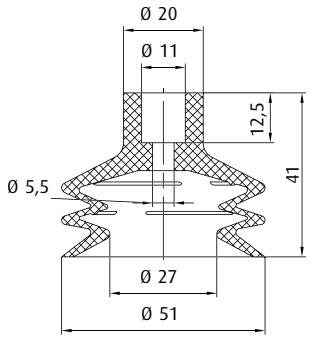


Item no. **20.050.065._***

Material Sl (tr), NR (sw)

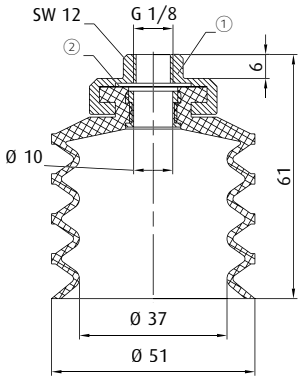
8 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
21.050.032._*	NBR (sw), SI (tr), NR (sw), NR (br)	8 mm

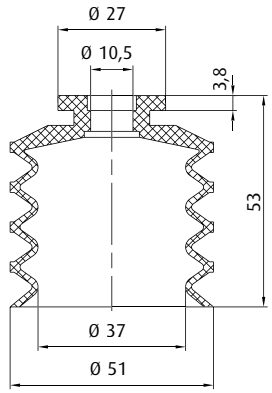


① = Filter screen ② = Aluminium

Item no.	Material	
24.050.087._*	SI (tr), CR (sw)	30 mm

Additional sizes available are found on p. 104.

Spare cup

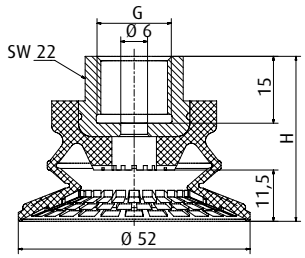


	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Item no.	Material	
25.050.028._*	SI (tr), CR (sw)	25 mm

Additional sizes available are found on p. 100.

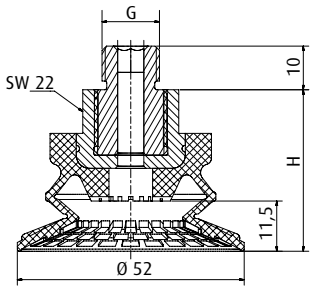
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.050.184._*	NBR (bl)	11.5	G1/4-female	42
22.050.185._*	NBR (bl)	11.5	G3/8-female	37

Additional sizes available are found on p. 133.

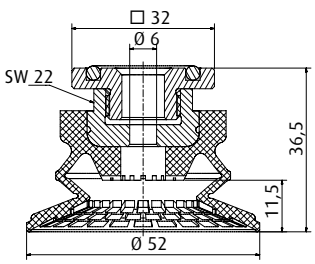
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.050.183._*	NBR (bl)	11.5	G1/4-male	37
22.050.186._*	NBR (bl)	11.5	M10-male	37
22.050.187._*	NBR (bl)	11.5	M14x1.5-male	37

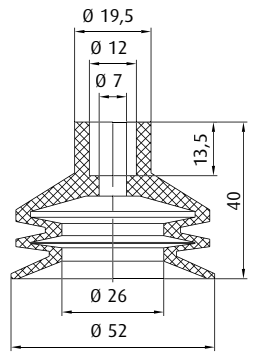
Additional sizes available are found on p. 133.

NEW



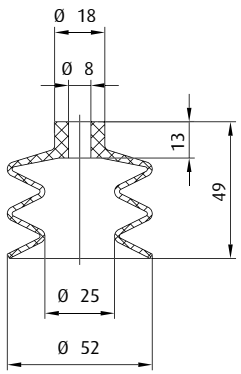
Item no.	Material	
22.050.188._*	NBR (bl)	11.5 mm

Additional sizes available are found on p. 133.



	Connection	see page
270.101	G1/4-male	426

Item no. 21.052.033._*
Material NBR (sw)
12 mm

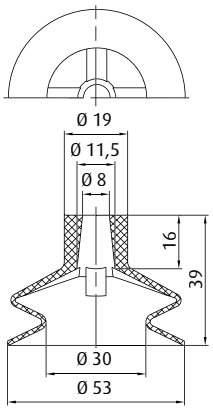


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

Item no. 21.052.156._*
Material Thermalon® (bl)
27 mm

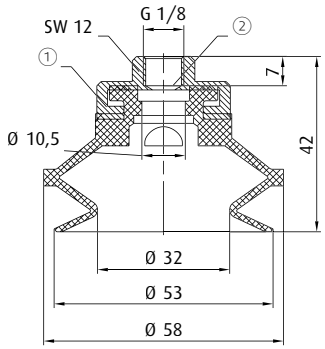
Additional sizes available are found on p. 92.



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.192	G1/4-female	432

Item no. 23.055.058._*
Material NBR (sw), SI (r)
11 mm

This vacuum cup is also available in the following dimensions: 31 mm, 75 mm

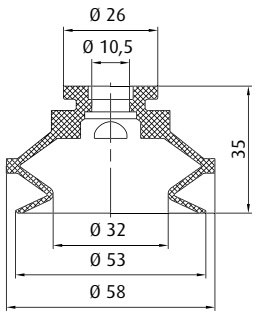


① = Filter screen ② = Aluminium

Item no. 22.050.056._*
Material Tepuflex® (or), SI (tr), CR (sw)
12 mm

Additional sizes available are found on p. 104.

Spare cup

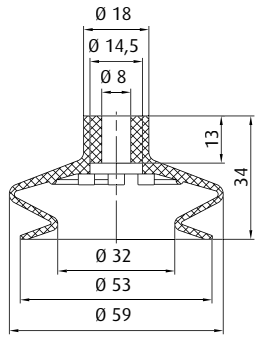


	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Item no. 23.050.054._*
Material Tepuflex® (or), SI (tr), CR (sw)
12 mm

Additional sizes available are found on p. 100.

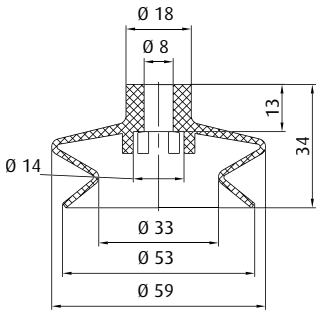
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

Item no.	Material	
23.053.033._*	NBR (sw), SI (tr), NR (gr)	11 mm

Additional sizes available are found on p. 81.



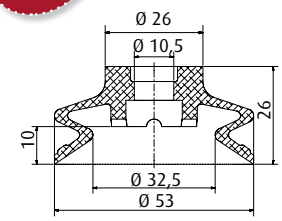
	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
23.053.243._*	Thermalon® (bl)	15 mm

Additional sizes available are found on p. 84.

NEW



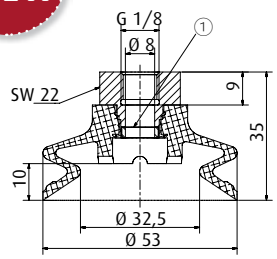
	Connection	see page
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Item no.	Material	
23.053.267._*	Varioflex® 60/30° (sw/r)	10 mm

Additional sizes available are found on p. 107.

Spare cup

NEW



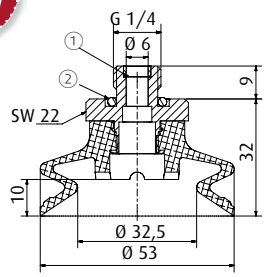
① = Filter screen

Item no.	Material	
22.053.259._*	Varioflex® 60/30° (sw/r)	10 mm

Additional sizes available are found on p. 107.

Spare cup

NEW

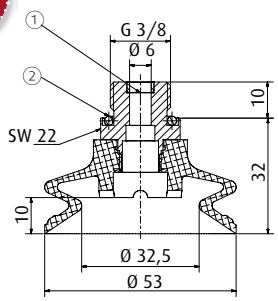


① = Filter screen ② = O-ring

Item no.	Material	
22.053.260._*	Varioflex® 60/30° (sw/r)	10 mm

Additional sizes available are found on p. 107.

NEW



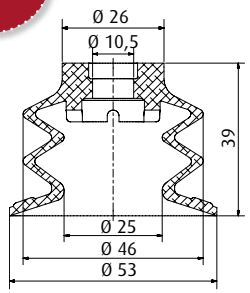
① = Filter screen ② = O-ring

Item no.	Material	
22.053.261._*	Varioflex® 60/30° (sw/r)	10 mm

Additional sizes available are found on p. 107.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

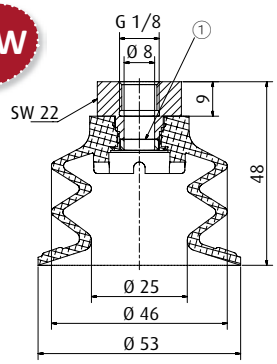
NEW



	Connection	see page
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

Spare cup

NEW



① = Filter screen

Item no.	Material	
21.053.178._*	Varioflex® 60/30° (sw/r)	19 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

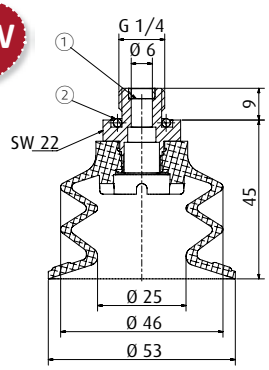
Item no.	Material	
20.053.151._*	Varioflex® 60/30° (sw/r)	19 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

Spare cup

NEW

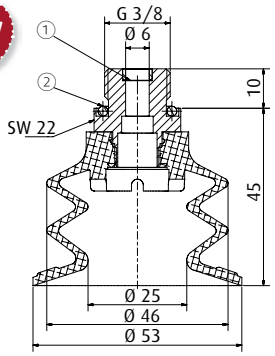


① = Filter screen ② = O-ring

Item no.	Material	
20.053.152._*	Varioflex® 60/30° (sw/r)	19 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

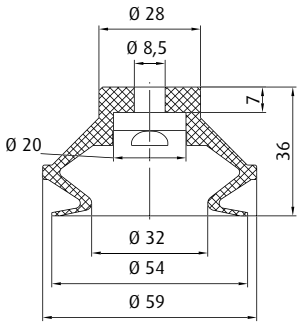
NEW



① = Filter screen ② = O-ring

Item no.	Material	
20.053.153._*	Varioflex® 60/30° (sw/r)	19 mm

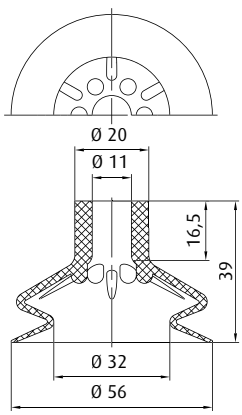
Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code



	Connection	see page
270.314	M6-male	415
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.492	G1/4-female	434

Item no.	Material	
23.050.127._*	NBR (sw), SI (tr), PU (bl)	10 mm

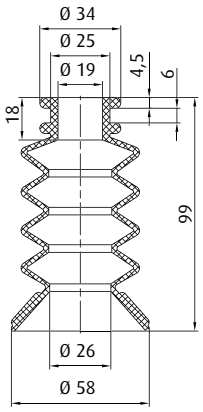
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 32 mm, 42 mm



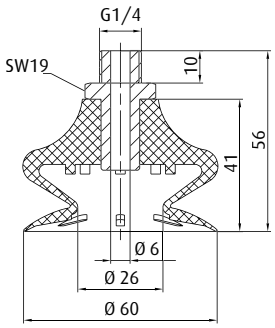
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	
23.056.150._*	SI (tr)	16 mm

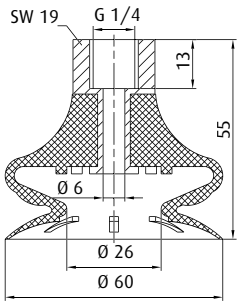
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



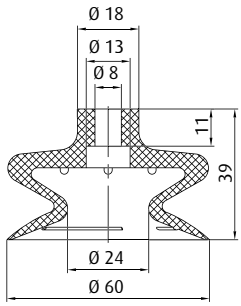
Item no.	Material	
25.058.049._*	Vinyl (bl)	55 mm



Item no.	Material	
22.060.142._*	Vulkollan® (br)	12 mm



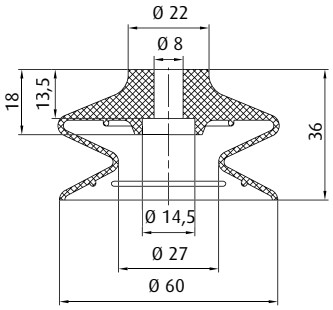
Item no.	Material	
22.060.143._*	Vulkollan® (br)	12 mm



	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

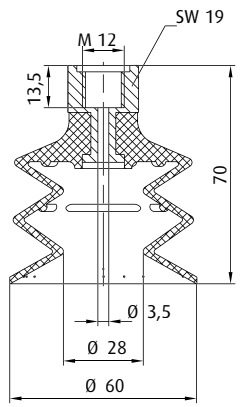
Item no.	Material	
23.060.059._*	NBR (sw), SI (r)	15 mm

This vacuum cup is also available in the following dimensions: 14 mm, 24 mm, 40 mm



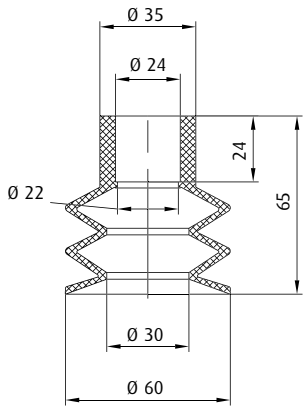
	Connection	see page
270.281	G1/4-male	428
270.282	G1/4-female	433

Item no.	Material	
23.060.172._*	SI (tr), NR (sw)	12 mm



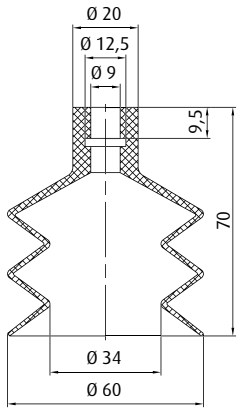
Item no.	Material	
20.060.101._*	NR (sw)	25 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



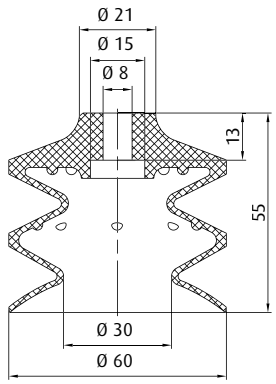
Item no.	Material	
21.060.035._*	EPDM (sw), SI (r)	27 mm

This vacuum cup is also available in the following dimensions: 40 mm



	Connection	see page
270.352	G1/8-male	420
270.204	G1/4-male	427
270.324	G1/4-female	432

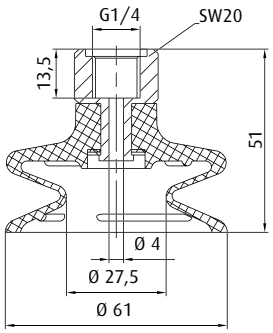
Item no.	Material	
21.060.099._*	Vulkollan® (br)	16 mm



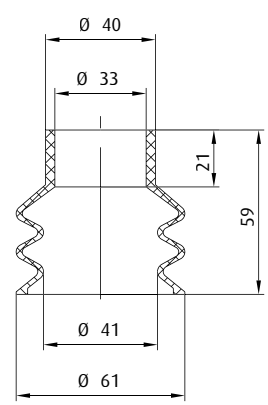
	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434

Item no.	Material	
21.062.092._*	Vulkollan® (br)	25 mm

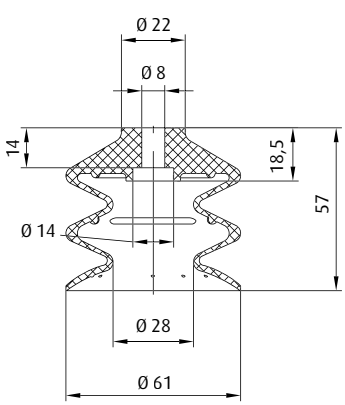
Additional sizes available are found on p. 97.



Item no.	Material	
22.060.107._*	SI (tr), NR (sw)	11 mm



Item no.	Material	
21.060.038._*	NBR (sw), SI (tr)	25 mm



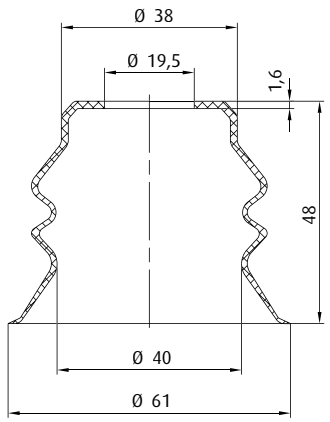
	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434

Item no.	Material	
21.060.051._*	HNBR (ge), SI (tr), NR (sw)	25 mm

Additional sizes available are found on p. 94.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

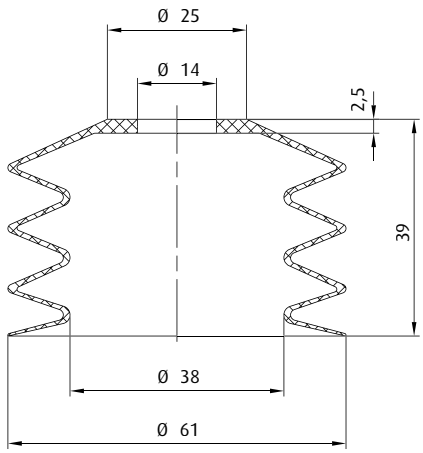
	Connection	see page
270.372	G1/2-male	437



Item no.	Material	
21.060.074._*	SI (tr)	12 mm

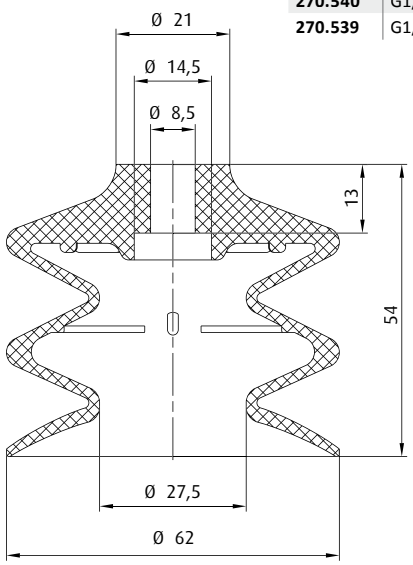
Additional sizes available are found on p. 126.

	Connection	see page
270.183	G1/4-male	431
270.182	G1/4-female	434



Item no.	Material	
25.060.033._*	NBR (sw), SI (br)	16 mm

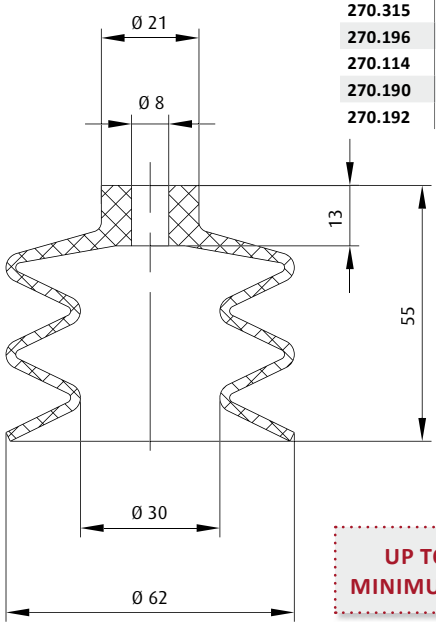
	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434



Item no.	Material	
21.062.055._*	NBR (sw), SI (tr)	25 mm

Additional sizes available are found on p. 89.

	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432



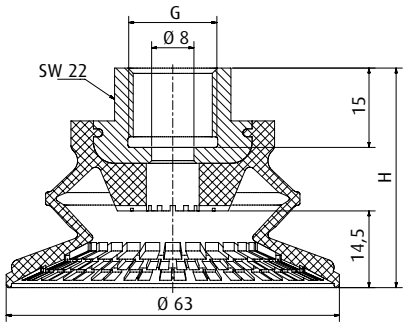
UP TO 160 °C & MINIMUM MARKING

Item no.	Material	
21.062.157._*	Thermalon® (bl)	31 mm

Additional sizes available are found on p. 92.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

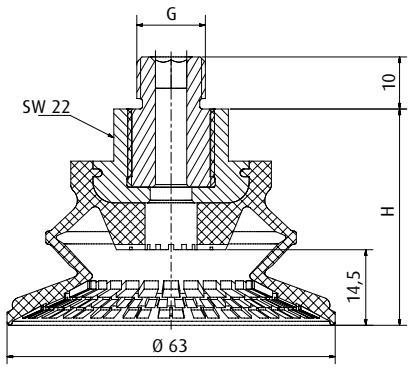
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.060.190._*	NBR (bl)	14.5	G1/4-female	46.5
22.060.191._*	NBR (bl)	14.5	G3/8-female	41.5

Additional sizes available are found on p. 133.

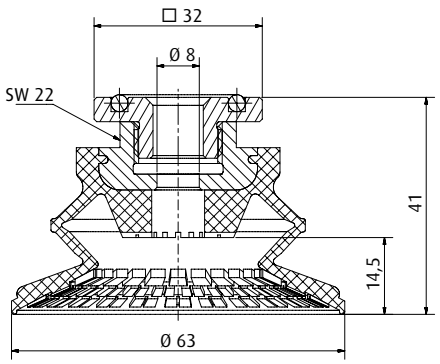
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.060.189._*	NBR (bl)	14.5	G1/4-male	41.5
22.060.192._*	NBR (bl)	14.5	M10-male	41.5
22.060.193._*	NBR (bl)	14.5	M14x1.5-male	41.5

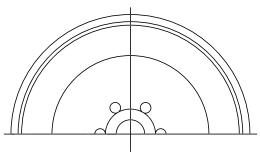
Additional sizes available are found on p. 133.

NEW

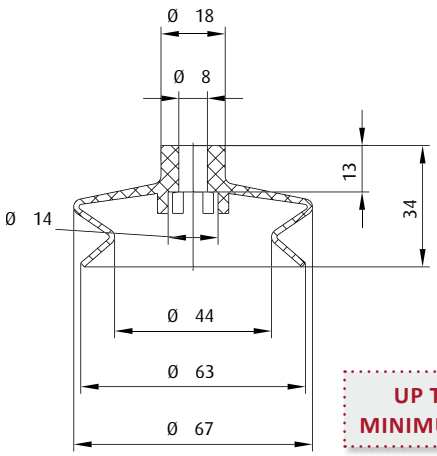


Item no.	Material	[mm]
22.060.194._*	NBR (bl)	14.5

Additional sizes available are found on p. 133.



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

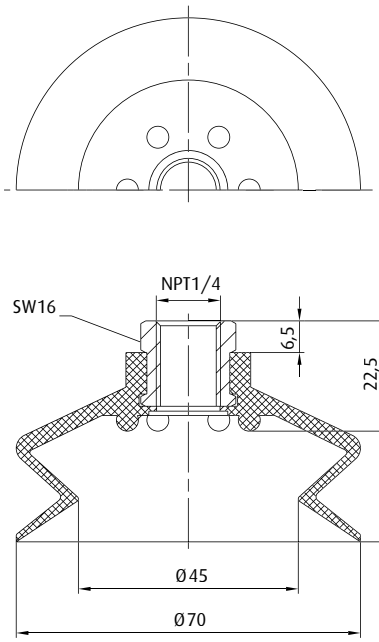


UP TO 160 °C & MINIMUM MARKING

Item no.	Material	[mm]
23.063.244._*	Thermalon® (bl)	15

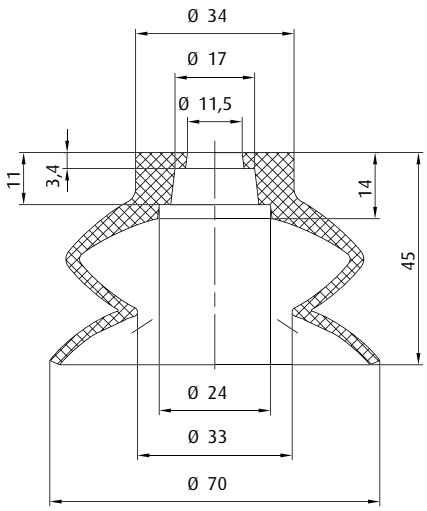
Additional sizes available are found on p. 84.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
22.070.127._*	Vinyl (bl)	13 mm

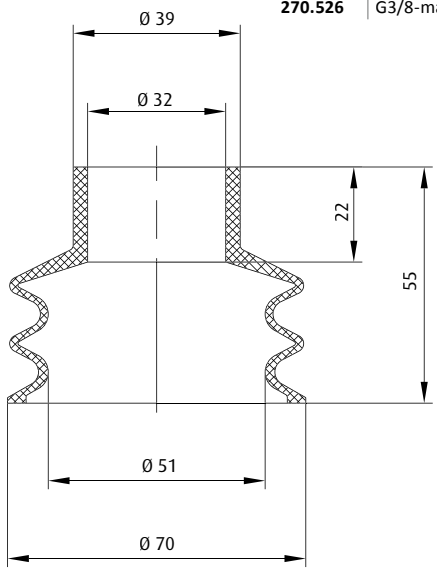
	Connection	see page
270.184	G1/4-male	431



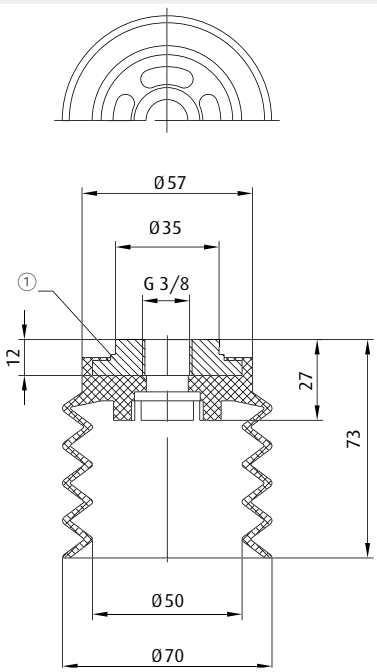
Item no.	Material	
23.070.060._*	NBR (sw), SI (tr), NR (sw), Vinyl (bl)	20 mm

Additional sizes available are found on p. 113.

	Connection	see page
270.526	G3/8-male	435



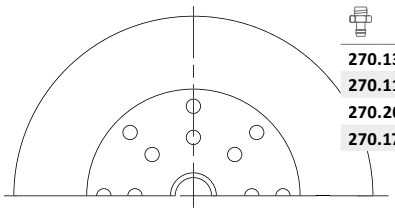
Item no.	Material	
21.070.041._*	NR (sw), SI (tr)	17 mm



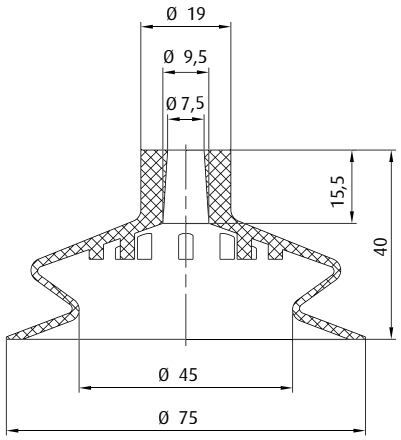
① = Aluminium

Item no.	Material	
25.069.050._*	Vinyl (bl)	32 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

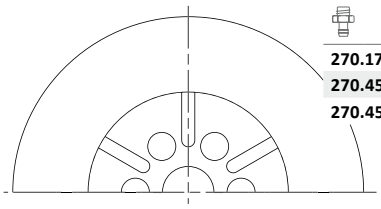


Item no. 23.075.063._*

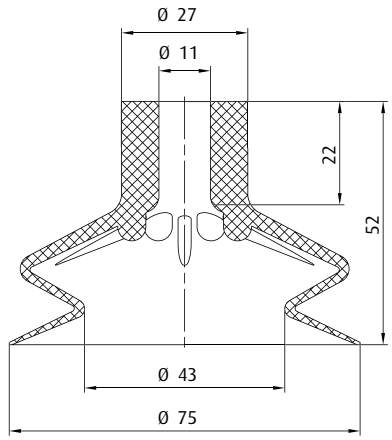
Material NBR (sw), SI (r)

17 mm

This vacuum cup is also available in the following dimensions: 31 mm, 53 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



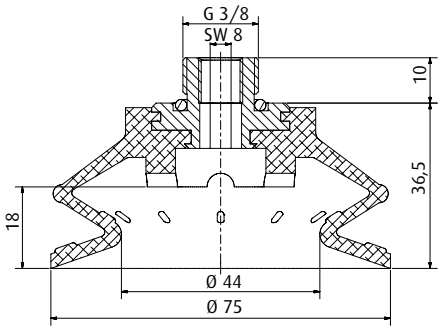
Item no. 23.075.151._*

Material NBR (sw), SI (tr)

20 mm

Additional sizes available are found on p. 81.

NEW



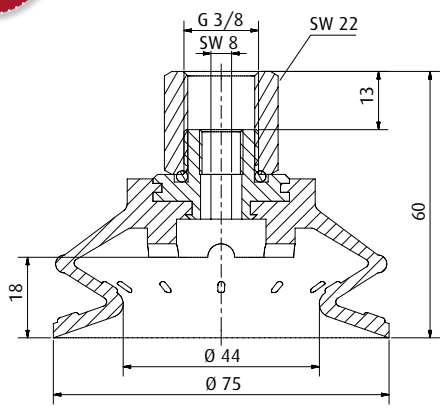
Item no. 22.075.262._*

Material Varioflex® 60/30° (sw/r)

18 mm

Additional sizes available are found on p. 107.

NEW



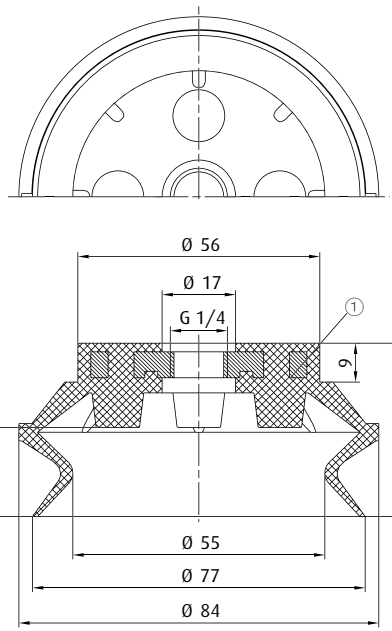
Item no. 22.075.263._*

Material Varioflex® 60/30° (sw/r)

18 mm

Additional sizes available are found on p. 107.

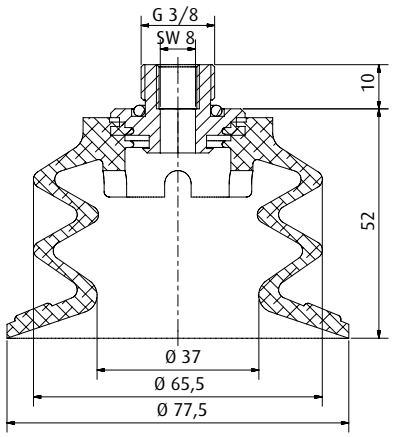
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium

Item no.	Material	
23.075.130._*	NBR (sw), SI (tr), PU (bl)	21 mm

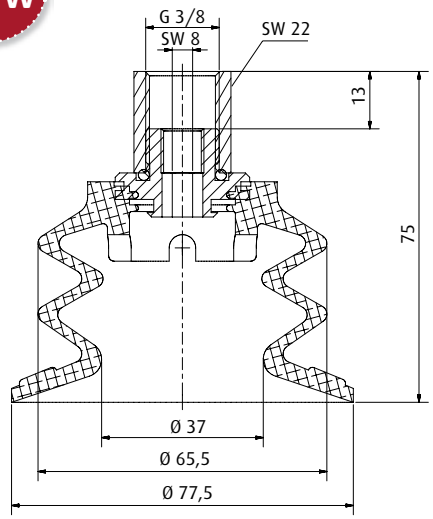
NEW



Item no.	Material	
20.077.154._*	Varioflex® 60/30° (sw/r)	25 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

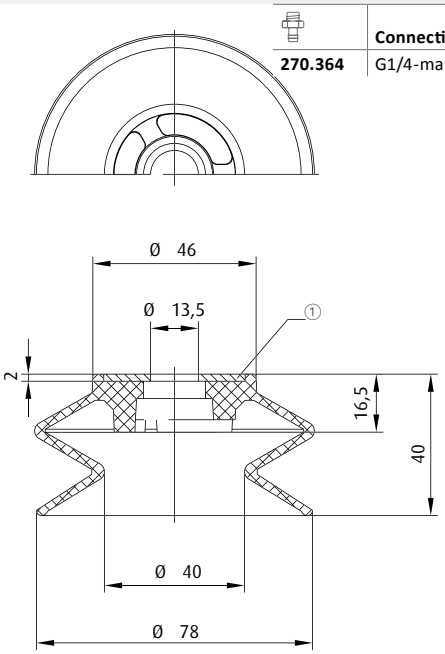
NEW



Item no.	Material	
20.077.155._*	Varioflex® 60/30° (sw/r)	25 mm

Additional sizes available are found on p. 110.
Ordering notes: For version with in bellows inserted filter disc please add "-FI" to material code

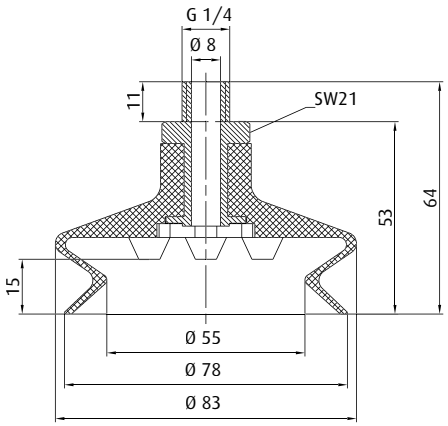
	Connection	see page
270.364	G1/4-male	430



① = Aluminium

Item no.	Material	
22.080.144._*	SBR (br)	23 mm

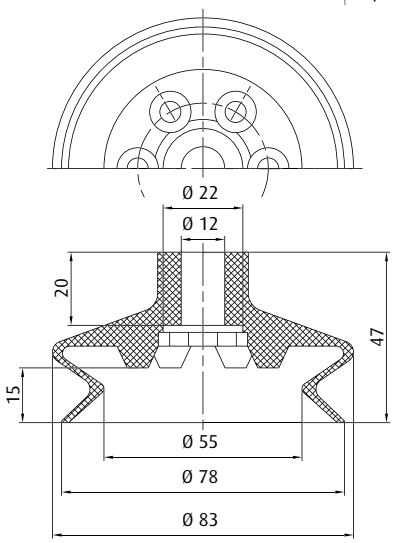
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
22.078.071._*	NBR (sw), SI (tr), NR (gr)	15 mm

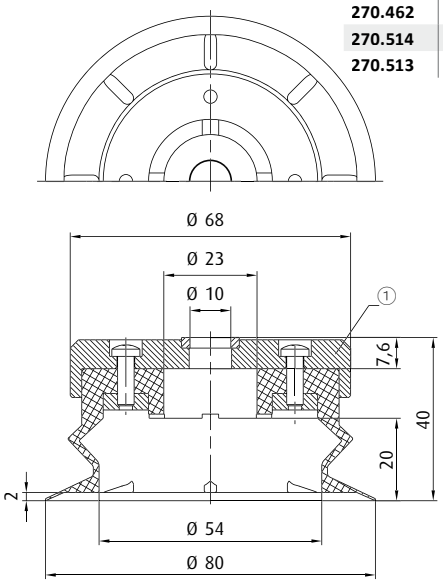
Spare cup

	Connection	see page
270.184	G1/4-male	431



Item no.	Material	
23.078.067._*	NBR (sw), SI (tr), NR (gr)	15 mm

	Connection	see page
270.462	M10-male	416
270.514	G1/4-male	429
270.513	G1/4-female	434



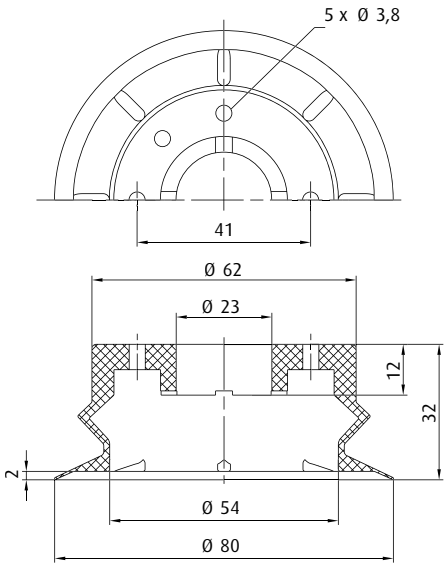
① = Aluminium

FLEXIBLE & STABLE

Item no.	Material	
22.080.161._*	NBR (sw), SI (tr)	10 mm

Additional sizes available are found on p. 119.

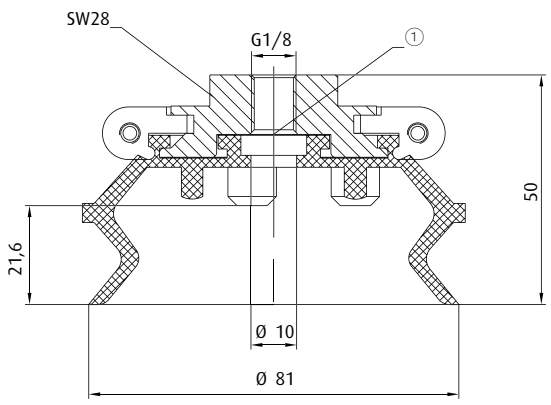
Spare cup



Item no.	Material	
23.080.144._*	NBR (sw), SI (tr)	10 mm

Additional sizes available are found on p. 119.

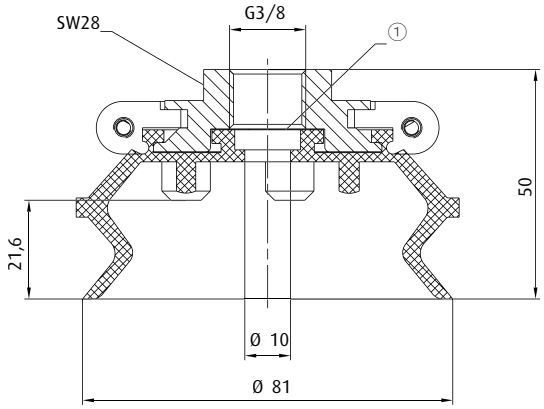
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material	
22.078.163._*	Tepuflex® (or), SI (tr), CR (sw)	22 mm

Additional sizes available are found on p. 104.



① = Filter screen

Item no.	Material	
22.078.166._*	Tepuflex® (or), SI (tr), CR (sw)	22 mm

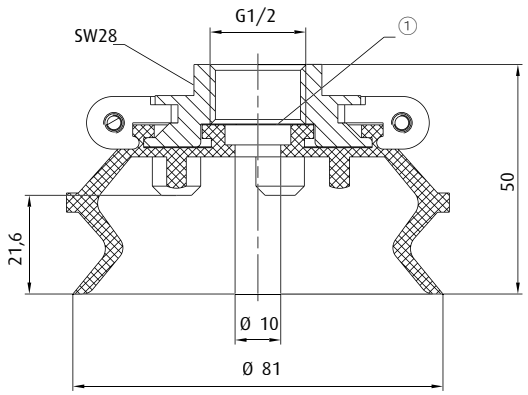
Additional sizes available are found on p. 104.

Spare cup

Spare cup

	Connection	see page
270.527-S	G1/8-female	424
270.528-S	G3/8-female	436
270.529-S	G1/2-female	436

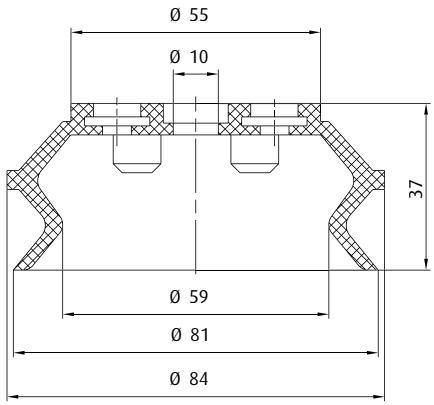
Spare cup



① = Filter screen

Item no.	Material	
22.078.169._*	Tepuflex® (or), SI (tr), CR (sw)	22 mm

Additional sizes available are found on p. 104.

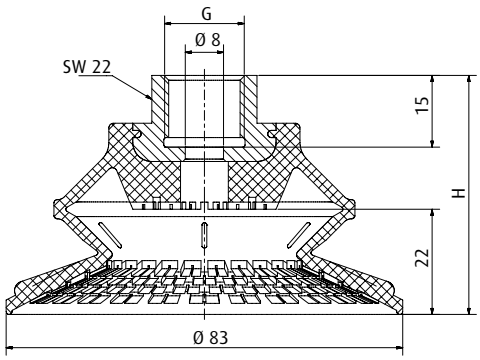


Item no.	Material	
23.078.065._*	Tepuflex® (or), SI (tr), CR (sw)	22 mm

Additional sizes available are found on p. 100.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

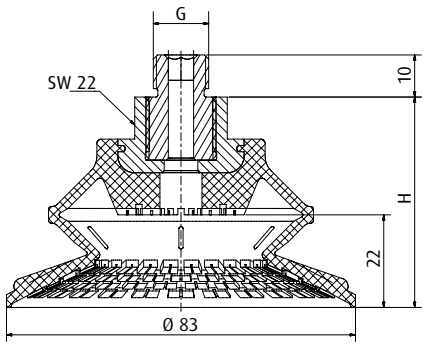
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.080.196._*	NBR (bl)	22	G1/4-female	55
22.080.197._*	NBR (bl)	22	G3/8-female	50

Additional sizes available are found on p. 133.

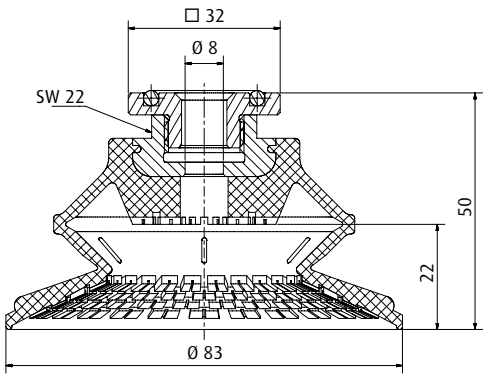
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.080.195._*	NBR (bl)	22	G1/4-male	50
22.080.198._*	NBR (bl)	22	M10-male	50
22.080.199._*	NBR (bl)	22	M14x1.5-male	50

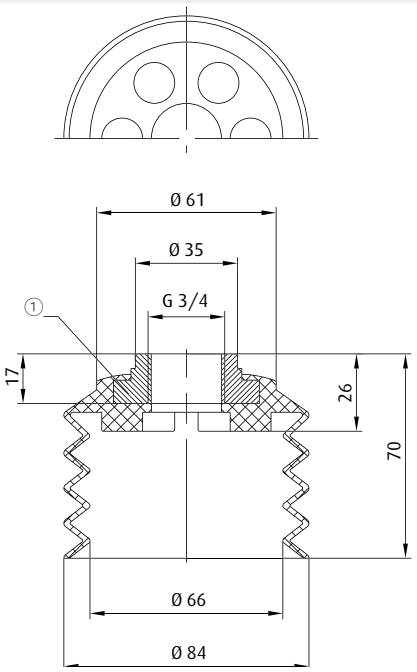
Additional sizes available are found on p. 133.

NEW



Item no.	Material	
22.080.200._*	NBR (bl)	22 mm

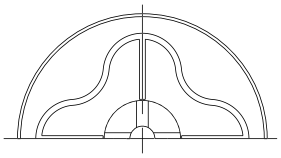
Additional sizes available are found on p. 133.



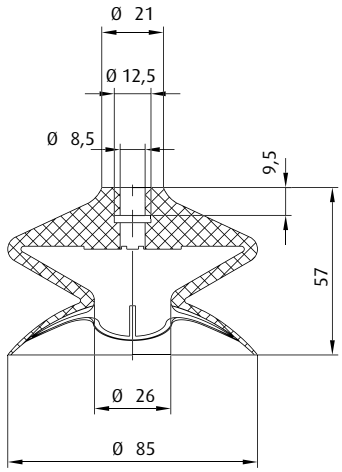
① = Aluminium

Item no.	Material	
25.084.051._*	Vinyl (bl)	31 mm

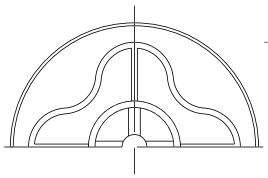
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



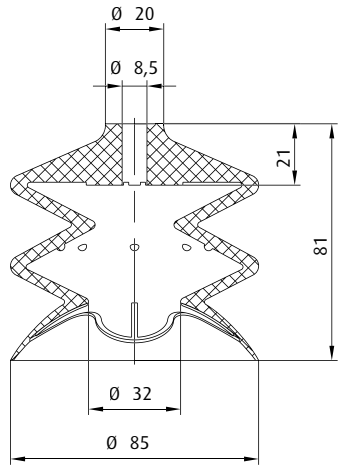
	Connection	see page
270.359	G1/4-male	427
270.361	G1/4-female	433



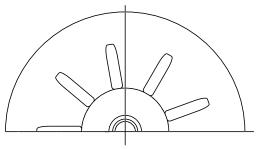
Item no.	Material	
23.085.201._*	Vulkollan® (br)	25 mm

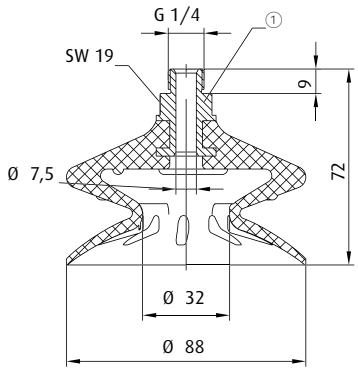


	Connection	see page
270.359	G1/4-male	427



Item no.	Material	
21.085.107._*	Vulkollan® (br)	38 mm

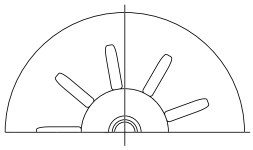


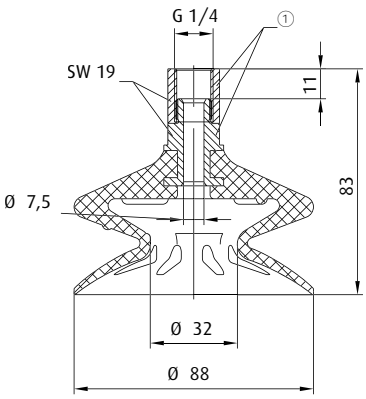


① = Aluminium fitting, vulcanised

Item no.	Material	
22.088.158._*	NBR (sw), SI (tr)	23 mm

Additional sizes available are found on p. 81.



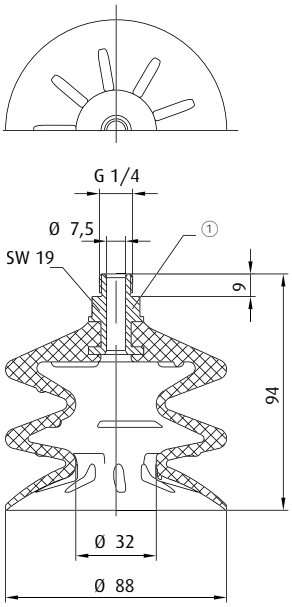


① = Aluminium fitting, vulcanised

Item no.	Material	
22.088.159._*	NBR (sw), SI (tr)	23 mm

Additional sizes available are found on p. 81.

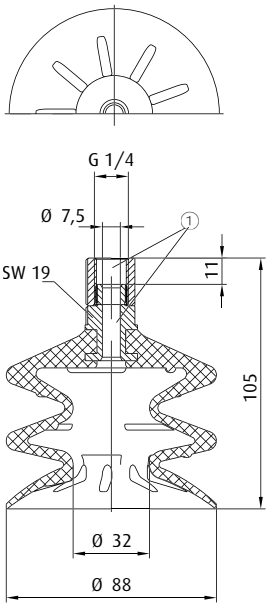
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium fitting, vulcanised

Item no.	Material	
20.088.123._*	NBR (sw), SI (tr)	36 mm

Additional sizes available are found on p. 89.

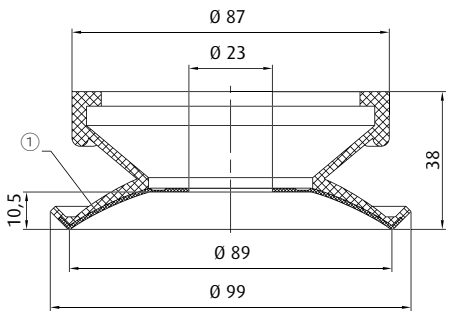


① = Aluminium fitting, vulcanised

Item no.	Material	
20.088.124._*	NBR (sw), SI (tr)	36 mm

Additional sizes available are found on p. 89.

	Connection	see page
270.400	G3/8-female	436

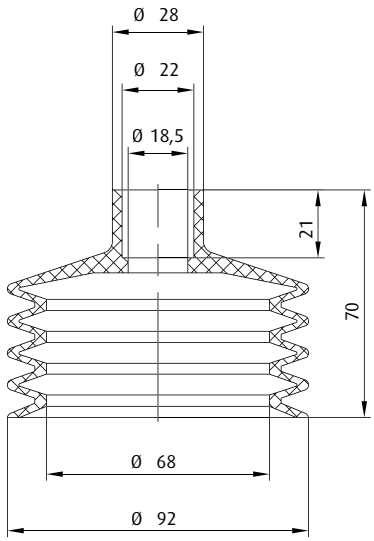


HEAT RESISTANT & LOW MARKING

① = Felt pads

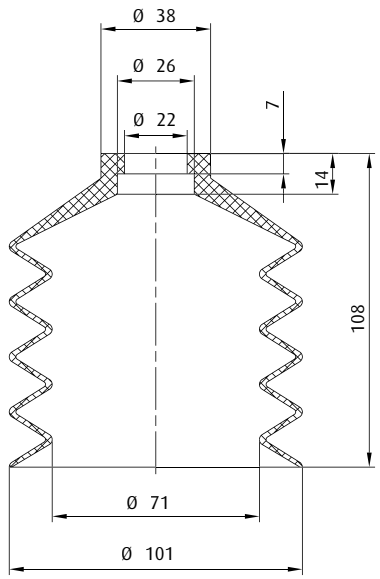
Item no.	Material	
26.090.001._*	SI (tr/ge), FKM (sw/ge)	17 mm

Additional sizes available are found on p. 164.



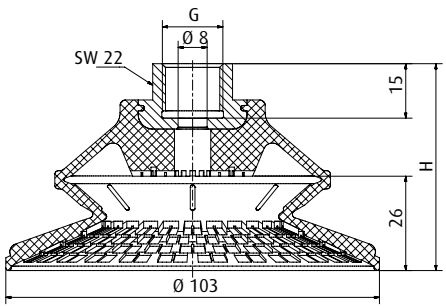
Item no.	Material	
25.091.052._*	Vinyl (bl)	32 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



Item no.	Material	
25.102.053._*	Vinyl (bl)	55 mm

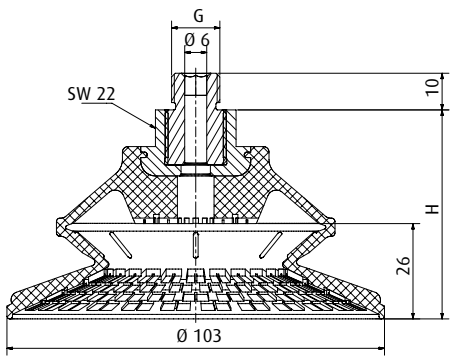
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.100.202._*	NBR (bl)	26	G1/4-female	62
22.100.203._*	NBR (bl)	26	G3/8-female	57

Additional sizes available are found on p. 133.

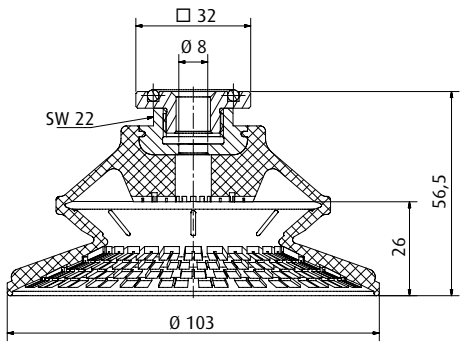
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.100.201._*	NBR (bl)	26	G1/4-male	57
22.100.204._*	NBR (bl)	26	M10-male	57
22.100.205._*	NBR (bl)	26	M14x1.5-male	57

Additional sizes available are found on p. 133.

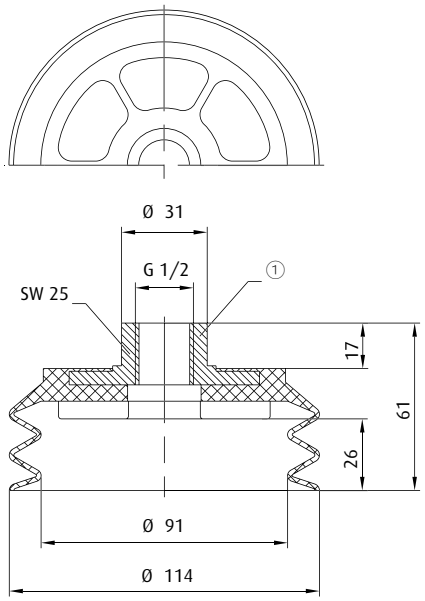
NEW



Item no.	Material	
22.100.206._*	NBR (bl)	26 mm

Additional sizes available are found on p. 133.

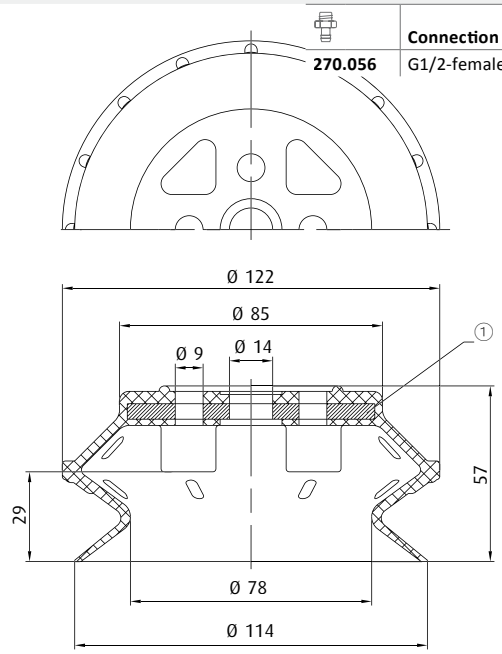
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium

Item no.	Material	
20.115.114._*	Vinyl (bl)	27 mm

	Connection	see page
270.056	G1/2-female	437

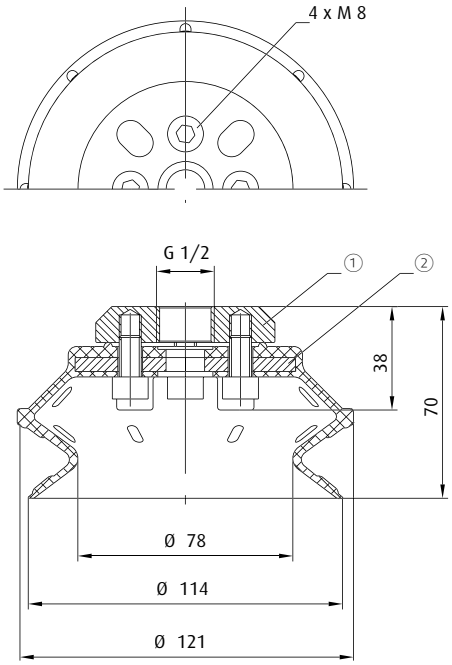


① = Steel

Item no.	Material	
23.110.070._*	NBR (sw)	29 mm

Notes: Hardness 70° Shore A

Spare cup

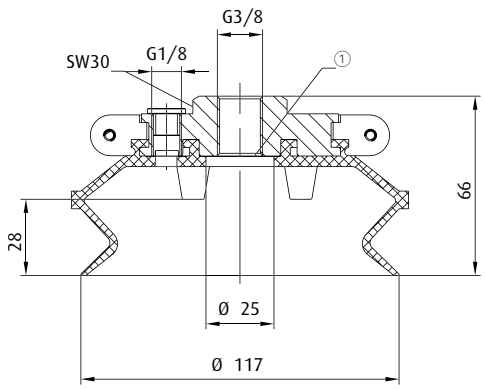


① = Aluminium ② = Steel

Item no.	Material	
22.110.080._*	NBR (sw)	29 mm

Notes: Hardness 70° Shore A

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



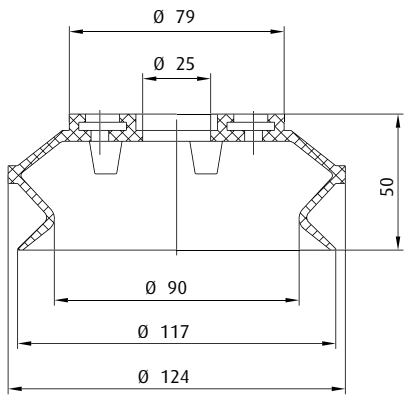
① = Filter screen

Item no.	Material	
22.117.164._*	Tepuflex® (or), SI (tr), CR (sw)	29 mm

Additional sizes available are found on p. 104.

Spare cup

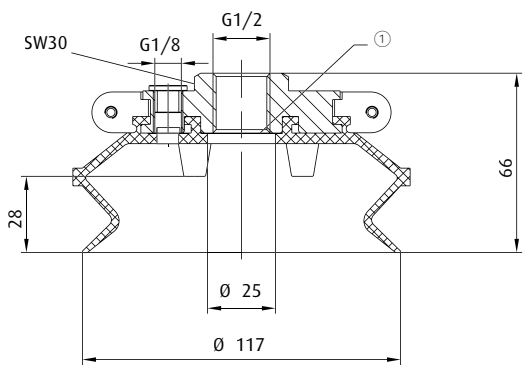
	Connection	see page
270.530-S	G3/8-female	437
270.531-S	G1/2-female	437



Item no.	Material	
23.117.069._*	Tepuflex® (or), SI (tr), CR (sw)	29 mm

Additional sizes available are found on p. 100.

Spare cup

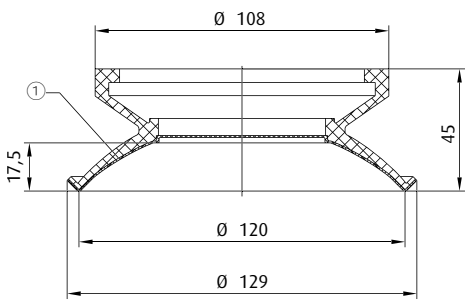


① = Filter screen

Item no.	Material	
22.117.167._*	Tepuflex® (or), SI (tr), CR (sw)	29 mm

Additional sizes available are found on p. 104.

	Connection	see page
270.402	G3/8-female	436



HEAT RESISTANT & LOW MARKING

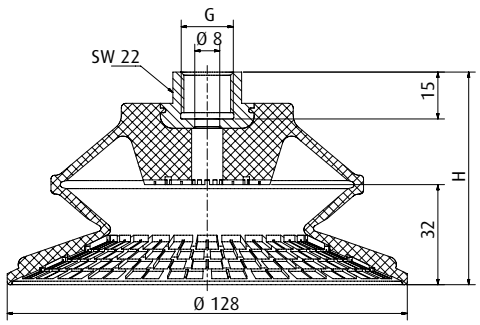
① = Felt pads

Item no.	Material	
26.120.002._*	FKM (sw/ge)	18 mm

Additional sizes available are found on p. 164.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

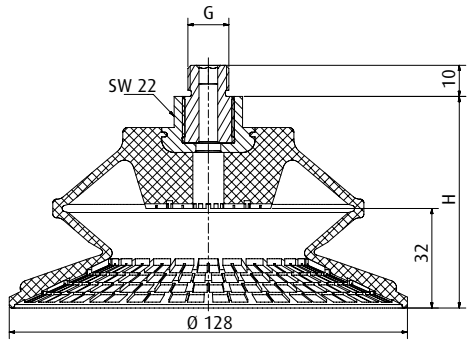
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.125.208._*	NBR (bl)	32	G1/4-female	73
22.125.209._*	NBR (bl)	32	G3/8-female	68

Additional sizes available are found on p. 133.

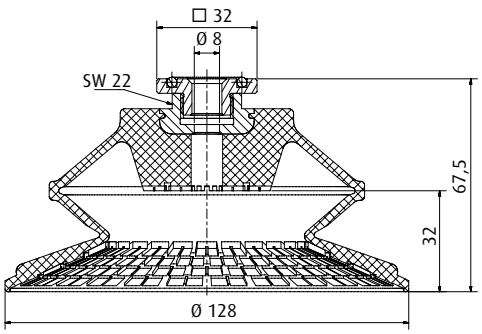
NEW



Item no.	Material	[mm]	Connection thread	H [mm]
22.125.207._*	NBR (bl)	32	G1/4-male	68
22.125.210._*	NBR (bl)	32	M10-male	68
22.125.211._*	NBR (bl)	32	M14x1.5-male	68

Additional sizes available are found on p. 133.

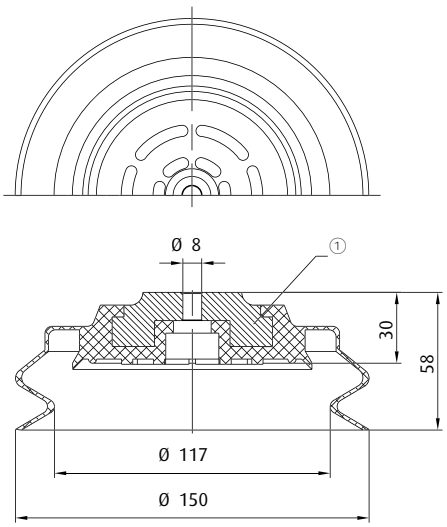
NEW



Item no.	Material	
22.125.212._*	NBR (bl)	32 mm

Additional sizes available are found on p. 133.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



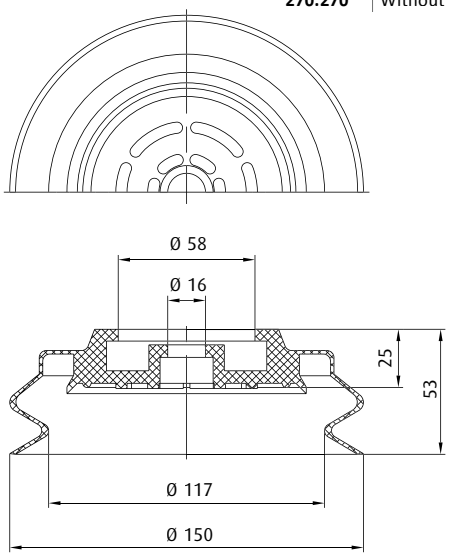
① = Aluminium

Item no.	Material	
22.150.109._*	NBR (sw)	28 mm

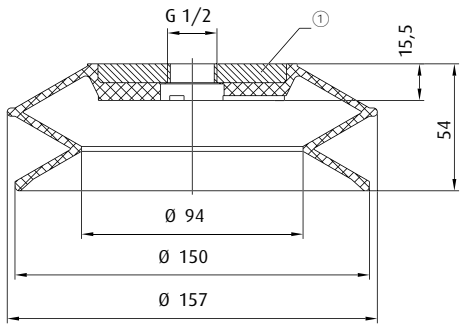
Additional sizes available are found on p. 136.

Spare cup

	Connection	see page
270.270	Without	440



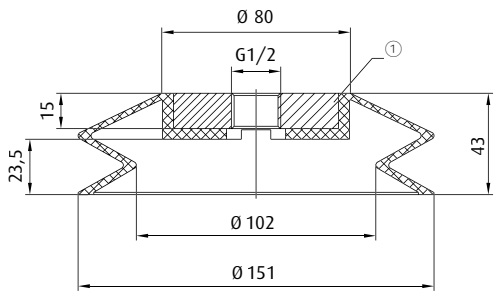
Item no.	Material	
23.150.090._*	NBR (sw)	28 mm



① = Steel

Item no.	Material	
22.150.084._*	NBR (gr), NR (br)	32 mm

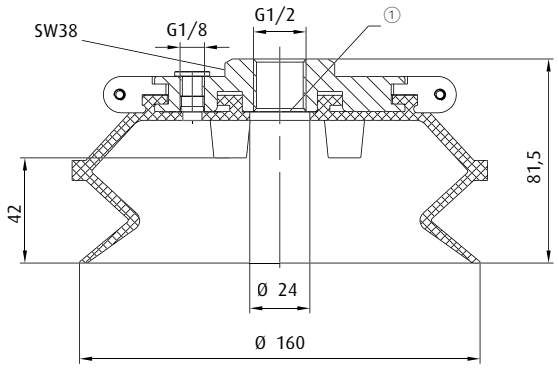
Additional sizes available are found on p. 137.



① = Aluminium

Item no.	Material	
22.150.020._*	NBR (sw), SI (tr)	20 mm

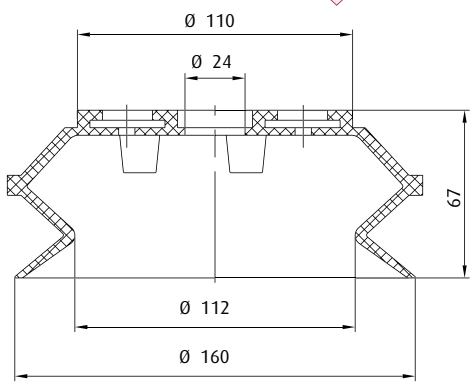
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

Item no.	Material		
22.160.165._*	Tepuflex® (or), SI (tr), CR (sw)	41 mm	Additional sizes available are found on p. 104. This vacuum cup is also available in the following dimensions: 160 mm

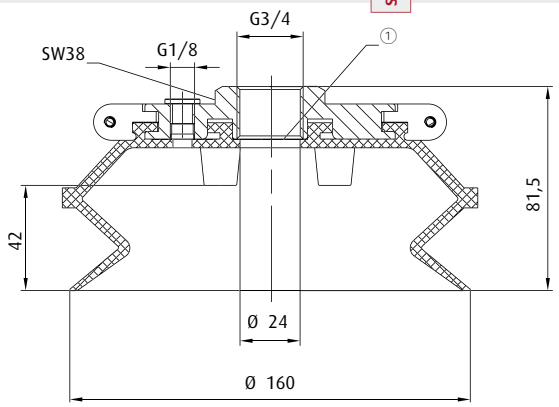
Spare cup



	Connection	see page
270.532-S	G1/2-female	437
270.533-S	G3/4-female	437

Item no.	Material		
23.160.072._*	Tepuflex® (or), SI (tr), CR (sw)	41 mm	Additional sizes available are found on p. 100.

Spare cup

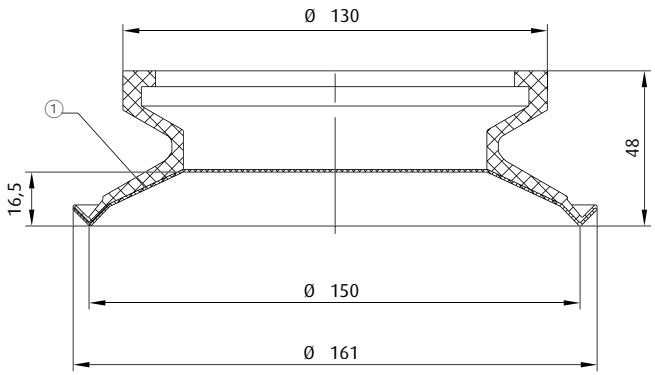


① = Filter screen

Item no.	Material		
22.160.168._*	Tepuflex® (or), SI (tr), CR (sw)	41 mm	Additional sizes available are found on p. 104.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

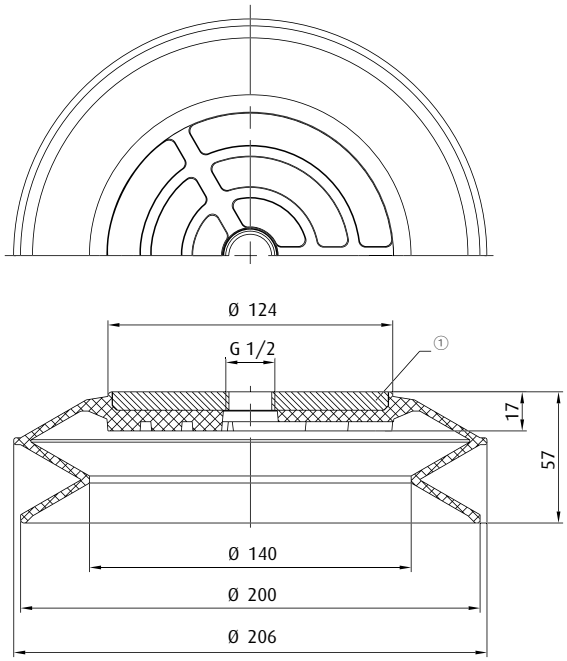
	Connection	see page
270.404	G3/8-female	436



HEAT RESISTANT & LOW MARKING

① = Felt pads

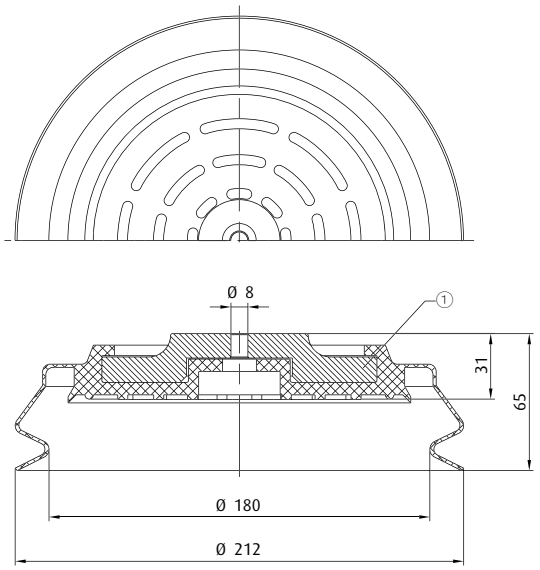
Item no.	Material		
26.160.003._*	FKM (sw/ge)	18 mm	Additional sizes available are found on p. 164.



① = Steel

Item no.	Material		
22.200.087._*	NBR (gr), NR (br)	30 mm	Additional sizes available are found on p. 137.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

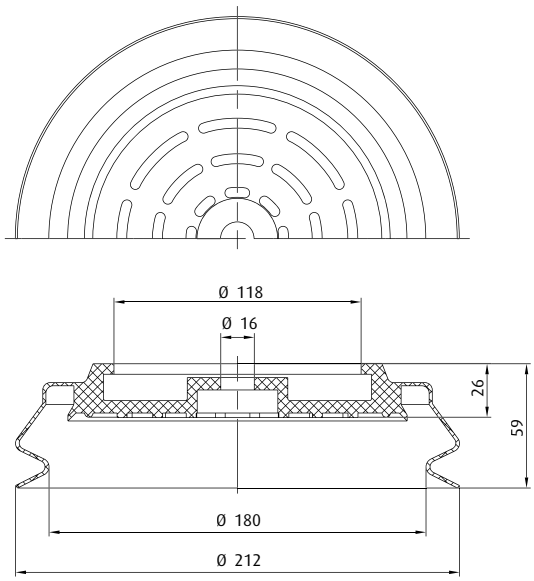


① = Aluminium

Item no.	Material		
22.210.115._*	NBR (sw)	32 mm	Additional sizes available are found on p. 136.

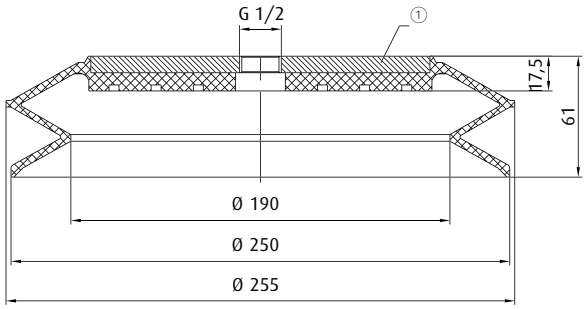
Spare cup

	Connection	see page
270.269	Without	440



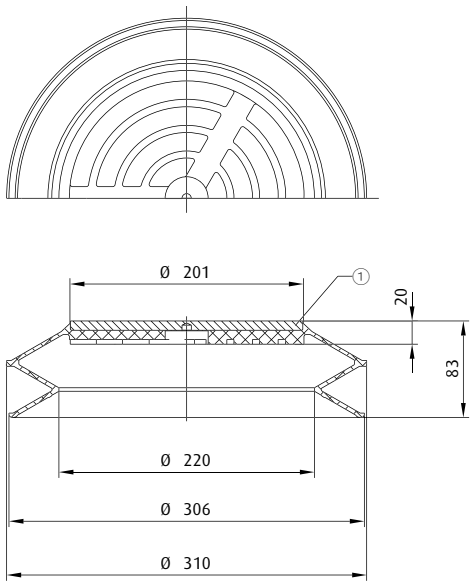
Item no.	Material		
23.210.009._*	NBR (sw)	32 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

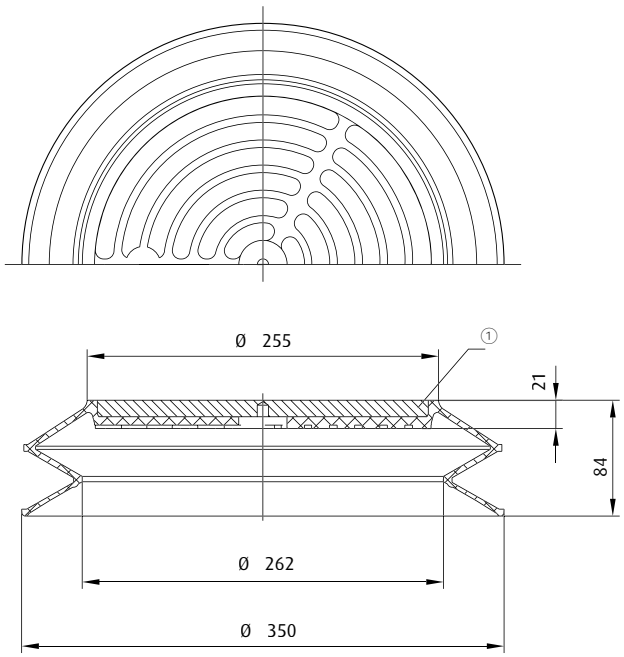
Item no.	Material		
22.250.088._*	NBR (gr), SI (tr)	38 mm	Additional sizes available are found on p. 137.



① = Steel

Item no.	Material		
22.300.091._*	NBR (gr)	60 mm	Additional sizes available are found on p. 137. **Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

Item no.	Material		
22.350.102._*	NBR (gr)	55 mm	Additional sizes available are found on p. 137. **Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

Application / Uses

> Oval vacuum cups are suited for elongated workpieces where only minimal space is available (e.g. rails, profiles, products with ridges)
> Also suitable for curved workpieces
> Significantly greater suction power than round vacuum cups of equal width

Designs

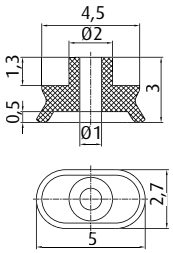
> FIPA oval vacuum cups are available as flat or bellows vacuum suction cups, with or without supporting ribs
> Supporting ribs:
- Improve stability and suction power
- Prevent flexible product parts from being sucked in
- Prevent slipping of the product while suction is being applied

Methods of connection

Vacuum cups for attaching to the fittings (plug-in)
> Secure hold
> Quick replacement
> Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced

Vulcanised fittings / retainer plates
> Very secure hold
> Secured against rotation during handling
> High degree of dimensional stability

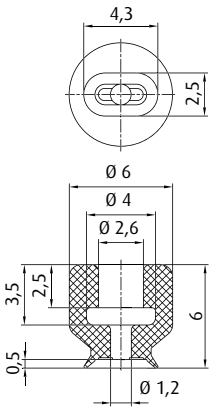
	Connection	see page
270.011	M3-male	408



Item no. 132.4x2.001._*
Material NBR (sw), SI (tr), PU (bl)
0.5 mm

Additional sizes available are found on p. 141.

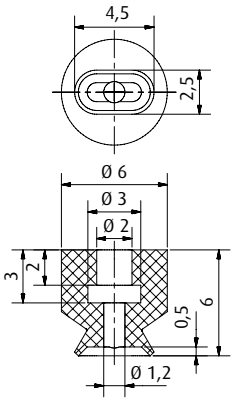
	Connection	see page
270.014	M3-male	408
270.111	M4-male	408
270.300	M5-male	411



Item no. 132.4x2.031._*
Material NBR (sw), HNBR (ge), SI (tr), PU (bl)
0.5 mm

Additional sizes available are found on p. 141.

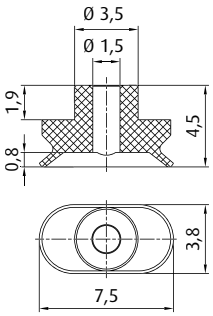
	Connection	see page
270.014	M3-male	408
270.111	M4-male	408
270.300	M5-male	411



Item no. 132.4x2.079._*
Material Thermalon® (bl)
0.4 mm

Additional sizes available are found on p. 144.

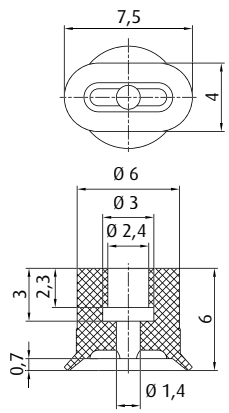
	Connection	see page
270.025	M3-male	408



Item no. 132.7x4.002._*
Material NBR (sw), SI (tr), SI-AS (sw)
0.8 mm

Additional sizes available are found on p. 141.

	Connection	see page
270.014	M3-male	408
270.111	M4-male	408
270.300	M5-male	411

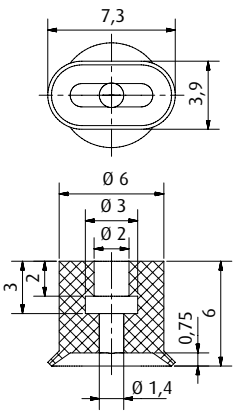


BESTSELLER

Item no. 132.7x4.034._*
Material NBR (sw), HNBR (ge), SI (tr)
0.8 mm

Additional sizes available are found on p. 141.

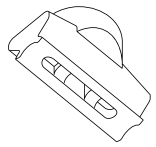
	Connection	see page
270.014	M3-male	408
270.111	M4-male	408
270.300	M5-male	411

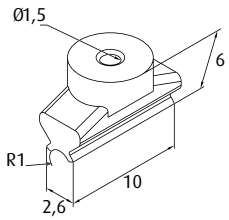


Item no. 132.7x4.080._*
Material Thermalon® (bl)
0.5 mm

Additional sizes available are found on p. 144.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

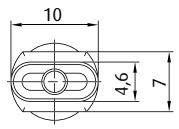


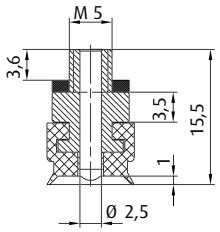


	Connection	see page
270.300	M5-male	411

Item no. 201.10x3.005._*
Material NBR (sw), SI (tr)
0 mm

Additional sizes available are found on p. 154.
Notes: Suitable for cylindrical products diam. 2-4 mm

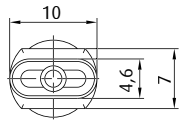


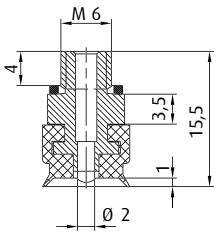


		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. 130.10x4.115._*
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.





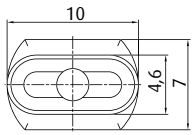
		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

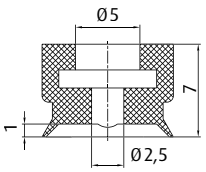
Item no. 130.10x4.068._*
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

Spare cup

Spare cup

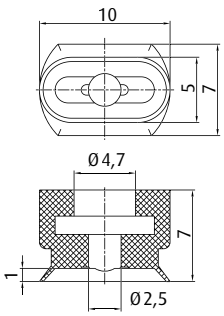




	Connection	see page
270.463	M5-male	412
270.339	M6-male	413

Item no. 132.10x4.003._*
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

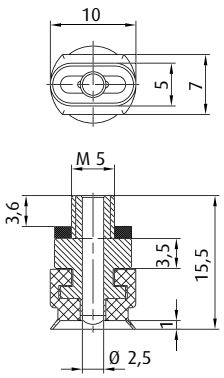
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.463	M5-male	412
270.339	M6-male	413

Item no. **132.10x5.007._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Spare cup

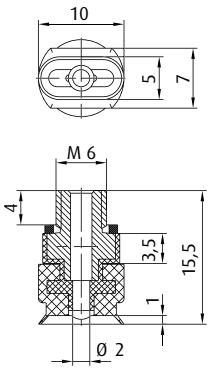


		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.10x5.116._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

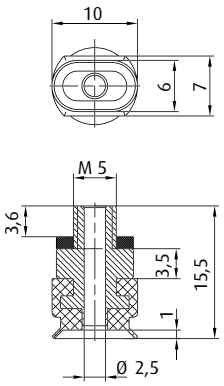
Spare cup



		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.10x5.071._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

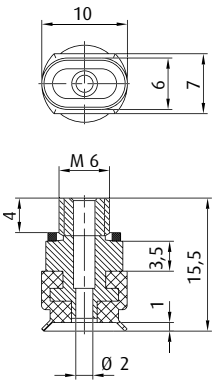
Additional sizes available are found on p. 152.



		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.10x6.117._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

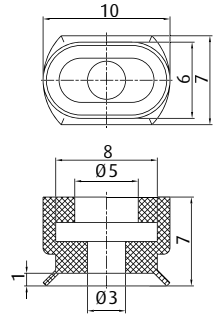


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.10x6.073._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

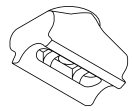
Spare cup

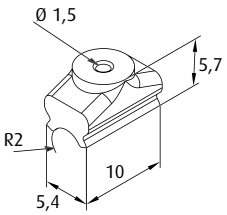


	Connection	see page
270.463	M5-male	412
270.339	M6-male	413

Item no. **132.10x6.011._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

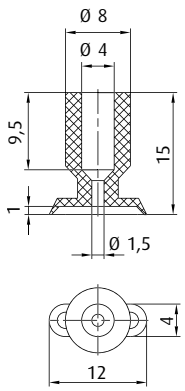




	Connection	see page
270.300	M5-male	411

Item no. 201.10x6.006._*
Material NBR (sw), SI (tr)
0 mm

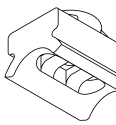
Additional sizes available are found on p. 154.

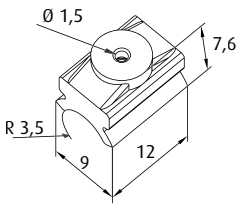


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no. 132.12x4.004._*
Material NBR (gr), SI (tr)
0.5 mm

Additional sizes available are found on p. 141.

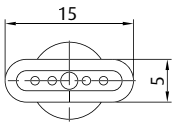


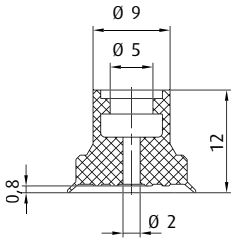


	Connection	see page
270.300	M5-male	411

Item no. 201.12x9.007._*
Material NBR (sw), SI (tr)
0 mm

Additional sizes available are found on p. 154.
Notes: Suitable for cylindrical products diam. 6-13 mm

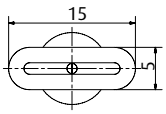


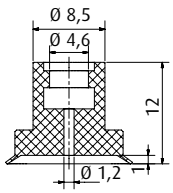


	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.15x5.008._*
Material NBR (gr), SI (tr), PU (bl)
1 mm

Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.

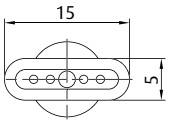


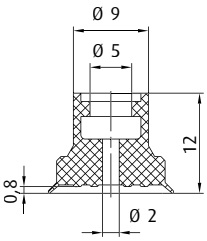


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.15x5.081._*
Material Thermalon® (bl)
0.6 mm

Additional sizes available are found on p. 144.



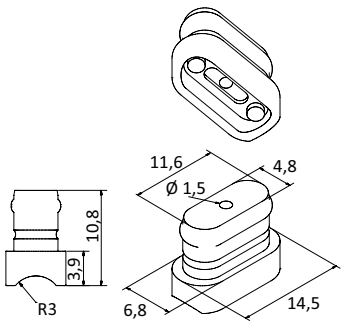


	Connection	see page
270.431	G1/8-male	418

Item no. 132.15x5.067._*
Material HNBR (ge)
1 mm

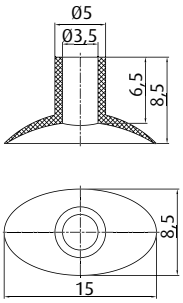
Additional sizes available are found on p. 146.
Ordering notes: Use of a gripper clamp (available separately) recommended.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



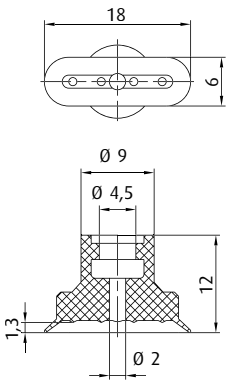
Item no.	Material	
132.15x7.073._*	Sl (r)	0 mm

Additional sizes available are found on p. 154.
Notes: Suitable for cylindrical products diam. 4-10 mm



Connection	see page
270.536 M5-male	409

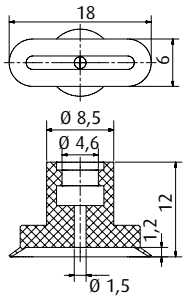
Item no.	Material	
132.15x8.5.33._*	NR (sw)	2 mm



Connection	see page
270.094 M5-male	411
270.005 M5-female	412
270.095 G1/8-male	418
270.096 G1/8-female	422

Item no.	Material	
132.18x6.012._*	NBR (gr), Sl (tr), PU (bl)	1 mm

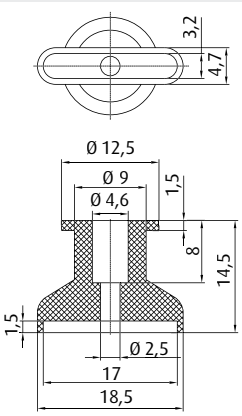
Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



Connection	see page
270.094 M5-male	411
270.095 G1/8-male	418
270.096 G1/8-female	422

Item no.	Material	
132.18x6.082._*	Thermalon® (bl)	1 mm

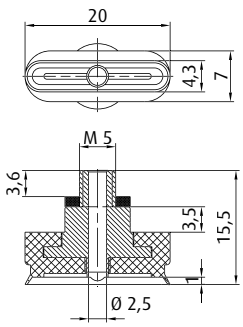
Additional sizes available are found on p. 144.



Connection	see page
270.013 M5-male	410
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421

Item no.	Material	
132.19x5.044._*	Vinyl (bl)	0 mm

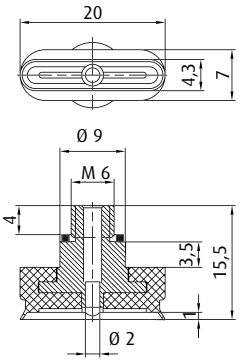
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.20x4.118._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

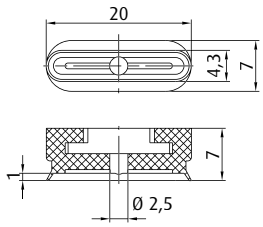


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.20x4.069._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

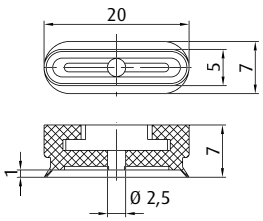
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.20x4.005._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

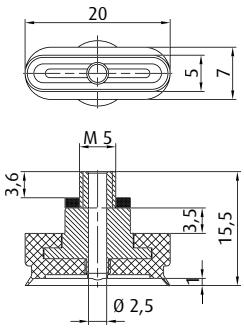
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.20x5.009._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Spare cup

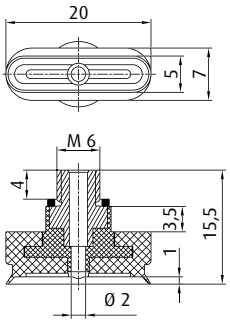


		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.20x5.119._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

Spare cup

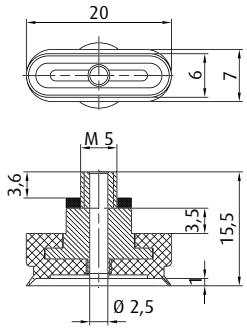


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.20x5.081._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

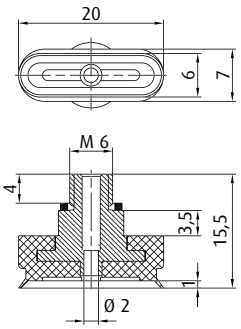
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.20x6.120._*** | **Material** NBR (sw), SI (tr), BR-AS (sw) | 0.9 mm

Additional sizes available are found on p. 152.

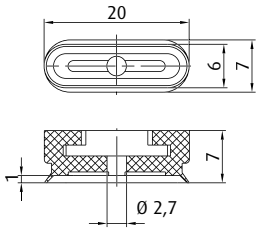


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.20x6.074._*** | **Material** NBR (sw), BR-AS (sw), SI (tr) | 0.9 mm

Additional sizes available are found on p. 152.

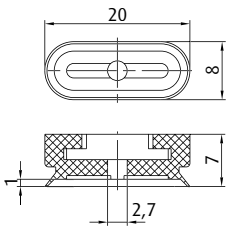
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.20x6.013._*** | **Material** NBR (sw), BR-AS (sw), SI (tr) | 0.9 mm

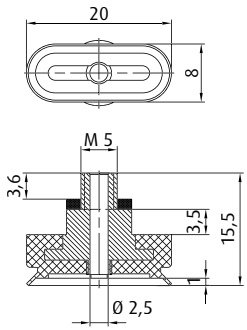
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.20x8.015._*** | **Material** NBR (sw), BR-AS (sw), SI (tr) | 0.9 mm

Spare cup

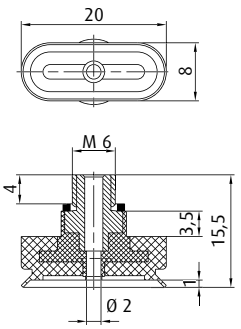


		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.20x8.121._*** | **Material** NBR (sw), SI (tr), BR-AS (sw) | 0.9 mm

Additional sizes available are found on p. 152.

Spare cup

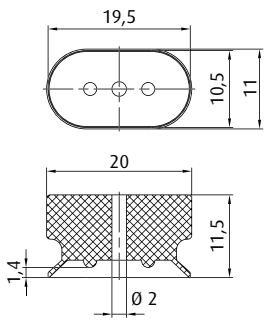


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.20x8.076._*** | **Material** NBR (sw), BR-AS (sw), SI (tr) | 0.9 mm

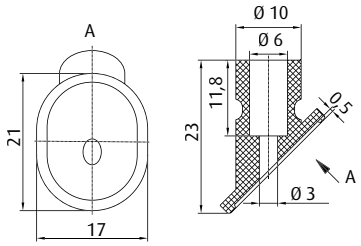
Additional sizes available are found on p. 152.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



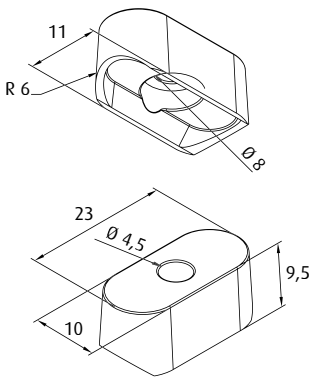
	Connection	see page
270.022	M5-male	409

Item no. 132.20X11.077._*
Material SI (tr)
1.5 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

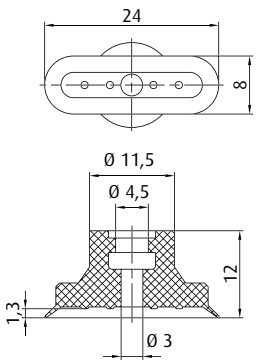
Item no. 132.21x17.047._*
Material NR (sw)
0 mm



	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

Item no. 9.23x11.036._*
Material SI (tr)
0 mm

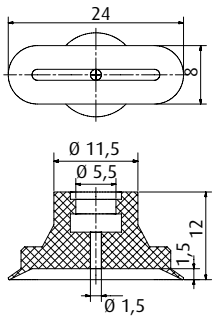
Additional sizes available are found on p. 154.
Notes: Suitable for cylindrical products diam. 10-18 mm



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.24x8.016._*
Material NBR (gr), SI (tr), NR (bg), PU (bl)
1 mm

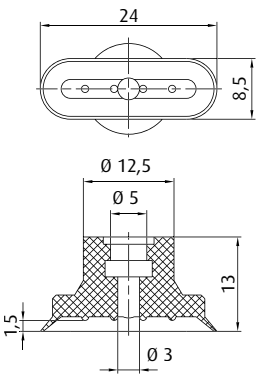
Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.24x8.083._*
Material Thermalon® (bl)
1 mm

Additional sizes available are found on p. 144.
Ordering notes: Use of a gripper clamp (available separately) recommended.

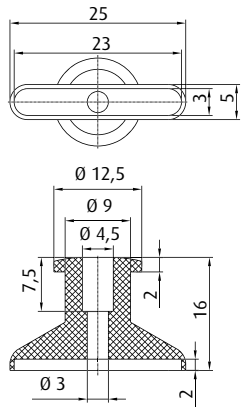


	Connection	see page
270.431	G1/8-male	418

Item no. 132.24x8.066._*
Material HNBR (ge)
1 mm

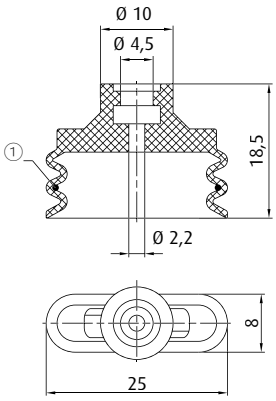
Additional sizes available are found on p. 146.
Ordering notes: Use of a gripper clamp (available separately) recommended.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. 132.25x5.045._*
Material Vinyl (bl)
0 mm



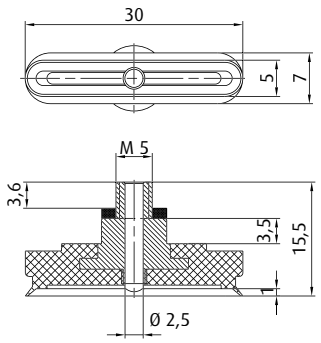
① = Wire strap stiffening

	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

BESTSELLER

Item no. 138.25x8.002._*
Material NBR (gr), SI (tr)
6 mm

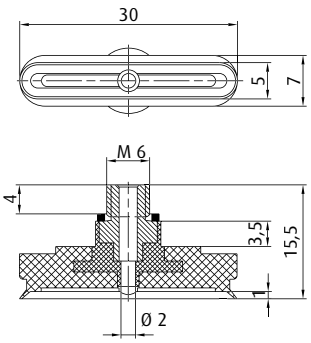
Additional sizes available are found on p. 148.
Ordering notes: Use of a gripper clamp (available separately) recommended.



		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. 130.30x5.123._*
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

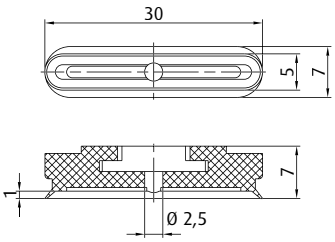


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. 130.30x5.072._*
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

Spare cup

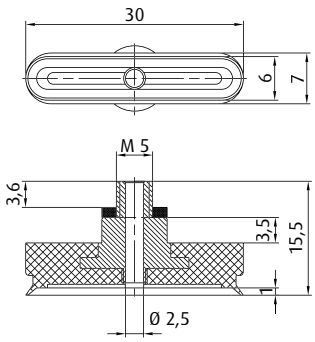


	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. 132.30x5.010._*
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Spare cup

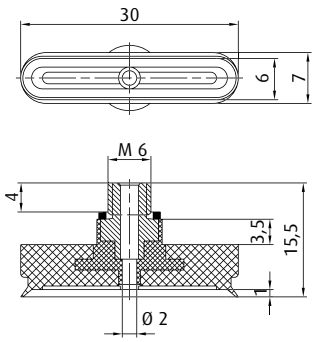
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.30x6.124._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

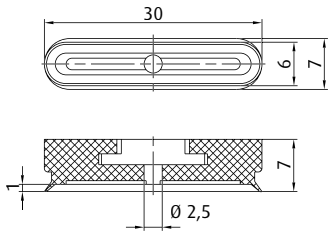


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.30x6.075._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

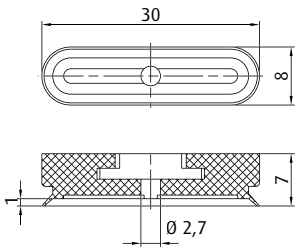
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.30x6.014._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

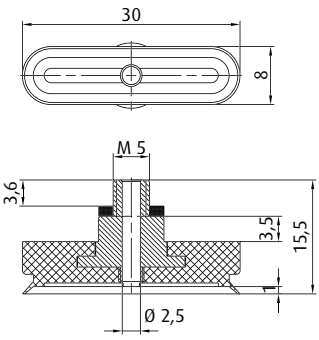
Spare cup



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

Item no. **132.30x8.017._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Spare cup

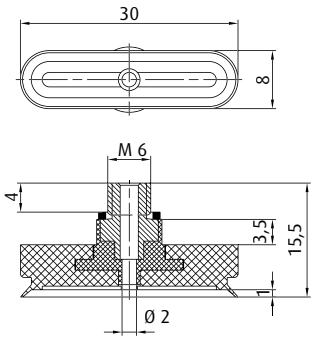


		see page
50.152	10 mm	444
50.153	20 mm	444

Item no. **130.30x8.125._***
Material NBR (sw), SI (tr), BR-AS (sw)
0.9 mm

Additional sizes available are found on p. 152.

Spare cup

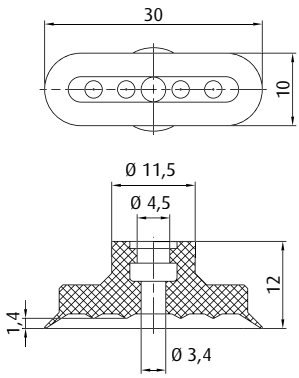


		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

Item no. **130.30x8.077._***
Material NBR (sw), BR-AS (sw), SI (tr)
0.9 mm

Additional sizes available are found on p. 152.

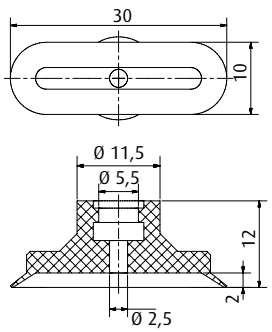
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.30x10.018._*
Material NBR (gr), SI (tr), PU (bl)
2 mm

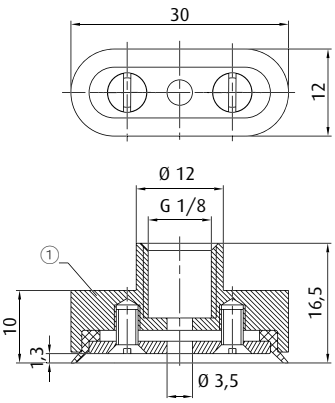
Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.30x10.084._*
Material Thermalon® (bl)
1 mm

Additional sizes available are found on p. 144.
Ordering notes: Use of a gripper clamp (available separately) recommended.

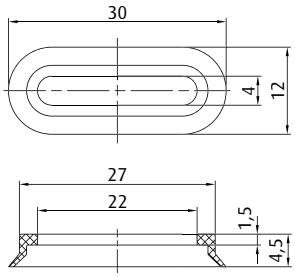


① = Aluminium

Item no. 130.30x12.057._*
Material SI (tr), NR (sw)
1 mm

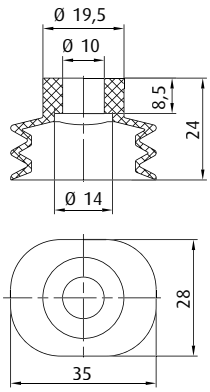
Additional sizes available are found on p. 157.

Spare cup



	Connection	see page
270.439	G1/8-female	424

Item no. 132.30x12.025._*
Material SI (tr), NR (sw)
1 mm

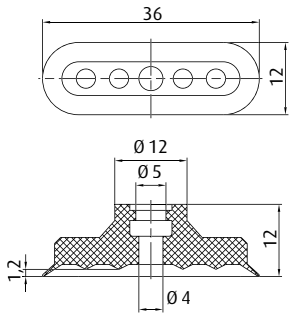


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

BESTSELLER

Item no. 138.35x28.001._*
Material Vinyl (bl)
9 mm

Additional sizes available are found on p. 149.



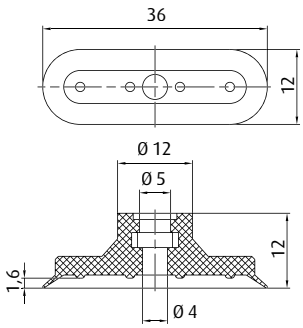
	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no. 132.36x12.019._*
Material NBR (gr), SI (tr), PU (bl)
2 mm

Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.

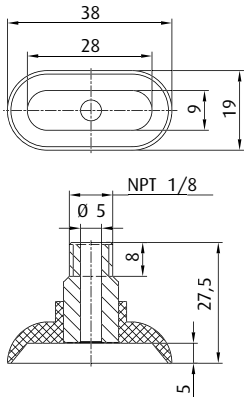
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.431	G1/8-male	418

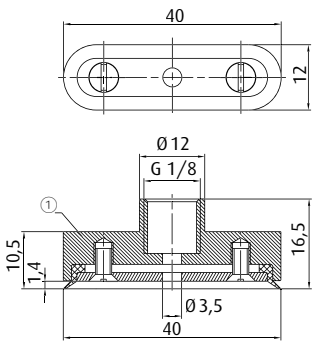


Item no.	Material	
132.36X12.068._*	HNBR (ge)	2 mm

Additional sizes available are found on p. 146.
Ordering notes: Use of a gripper clamp (available separately) recommended.



Item no.	Material	
130.38x19.085._*	Vinyl (bl)	0 mm



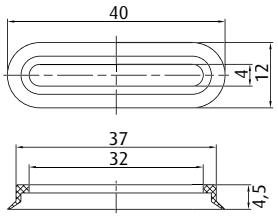
① = Aluminium

Item no.	Material	
130.40x12.058._*	SI (tr), NR (sw)	1 mm

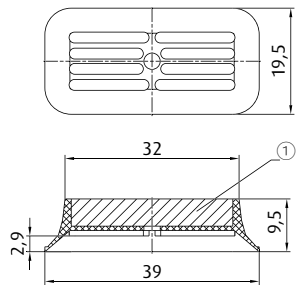
Additional sizes available are found on p. 157.

Spare cup

	Connection	see page
270.440	G1/8-female	424



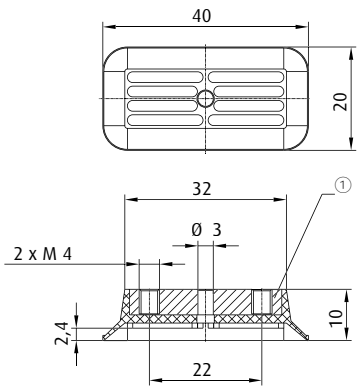
Item no.	Material	
132.40x12.027._*	SI (tr), NR (sw)	1 mm



① = Steel

Item no.	Material	
9.40x20.041._*	NBR (gr), SI (tr), PU (bg)	2 mm

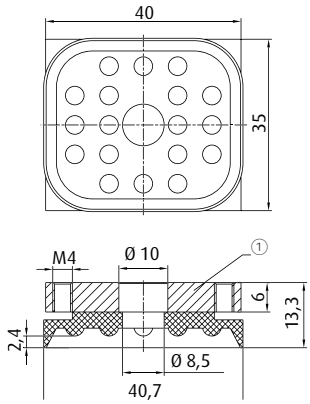
Ordering notes: Customised drilling patterns on request



① = Steel

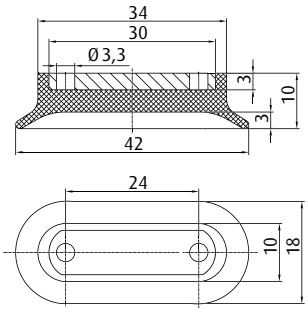
Item no.	Material	
9.40x20.057._*	SI (tr)	2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

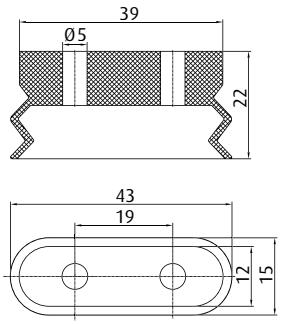


① = Steel

Item no.	Material	
155.40x35.004._*	NBR (gr)	2.5 mm

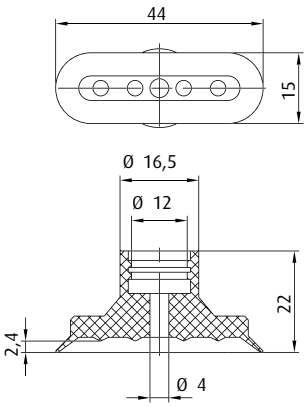


Item no.	Material	
130.42x18.037._*	SI (tr)	2.5 mm



	Connection	see page
270.013	M5-male	410

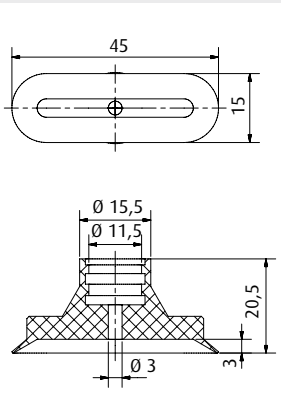
Item no.	Material	
138.43x15.001._*	Vinyl (bl)	8 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
132.45x15.020._*	NBR (gr), SI (tr), PU (bl)	3 mm

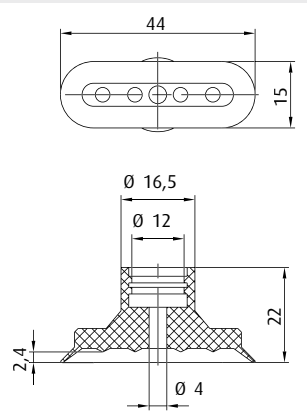
Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
132.45x15.085._*	Thermalon® (bl)	2 mm

Additional sizes available are found on p. 144.
Ordering notes: Use of a gripper clamp (available separately) recommended.

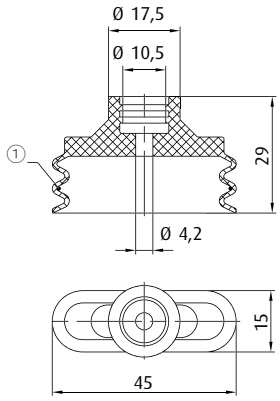


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
132.45x15.064._*	HNBR (ge)	3 mm

Additional sizes available are found on p. 146.
Ordering notes: Use of a gripper clamp (available separately) recommended.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

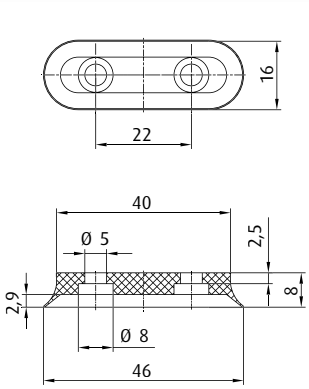


① = Wire strap stiffening

	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

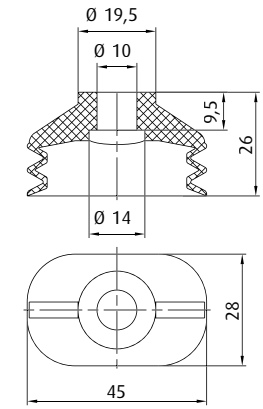
Item no. 138.45x15.003._*
Material NBR (gr), SI (tr)
8 mm

Additional sizes available are found on p. 148.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

Item no. 9.45x15.038._*
Material NBR (sw), SI (tr)
3 mm

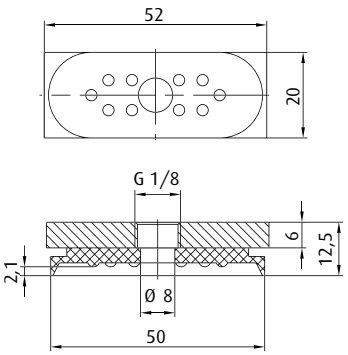


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

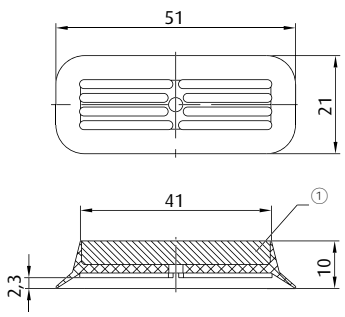
BESTSELLER

Item no. 138.45x28.013._*
Material Vinyl (bl)
9 mm

Additional sizes available are found on p. 149.



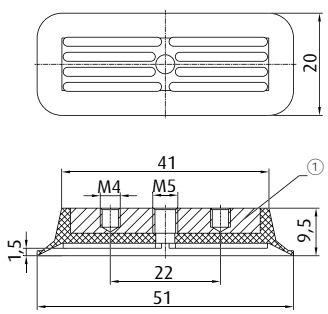
Item no. 130.50x20.102._*
Material NBR (gr)
3 mm



① = Steel

Item no. 9.50x20.001._*
Material NBR (gr), SI (tr)
2 mm

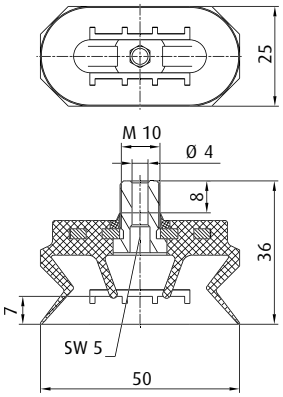
Ordering notes: Customised drilling patterns on request



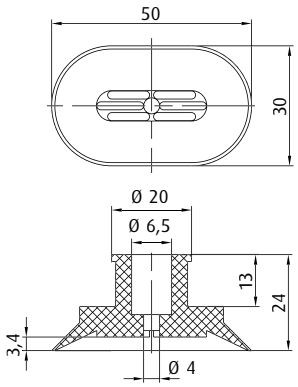
① = Aluminium

Item no. 9.50x20.034._*
Material NBR (gr), SI (tr)
2 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



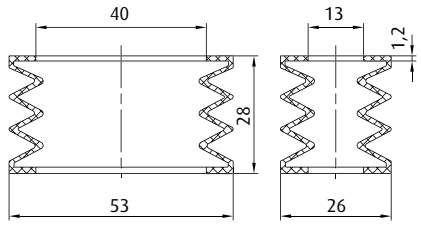
Item no.	Material	
130.50x25.094._*	NBR (sw), SI (tr)	8 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

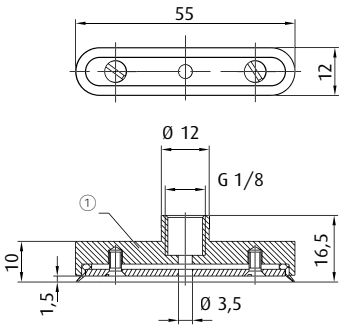
Item no.	Material	
132.50x30.030._*	NBR (gr), SBR (br)	5 mm

	Connection	see page
270.508	G1/8-female	439



Item no.	Material	
209.52x25.006._*	SI (tr)	13 mm

Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement



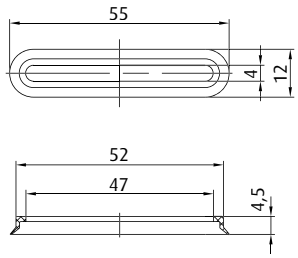
① = Aluminium

Item no.	Material	
130.55x12.082._*	NBR (sw), SI (tr), NR (sw)	1 mm

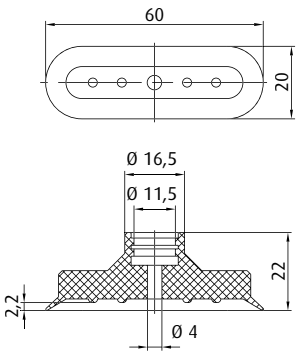
Additional sizes available are found on p. 157.

Spare cup

	Connection	see page
270.441	G1/8-female	424



Item no.	Material	
132.55x12.029._*	NBR (sw), SI (tr), NR (sw)	1 mm



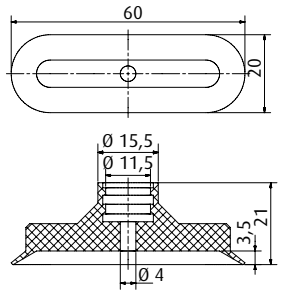
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.	Material	
132.60x20.022._*	NBR (gr), SI (tr), PU (bg)	3 mm

Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.

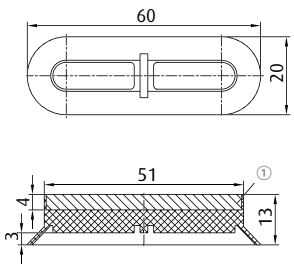
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432



Item no.	Material	
132.60x20.086._*	Thermalon® (bl)	2.5 mm

Additional sizes available are found on p. 144.
Ordering notes: Use of a gripper clamp (available separately) recommended.

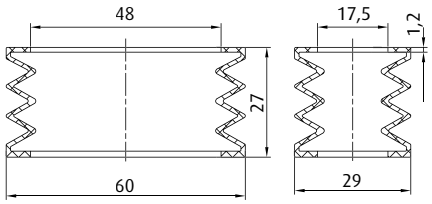


① = Steel

Item no.	Material	
9.60x20.003._*	SBR (sw), NR (bg)	4 mm

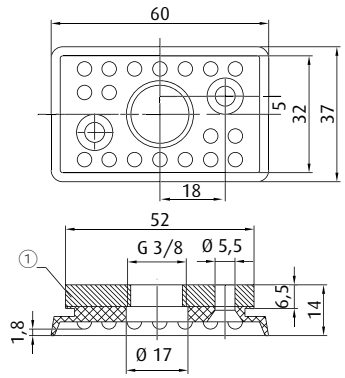
Ordering notes: Customised drilling patterns on request

	Connection	see page
270.509	G1/4-female	439



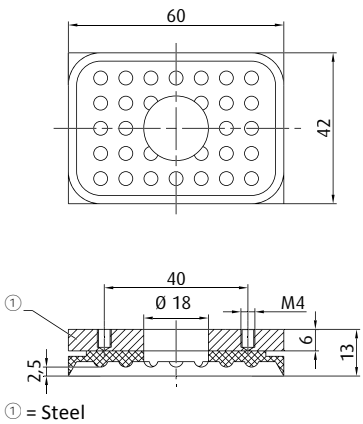
Item no.	Material	
209.60x29.001._*	NBR (sw), SI (tr)	13 mm

Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement



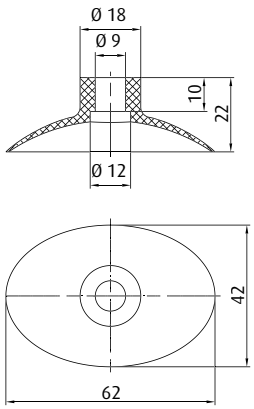
① = Aluminium

Item no.	Material	
130.60x38.091._*	NBR (gr)	2 mm



① = Steel

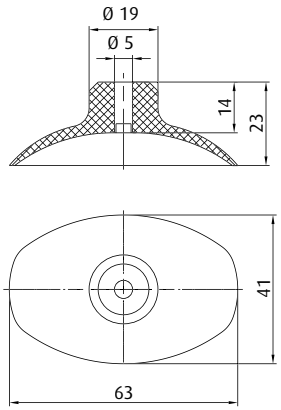
Item no.	Material	
155.60x42.005._*	NBR (gr)	2.5 mm



PERFECT FOR SOAPS

Item no.	Material	
130.62x42.111._*	Vulkollan® (br)	7 mm

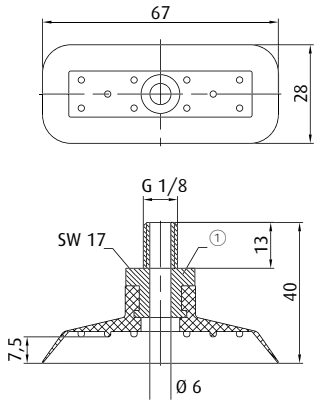
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

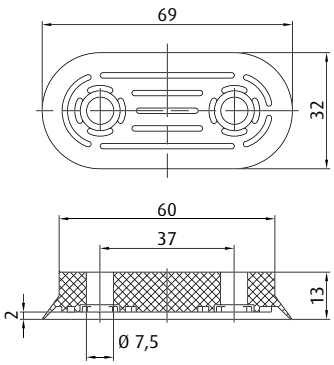
PERFECT FOR SOAPS

Item no.	Material	
132.60x42.052._*	SI (g)	8 mm



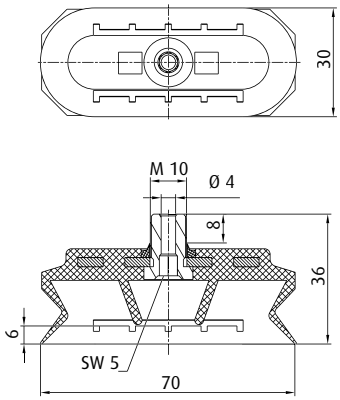
① = Aluminium

Item no.	Material	
130.67x28.104._*	Vulkollan® (br)	7 mm

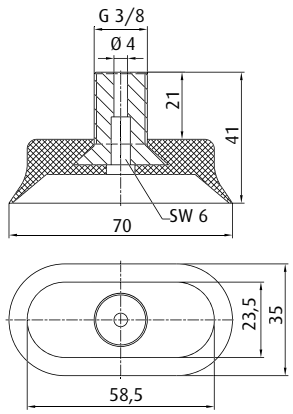


	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423

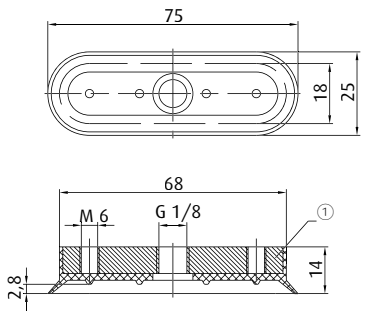
Item no.	Material	
132.69x32.060._*	NR (bg)	2 mm



Item no.	Material	
130.70x30.095._*	NBR (sw)	8 mm



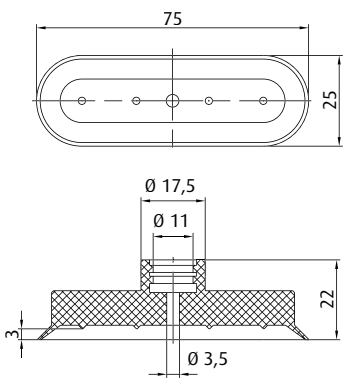
Item no.	Material	
130.70x35.089._*	NR (sw)	6 mm



① = Aluminium

Item no.	Material	
130.75x25.080._*	NBR (sw), SI (r)	3 mm

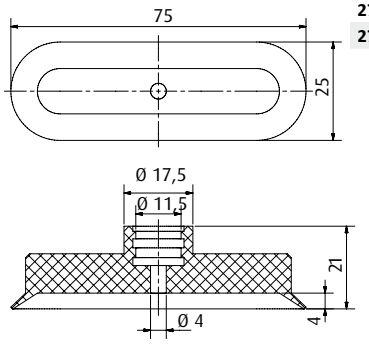
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. **132.75x25.023._***
Material NBR (gr), Sl (tr)
3 mm

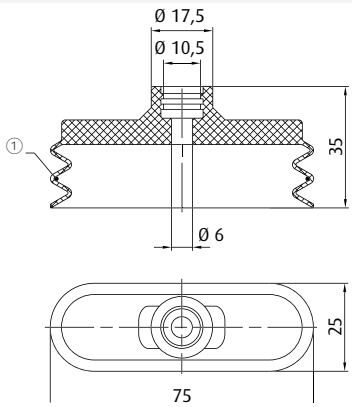
Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. **132.75x25.087._***
Material Thermalon® (bl)
2.5 mm

Additional sizes available are found on p. 144.
Ordering notes: Use of a gripper clamp (available separately) recommended.

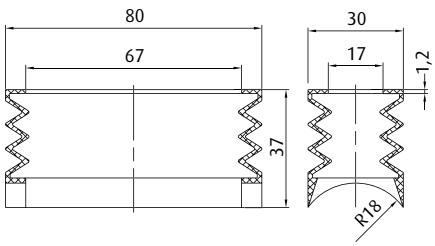


① = Wire strap stiffening

	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no. **138.75x25.004._***
Material NBR (gr), Sl (tr)
11 mm

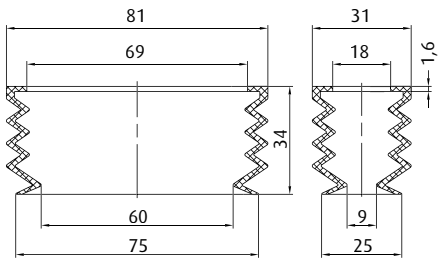
Additional sizes available are found on p. 148.
Ordering notes: Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.392	G1/4-female	439

Item no. **201.79x29.002._***
Material Sl (tr)
16 mm

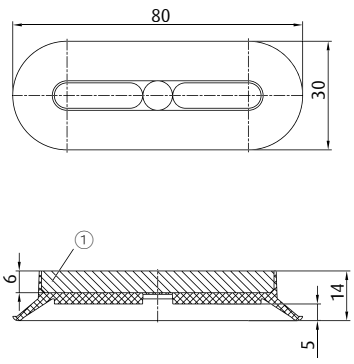
Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement



	Connection	see page
270.392	G1/4-female	439

Item no. **209.80x30.003._***
Material Sl (tr)
20 mm

Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement



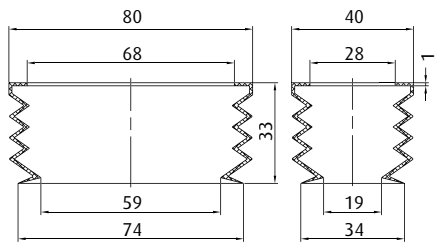
① = Aluminium

Item no. **9.80x30.004._***
Material NR (br)
5 mm

Ordering notes: Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

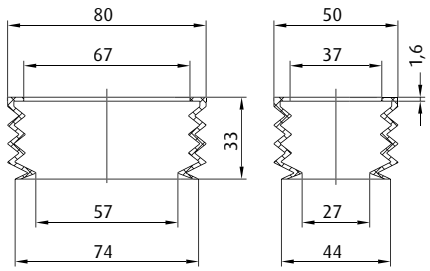
	Connection	see page
270.510	G1/4-female	439



Item no.	Material	
209.80x40.004._*	Si (tr)	20 mm

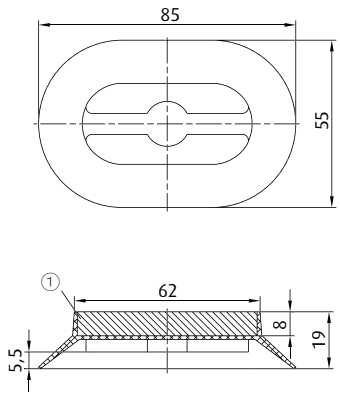
Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement

	Connection	see page
270.511	G1/4-female	439



Item no.	Material	
209.80x50.005._*	Si (tr)	20 mm

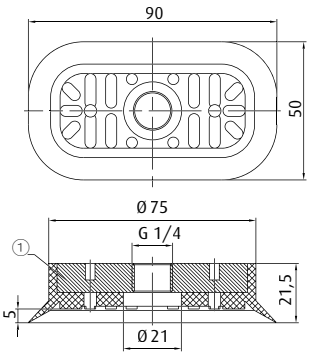
Additional sizes available are found on p. 150.
Ordering notes: On request, available with wire reinforcement



① = Aluminium

Item no.	Material	
9.85x55.006._*	NBR (gr), NR (bg)	7 mm

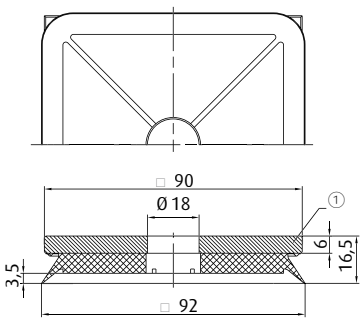
Ordering notes: Customised drilling patterns on request



① = Aluminium

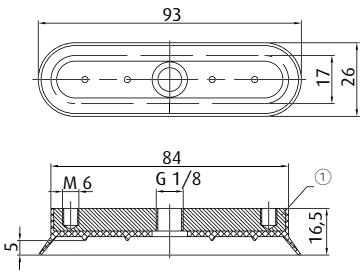
Item no.	Material	
130.90x50.113._*	NR (bg)	5 mm

Additional sizes available are found on p. 158.



① = Steel

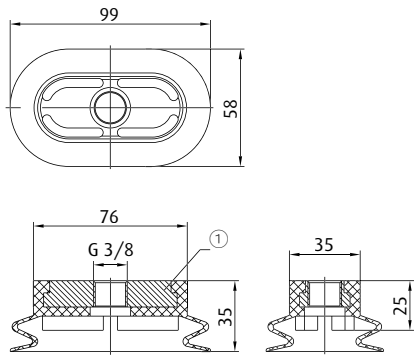
Item no.	Material	
130.92x92.006._*	NBR (gr)	3 mm



① = Aluminium

Item no.	Material	
130.96x27.036._*	Si (r)	6 mm

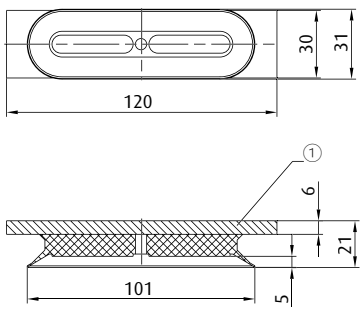
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium

Item no.	Material	
130.97x55.126._*	Vinyl (bl)	11 mm

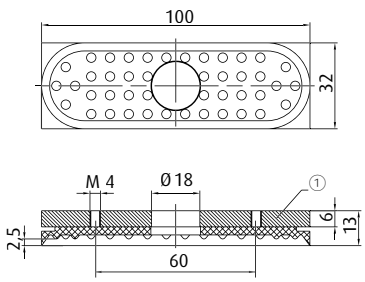
Additional sizes available are found on p. 149.



① = Steel

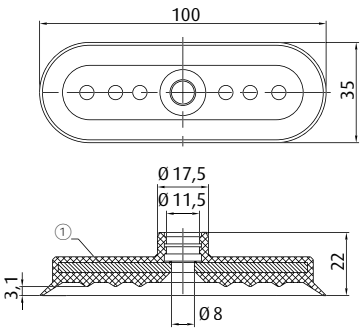
Item no.	Material	
9.100x30.007._*	NBR (gr), SBR (br)	5 mm

Ordering notes: Customised drilling patterns on request



① = Aluminium

Item no.	Material	
130.100x32.067._*	NBR (gr)	2.5 mm

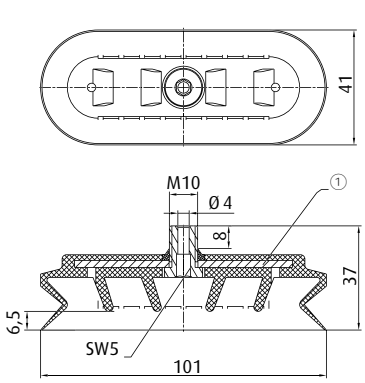


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

① = Aluminium

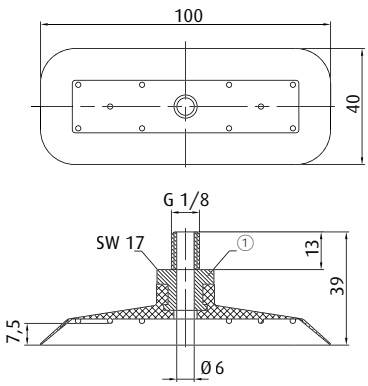
Item no.	Material	
132.100x35.26._*	NBR (sw)	3 mm

Additional sizes available are found on p. 141.
Ordering notes: Use of a gripper clamp (available separately) recommended.



① = Steel

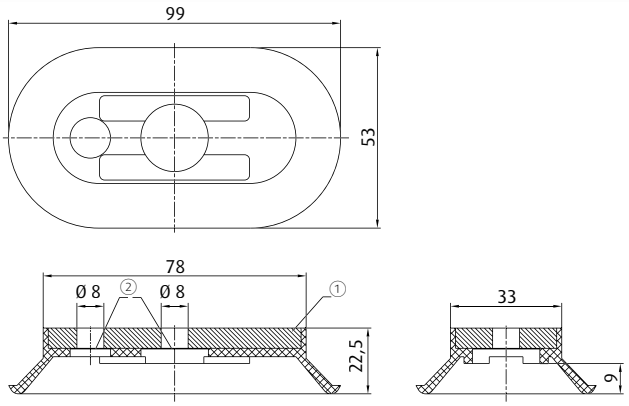
Item no.	Material	
130.100x40.096._*	NBR (sw), SI (tr)	8 mm



① = Aluminium

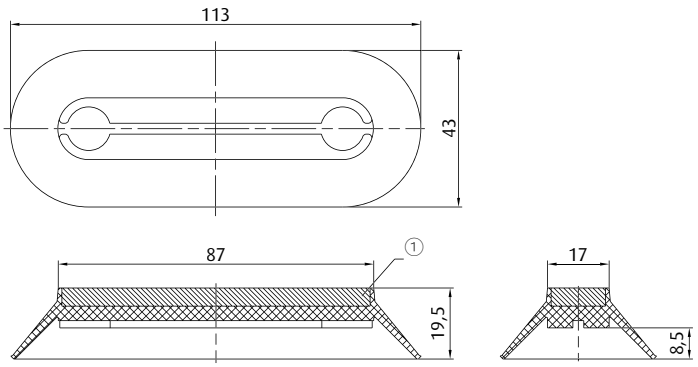
Item no.	Material	
130.100x40.105._*	Vulkollan® (br)	7 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



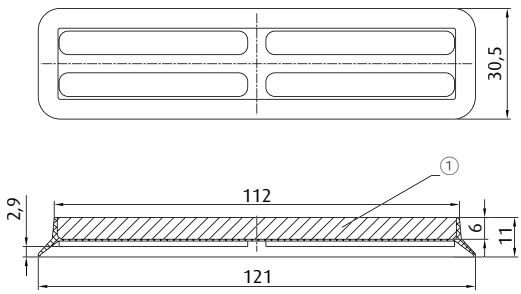
① = Aluminium ② = Sealed with rubber

Item no.	Material		
9.100x55.020._*	NR (or)	8 mm	Additional sizes available are found on p. 160.



① = Steel

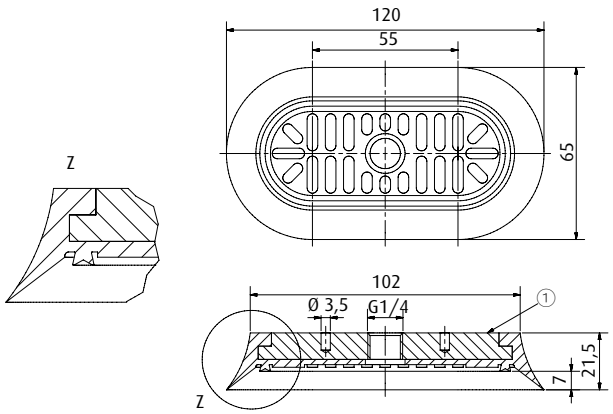
Item no.	Material		
9.110x40.009._*	NBR (gr), NR (br)	9 mm	Additional sizes available are found on p. 160. **Ordering notes:** Version with aluminium carrier: 9.110x40.011._



① = Steel

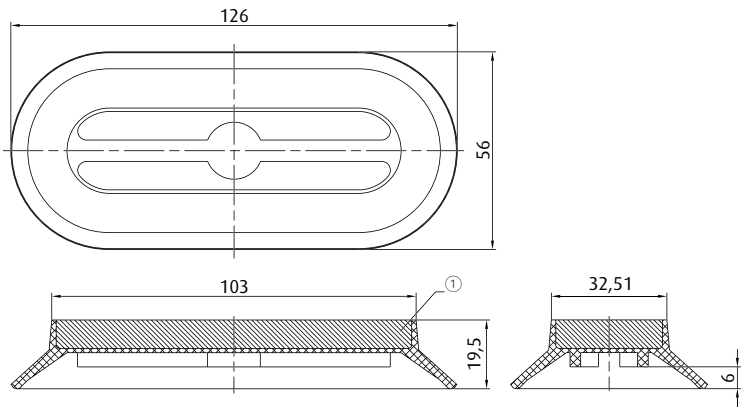
Item no.	Material		
9.120x30.062._*	NBR (gr)	3 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



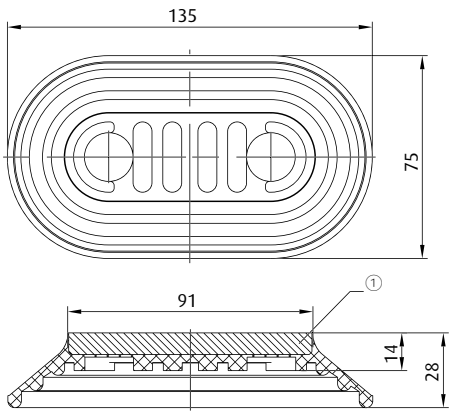
① = Aluminium

Item no.	Material		
9.120x65.088._*	NR (bg)	7 mm	Additional sizes available are found on p. 158.



① = Steel

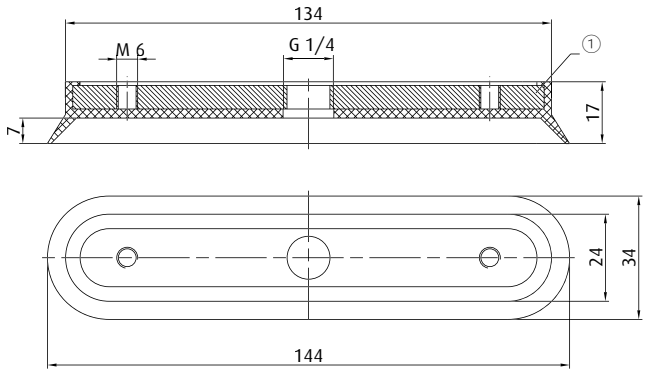
Item no.	Material		
9.125x55.012._*	NBR (gr), SBR (br), NR (br)	9 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request



① = Steel

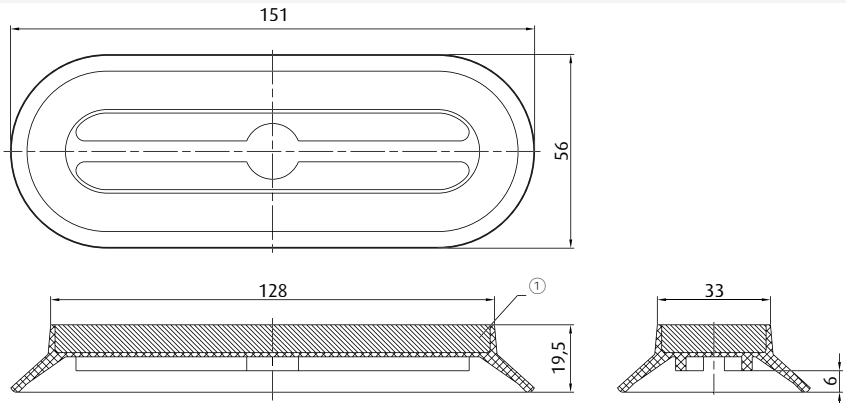
Item no.	Material		
9.135x75.066._*	SBR (sw)	12 mm	**Ordering notes:** Customised drilling patterns on request **Notes:** Especially well-suited for rough surfaces

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



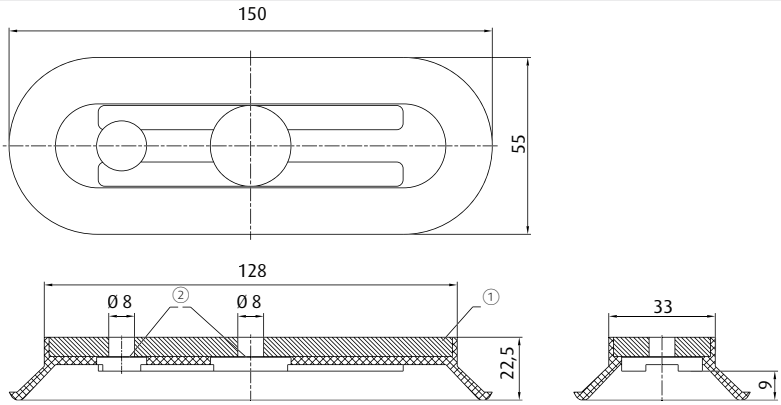
① = Aluminium

Item no.	Material		
130.145x34.55._*	NBR (sw), SI (r)	7 mm	



① = Steel

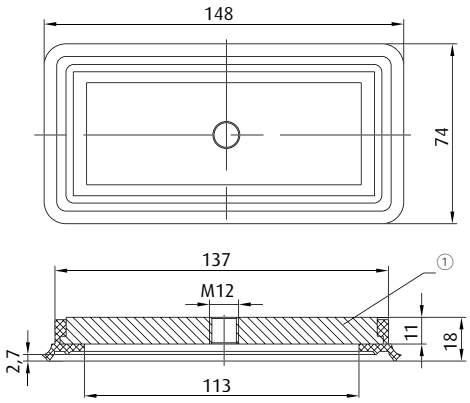
Item no.	Material		
9.150x55.013._*	NBR (gr)	7 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request



① = Aluminium ② = Sealed with rubber

Item no.	Material		
9.150x55.083._*	NR (or)	8 mm	Additional sizes available are found on p. 160.

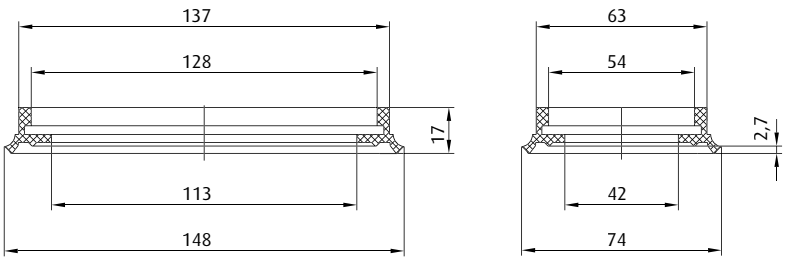
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



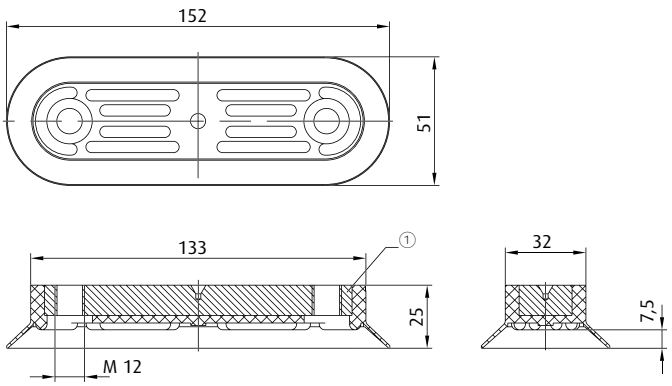
① = Aluminium

Item no.	Material		
155.150x75.3._*	NBR (sw)	1.5 mm	

Spare cup



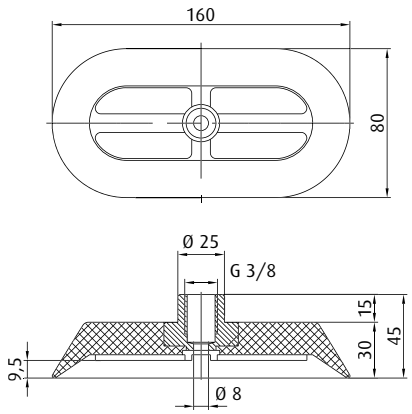
Item no.	Material		
216.150x75.3._*	NBR (sw)	1.5 mm	



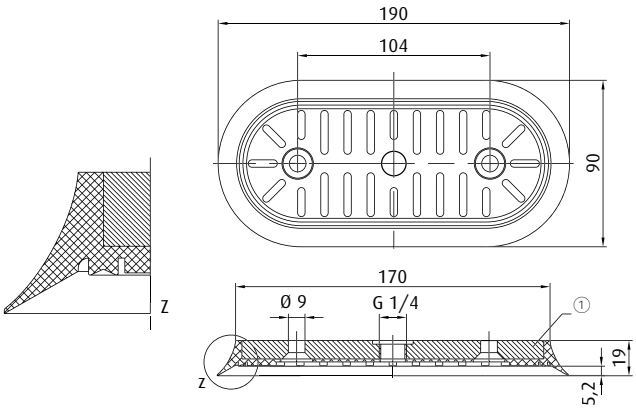
① = Aluminium

Item no.	Material		
130.152x51.092._*	Vinyl (bl)	7 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



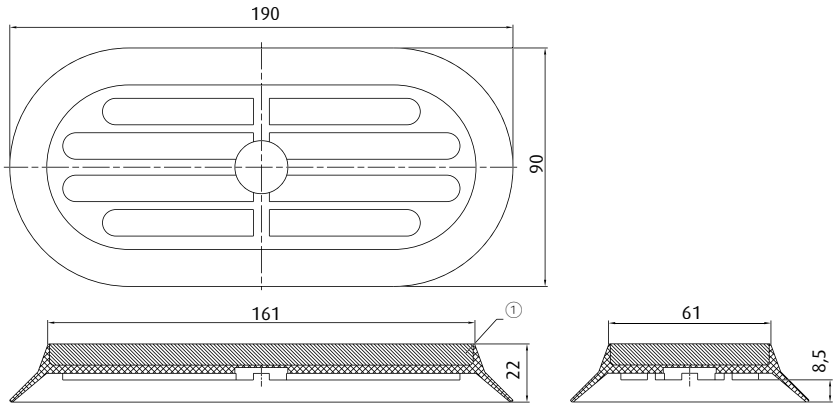
Item no.	Material		
9.160x80.075._*	SBR (sw)	9 mm	



BESTSELLER

① = Aluminium

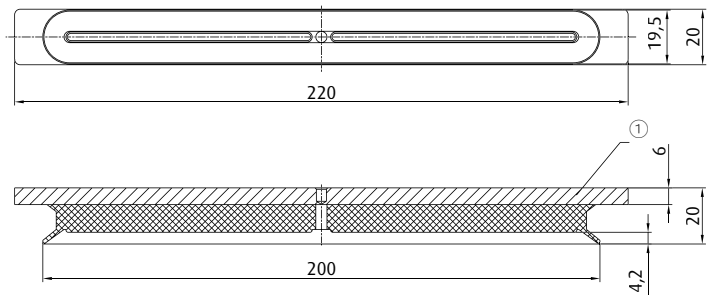
Item no.	Material		
9.190x90.061._*	NR (bg)	5.5 mm	Additional sizes available are found on p. 158.



① = Steel

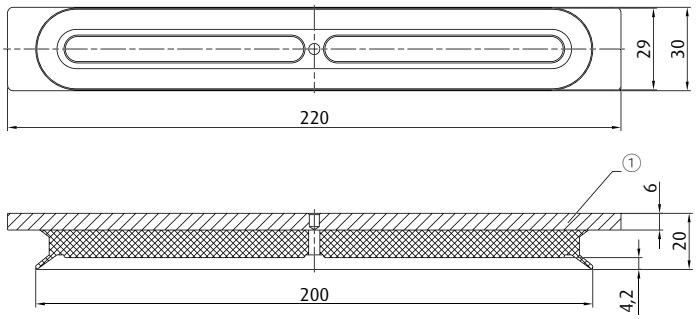
Item no.	Material		
9.200x100.015._*	NBR (gr), SBR (sw), NR (br)	8 mm	Additional sizes available are found on p. 160. **Ordering notes:** Version with aluminium carrier: 9.200x100.054._

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



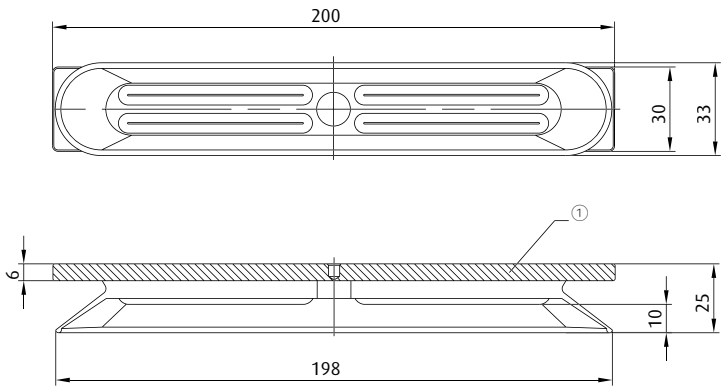
① = Steel

Item no.	Material		Ordering notes: Customised drilling patterns on request
9.200x20.063._*	NBR (gr)	5 mm	



① = Steel

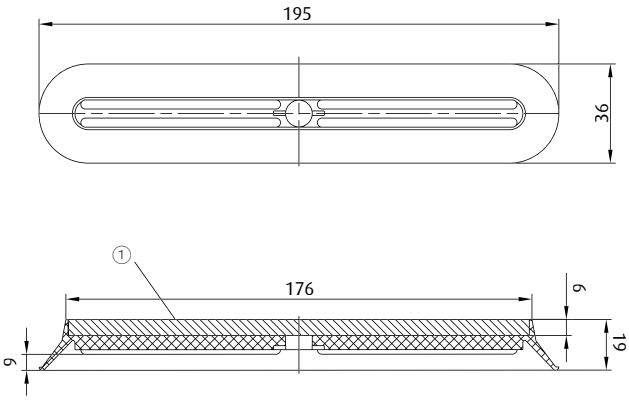
Item no.	Material		Ordering notes: Customised drilling patterns on request
9.200x30.031._*	SBR (br), NBR (gr)	4 mm	



① = Steel

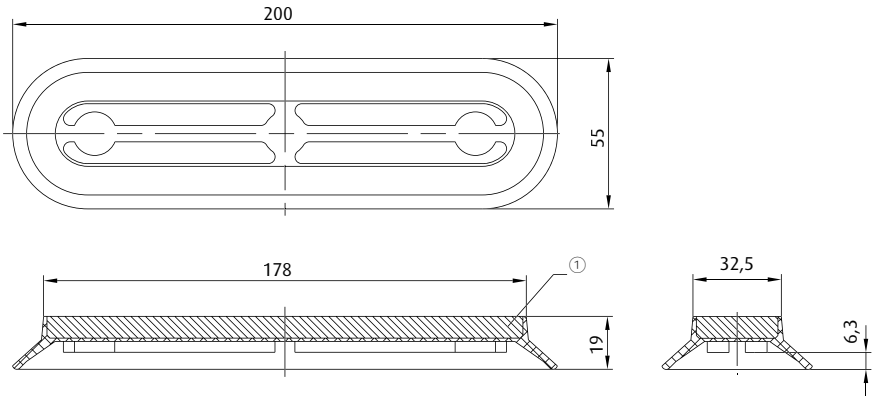
Item no.	Material		Ordering notes: Customised drilling patterns on request
9.200x35.065._*	NBR (gr), PU (bg)	10 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



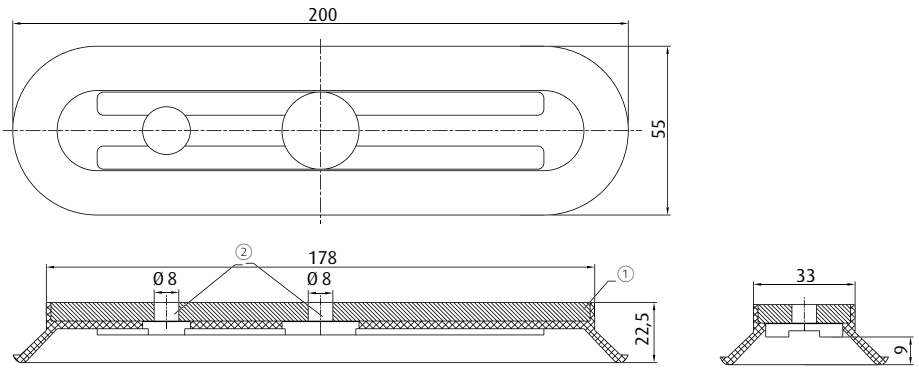
① = Steel

Item no.	Material		
9.200x40.010._*	SBR (br), NBR (gr)	9 mm	Additional sizes available are found on p. 160. **Ordering notes:** Version with aluminium carrier: 9.200x40.030._* on request customised drilling patterns available



① = Steel

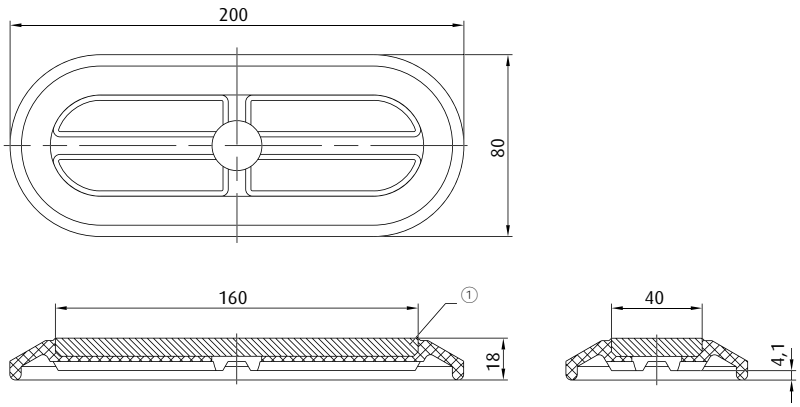
Item no.	Material		
9.200x55.014._*	NBR (gr)	7 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request



① = Aluminium ② = Sealed with rubber

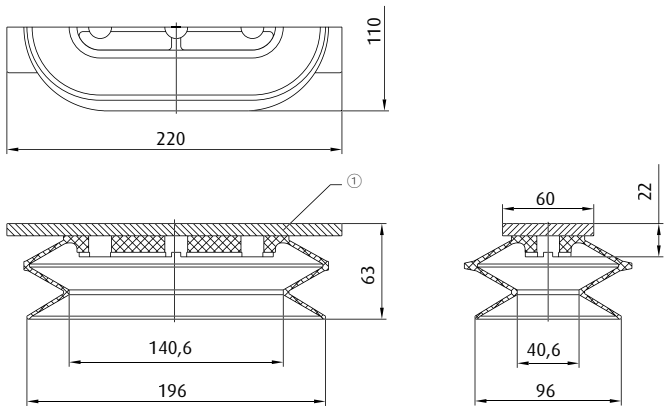
Item no.	Material		
9.200x55.020._*	NR (or)	8 mm	Additional sizes available are found on p. 160.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



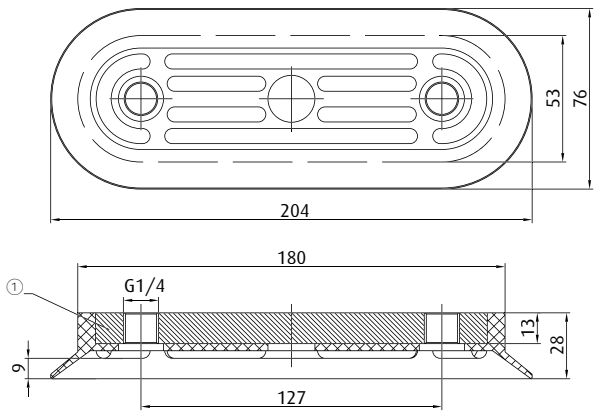
① = Steel

Item no.	Material		Ordering notes
9.200x80.067._*	SBR (sw)	4 mm	**Ordering notes:** Customised drilling patterns on request



① = Aluminium

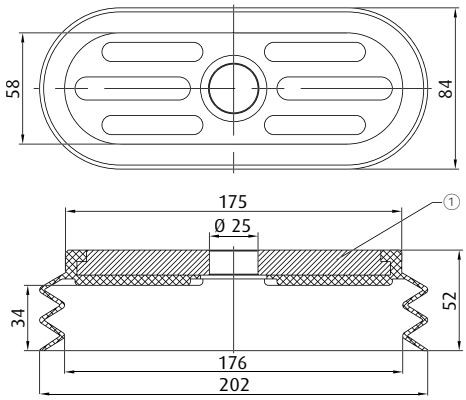
Item no.	Material		Ordering notes
138.200x100.005._*	SBR (br), NBR (gr)	41 mm	**Ordering notes:** With steel wire reinforcement in the fold: 138.200x100.006._* Customised drilling patterns on request



① = Aluminium

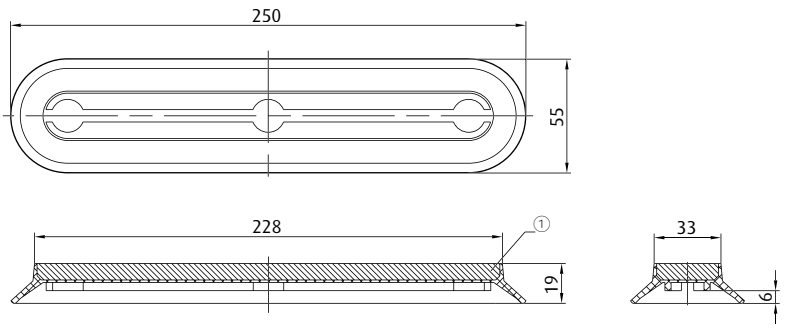
Item no.	Material		Ordering notes
130.204x76.86._*	Vinyl (bl)	8 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



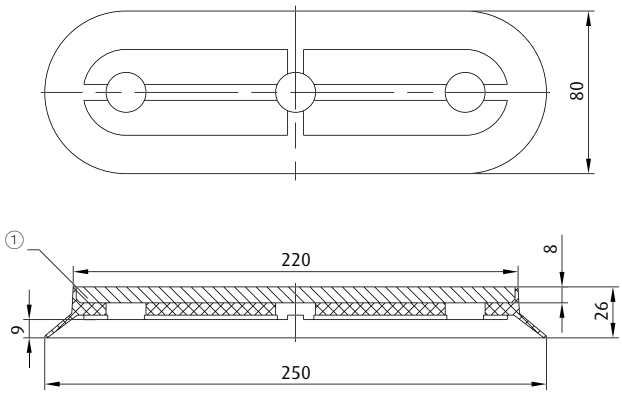
① = Aluminium

Item no.	Material		
137.205x82.1._*	Vinyl (bl)	25 mm	



① = Steel

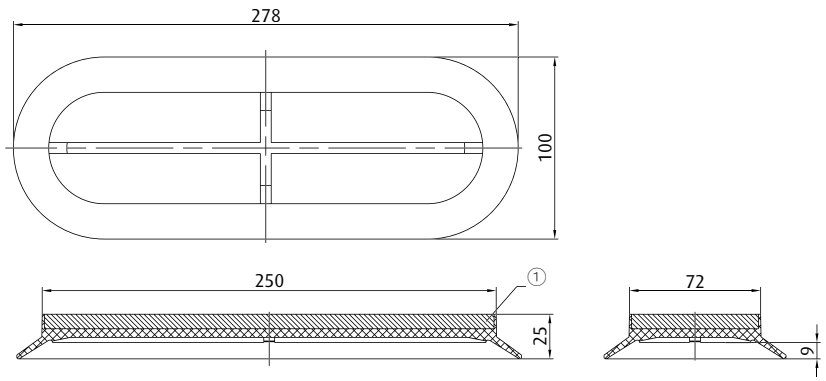
Item no.	Material		
9.250x55.016._*	NBR (gr), NR (br)	8 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request



① = Steel

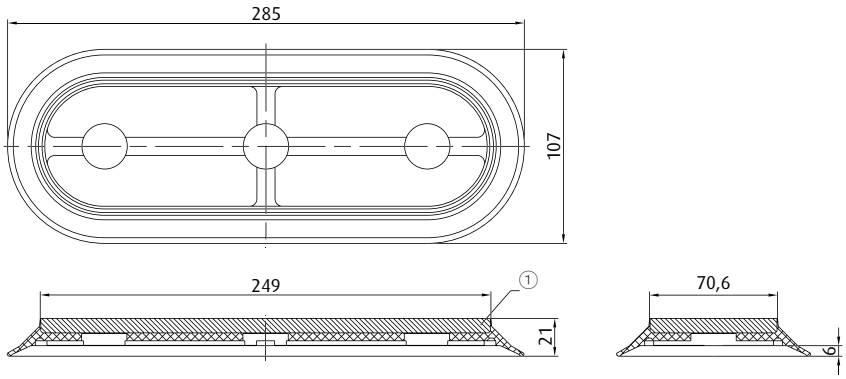
Item no.	Material		
9.250x80.033._*	NBR (gr), SBR (br), NR (br)	10 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



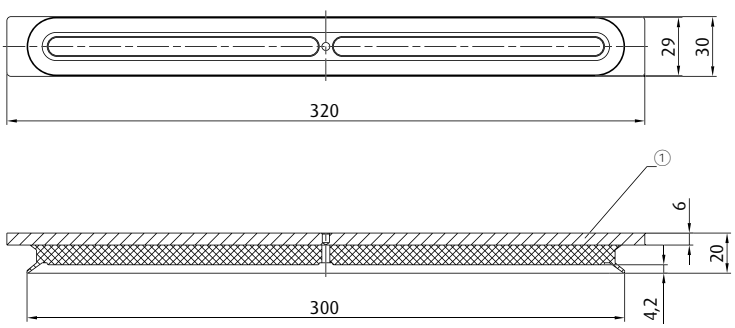
① = Steel

Item no.	Material		
9.280x100.017._*	NBR (gr), SBR (br)	10 mm	Additional sizes available are found on p. 160. **Ordering notes:** Version with aluminium carrier: 9.280x100.018._*



① = Steel

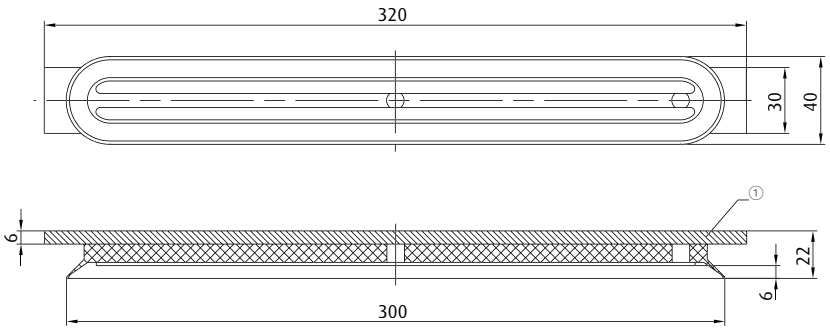
Item no.	Material		
9.280x107.070._*	SBR (br)	6 mm	**Ordering notes:** Customised drilling patterns on request



① = Steel

Item no.	Material		
9.300x30.069._*	NBR (gr)	5 mm	**Ordering notes:** Customised drilling patterns on request

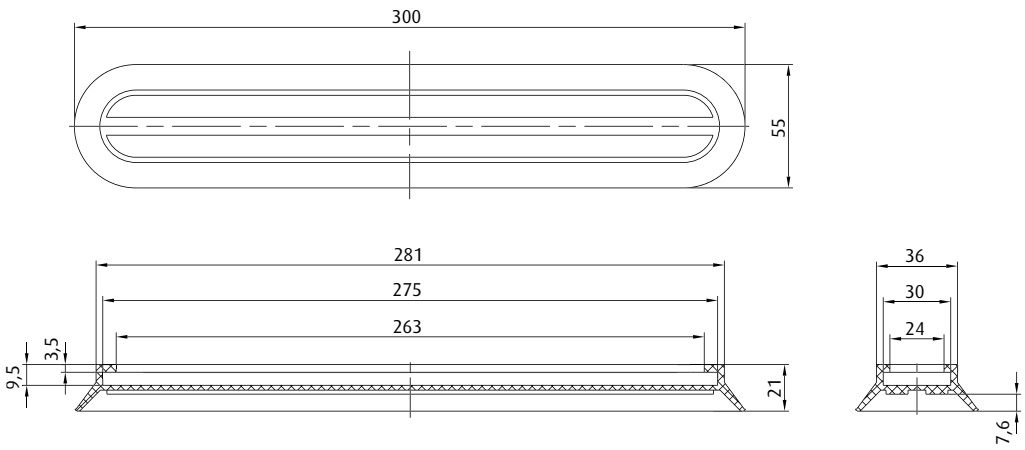
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

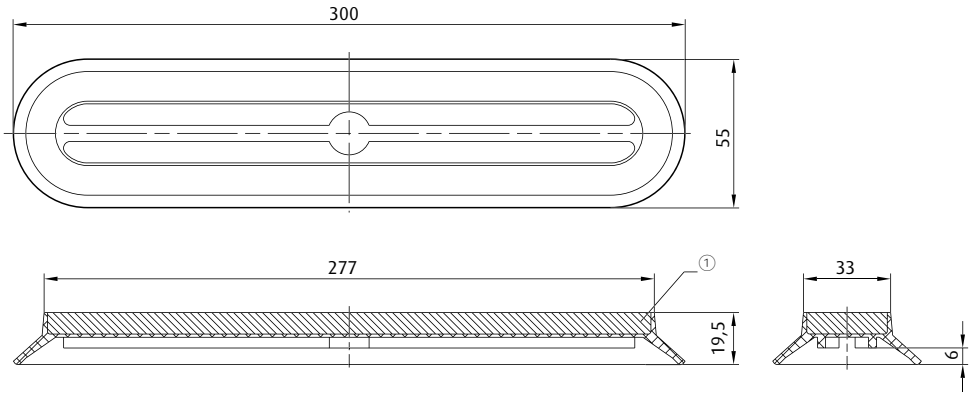
Item no.	Material		Ordering notes
9.300x40.064._*	NBR (gr)	7 mm	**Ordering notes:** Customised drilling patterns on request

	Connection	see page
270.332	Without	438



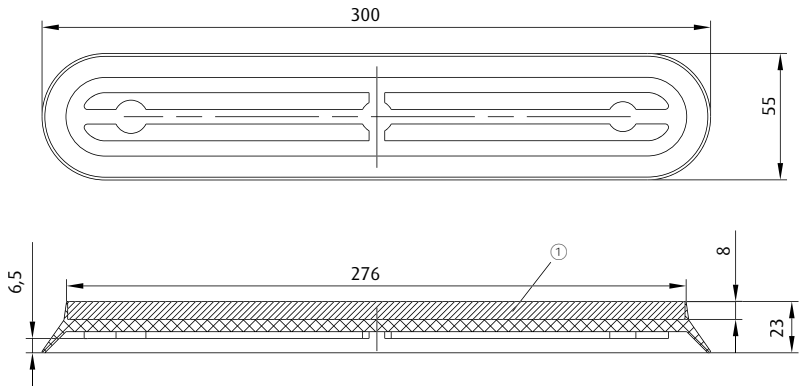
Item no.	Material		
9.290x55.071._*	NBR (gr)	7 mm	

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

Item no.	Material		
9.300x55.019._*	NBR (gr)	8 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request

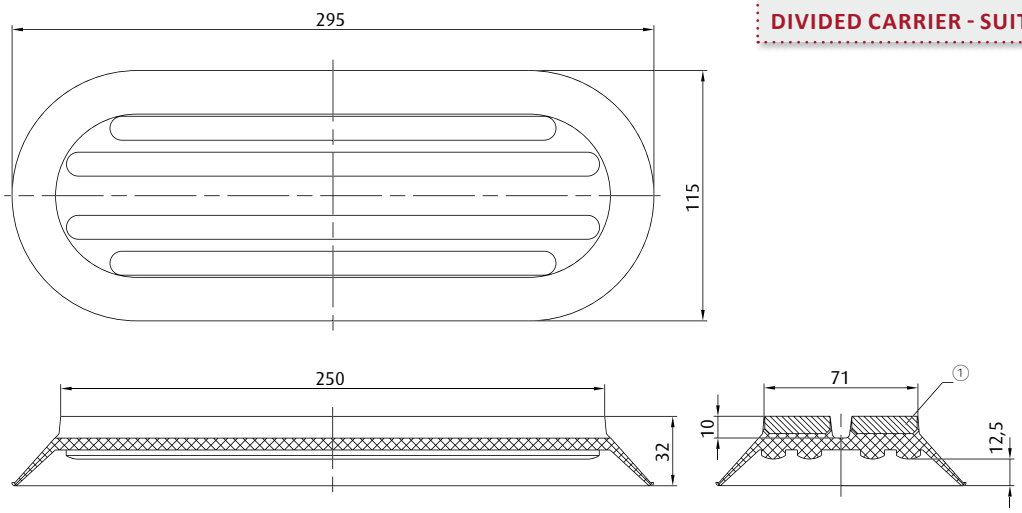


① = Aluminium

Item no.	Material		
9.300x55.020._*	NBR (gr)	8 mm	**Ordering notes:** Customised drilling patterns on request

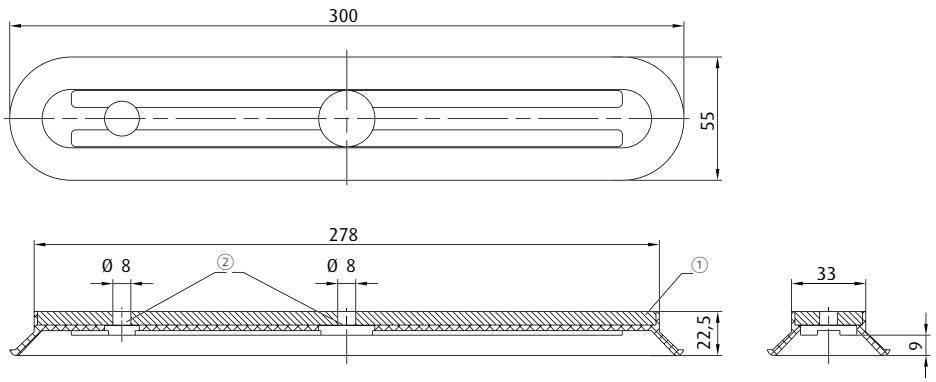
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

DIVIDED CARRIER - SUITABLE FOR PIPES



① = Steel beam divided (flexible)

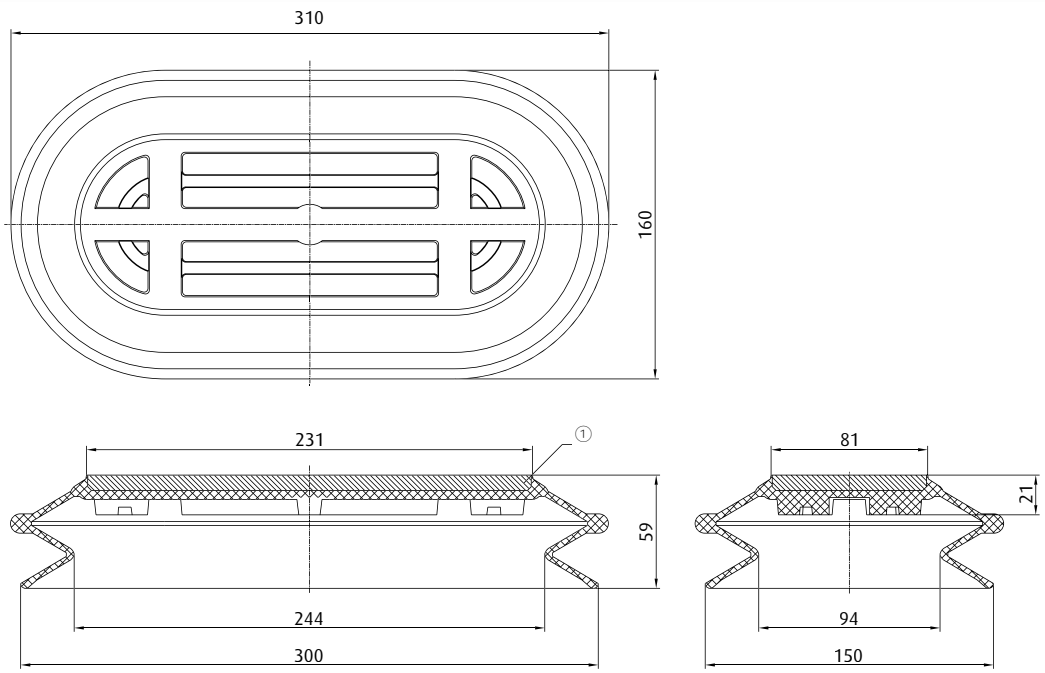
Item no.	Material		
9.300x115.068._*	NBR (gr)	14 mm	**Ordering notes:** Customised drilling patterns on request



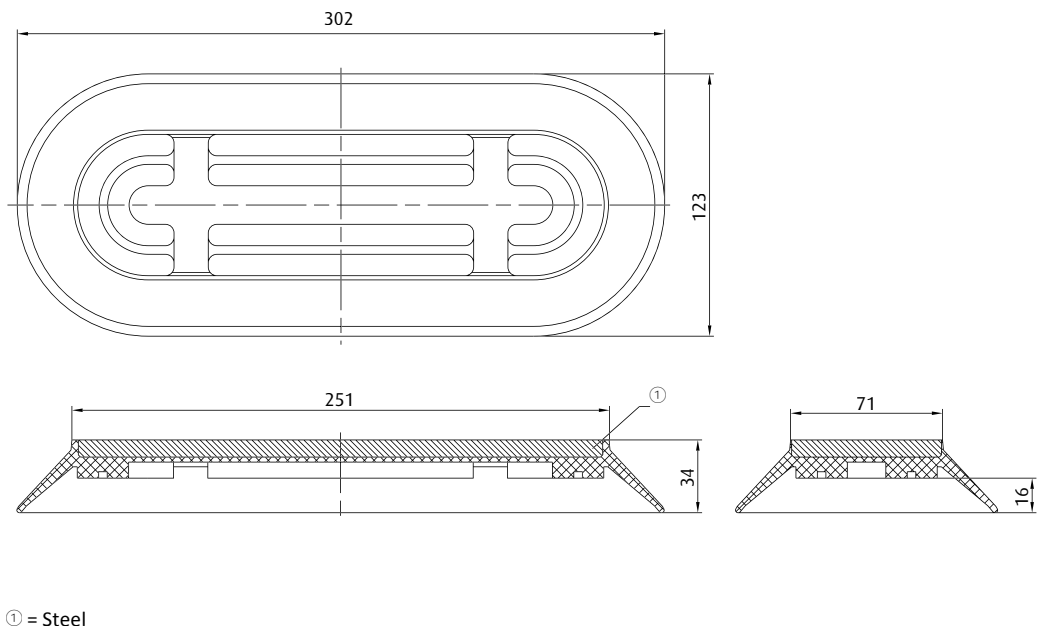
① = Aluminium ② = Sealed with rubber

Item no.	Material		
9.300x55.046._*	NR (or)	8 mm	Additional sizes available are found on p. 160.

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

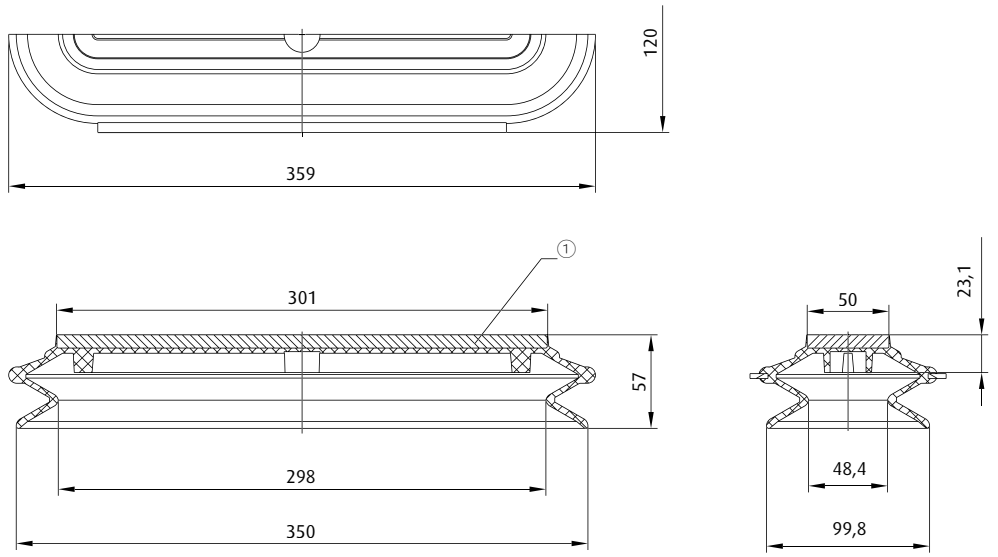


Item no.	Material		Ordering notes
138.300x150.007._*	SBR (br), NBR (gr)	39 mm	**Ordering notes:** With vulcanised metal reinforcement in the fold: 138.300x150.008._*



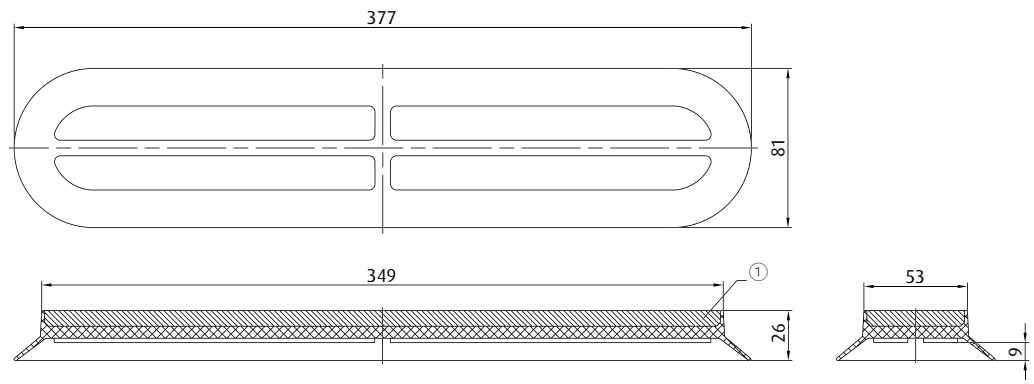
Item no.	Material		Ordering notes
9.300x120.021._*	NBR (gr), SBR (br)	17 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

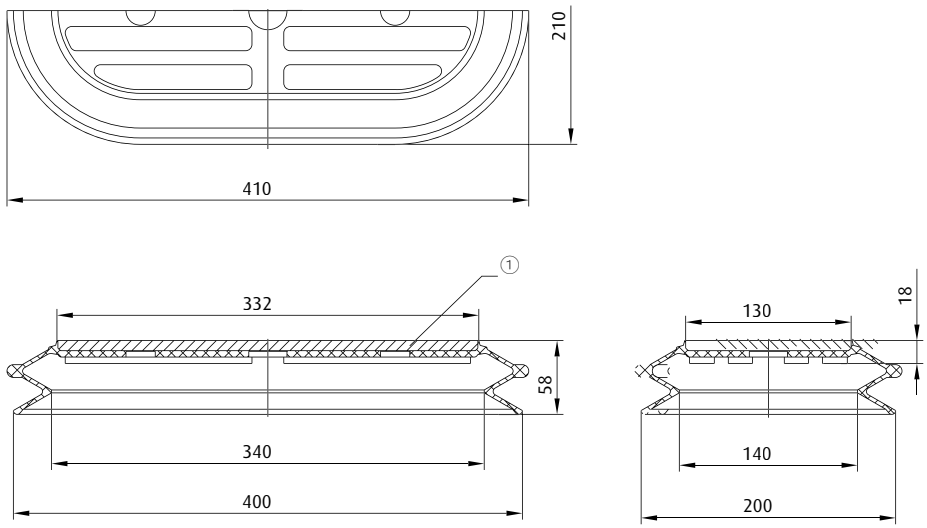
Item no.	Material		
138.350x100.009._*	SBR (br), NBR (gr)	39 mm	**Ordering notes:** With vulcanised metal reinforcement in the fold: 138.350x100.010._*



① = Steel

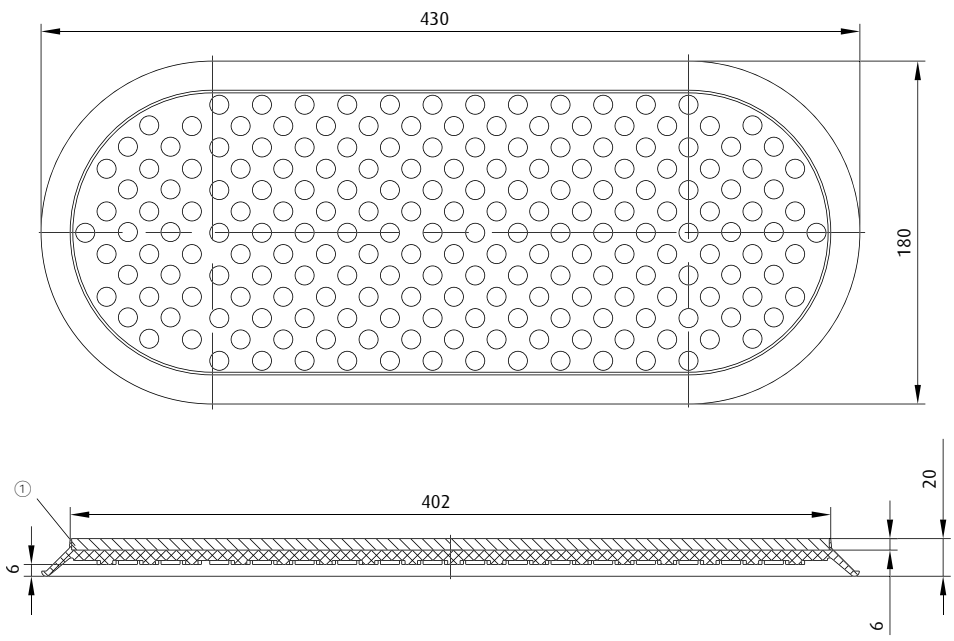
Item no.	Material		
9.370x70.022._*	NBR (gr), SBR (br)	10 mm	Additional sizes available are found on p. 160. **Ordering notes:** Version with aluminium carrier: 9.370x70.023._*

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

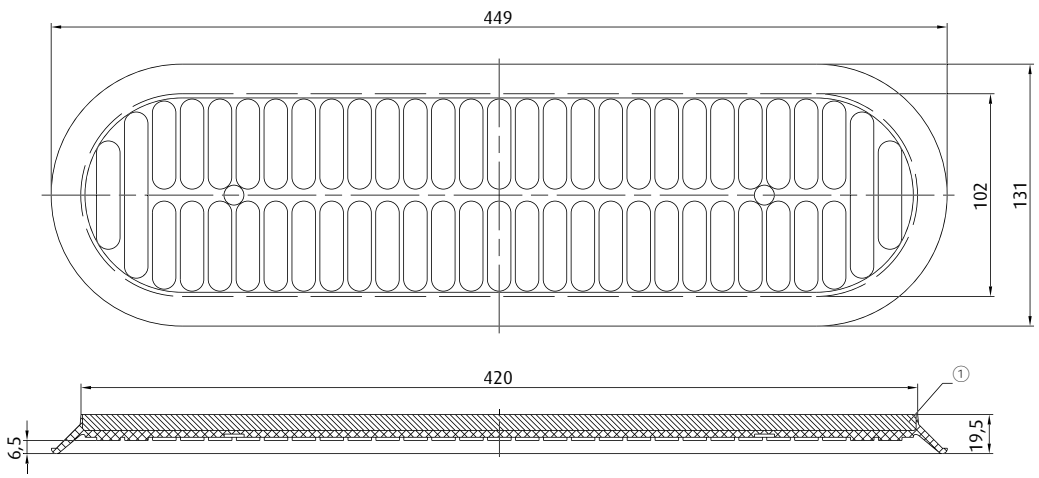
Item no.	Material		Ordering notes
138.400x200.011._*	SBR (br), NBR (gr)	39 mm	**Ordering notes:** With vulcanised metal reinforcement in the fold: 138.400x200.012._*



① = Steel

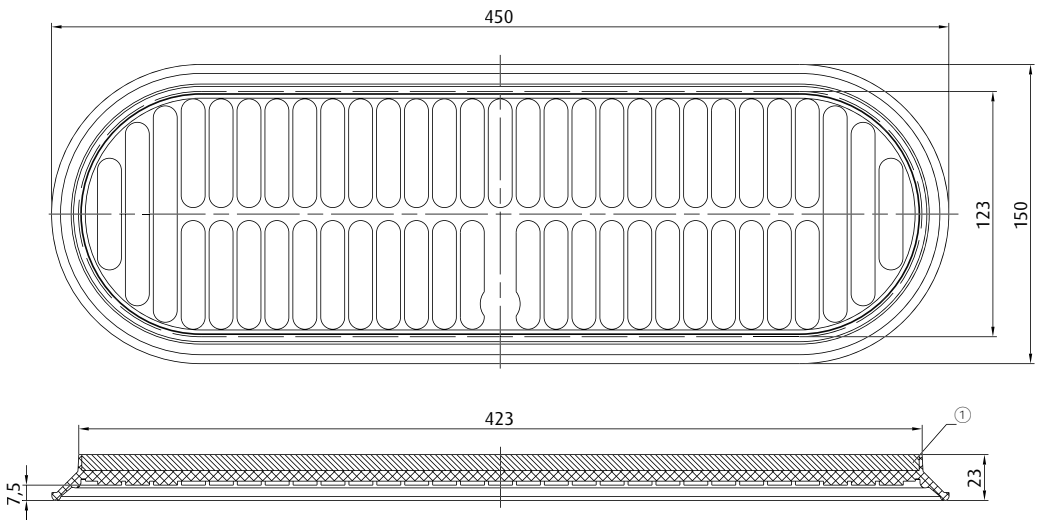
Item no.	Material		
9.430x180.024._*	SBR (sw), NBR (gr), PU (bg)	6 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

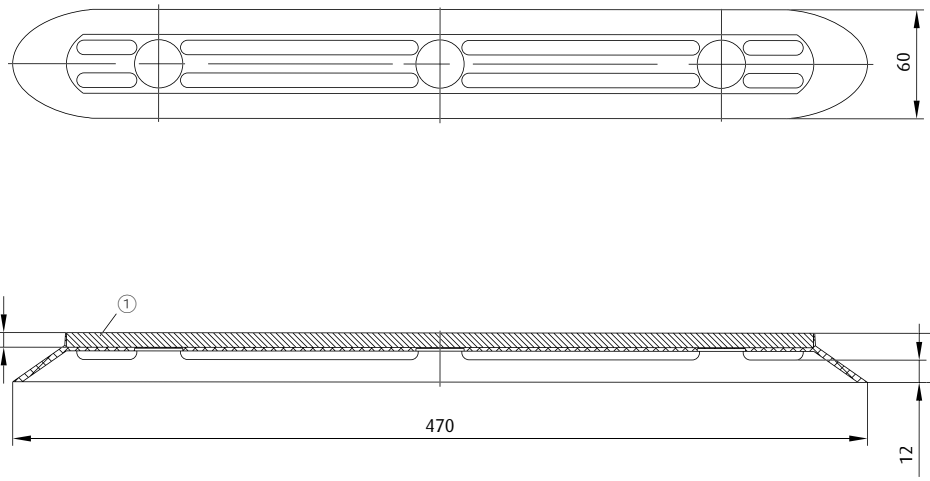
Item no.	Material		
9.450x130.025._*	NBR (gr), SBR (br)	6 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request



① = Steel

Item no.	Material		
9.450x150.026._*	NBR (gr), SBR (sw)	9 mm	**Ordering notes:** Customised drilling patterns on request

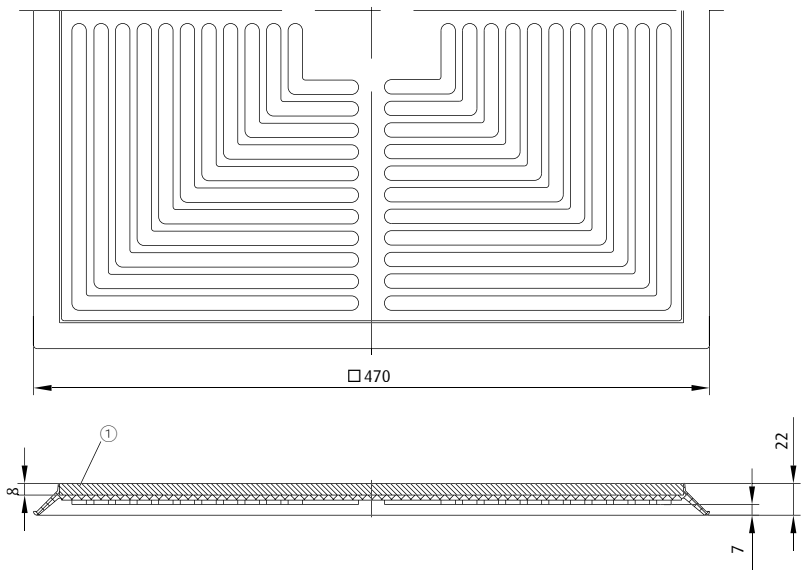
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



SUITABLE FOR ROUND SECTIONS AND PIPES

① = Steel

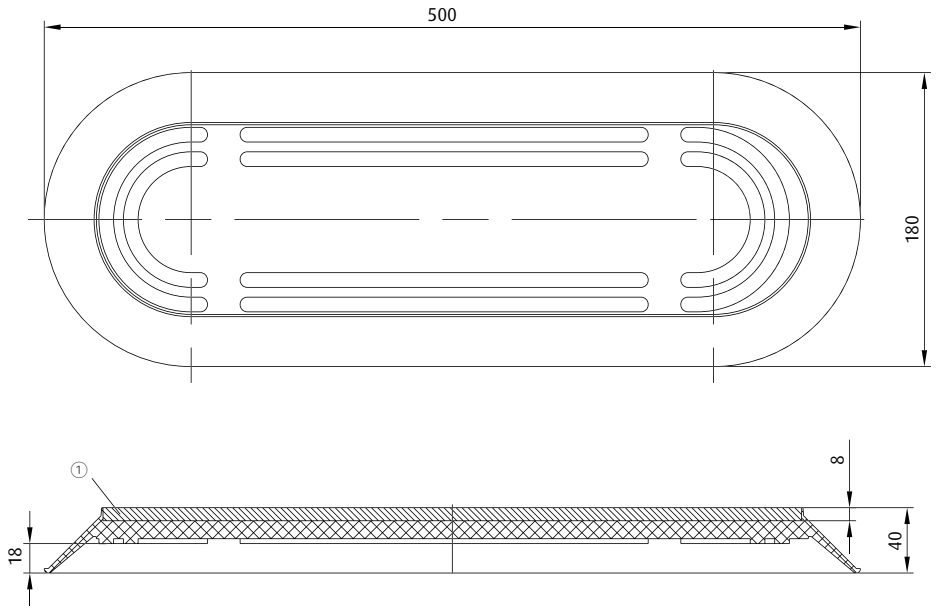
Item no.	Material		
9.470x60.072._*	NBR (gr), SBR (sw)	12 mm	**Ordering notes:** Customised drilling patterns on request



① = Steel

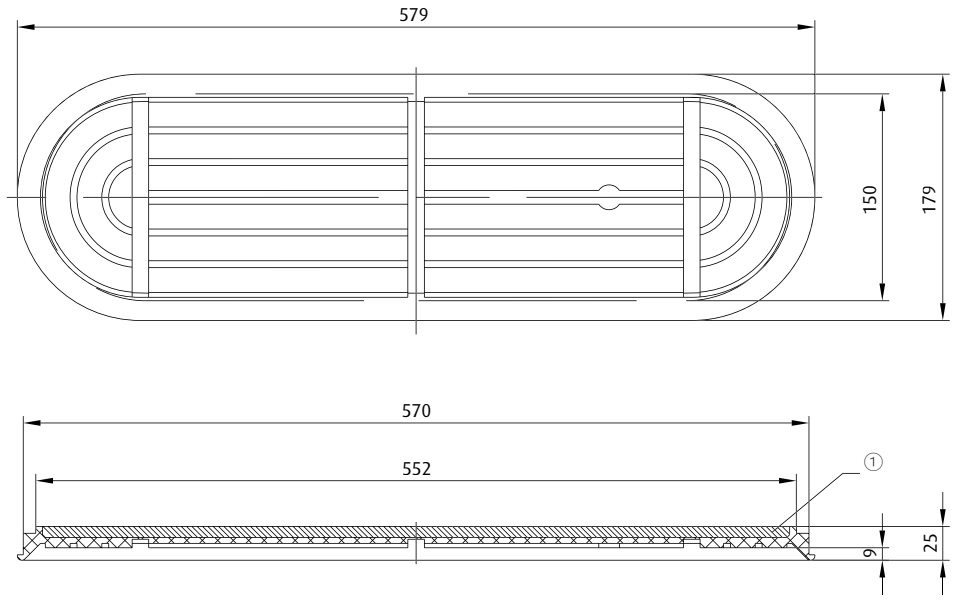
Item no.	Material		
9.470x470.027._*	SBR (sw)	6 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

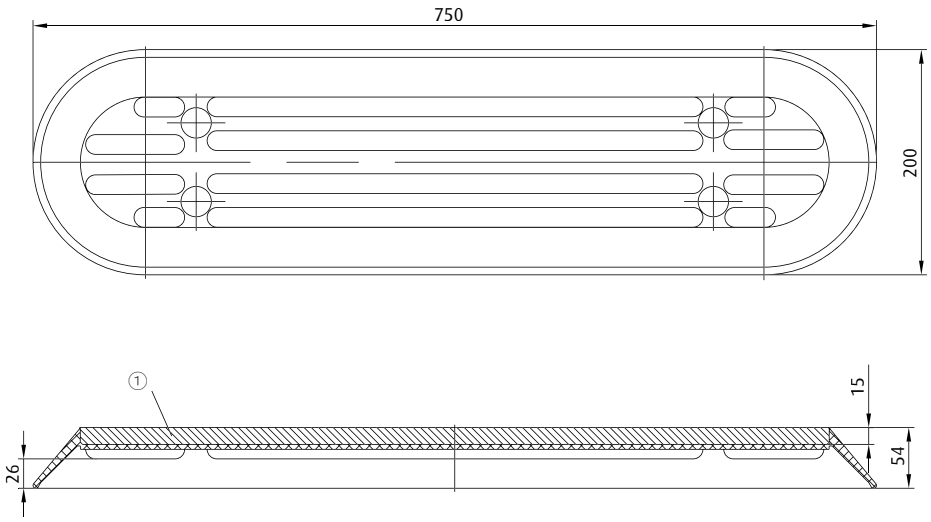
Item no.	Material		
9.500x180.028._*	NBR (gr), SBR (sw)	21 mm	**Ordering notes:** Customised drilling patterns on request



① = Steel

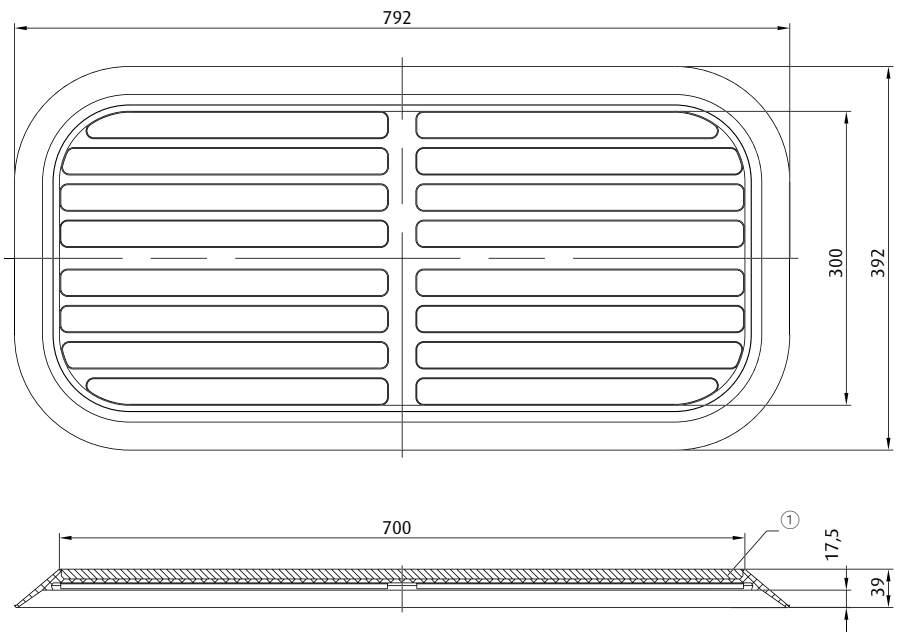
Item no.	Material		
9.580x180.029._*	NBR (gr), SBR (br)	10 mm	Additional sizes available are found on p. 160. **Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760



① = Steel

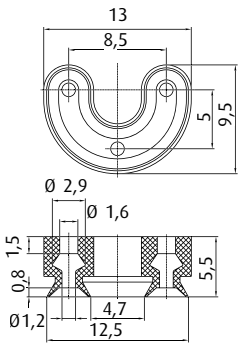
Item no.	Material		Ordering notes
9.750x200.049._*	SBR (br)	29 mm	**Ordering notes:** Customised drilling patterns on request



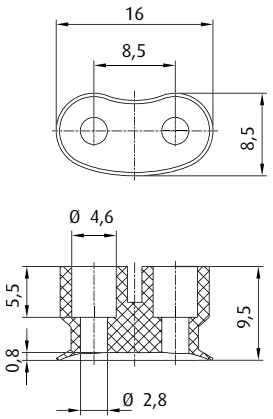
① = Steel

Item no.	Material		Ordering notes
9.800x400.048._*	SBR (br), NBR (gr)	20 mm	**Ordering notes:** Customised drilling patterns on request

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for Vacuum cups you will find on page 760

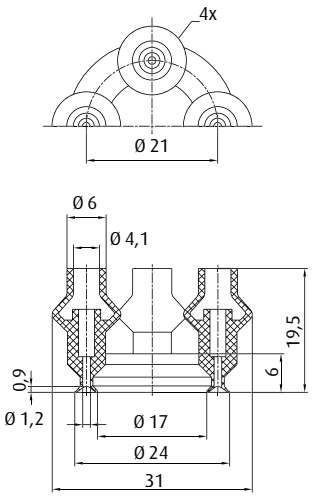


Item no.	Material	
107.013.095._*	SI (tr)	0.7 mm

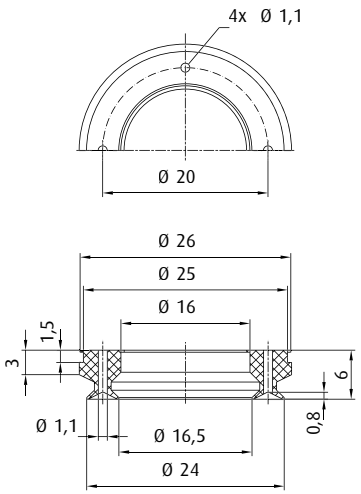


Item no.	Material	
107.017.093._*	SI (tr)	0.2 mm

	Connection	see page
270.010	M5-male	411

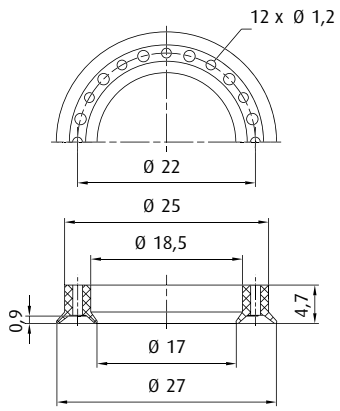


Item no.	Material	
107.024.060._*	SI (tr)	0.8 + 1.4 mm

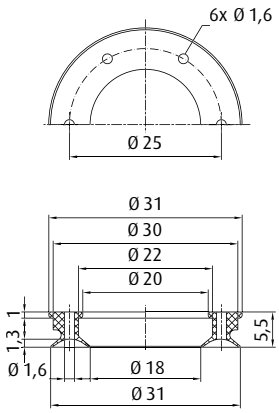


Item no.	Material	
107.024.061._*	SI (tr)	0.8 mm

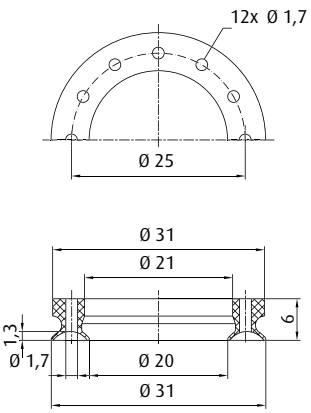
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760



Item no.	Material	
107.027.121._*	SI (tr)	0.5 mm



Item no.	Material	
107.031.079._*	SI (bl)	1.3 mm



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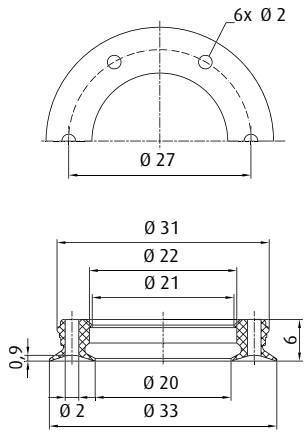
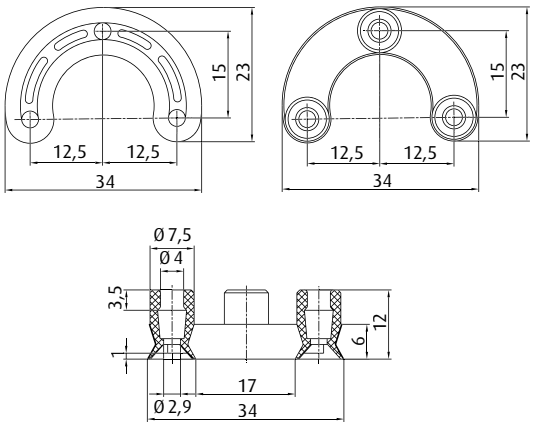
Item no.	Material	
107.031.091._*	SI (tr)	1.3 mm



Item no.	Material	
107.033.046._*	SI-AS (sw)	0.5 mm

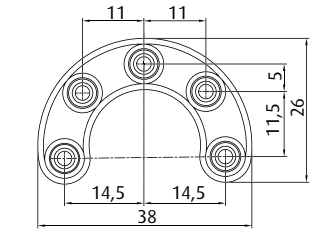
*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

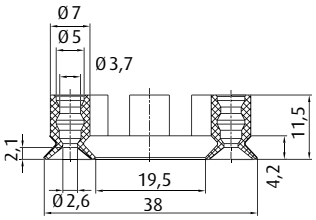
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421



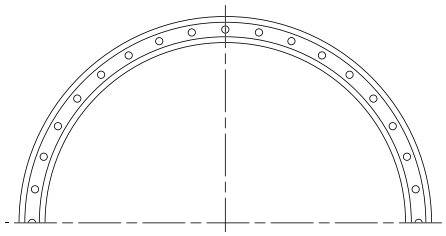
Item no.	Material	
107.033.047._*	Sl (tr)	1.2 mm

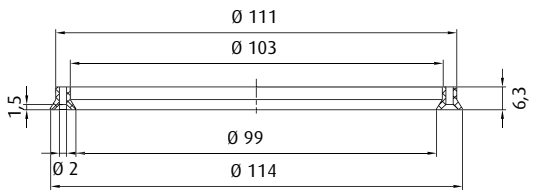
	Connection	see page
270.399	M5-male	410





Item no.	Material	
107.038.119._*	Sl (tr)	2 mm





PTFE COATED

Item no.	Material	
107.114.118._*	Sl (tr)	0.5 mm

*** When ordering please add the appropriate material code to item no. You will find it in the foldout.**
Average holding forces for vacuum cups you will find on page 760

Standard fittings for vacuum cups 408

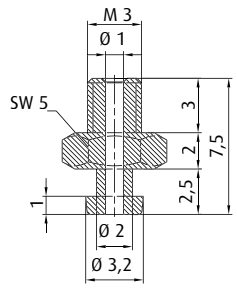
Carrier plates for vacuum cups 438

Fittings for suction discs 441

Spring levelers 442

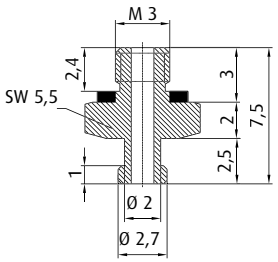
Lifting cylinders 460

Joints 470



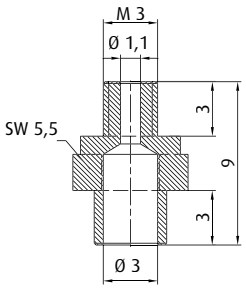
Technical data

Item no.	Thread G1
270.014	M3-male



Technical data

Item no.	Thread G1
270.524	M3-male

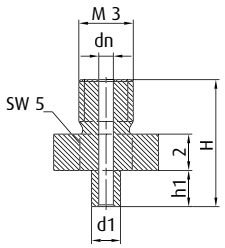


Technical data

Item no.	Thread G1
270.427	M3-male

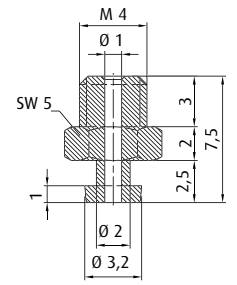
Notes:

Vacuum cup is plugged into the borehole of the fitting



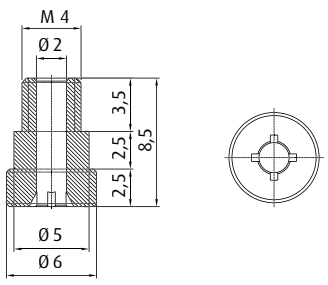
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	Ø d1 [mm]	Ø dn [mm]
270.026	M3-male	6	1	1.1	0.6
270.011	M3-male	7	2	1.6	0.8
270.025	M3-male	7.5	2	2	1



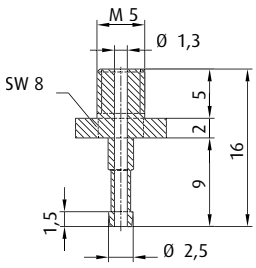
Technical data

Item no.	Thread G1
270.111	M4-male



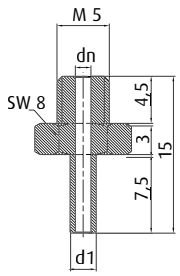
Technical data

Item no.	Thread G1
270.458	M4-male



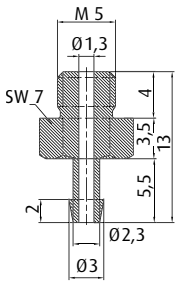
Technical data

Item no.	Thread G1
270.195	M5-male



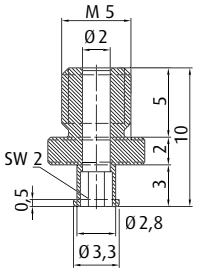
Technical data

Item no.	Thread G1	Ø d1 [mm]	Ø dn [mm]
270.001	M5-male	2.5	1.5
270.022	M5-male	3.4	2



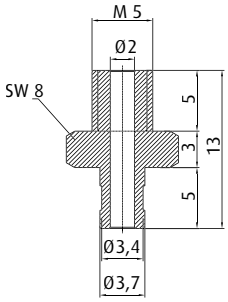
Technical data

Item no.	Thread G1
270.153	M5-male



Technical data

Item no.	Thread G1
270.283	M5-male



Technical data

Item no.	Thread G1
270.536	M5-male

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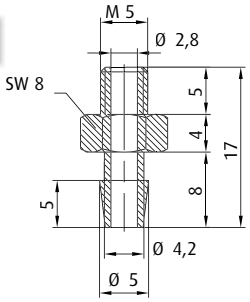
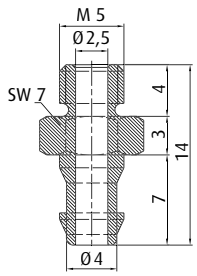


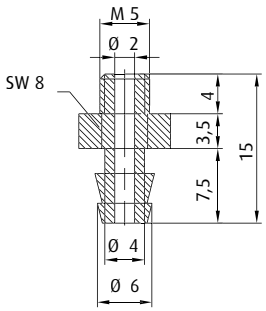
Technical data

Item no.	Thread G1
270.134	M5-male



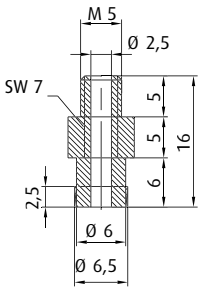
Technical data

Item no.	Thread G1
270.399	M5-male



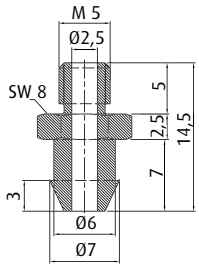
Technical data

Item no.	Thread G1
270.024	M5-male



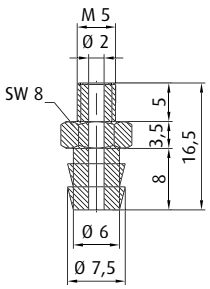
Technical data

Item no.	Thread G1
270.013	M5-male



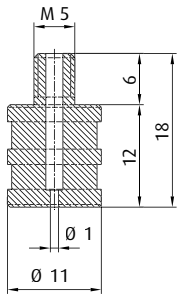
Technical data

Item no.	Thread G1
270.317	M5-male



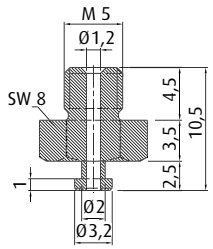
Technical data

Item no.	Thread G1
270.443	M5-male



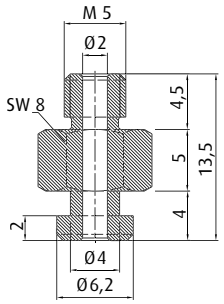
Technical data

Item no.	Thread G1
270.244	M5-male



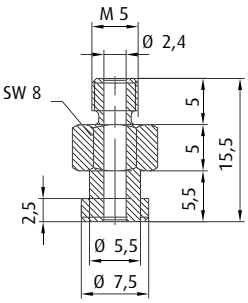
Technical data

Item no.	Thread G1
270.300	M5-male



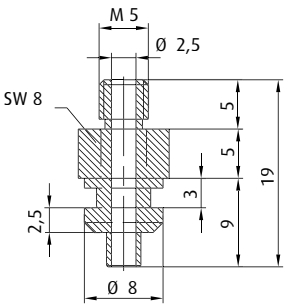
Technical data

Item no.	Thread G1
270.010	M5-male



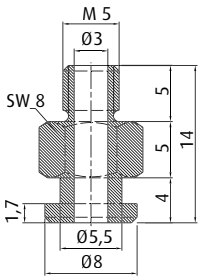
Technical data

Item no.	Thread G1
270.094	M5-male



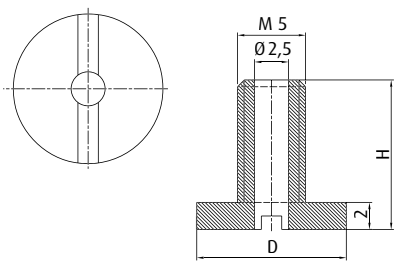
Technical data

Item no.	Thread G1
270.037	M5-male



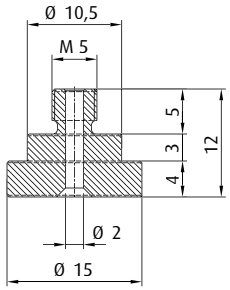
Technical data

Item no.	Thread G1
270.200	M5-male



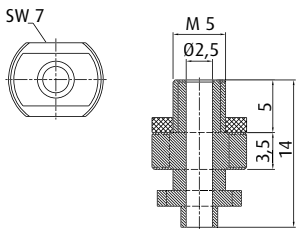
Technical data

Item no.	Thread G1	H [mm]	Ø D [mm]
270.310	M5-male	9	8
270.311	M5-male	11	11



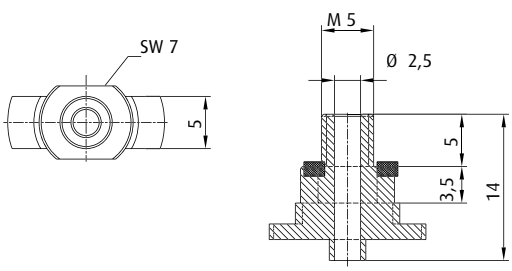
Technical data

Item no.	Thread G1
270.521	M5-male



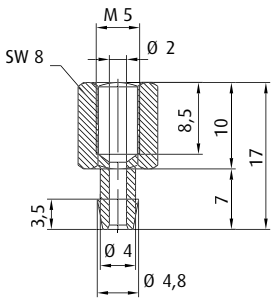
Technical data

Item no.	Thread G1
270.463	M5-male



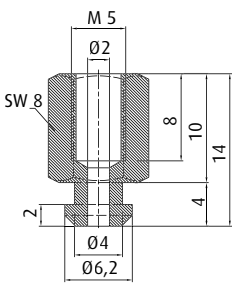
Technical data

Item no.	Thread G1
270.464	M5-male



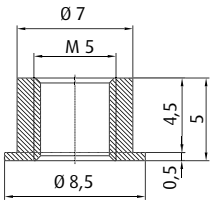
Technical data

Item no.	Thread G1
270.347	M5-female



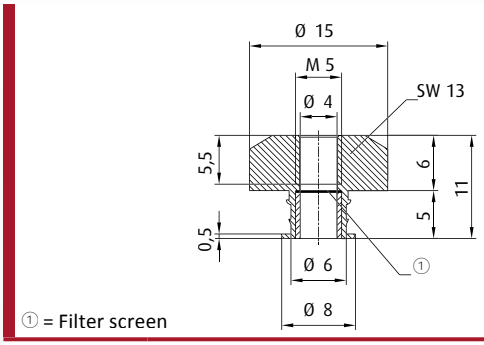
Technical data

Item no.	Thread G1
270.005	M5-female



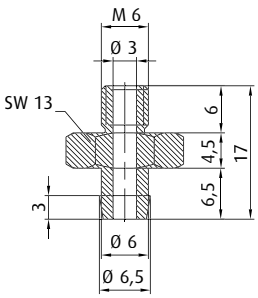
Technical data

Item no.	Thread G1
270.382	M5-female



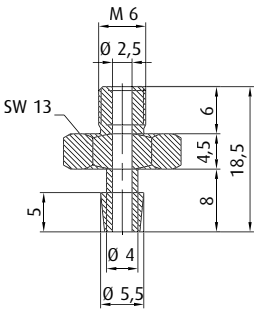
Technical data

Item no.	Thread G1
270.500-S	M5-female



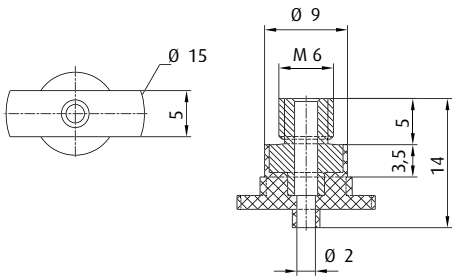
Technical data

Item no.	Thread G1
270.103	M6-male



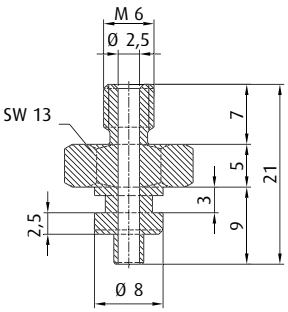
Technical data

Item no.	Thread G1
270.104	M6-male



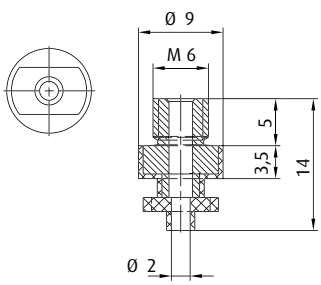
Technical data

Item no.	Thread G1
270.340	M6-male



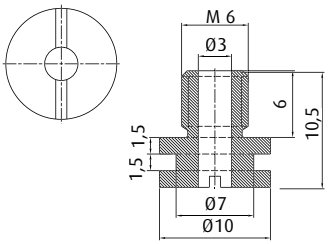
Technical data

Item no.	Thread G1
270.373	M6-male



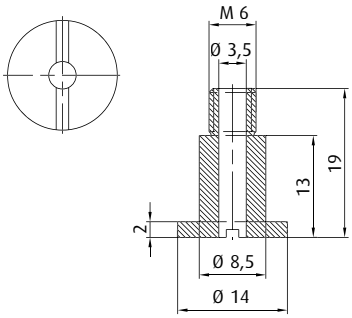
Technical data

Item no.	Thread G1
270.339	M6-male



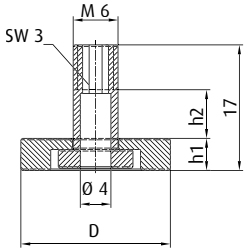
Technical data

Item no.	Thread G1
270.105	M6-male



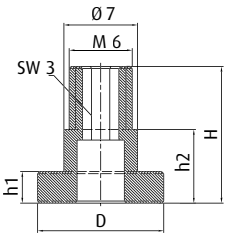
Technical data

Item no.	Thread G1
270.315	M6-male



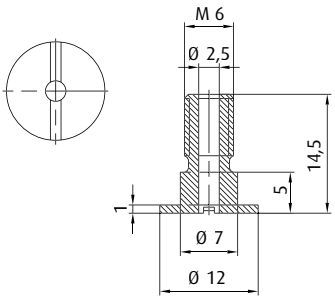
Technical data

Item no.	Thread G1	h1 [mm]	h2 [mm]	Ø D [mm]
270.498	M6-male	5	6	15
270.499	M6-male	4.5	6.5	20



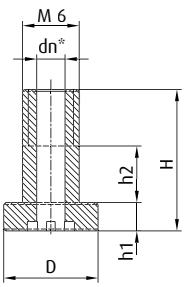
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.459	M6-male	11	2.5	6	10
270.460	M6-male	13	3	7	10



Technical data

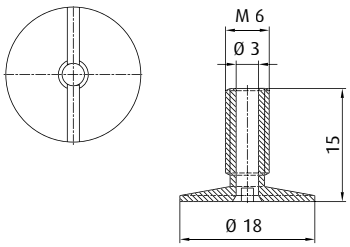
Item no.	Thread G1
270.039	M6-male



* = 270.461: Wrench size SW 3

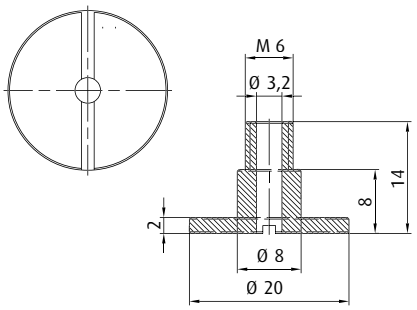
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]	Ø dn [mm]
270.312/19	M6-male	14	2	5	11	3.5
270.457	M6-male	15	3	6	10	3
270.461	M6-male	16.5	2.5	8	10	--



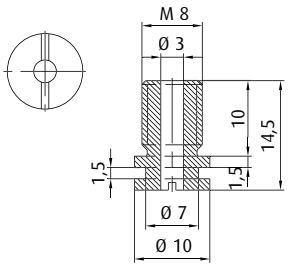
Technical data

Item no.	Thread G1
270.254	M6-male



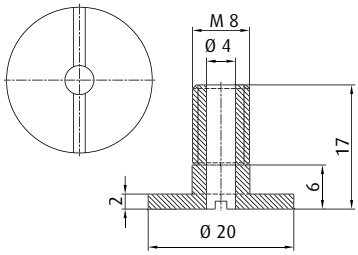
Technical data

Item no.	Thread G1
270.314	M6-male



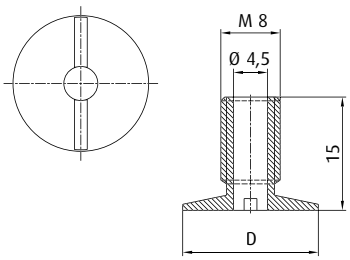
Technical data

Item no.	Thread G1
270.040	M8-male



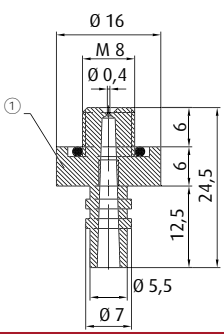
Technical data

Item no.	Thread G1
270.313	M8-male



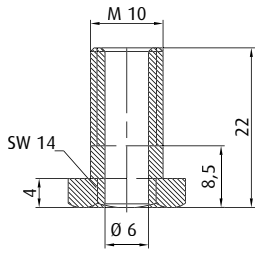
Technical data

Item no.	Thread G1	Ø D [mm]
270.247	M8-male	12
270.255	M8-male	15
270.256	M8-male	18



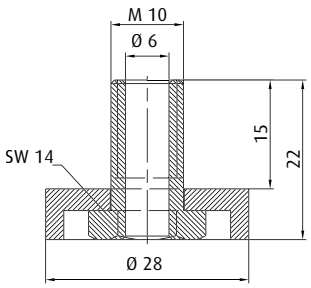
Technical data

Item no.	Thread G1
270.378	M8-male



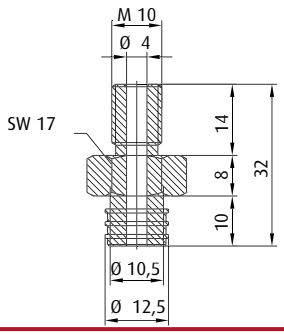
Technical data

Item no.	Thread G1
270.462	M10-male



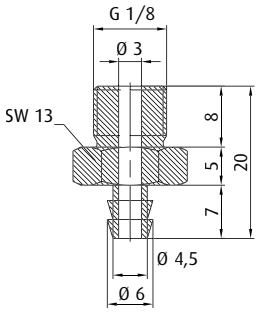
Technical data

Item no.	Thread G1
270.512	M10-male



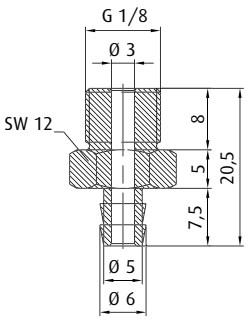
Technical data

Item no.	Thread G1
270.177	M10-male



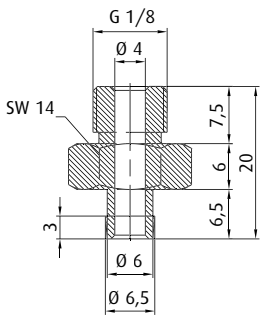
Technical data

Item no.	Thread G1
270.033	G1/8-male



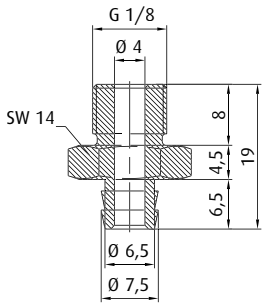
Technical data

Item no.	Thread G1
270.205	G1/8-male



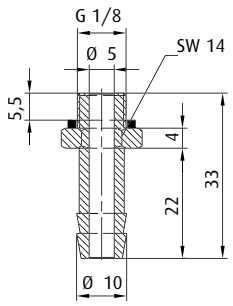
Technical data

Item no.	Thread G1
270.003	G1/8-male



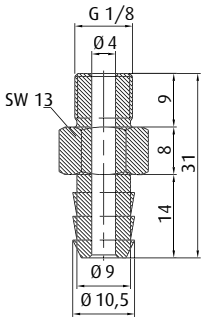
Technical data

Item no.	Thread G1
270.238	G1/8-male



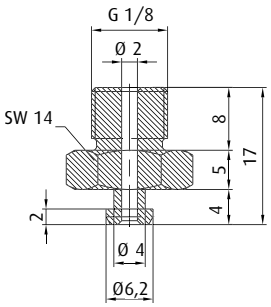
Technical data

Item no.	Thread G1
270.060	G1/8-male



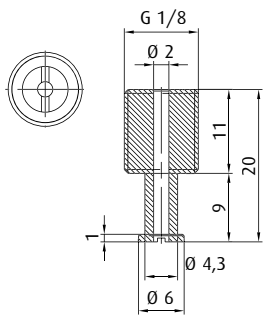
Technical data

Item no.	Thread G1
270.132	G1/8-male



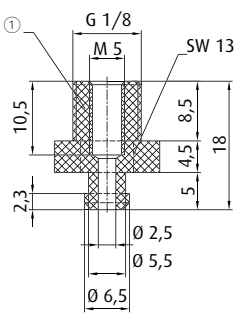
Technical data

Item no.	Thread G1
270.009	G1/8-male



Technical data

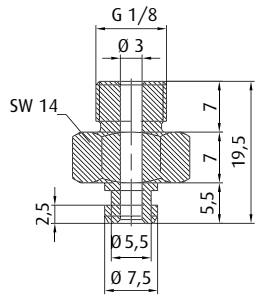
Item no.	Thread G1
270.242	G1/8-male



① = Material: POM

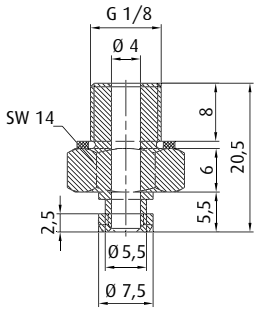
Technical data

Item no.	Thread G1
270.188	G1/8-male



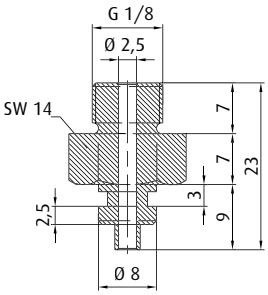
Technical data

Item no.	Thread G1
270.095	G1/8-male



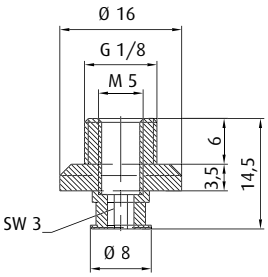
Technical data

Item no.	Thread G1
270.431	G1/8-male



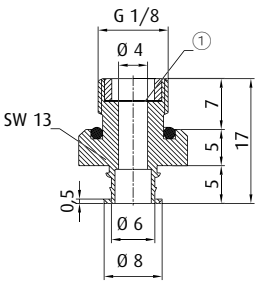
Technical data

Item no.	Thread G1
270.085	G1/8-male



Technical data

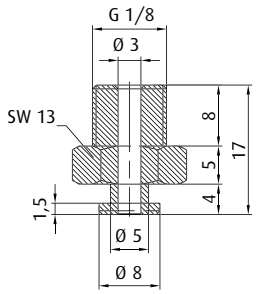
Item no.	Thread G1
270.250	G1/8-male



① = Filter screen

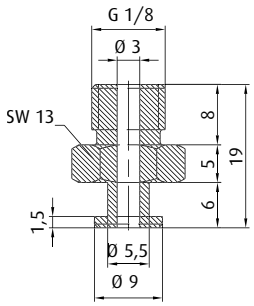
Technical data

Item no.	Thread G1
270.503-S	G1/8-male



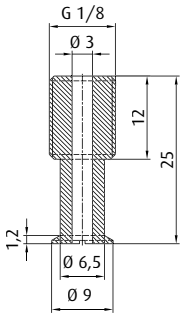
Technical data

Item no.	Thread G1
270.064	G1/8-male



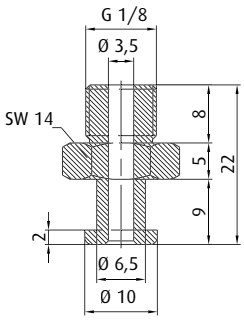
Technical data

Item no.	Thread G1
270.063	G1/8-male



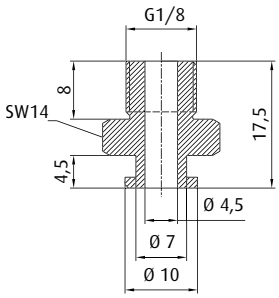
Technical data

Item no.	Thread G1
270.147	G1/8-male



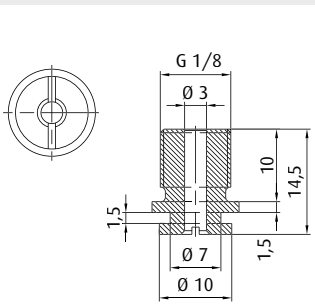
Technical data

Item no.	Thread G1
270.030	G1/8-male



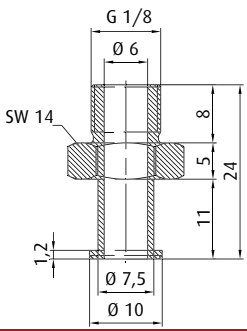
Technical data

Item no.	Thread G1
270.543	G1/8-male



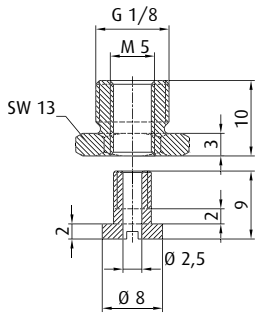
Technical data

Item no.	Thread G1
270.077	G1/8-male



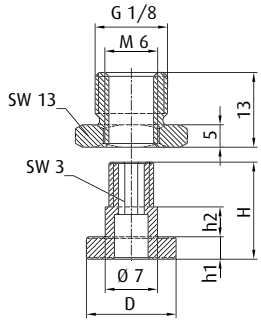
Technical data

Item no.	Thread G1
270.112	G1/8-male



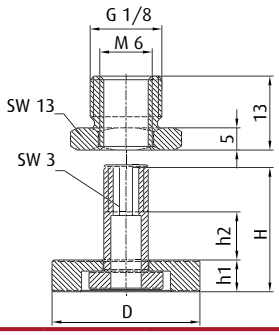
Technical data

Item no.	Thread G1
270.493	G1/8-male



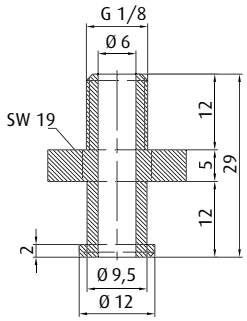
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.480	G1/8-male	11	2.5	3.5	10
270.482	G1/8-male	13	3	4	12



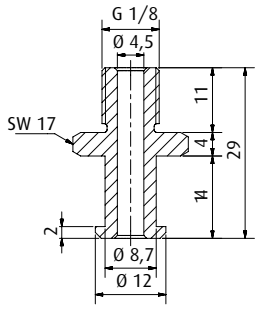
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.486	G1/8-male	17	5	6	15
270.490	G1/8-male	17	4.5	6.5	20



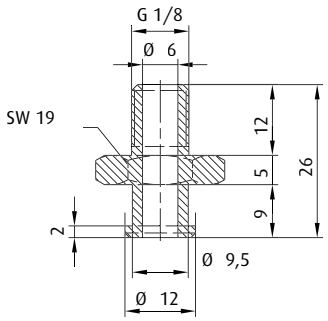
Technical data

Item no.	Thread G1
270.352	G1/8-male



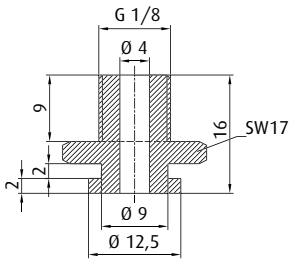
Technical data

Item no.	Thread G1
270.196	G1/8-male



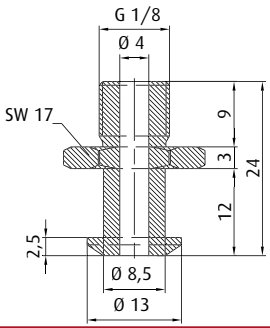
Technical data

Item no.	Thread G1
270.354	G1/8-male



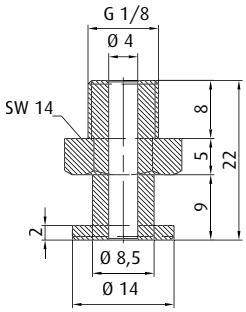
Technical data

Item no.	Thread G1
270.541	G1/8-male



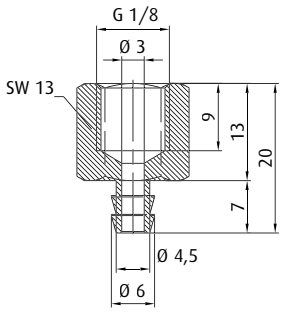
Technical data

Item no.	Thread G1
270.093	G1/8-male



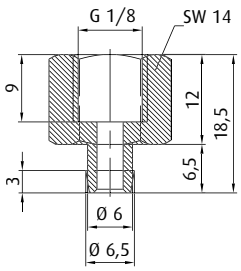
Technical data

Item no.	Thread G1
270.012	G1/8-male



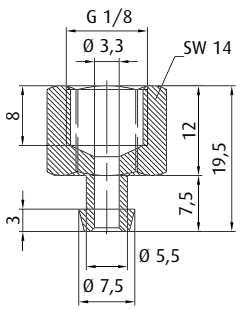
Technical data

Item no.	Thread G1
270.478	G1/8-female



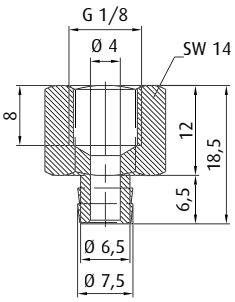
Technical data

Item no.	Thread G1
270.015	G1/8-female



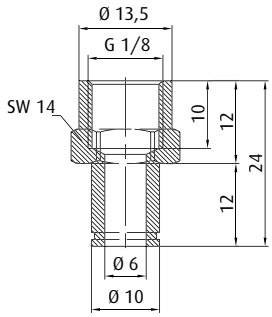
Technical data

Item no.	Thread G1
270.109	G1/8-female



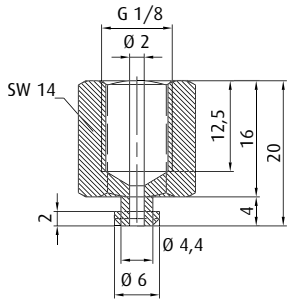
Technical data

Item no.	Thread G1
270.110	G1/8-female



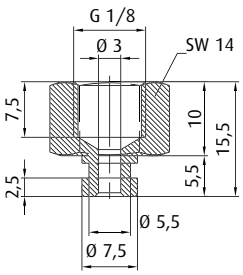
Technical data

Item no.	Thread G1
270.114	G1/8-female



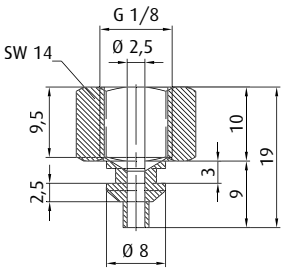
Technical data

Item no.	Thread G1
270.007	G1/8-female



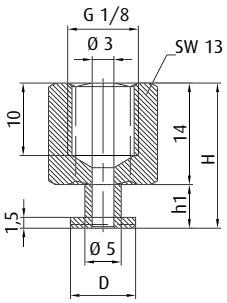
Technical data

Item no.	Thread G1
270.096	G1/8-female



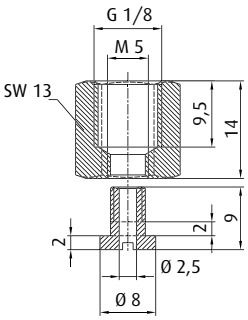
Technical data

Item no.	Thread G1
270.086	G1/8-female



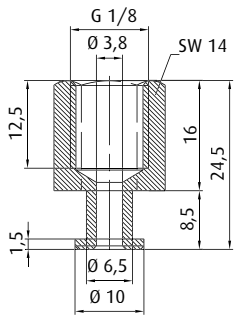
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	Ø D [mm]
270.065	G1/8-female	18	4	8.5
270.061	G1/8-female	20	6	9



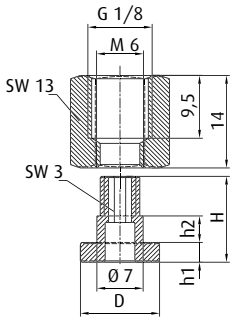
Technical data

Item no.	Thread G1
270.494	G1/8-female



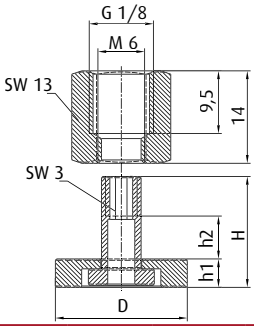
Technical data

Item no.	Thread G1
270.019	G1/8-female



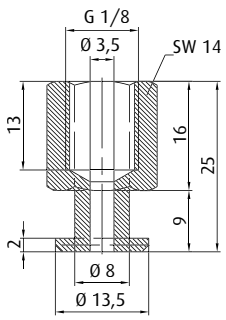
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.479	G1/8-female	11	2.5	3.5	10
270.481	G1/8-female	13	3	4	12



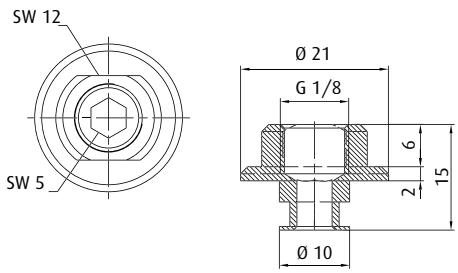
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.485	G1/8-female	17	5	6	15
270.489	G1/8-female	17	4.5	6.5	20



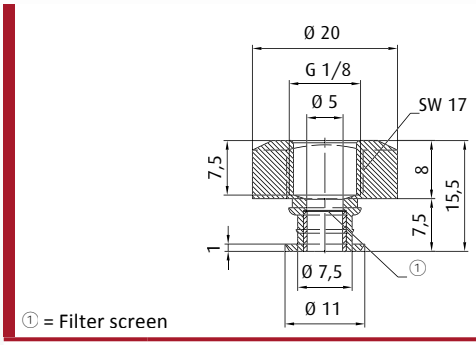
Technical data

Item no.	Thread G1
270.020	G1/8-female



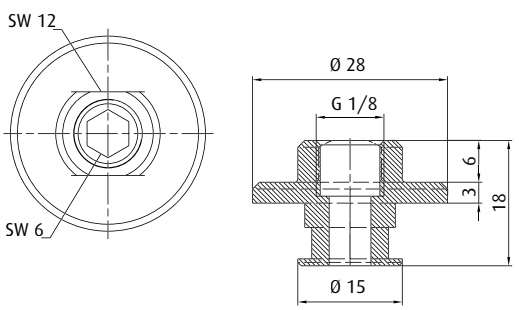
Technical data

Item no.	Thread G1
270.251	G1/8-female



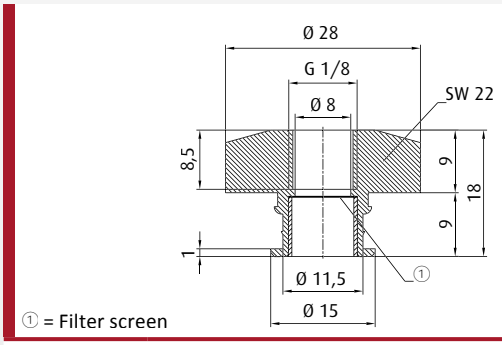
Technical data

Item no.	Thread G1
270.501-S	G1/8-female



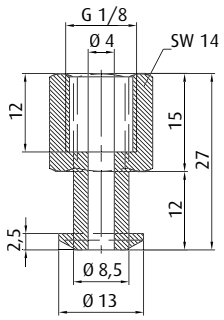
Technical data

Item no.	Thread G1
270.252	G1/8-female



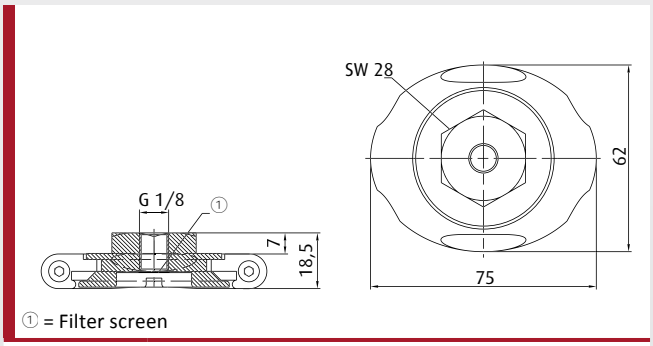
Technical data

Item no.	Thread G1
270.502-S	G1/8-female



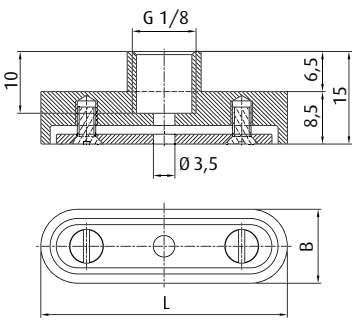
Technical data

Item no.	Thread G1
270.092	G1/8-female



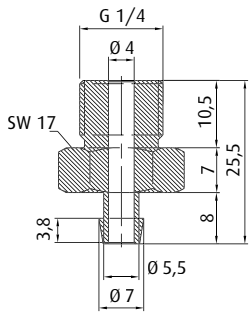
Technical data

Item no.	Thread G1
270.527-S	G1/8-female



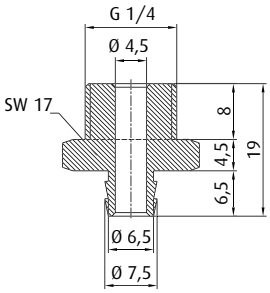
Technical data

Item no.	Thread G1	Ø L [mm]	Ø B [mm]
270.439	G1/8-female	30	12
270.440	G1/8-female	40	12
270.441	G1/8-female	55	12



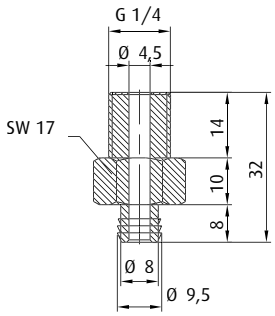
Technical data

Item no.	Thread G1
270.194	G1/4-male



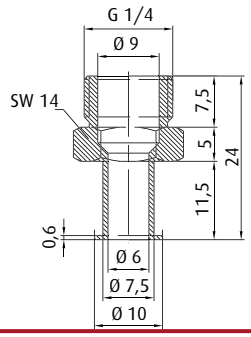
Technical data

Item no.	Thread G1
270.534	G1/4-male



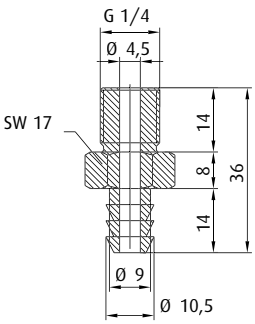
Technical data

Item no.	Thread G1
270.043	G1/4-male



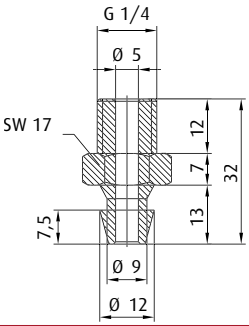
Technical data

Item no.	Thread G1
270.113	G1/4-male



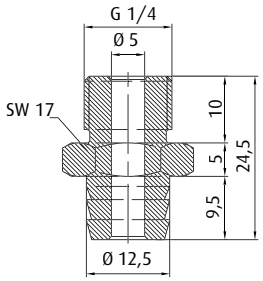
Technical data

Item no.	Thread G1
270.208	G1/4-male



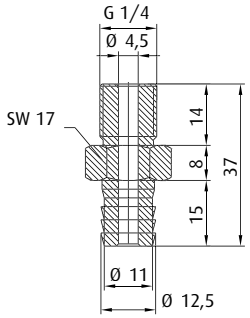
Technical data

Item no.	Thread G1
270.515	G1/4-male



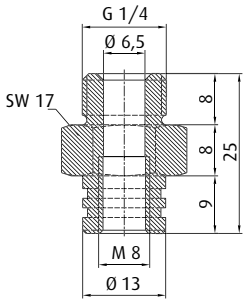
Technical data

Item no.	Thread G1
270.451	G1/4-male



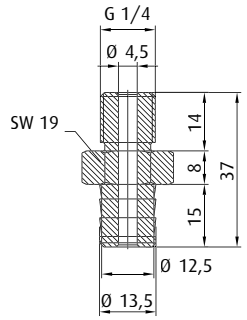
Technical data

Item no.	Thread G1
270.044	G1/4-male



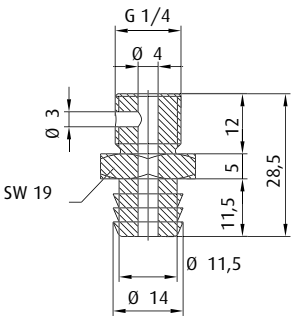
Technical data

Item no.	Thread G1
270.097	G1/4-male



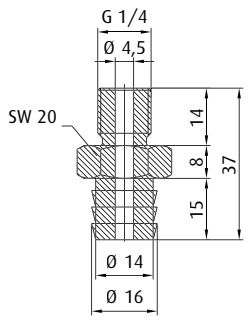
Technical data

Item no.	Thread G1
270.049-1	G1/4-male



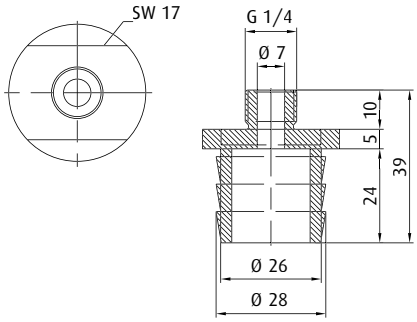
Technical data

Item no.	Thread G1
270.101	G1/4-male



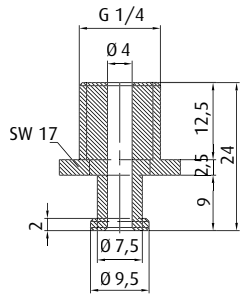
Technical data

Item no.	Thread G1
270.207	G1/4-male



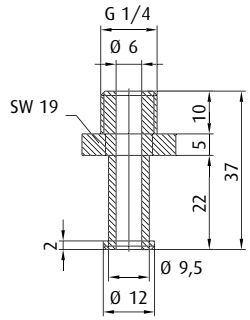
Technical data

Item no.	Thread G1
270.438	G1/4-male



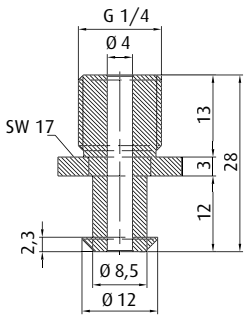
Technical data

Item no.	Thread G1
270.274	G1/4-male



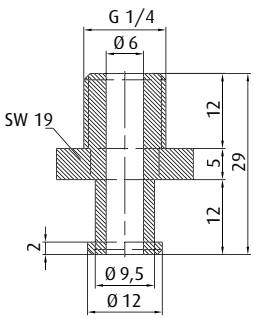
Technical data

Item no.	Thread G1
270.359	G1/4-male



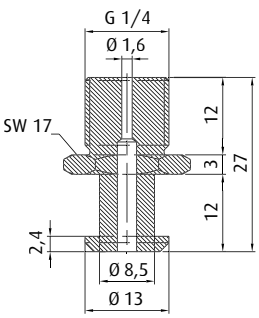
Technical data

Item no.	Thread G1
270.249	G1/4-male



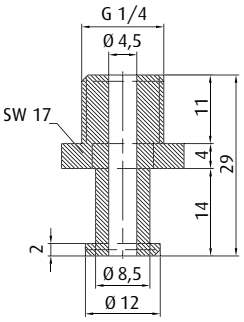
Technical data

Item no.	Thread G1
270.204	G1/4-male



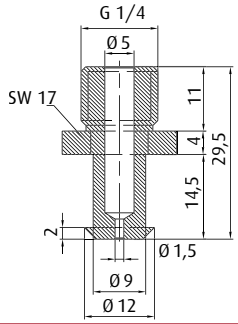
Technical data

Item no.	Thread G1
270.099	G1/4-male



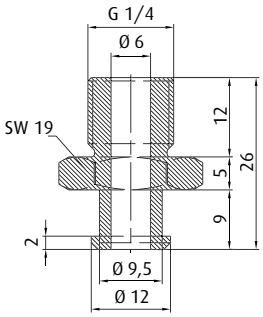
Technical data

Item no.	Thread G1
270.190	G1/4-male



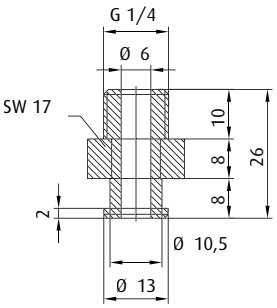
Technical data

Item no.	Thread G1
270.002	G1/4-male



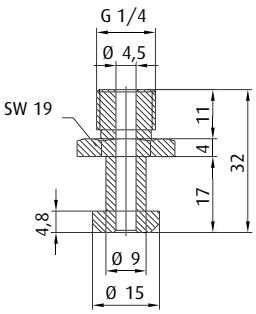
Technical data

Item no.	Thread G1
270.034	G1/4-male



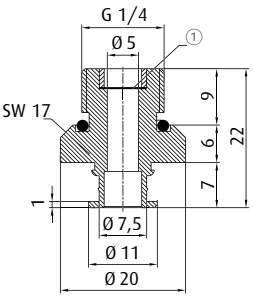
Technical data

Item no.	Thread G1
270.213	G1/4-male



Technical data

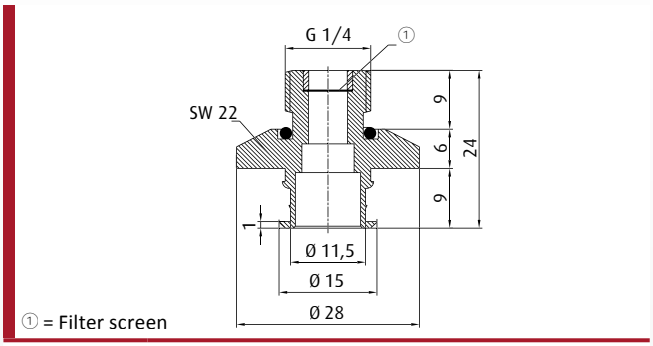
Item no.	Thread G1
270.281	G1/4-male



① = Filter screen

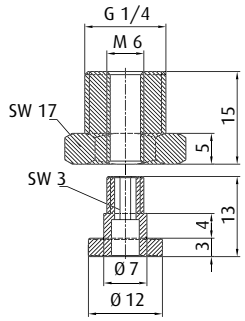
Technical data

Item no.	Thread G1
270.506-S	G1/4-male



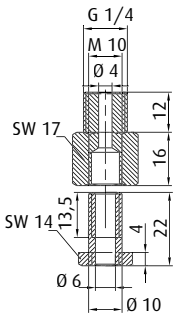
Technical data

Item no.	Thread G1
270.504-S	G1/4-male



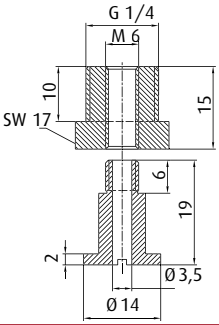
Technical data

Item no.	Thread G1
270.483	G1/4-male



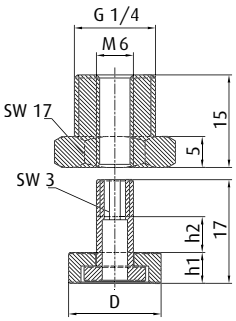
Technical data

Item no.	Thread G1
270.514	G1/4-male



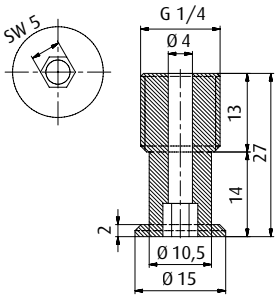
Technical data

Item no.	Thread G1
270.540	G1/4-male



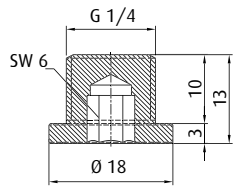
Technical data

Item no.	Thread G1	h1 [mm]	h2 [mm]	Ø D [mm]
270.487	G1/4-male	5	6	15
270.491	G1/4-male	4.5	6.5	20



Technical data

Item no.	Thread G1
270.175	G1/4-male

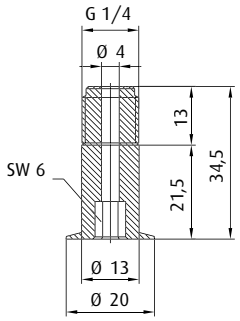


Technical data

Item no.	Thread G1
270.364	G1/4-male

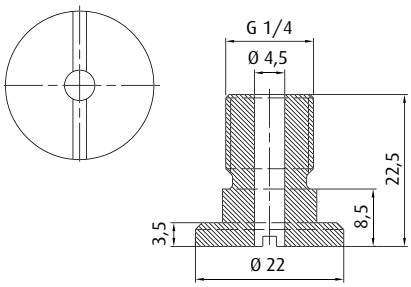
Ordering notes:

Without drilling



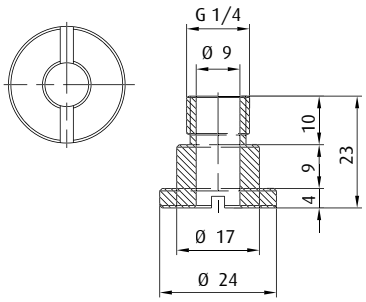
Technical data

Item no.	Thread G1
270.141	G1/4-male



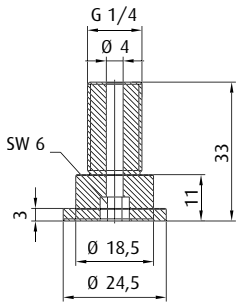
Technical data

Item no.	Thread G1
270.210	G1/4-male



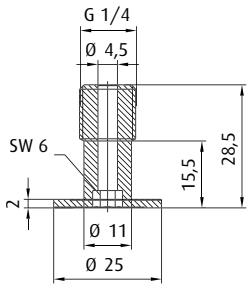
Technical data

Item no.	Thread G1
270.237	G1/4-male



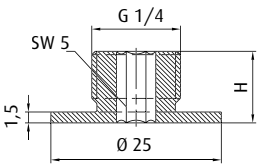
Technical data

Item no.	Thread G1
270.145	G1/4-male



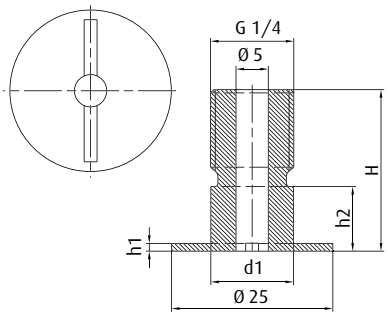
Technical data

Item no.	Thread G1
270.176	G1/4-male



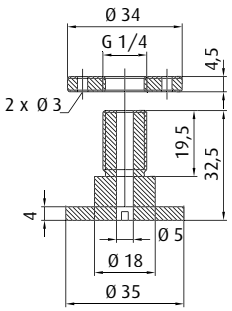
Technical data

Item no.	Thread G1	H [mm]
270.182.U	G1/4-male	10.5
270.183	G1/4-male	15



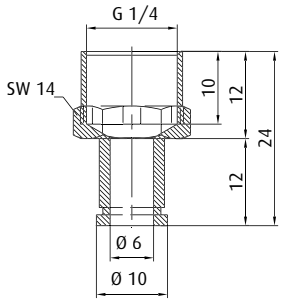
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø d1 [mm]
270.042	G1/4-male	25	1.2	10	13
270.184	G1/4-male	30	0.8	11	13
270.216	G1/4-male	37.5	1.3	23.5	15.5



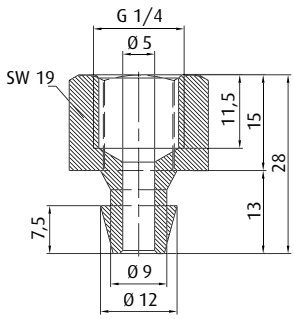
Technical data

Item no.	Thread G1
270.100	G1/4-male



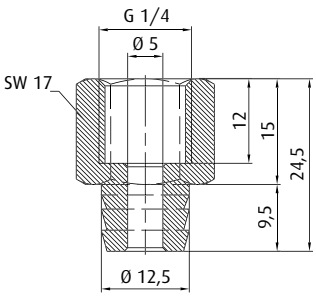
Technical data

Item no.	Thread G1
270.178	G1/4-female



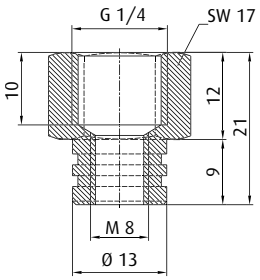
Technical data

Item no.	Thread G1
270.434	G1/4-female



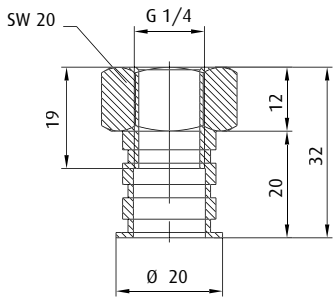
Technical data

Item no.	Thread G1
270.452	G1/4-female



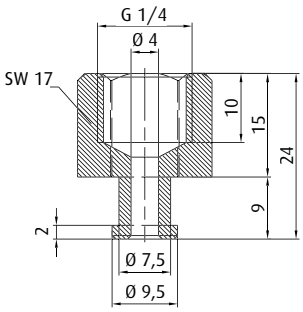
Technical data

Item no.	Thread G1
270.098	G1/4-female



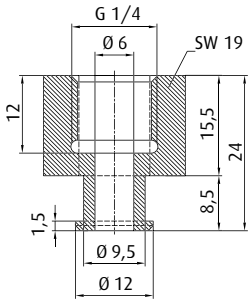
Technical data

Item no.	Thread G1
270.116	G1/4-female



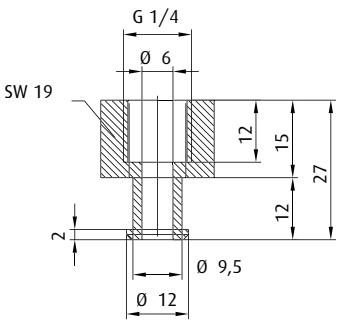
Technical data

Item no.	Thread G1
270.275	G1/4-female



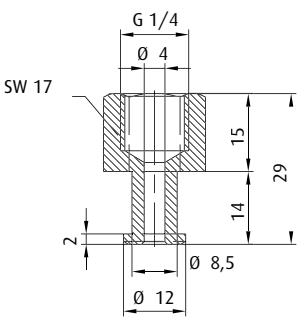
Technical data

Item no.	Thread G1
270.038	G1/4-female



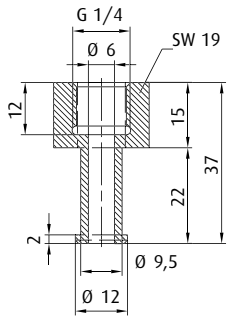
Technical data

Item no.	Thread G1
270.324	G1/4-female



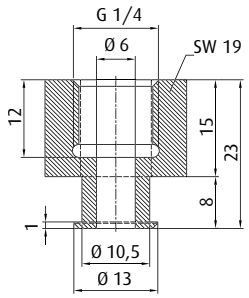
Technical data

Item no.	Thread G1
270.192	G1/4-female



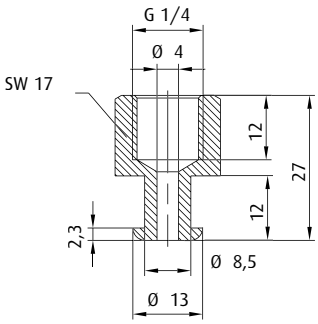
Technical data

Item no.	Thread G1
270.361	G1/4-female



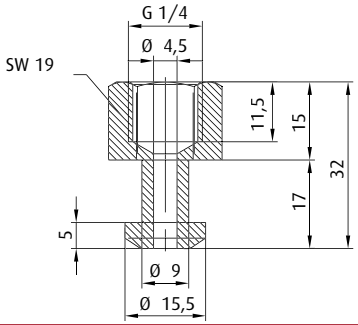
Technical data

Item no.	Thread G1
270.356	G1/4-female



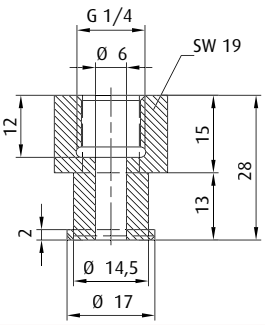
Technical data

Item no.	Thread G1
270.248	G1/4-female



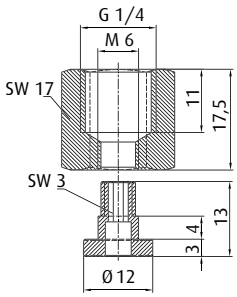
Technical data

Item no.	Thread G1
270.282	G1/4-female



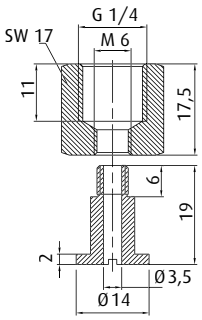
Technical data

Item no.	Thread G1
270.358	G1/4-female



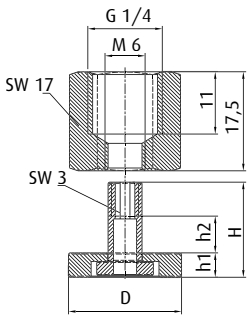
Technical data

Item no.	Thread G1
270.484	G1/4-female



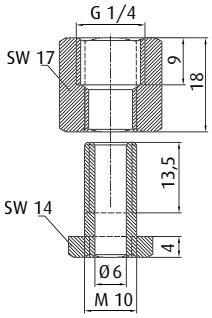
Technical data

Item no.	Thread G1
270.539	G1/4-female



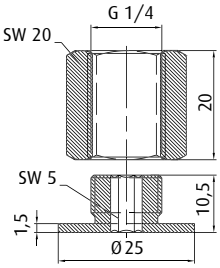
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.488	G1/4-female	17	5	6	15
270.492	G1/4-female	17	4.5	6.5	20



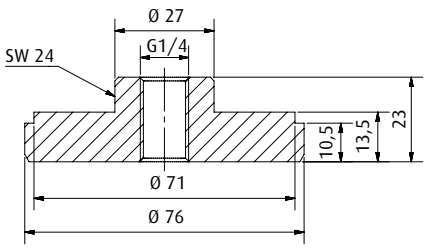
Technical data

Item no.	Thread G1
270.513	G1/4-female



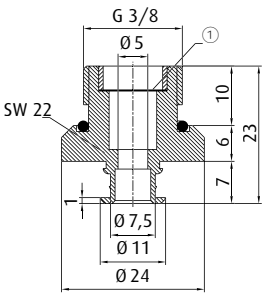
Technical data

Item no.	Thread G1
270.182	G1/4-female



Technical data

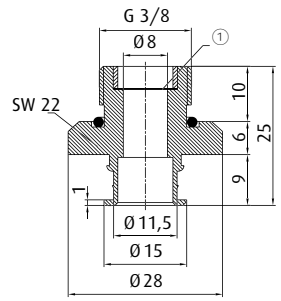
Item no.	Thread G1
270.554	G1/4-female



① = Filter screen

Technical data

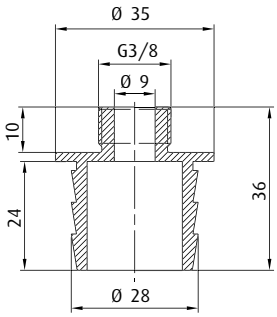
Item no.	Thread G1
270.505-S	G3/8-male



① = Filter screen

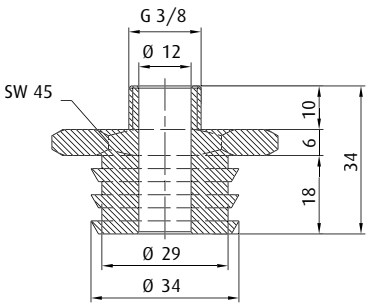
Technical data

Item no.	Thread G1
270.507-S	G3/8-male



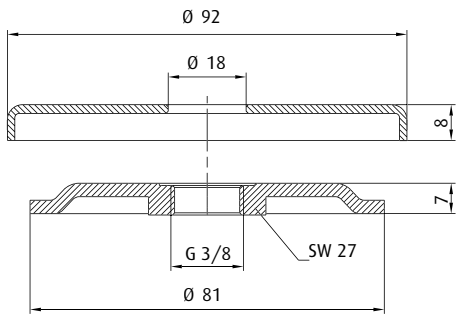
Technical data

Item no.	Thread G1
270.442	G3/8-male



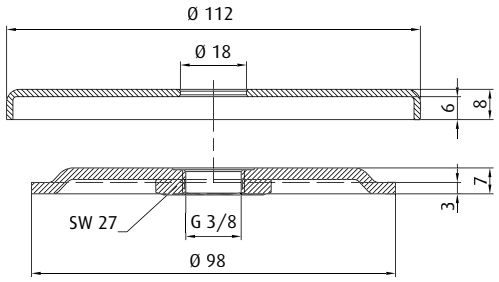
Technical data

Item no.	Thread G1
270.526	G3/8-male



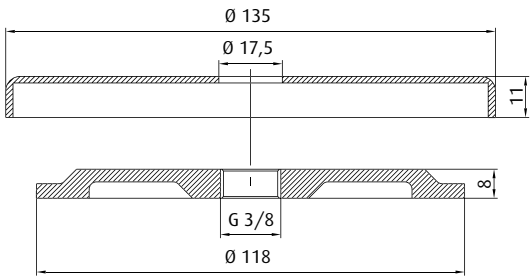
Technical data

Item no.	Thread G1
270.400	G3/8-female



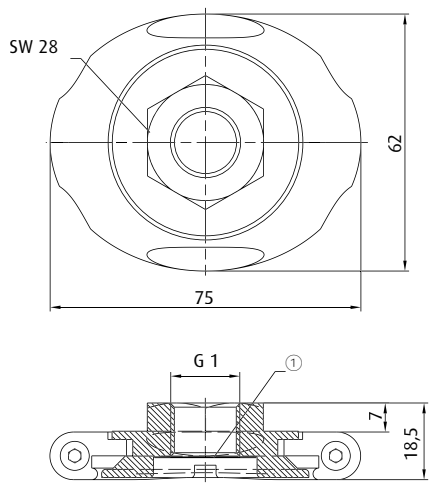
Technical data

Item no.	Thread G1
270.402	G3/8-female



Technical data

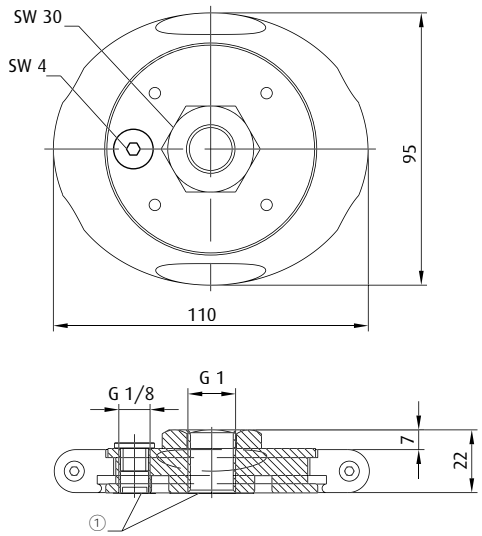
Item no.	Thread G1
270.404	G3/8-female



① = Filter screen

Technical data

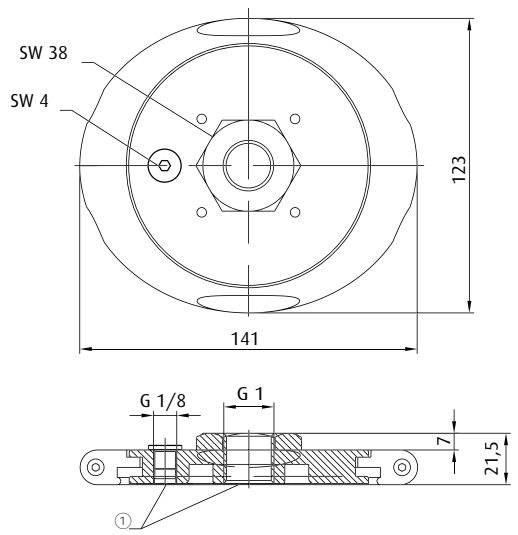
Item no.	Thread G1
270.528-S	G3/8-female
270.529-S	G1/2-female



① = Filter screen

Technical data

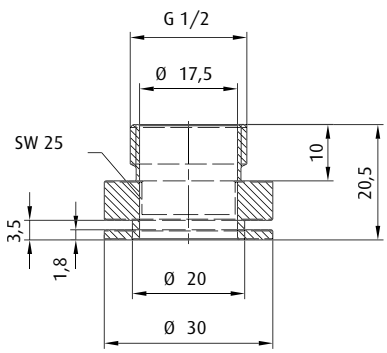
Item no.	Thread G1
270.530-S	G3/8-female
270.531-S	G1/2-female



① = Filter screen

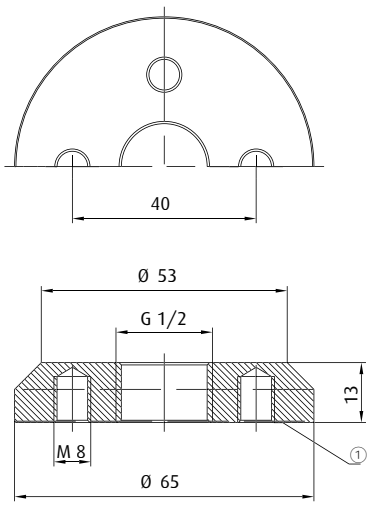
Technical data

Item no.	Thread G1
270.532-S	G1/2-female
270.533-S	G3/4-female



Technical data

Item no.	Thread G1
270.372	G1/2-male



① = Aluminium

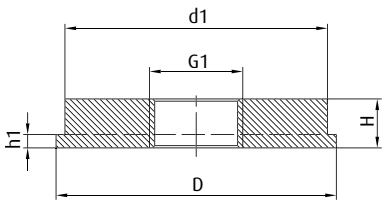
Technical data

Item no.	Thread G1
270.056	G1/2-female

Ordering notes:

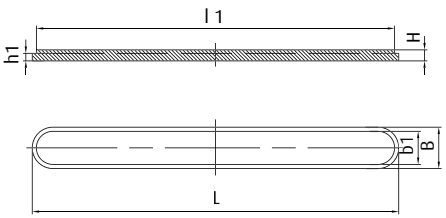
4x screw M8x16 included in delivery

Carrier plates SZ-NIP-T



Technical data		Dimensions				
Item no.	Thread G1	G1	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]
270.233	G1/8-female	G1/8	6	3.1	17.5	14.9
270.234	G1/8-female	G1/8	6	3	21	17.5
270.235	G1/8-female	G1/8	5.5	2.1	28.5	25
270.289	G1/8-female	G1/8	10	3	29	20
270.179	G1/4-female	G1/4	20	14.5	43	32
270.262	G1/8-female	G1/8	10	3	44	40
270.284	G1/4-female	G1/4	10	3	44	40
270.338	M12x1.75-female	M12x1.75	10	3	55	45
270.180	G1/4-female	G1/4	20	14	60	50
270.158	G1/8-female	G1/8	11	3	63	59
270.264	G1/4-female	G1/4	11	3	63	59
270.161	G3/8-female	G3/8	11	3	63	59
270.286	G1/2-female	G1/2	11	3	63	59
270.224	G1/4-female	G1/4	11	3	92	88
270.167	G3/8-female	G3/8	11	3	92	88
270.266	G1/2-female	G1/2	11	3	92	88
270.164	G1/8-female	G1/8	11	3	95	88
270.171	G1/4-female	G1/4	15	4	127	120
270.173	G3/8-female	G3/8	15	4	127	120
270.268	G1/2-female	G1/2	15	4	127	120
270.335	G1/2-female	G1/2	20	14	160	150

Carrier plates SZ-NIP-T



Technical data		Dimensions					
Item no.	Thread G1	L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
270.332	Without	266	260	30	24	8	5.5

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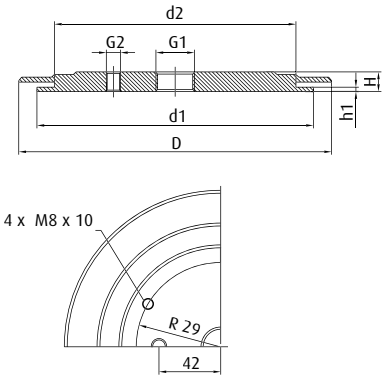
Carrier plates SZ-NIP-T

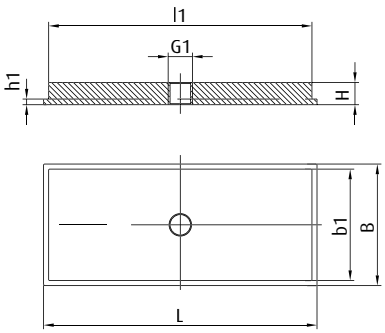


Technical data

Dimensions

Item no.	Thread G1	G1	G2	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
270.070	G3/4-female	G3/4	G1/8	13.5	3	215	190	166
270.076	G3/4-female	G3/4	G1/8	13.5	3	315	309	285

Carrier plates SZ-NIP-T

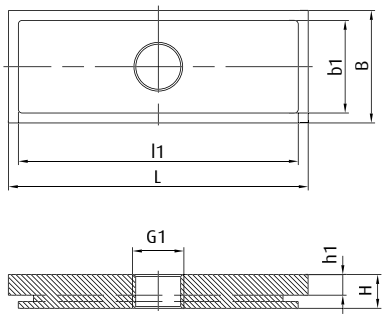


Technical data

Dimensions

Item no.	Thread G1	L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
270.465	M12-female	135	130	60	55	11	2.8

Carrier plates SZ-NIP-T

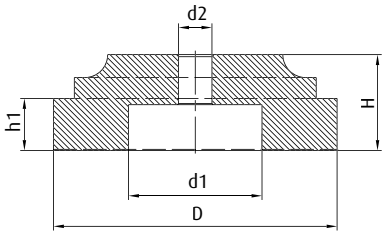


Technical data

Dimensions

Item no.	Thread G1	G1	L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
270.508	G1/8-female	G1/8	52	48	25	22	9	5.5
270.509	G1/4-female	G1/4	60	56	29	25	9	5.5
270.392	G1/4-female	G1/4	80	75	30	25	9	5.5
270.510	G1/4-female	G1/4	80	75	40	35	9	5.5
270.511	G1/4-female	G1/4	80	75	50	44	9	5.5

Carrier plates SZ-NIP-T

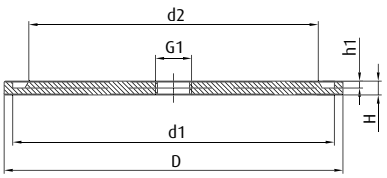


Technical data

Dimensions

Item no.	Thread G1	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
270.270	Without	23	12.5	68	32	8
270.269	Without	23	12	130	50	8

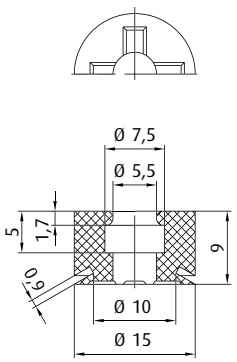
Carrier plates SZ-NIP-T



Technical data

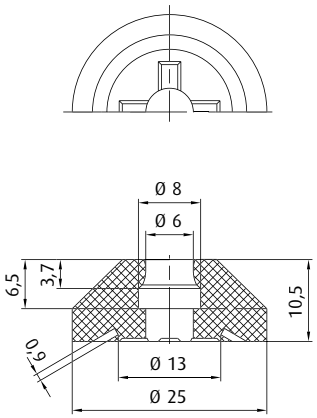
Dimensions

Item no.	Thread G1	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
270.415	Without	8	4.8	95	86	62
270.155	Without	8	4	158	148	123
270.236	G1/2-female	8	4	196	186	167
270.535	Without	10	5	237	227	198



Technical data

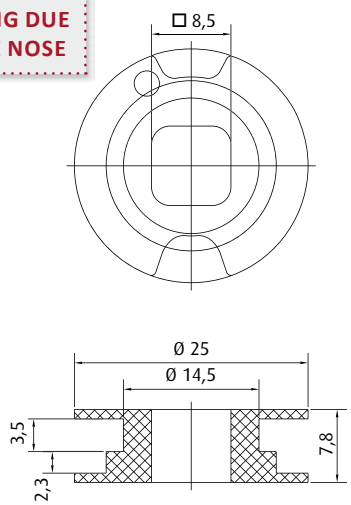
Item no.	Thread G1	Material / Colour
270.067	Without	NBR (sw) - 80° Shore A



Technical data

Item no.	Thread G1	Material / Colour
270.068	Without	NBR (sw) - 80° Shore A

EASY MOUNTING DUE TO ABRADABLE NOSE



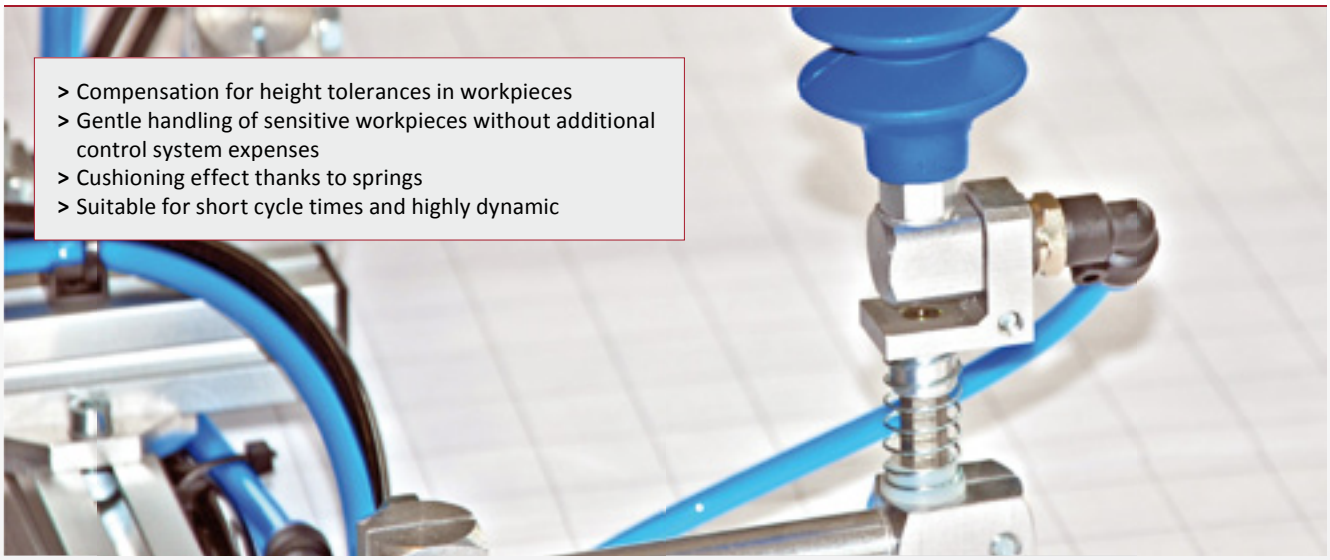
Technical data

Item no.	Thread G1
270.419	Without

Ordering notes:

Suitable mounting aid: Item No. 90.007

FIPA Spring levelers



> Compensation for height tolerances in workpieces
> Gentle handling of sensitive workpieces without additional control system expenses
> Cushioning effect thanks to springs
> Suitable for short cycle times and highly dynamic

Standard spring levelers - SZ-NIV-S

> Suitable for universal use
> Optional: M5-female also available in anti-twist design
> Stroke: 5 - 75 mm
> Vacuum connection: M5-female, G1/8-male, G1/4-male

> See page 444

Spring levelers with internal spring - SZ-NIV-I

> Spring protected against contamination and damage
> Spring travel limitation for a longer service life
> Stroke: 7 - 20 mm
> Vacuum connection: M5-female, G1/8-male

> See page 446

Heavy-duty spring levelers - SZ-NIV-HD

> High quality plain bearings for harsh operating conditions
> Also available with rotation protection
> Stroke: 15 - 75 mm
> Vacuum connection:
G1/8-male, G1/4-male, G3/8-male, G1/2-male and M12-male, M16-male

> See page 447

Further spring levelers with thread connection

> Suitable for universal use
> Vacuum connection: M5-male, M8-male, G1/8-male, G1/8-female, G1/4-female

> See page 450

FIPA Spring levelers

Spring levelers for direct vacuum cup mounting

> Direct mounting on the vacuum cup – no additional fitting required
> Designs available both with and without anti-rotation device

Internal spring - SZ-NIV-DI
> Stroke: 6 - 20 mm

> See page 454

Open spring - SZ-NIV-DA
> Stroke: 5 - 50 mm

> See page 456

Mounting brackets for spring levelers

> Integration of spring levelers into gripper systems
> Compatible with FIPA spring levelers SZ-NIV-S and SZ-NIV-HD

> See page 458

Standard spring levelers with threaded connection - SZ-NIV-S

Product Description

> Compensate for height differences
> Soft attachment for sensitive products
> Leveling as standard version
> Vacuum connection on top, vacuum channel via spring leveler
> Also available non-rotating (M5-female)

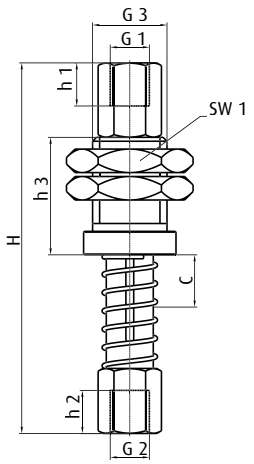
Notes

> Recommendation: For the best possible service life do not exceed max. lift indicated

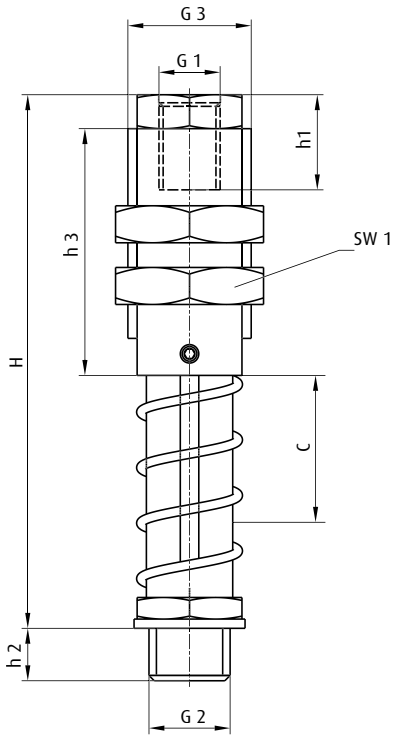
Technical data

Item no.	Model	Thread suction side G2	Thread fixing bushes G3	Lift C [mm]	Non-rotating	Weight [g]	Suitable mounting bracket for gripper systems
50.158	SZ-NIV-S-M5-IG-5	M5-female	G1/8-male	5	--	17	GR02.230 (p.458)
50.149	SZ-NIV-S-M5-IG-10	M5-female	G1/8-male	10	--	18	GR02.230 (p.458)
50.152	SZ-NIV-S-M5-IG-10-VS	M5-female	G1/8-male	10	Yes	19	GR02.230 (p.458)
50.150	SZ-NIV-S-M5-IG-20	M5-female	G1/8-male	20	--	20	GR02.230 (p.458)
50.153	SZ-NIV-S-M5-IG-20-VS	M5-female	G1/8-male	20	Yes	21	GR02.230 (p.458)
50.230	SZ-NIV-S-G1/8-AG-15	G1/8-male	M16x1-male	15	--	94	GR02.231 (p.458)
50.160	SZ-NIV-S-G1/8-AG-25	G1/8-male	M16x1-male	25	--	94	GR02.231 (p.458)
50.162	SZ-NIV-S-G1/8-AG-50	G1/8-male	M16x1-male	50	--	110	GR02.231 (p.458)
50.164	SZ-NIV-S-G1/4-AG-25	G1/4-male	M20x1.5-male	25	--	136	GR02.232 (p.458)
50.166	SZ-NIV-S-G1/4-AG-75	G1/4-male	M20x1.5-male	75	--	195	GR02.232 (p.458)

Dimensions



50.158 | 50.149 | 50.152 | 50.150 | 50.153



50.230 | 50.160 | 50.162 | 50.164 | 50.166

Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (male)	G2 (female)	G3 (male)	C [mm]
50.158	43	5.5	6.2	15	14	M5	--	M5	G1/8	5
50.149	47	5.5	6.2	15	14	M5	--	M5	G1/8	10
50.152	47	5.5	6.2	15	14	M5	--	M5	G1/8	10
50.150	59	5.5	6.2	15	14	M5	--	M5	G1/8	20
50.153	59	5.5	6.2	15	14	M5	--	M5	G1/8	20
50.230	72	8	6.5	30	22	G1/8	G1/8	--	M16x1	15
50.160	85	8.5	6.5	30	22	G1/8	G1/8	--	M16x1	25
50.162	116	8.5	6.5	30	22	G1/8	G1/8	--	M16x1	50
50.164	86	13	9	40	24	G1/8	G1/4	--	M20x1.5	25
50.166	145	13	9	40	24	G1/8	G1/4	--	M20x1.5	75

Spring levelers with internal spring and threaded connection - SZ-NIV-I

BESTSELLER

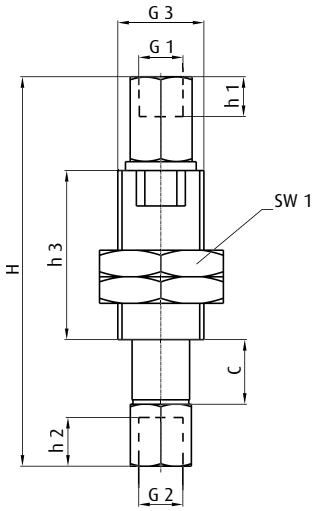
Product Description

> Compensate for height differences
> Soft attachment for sensitive products
> With internal spring protected from dirt and with spring deflection limiter
> Vacuum connection on top, vacuum channel via spring leveler

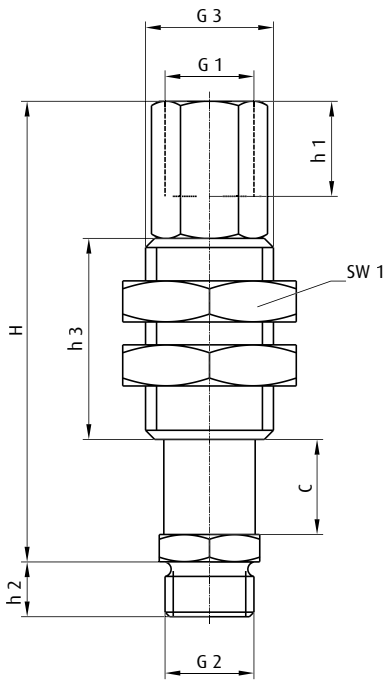
Technical data

Item no.	Model	Thread suction side G2	Thread fixing bushes G3	Lift C [mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.120	SZ-NIV-I-M5-IG-7	M5-female	G1/8-male	7	17	GR02.230 (p.458)
50.123	SZ-NIV-I-G1/8-AG-8	G1/8-male	M14x1.5-male	8	41	--
50.124	SZ-NIV-I-G1/8-AG-20	G1/8-male	M16x1-male	20	73	GR02.231 (p.458)

Dimensions



50.120



50.123 | 50.124

Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (female)	G2 (male)	G3 (male)	C [mm]
50.120	44	4.3	5	19	14	M5	M5	--	G1/8	7
50.123	50	10	6	22	19	G1/8	--	G1/8	M14x1.5	8
50.124	73	12	5.6	35	21	G1/8	--	G1/8	M16x1	20

Heavy-duty spring levelers - SZ-NIV-HD

HEAVY-DUTY DESIGN

Product Description

> Compensate for height differences
> Soft attachment for sensitive products
> Long life even under the toughest conditions
> Leveling with stainless steel shaft and high-quality bearings
> Vacuum connection on top, vacuum channel via spring leveler
> Optionally also available non-rotating

Notes

> Recommendation: For the best possible service life do not exceed max. lift indicated

Technical data

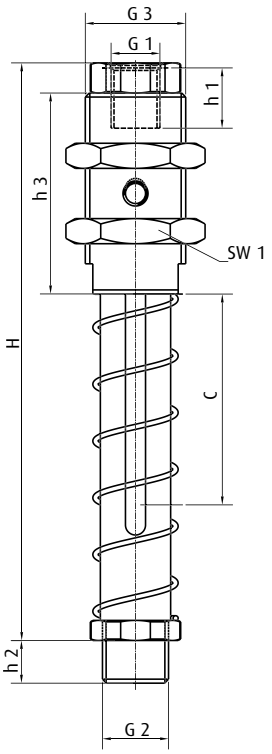
Item no.	Model	Thread suction side G2	Lift C [mm]	Non-rotating	Spring rate [N/mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.315	SZ-NIV-HD-G1/8-AG-15	G1/8-male	15	--	0.221	83	GR02.231 (p.458)
50.310	SZ-NIV-HD-G1/8-AG-15-VS	G1/8-male	15	Yes	0.221	83	GR02.231 (p.458)
50.316	SZ-NIV-HD-G1/8-AG-25	G1/8-male	25	--	0.143	89	GR02.231 (p.458)
50.311	SZ-NIV-HD-G1/8-AG-25-VS	G1/8-male	25	Yes	0.143	89	GR02.231 (p.458)
50.317	SZ-NIV-HD-G1/8-AG-50	G1/8-male	50	--	0.097	104	GR02.231 (p.458)
50.312	SZ-NIV-HD-G1/8-AG-50-VS	G1/8-male	50	Yes	0.097	104	GR02.231 (p.458)
50.345	SZ-NIV-HD-G1/4-AG-25	G1/4-male	25	--	0.711	134	GR02.232 (p.458)
50.340	SZ-NIV-HD-G1/4-AG-25-VS	G1/4-male	25	Yes	0.711	134	GR02.232 (p.458)
50.346	SZ-NIV-HD-G1/4-AG-50	G1/4-male	50	--	0.452	160	GR02.232 (p.458)
50.341	SZ-NIV-HD-G1/4-AG-50-VS	G1/4-male	50	Yes	0.452	160	GR02.232 (p.458)
50.347	SZ-NIV-HD-G1/4-AG-75	G1/4-male	75	--	0.262	186	GR02.232 (p.458)
50.342	SZ-NIV-HD-G1/4-AG-75-VS	G1/4-male	75	Yes	0.262	186	GR02.232 (p.458)
50.350	SZ-NIV-HD-G3/8-AG-25	G3/8-male	25	--	3.828	410	--
50.353	SZ-NIV-HD-G3/8-AG-25-VS	G3/8-male	25	Yes	3.828	406	--
50.351	SZ-NIV-HD-G3/8-AG-75	G3/8-male	75	--	1.072	531	--
50.354	SZ-NIV-HD-G3/8-AG-75-VS	G3/8-male	75	Yes	1.072	525	--
50.360	SZ-NIV-HD-G1/2-AG-25	G1/2-male	25	--	3.828	419	--
50.363	SZ-NIV-HD-G1/2-AG-25-VS	G1/2-male	25	Yes	3.828	416	--
50.361	SZ-NIV-HD-G1/2-AG-75	G1/2-male	75	--	1.072	548	--
50.364	SZ-NIV-HD-G1/2-AG-75-VS	G1/2-male	75	Yes	1.072	540	--
50.366	SZ-NIV-HD-M12-AG-25	M12-male	25	--	0.711	150	GR02.232 (p.458)
50.367	SZ-NIV-HD-M12-AG-25-VS	M12-male	25	Yes	0.711	150	GR02.232 (p.458)

Continued on the next page

Technical data

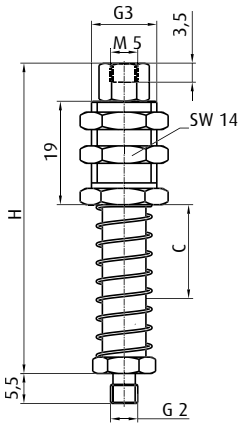
Item no.	Model	Thread suction side G2	Lift C [mm]	Non-rotating	Spring rate [N/mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.368	SZ-NIV-HD-M12-AG-50	M12-male	50	--	0.452	176	GR02.232 (p.458)
50.369	SZ-NIV-HD-M12-AG-50-VS	M12-male	50	Yes	0.452	176	GR02.232 (p.458)
50.370	SZ-NIV-HD-M12-AG-75	M12-male	75	--	0.262	202	GR02.232 (p.458)
50.371	SZ-NIV-HD-M12-AG-75-VS	M12-male	75	Yes	0.262	202	GR02.232 (p.458)
50.372	SZ-NIV-HD-M16-AG-25	M16-male	25	--	3.828	451	--
50.373	SZ-NIV-HD-M16-AG-25-VS	M16-male	25	Yes	3.828	447	--
50.374	SZ-NIV-HD-M16-AG-75	M16-male	75	--	1.072	572	--
50.375	SZ-NIV-HD-M16-AG-75-VS	M16-male	75	Yes	1.072	566	--

Dimensions



Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (male)	G3 (male)	C [mm]
50.315	72	8	8	30	22	G1/8	G1/8	M16x1	15
50.310	72	8	8	30	22	G1/8	G1/8	M16x1	15
50.316	85	8	8	30	22	G1/8	G1/8	M16x1	25
50.311	85	8	8	30	22	G1/8	G1/8	M16x1	25
50.317	116	8	8	30	22	G1/8	G1/8	M16x1	50
50.312	116	8	8	30	22	G1/8	G1/8	M16x1	50
50.345	85.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	25
50.340	85.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	25
50.346	115	12	8.5	40	24	G1/8	G1/4	M20x1.5	50
50.341	115	12	8.5	40	24	G1/8	G1/4	M20x1.5	50
50.347	144.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	75
50.342	144.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	75
50.350	104	14	12	53	36	G3/8	G3/8	M30x1.5	25

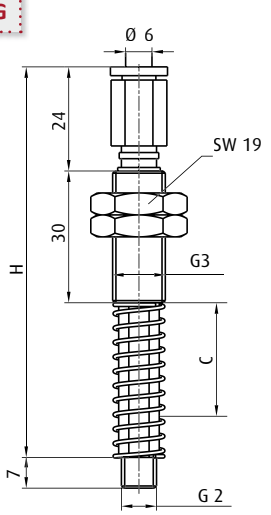
Item no.	**H** [mm]	**h1** [mm]	**h2** [mm]	**h3** [mm]	**SW1**	**G1 (female)**	**G2 (male)**	**G3 (male)**	**C** [mm]
50.353	104	14	12	53	36	G3/8	G3/8	M30x1.5	25
50.351	175	14	12	53	36	G3/8	G3/8	M30x1.5	75
50.354	175	14	12	53	36	G3/8	G3/8	M30x1.5	75
50.360	104	14	12	53	36	G3/8	G1/2	M30x1.5	25
50.363	104	14	12	53	36	G3/8	G1/2	M30x1.5	25
50.361	175	14	12	53	36	G3/8	G1/2	M30x1.5	75
50.364	175	14	12	53	36	G3/8	G1/2	M30x1.5	75
50.366	97.5	12	10	40	24	G1/8	M12	M20x1.5	25
50.367	97.5	12	10	40	24	G1/8	M12	M20x1.5	25
50.368	127	12	10	40	24	G1/8	M10	M20x1.5	50
50.369	127	12	10	40	24	G1/8	M12	M20x1.5	50
50.370	156.5	12	10	40	24	G1/8	M12	M20x1.5	75
50.371	156.5	12	10	40	24	G1/8	M12	M20x1.5	75
50.372	119	14	10	53	36	G3/8	M16	M30x1.5	25
50.373	119	14	10	53	36	G3/8	M16	M30x1.5	25
50.374	190	14	10	53	36	G3/8	M16	M30x1.5	75
50.375	190	14	10	53	36	G3/8	M16	M30x1.5	75



Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.121	M5-male	10	28	M12x1-male	47
50.122	M5-male	20	31	M12x1-male	57

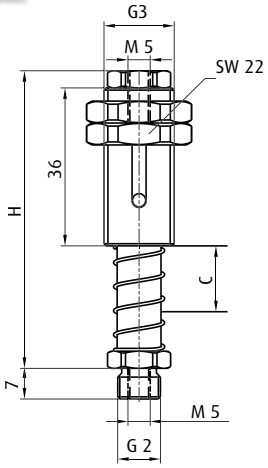
NON-ROTATING



Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.054	M8-male	25	Yes	83	M12x1.25-male	89

NON-ROTATING



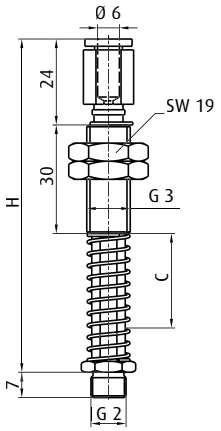
Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.066	G1/8-male	15	Yes	70	M16x1.5-male	68

Notes:

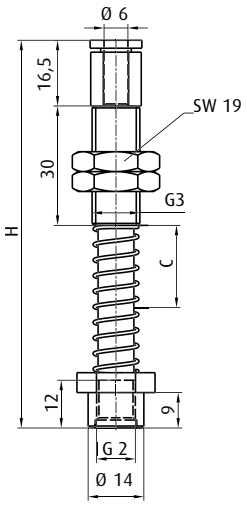
with plastic slide bearings

NON-ROTATING



Technical data

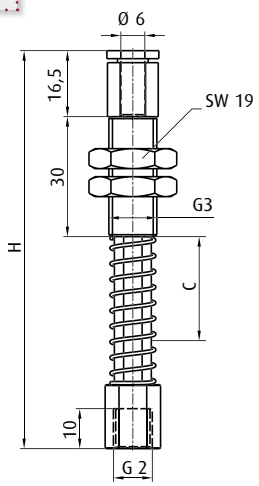
Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.055	G1/8-male	25	Yes	64	M12x1.25-male	92



Technical data

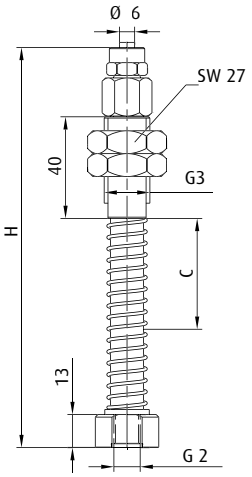
Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.021	G1/8-female	25	75	M12x1.5-male	98

NON-ROTATING



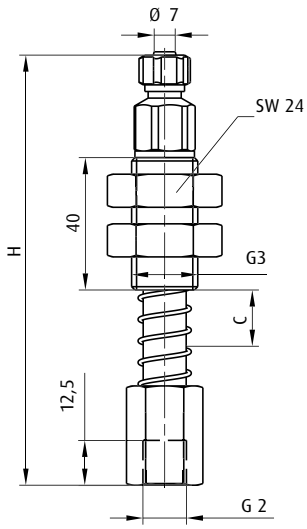
Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.056	G1/8-female	25	Yes	63	M12x1.5-male	100



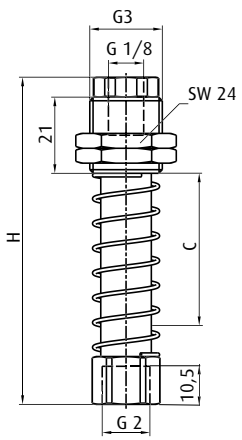
Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.028	G1/8-female	25	240	M18x1.5-male	119
50.029	G1/8-female	50	280	M18x1.5-male	157
50.030	G1/8-female	75	310	M18x1.5-male	194



Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.106	G1/4-female	45	250	M20x1.5-male	167



Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.050	G1/4-female	42	122	M20x1.5-male	90

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Notes:

Spring levelers for direct vacuum cup mounting - internal spring - SZ-NIV-DI

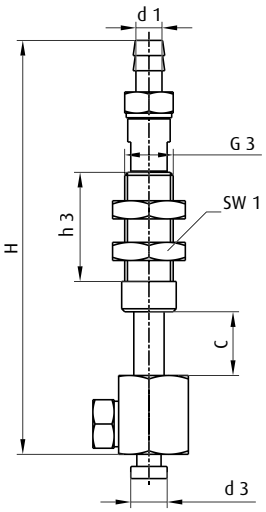
Product Description

> Soft attachment for sensitive products
> With internal spring protected from dirt and with spring deflection limiter
> Compensate for height differences
> Direct mounting of the spring leveler on the vacuum cup, no additional fitting required
> Vacuum connection on top, vacuum channel via spring leveler

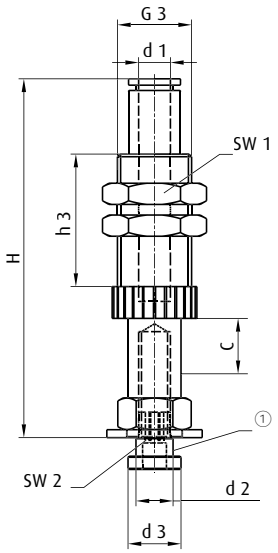
Technical data

Item no.	Lift C [mm]	Non-rotating	Hose inner Ø [mm]	Hose outer Ø [mm]	Thread suction side G2	Thread fixing bushes G3	Weight [g]	Design	Suitable fittings for extrusion system
50.330	10	--	4	--	Without (Snap-in)	M8x0.75	19	--	--
50.103	6	Yes	--	6	Without (Snap-in)	M14x1-male	34	--	--
50.104	6	Yes	--	4	Without (Snap-in)	M14x1-male	33	--	--
50.125	10	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.126	15	Yes	--	6	Without (Snap-in)	M14x1-male	41	--	--
50.127	20	Yes	--	6	Without (Snap-in)	M14x1-male	48	--	--
50.085	6	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.086	6	Yes	--	4	Without (Snap-in)	M14x1-male	36	--	--
50.128	10	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.129	15	Yes	--	6	Without (Snap-in)	M14x1-male	41	--	--
50.130	20	Yes	--	6	Without (Snap-in)	M14x1-male	48	--	--
50.018	8.5	--	--	4	Without (Snap-in)	M16x1-male	21	Plastic corpus	GR02.231 (p.458)
50.019	8.5	--	--	6	Without (Snap-in)	M16x1-male	22	Plastic corpus	GR02.231 (p.458)
50.020	8.5	--	--	6	Without (Snap-in)	M16x1-male	23	Plastic corpus	GR02.231 (p.458)

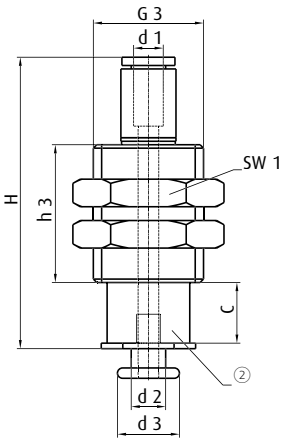
Dimensions



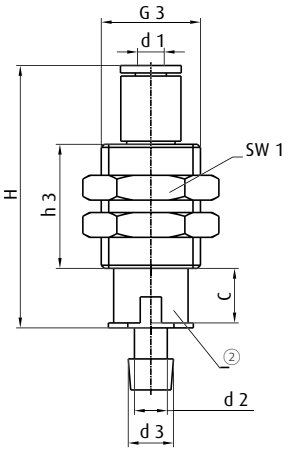
50.330



50.103 | 50.104 | 50.125 | 50.126 | 50.127 | 50.085 | 50.086 | 50.128 | 50.129 | 50.130



50.018 | 50.019



50.020

① = Mounting screw ② = Plastic body

Item no.	Ø **d1** [mm]	Ø **d2** [mm]	**d2**	Ø **d3** [mm]	**G3**	**H** [mm]	**h3** [mm]	**SW1**	**SW2**	**C** [mm]
50.330	4.3	--	--	6	M8x0.75	68	18	12	--	10
50.103	6	--	M4	6.3	M14x1	52	20	17	+	6
50.104	4	--	M4	6.3	M14x1	52	20	17	+	6
50.125	6	5	--	6	M14x1	56	20	17	3	10
50.126	6	5	--	6	M14x1	67	25	17	3	15
50.127	6	5	--	6	M14x1	83	34	17	3	20
50.085	6	7	--	10	M14x1	52	20	17	3	6
50.086	4	7	--	10	M14x1	52	20	17	3	6
50.128	6	7	--	10	M14x1	58	20	17	3	10
50.129	6	7	--	10	M14x1	68	25	17	3	15
50.130	6	7	--	10	M14x1	83	34	17	3	20
50.018	4	5	--	9	M16x1	45	20	19	--	8.5
50.019	6	5	--	9	M16x1	46.5	20	19	--	8.5
50.020	6	5	--	7.3	M16x1	42.5	20	19	--	8.5

Spring levelers for direct vacuum cup mounting - spring open - SZ-NIV-DA

Series 1

Series 2

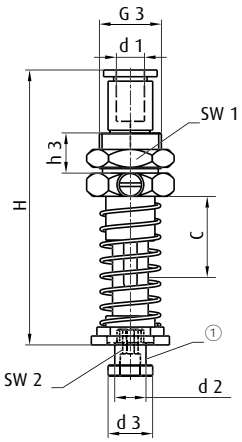
Product Description

> Direct mounting of the spring leveler on the vacuum cup, no additional fitting required
> Compensate for height differences
> Soft attachment for sensitive products
> Leveling with an open spring

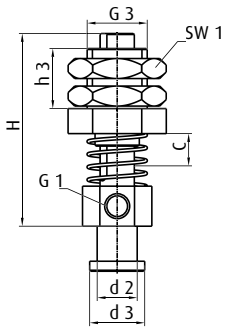
Technical data

Item no.	Series	Lift C [mm]	Non-rotating	Hose outside Ø [mm]	Hose inner Ø [mm]	Thread suction side G2	Thread fixing bushes G3	Weight [g]
50.095	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.096	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.097	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.098	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.170	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.171	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.172	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.173	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.174	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.175	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.176	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.177	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.141	2	10	--	--	--	Without (Snap-in)	M10x1-male	12
50.005	2	5	--	--	--	Without (Snap-in)	M12-male	23
50.145	2	10	--	--	--	Without (Snap-in)	M12-male	39
50.146	2	30	--	--	--	Without (Snap-in)	M12-male	46
50.037	2	25	--	--	4	Without (Snap-in)	M12x1.5-male	69

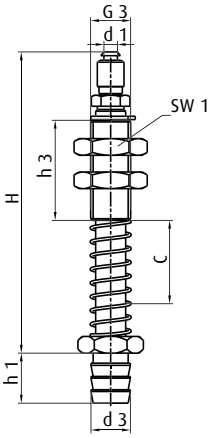
Dimensions



50.095 | 50.096 | 50.097 | 50.098 | 50.170 | 50.171 | 50.172 | 50.173 | 50.174 | 50.175 | 50.176 | 50.177



50.141 | 50.005 | 50.145 | 50.146



50.037

① = Mounting screw M6

Item no.	Ø **d1** [mm]	Ø **d2** [mm]	Ø **d3** [mm]	**G1**	**G3**	**H** [mm]	**h1** [mm]	**h3** [mm]	**SW1**	**SW2**	**C** [mm]
50.095	6	7	10	--	M14x1	61	--	9	17	3	20
50.096	6	7	10	--	M14x1	75	--	9	17	3	30
50.097	6	7	10	--	M14x1	87	--	9	17	3	40
50.098	6	7	10	--	M14x1	100	--	9	17	3	50
50.170	6	6	15	--	M14x1	61	--	9	17	3	20
50.171	6	6	15	--	M14x1	75	--	9	17	3	30
50.172	6	6	15	--	M14x1	87	--	9	17	3	40
50.173	6	6	15	--	M14x1	100	--	9	17	3	50
50.174	6	6	20	--	M14x1	61	--	9	17	3	20
50.175	6	6	20	--	M14x1	75	--	9	17	3	30
50.176	6	6	20	--	M14x1	87	--	9	17	3	40
50.177	6	6	20	--	M14x1	100	--	9	17	3	50
50.141	--	5	7	M5	M10x1	40	--	12	14	--	8
50.005	--	8	11	M5	M12	43	--	16	19	--	5
50.145	--	8	11	M5	M12	44	--	15	17	--	10
50.146	--	8	11	M5	M12	65	--	15	17	--	30
50.037	4	--	5.5	--	M12x1.5	89	7	30	19	--	25

SLine / MLine mounting brackets - for spring levelers

Connection of vacuum cups in gripper systems via spring levelers

Mounting example

Product Description

> Compatible with commercially available spring levelers
> Particularly compatible with FIPA spring levelers SZ-NIV-S and SZ-NIV-HD

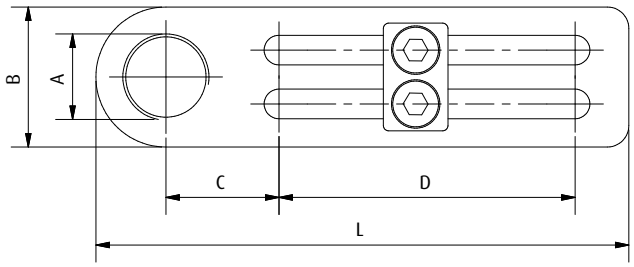
Ordering notes

> Channel nuts included in delivery

Technical data

Item no.	Weight [g]
GR02.230	29
GR02.231	55
GR02.232	63

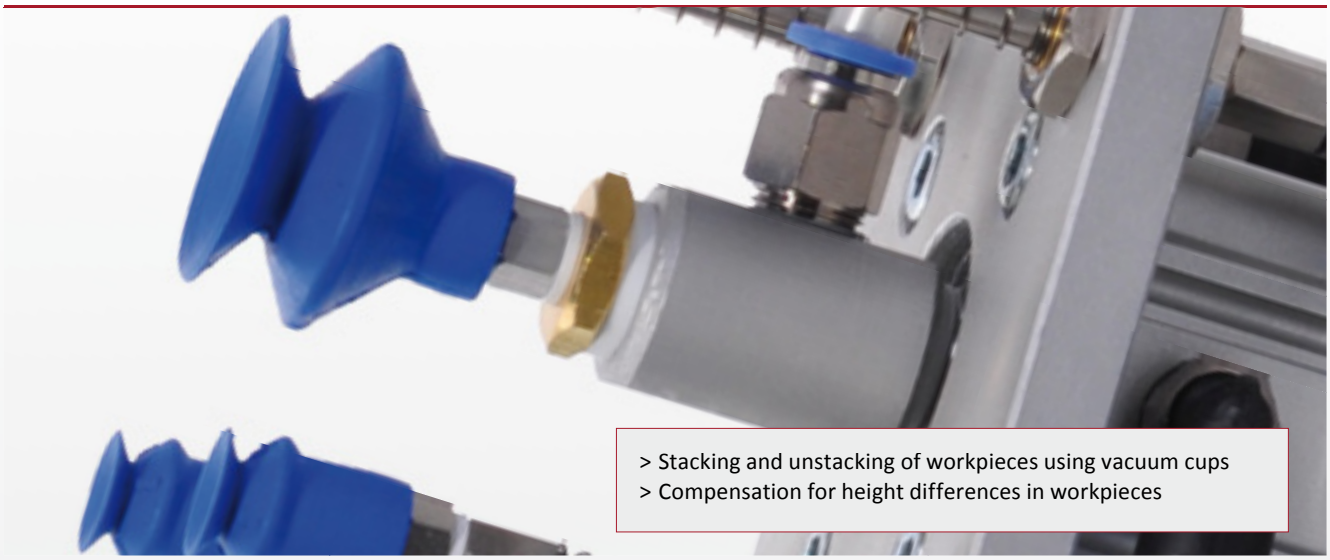
Dimensions



Item no.	A	B [mm]	C [mm]	D [mm]	L [mm]
GR02.230	G1/8	20	17	45	82
GR02.231	M16x1	26	21	55	99
GR02.232	M20x1.5	28	21	65	110

Notes:

FIPA Lifting cylinders



> Stacking and unstacking of workpieces using vacuum cups
> Compensation for height differences in workpieces

Compressed-air operated lifting cylinders for direct vacuum cup mounting (55.100 - 55.120)

> Stacking and unstacking applications
> Integrated vacuum generation
> Specially suited for vacuum cups of SFU-F and SBF-B series

> See page 462

Compressed-air operated lifting cylinders - with anti-twist (55.005)

> Picking-up and stacking flat and sensitive objects such as signs, card, labels, veneer correct position using an anti-twist piston rod
> Integrated vacuum generation
> Very short cycle times thanks to integrated compressed air pulse during placement
> Very compact design in robust aluminium housing
> Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces
> Optional part control by monitoring piston position

> See page 466

Vacuum operated lifting cylinder - with anti-twist (55.000, 55.001, 55.004)

> Suction and lifting of flat and sensitive objects such as signs, cards, labels, veneer
> Part extraction from injection molds
> Fixation of workpieces in cutting stations
> Compensation of height differences between vacuum cup and workpiece
> Short cycle times thanks to low moving masses
> Robust aluminium housing
> Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces
> Particularly low-noise design

> See page 468

FIPA Lifting cylinders

Vacuum operated lifting cylinders - with anti-twist (55.002)

> Stacking and lifting of metal sheets and heavy parts
> Compensation of height differences between vacuum cup and workpiece
> Robust aluminium housing
> Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces

> See page 468

Operation principles

55.100 to 55.120
In the initial position the piston rod is extended. As soon as compressed air supply is activated, vacuum is created by the integrated ejector. When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted.
The handled object is held in position until compressed air supply is turned off.

55.005
In the initial position the piston rod is retracted. As soon as compressed air supply is activated, vacuum is created by the integrated ejector and the piston rod is extended.
When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted.
When compressed air is switched off, a pulse of compressed air from an integrated air chamber drives the piston rod back out and the object is released.

55.000 to 55.004
In the initial position the piston rod is retracted. Upon application of vacuum, the piston rod with the vacuum cup is extended.
When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted.
The gripped object remains on the vacuum cup until vacuum supply is switched off.

Vacuum lifting cylinder - operated by compressed air

For flat suction picking, e.g. for suction cup series SFU-F Ø 4 - 15 mm

Product Description

> Stacking and destacking of workpieces
> Vacuum generation by compressed air using an integrated ejector
> Lifting cylinder extended during idle state
> Cycle time independent of lift and weight

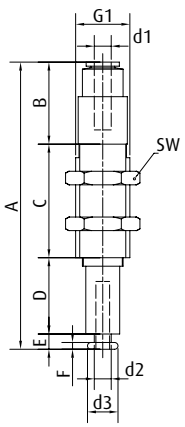
Ordering notes

> Suitable vacuum cups can be found in chapter vacuum cups series, flat vacuum cups SFU-F Ø 4 - 15 mm and bellows vacuum cups SBF-B Ø 6 - 15 mm

Technical data

Item no.	Lift [mm]	Lifting force [N]	Operating pressure [bar]	Vacuum level [mbar]	Cycles [1/min]	Weight [g]	Suitable fittings for extrusion system
55.100	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.102	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.104	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.106	30	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)
55.108	5	3.5 - 5	3.5 - 4.5	-700	50	32	GR02.231 (p.458)
55.110	10	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)
55.112	20	3.5 - 5	3.5 - 4.5	-700	50	52	GR02.231 (p.458)
55.114	30	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)

Dimensions



Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	E [mm]	F [mm]	SW
55.100	M16x1	55	23.5	22	5	4	5	9	4.5	2	19
55.102	M16x1	65	23.5	27	10	4	5	9	4.5	2	19
55.104	M16x1	85	23.5	37	20	4	5	9	4.5	2	19
55.106	M16x1	105	23.5	47	30	4	5	9	4.5	2	19
55.108	M16x1	56.5	25	22	5	6	5	9	4.5	2	19
55.110	M16x1	66.5	25	27	10	6	5	9	4.5	2	19
55.112	M16x1	86.5	25	37	20	6	5	9	4.5	2	19
55.114	M16x1	106.5	25	47	30	6	5	9	4.5	2	19

Vacuum lifting cylinder - operated by compressed air

For high suction picking, e.g. for series SFU-F Ø 20 - 40 mm

Product Description

> Stacking and destacking of workpieces
> Vacuum generation by compressed air using an integrated ejector
> Lifting cylinder extended during idle state
> Cycle time independent of lift and weight

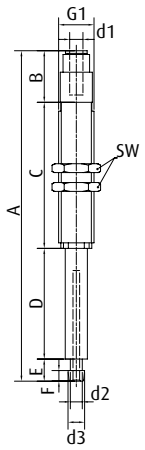
Ordering notes

> Suitable vacuum cups can be found in chapter vacuum cups series, flat vacuum cups SFU-F Ø 20 - 40 mm and bellow vacuum cups SBF-B Ø 20 mm

Technical data

Item no.	Lift [mm]	Lifting force [N]	Operating pressure [bar]	Vacuum level [mbar]	Cycles [1/min]	Weight [g]	Suitable fittings for extrusion system
55.101	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.103	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.105	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.107	30	3.5 - 5	3.5 - 4.5	-700	50	46	GR02.231 (p.458)
55.109	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.111	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.113	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.115	30	3.5 - 5	3.5 - 4.5	-700	50	46	GR02.231 (p.458)
55.120	50	3.5 - 5	3.5 - 4.5	-700	50	56	GR02.231 (p.458)

Dimensions



Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	E [mm]	F [mm]	SW
55.101	M16x1	60.5	23.5	22	5	4	5	7.5	10	5	19
55.103	M16x1	70.5	23.5	27	10	4	5	7.5	10	5	19
55.105	M16x1	90.5	23.5	37	20	4	5	7.5	10	5	19
55.107	M16x1	110.5	23.5	47	30	4	5	7.5	10	5	19
55.109	M16x1	62	25	22	5	6	5	7.5	10	5	19
55.111	M16x1	72	25	27	10	6	5	7.5	10	5	19
55.113	M16x1	92	25	37	20	6	5	7.5	10	5	19
55.115	M16x1	112	25	47	30	6	5	7.5	10	5	19
55.120	M16x1	151	25	67	50	6	5	7.5	10	5	19

Lifting cylinder - operated by compressed air

With blow-off feature, torsionally rigid

Product Description

> Stacking and destacking of thin and sensitive products, such as e.g. signboards, cards, paper, thin wood (veneers)
> Very short cycle times thanks to compressed air pulse during placement
> Suitable for fast transport movements
> Torsionally rigitd piston rods for correctly positioned placement
> Robust aluminium housing with Hartcoat® coating in compact design with integrated ejector, valve technology and air chamber for blow-off air
> Optional PNP magnetic field sensor to monitor lifting of workpiece

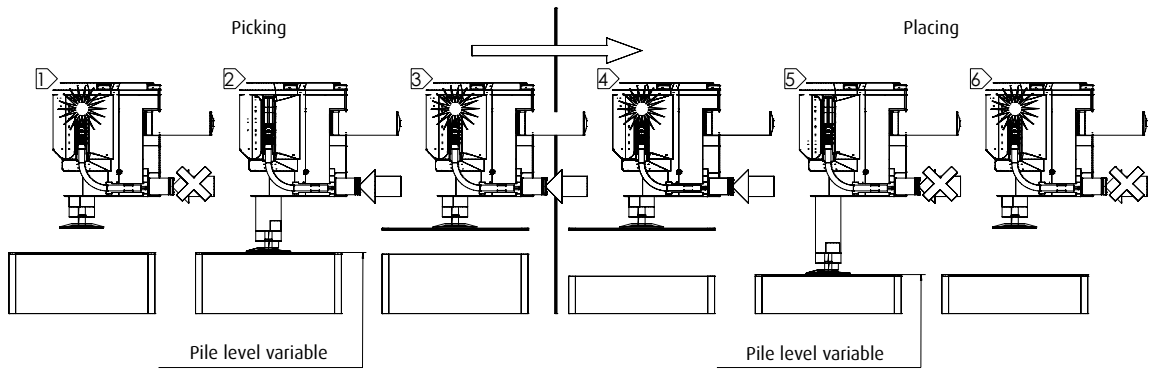
Notes

> For release of workpiece (in defined position) compressed air line needs to be shut and ventilated by means of a 3/2 way valve. Otherwise the piston wil not extend again for product release and the workpiece will just fall down.

Technical data

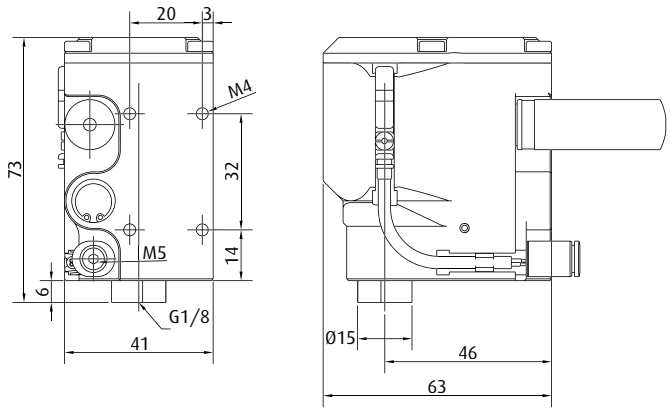
Item no.	Lift [mm]	Lifting force at 6 bar [N]	Operating pressure [bar]	Volume flow at 6 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable accessories
55.005	25	8	5 - 8	48	5 - 80	220	Silencers 72.028 (p.577) Magnetic field sensor 55.099

Wiring diagram



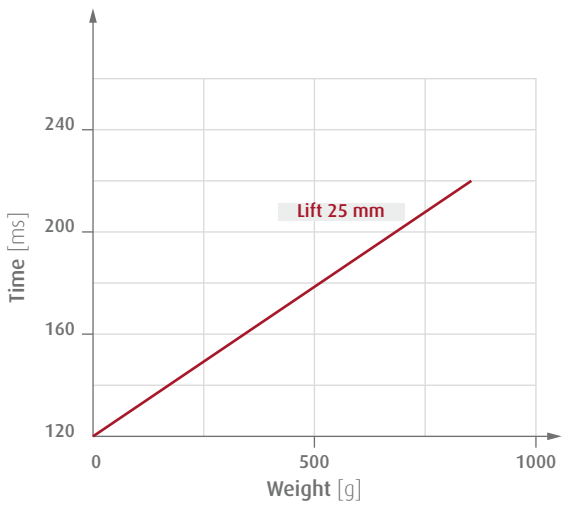
Process:
1. Initial position: Compressed air off, piston drawn in, magnetic sensor in operation
2. Compressed air switched on, piston moves out, workpiece is pulled in, piston retracts with the workpiece to the initial position
3. Workpiece sucked in and lifted, compressed air on, magnetic field sensor in operation
4. Transport movement
5. Switch off compressed air, piston moves out with the workpiece, places the workpiece and retracts to the initial position
6. Initial position: Compressed air off, piston drawn in, magnetic sensor in operation

Dimensions

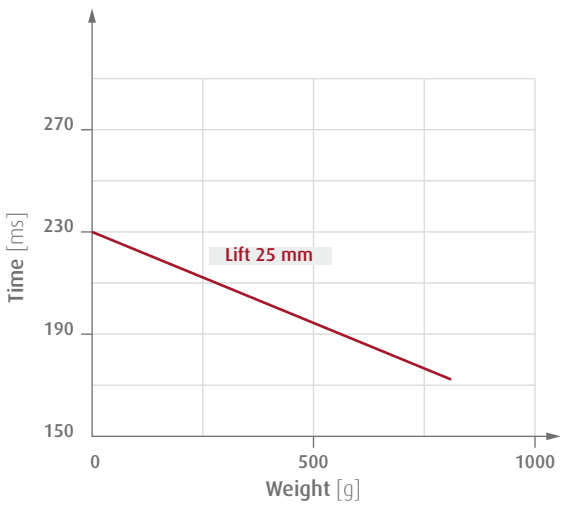


Diagrams

> Double lift lifting time against weight, pressure 6 bar



> Double lift lifting time against weight, pressure 6 bar



Lifting cylinder - vacuum-operated

Torsionally rigid

55.000 | 55.001 | 55.004

55.002

Product Description

> Picking-up and stacking flat and sensitive objects such as e.g. signs, card, paper, veneers
> Suitable for short cycle times
> Application e.g. for workpiece fixation in cutting stations
> Robust aluminium housing, Hartcoat® treated
> Anti-twist piston rod
> Particularly low-noise version

Notes

> 55.002: Stacking and lifting of metal sheet and heavy parts, not suitable for workpieces permeable to air

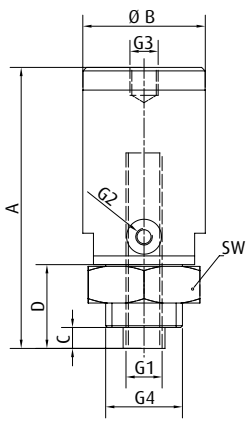
Ordering notes

> Customised sizes on request

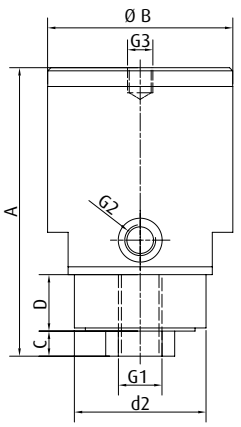
Technical data

Item no.	Lift [mm]	Volume flow at 80 % vacuum [Nl/min]	Lifting force at 80 % vacuum [N]	Cycle time (extend-suction-lift) [s]	Operating temperature [°C]	Weight [g]
55.000	17	15	3	0.3	5 - 80	55
55.001	25	30	10	0.4	5 - 80	145
55.002	30	35	50	0.7	5 - 80	310
55.004	40	30	10	0.7	5 - 80	185

Dimensions



55.000 | 55.001 | 55.004



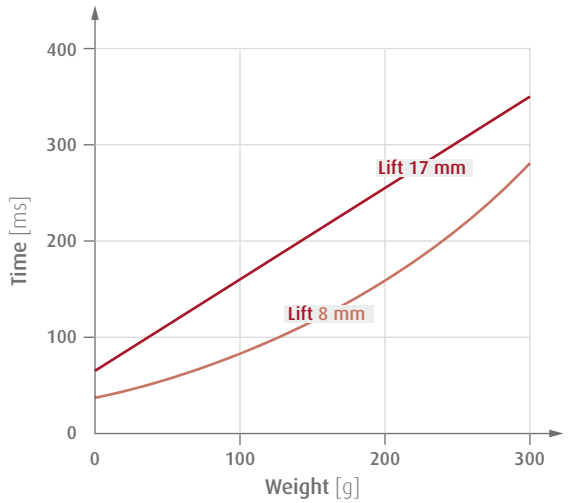
55.002

Phone +49 (0)89 / 96 24 89-0

Item no.	G1	G2	G3	G4	A [mm]	Ø B [mm]	C [mm]	D [mm]	d2 [mm]	SW
55.000	M5	M5	M6	M16x1.5	55.5	24	4	16	--	24
55.001	G1/8	M5	M8	M22x1.5	78	35	6	22	--	32
55.002	G1/4	G1/8	M10	--	92	59	9	18	44	--
55.004	G1/8	G1/8	M8	M22x1.5	98	35	9	24	--	32

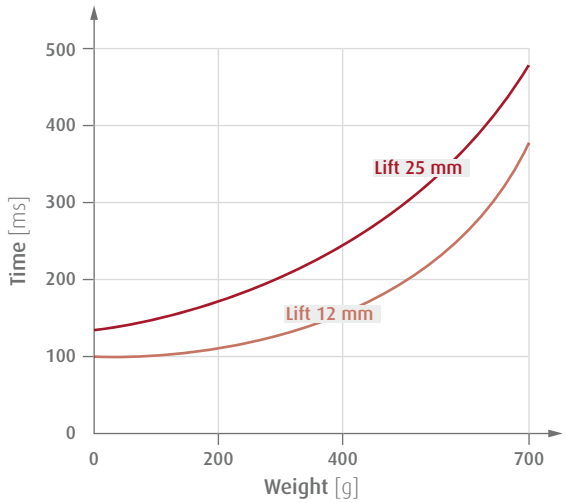
Diagrams

> Double lift lifting time against weight



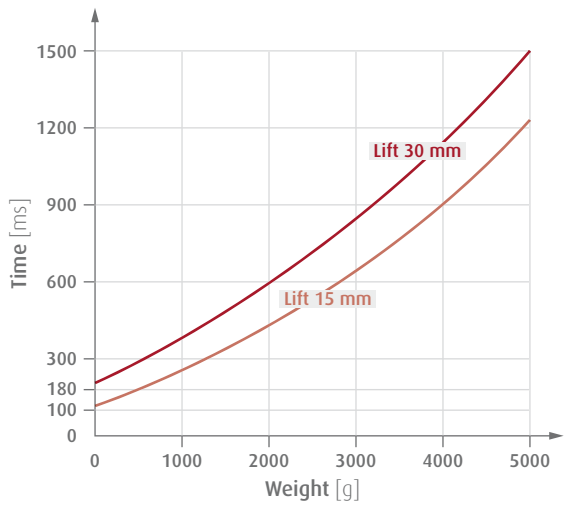
55.000

> Double lift lifting time against weight



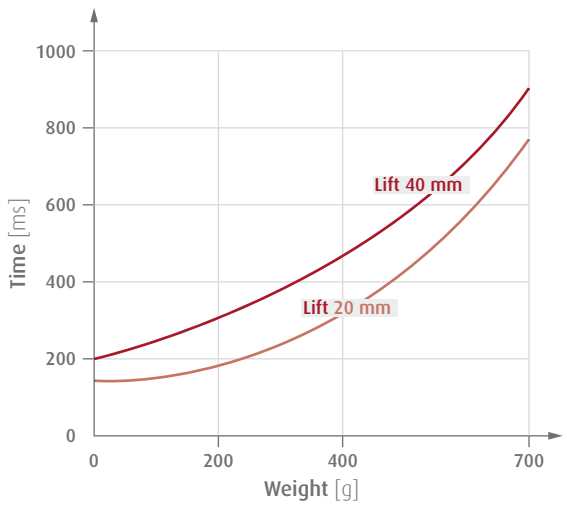
55.001

> Double lift lifting time against weight



55.002

> Double lift lifting time against weight



55.004

G threaded ball joints - SZ-GKG

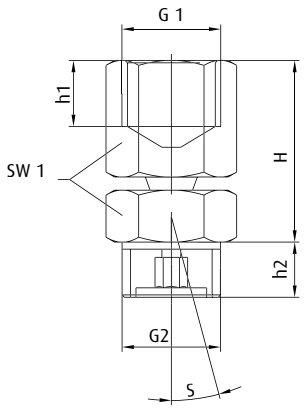
Product Description

> Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
> Angle compensation for sagging products, such as sheet goods
> Version: Ball and socket with O-ring seal

Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Lifting force [N]	Weight [g]
270.072	G1/8-male	G1/8-female	2x15	300	26
270.073/1	G1/4-male	G1/4-female	2x15	1,500	49
270.075	G1/2-male	G1/2-female	2x15	2,500	116

Dimensions



Item no.	Ø **dn** [mm]	**G1**	**G2**	**H** [mm]	**h1** [mm]	**h2** [mm]	**SW1**	**S** [°]
270.072	2	G1/8	G1/8	25	8.5	7	14	2 - 15
270.073/1	3.5	G1/4	G1/4	37	11	10	19	2 - 15
270.075	4	G1/2	G1/2	38.5	14	11.5	24	2 - 15

Metric threaded ball joints - SZ-GKM

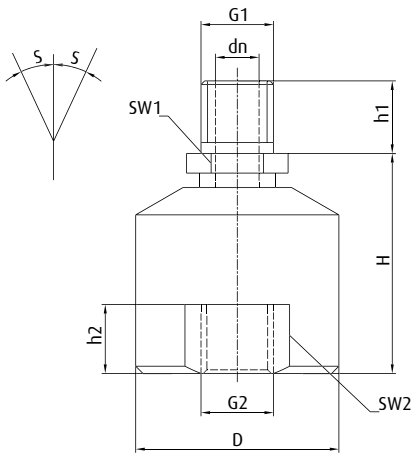
Product Description

> Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
> Angle compensation for sagging products, such as sheet goods
> Version: Ball and socket with O-ring seal

Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Weight [g]
270.185	M4-female	M4-male	2x15	9
270.186	M6-female	M6-male	2x15	20
270.187	M10-female	M10-male	2x15	58

Dimensions



Item no.	Ø D [mm]	Ø dn [mm]	G1	G2	H [mm]	h1 [mm]	h2 [mm]	SW1	SW2	S [°]
270.185	15	2	M4	M4	19	4	7	4	--	2 - 15
270.186	20	3	M6	M6	23	6	6.5	7	--	2 - 15
270.187	28	6	M10	M10	30	10	9.5	12	24	2 - 15

Rubber joints - SZ-GG

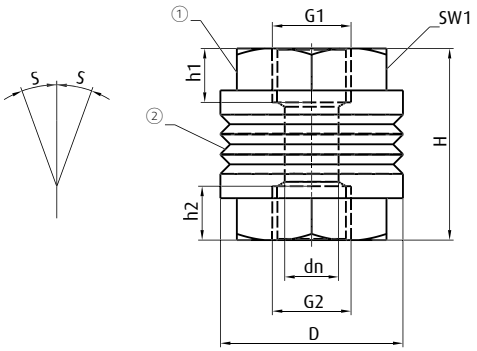
Product Description

> Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
> Angle compensation for sagging products, such as sheet goods
> Automatic reset of the vacuum cup to normal position
> Version: Rubber-metal connection with vacuum channel

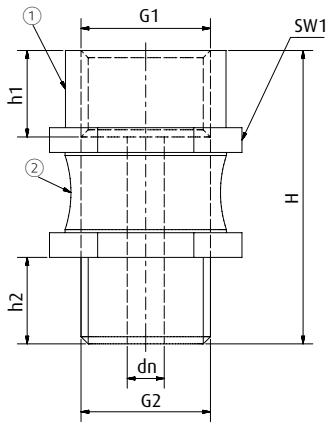
Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Lifting force [N]	Weight [g]
270.199	G1/4-female	G1/4-female	2x25	450	49
270.201	G1/4-female	G1/4-female	2x10	850	75
270.202	G3/8-female	G3/8-female	2x10	850	63
270.203	G1/2-male	G1/2-female	2x12	3,000	100

Dimensions



270.199 | 270.201 | 270.202



270.203

① = Brass/steel ② = Rubber

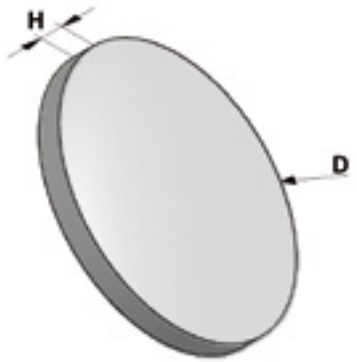
Item no.	Ø **D** [mm]	Ø **dn** [mm]	**G1**	**G2**	**H** [mm]	**h1** [mm]	**h2** [mm]	**SW1**	**S** [°]
270.199	30	5	G1/4	G1/4	46	8	8	17	2 - 25
270.201	30.5	9	G1/4	G1/4	32	9	9	25	2 - 10
270.202	30.5	11	G3/8	G3/8	32	9	9	25	2 - 10
270.203	--	6	G1/2	G1/2	33.5	14	14	27	2 - 12

Filter discs 474

Rings and clamps 475

Filter discs - SZ-FI

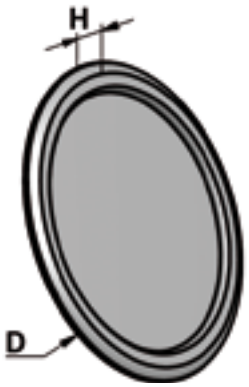
For insertion into vacuum cup fold



Technical data			Dimensions	
Item no.	Material	Usage temperature [°C]	H [mm]	Ø D [mm]
78.200	HDPE white	-40 - 80	1.5	17.5
78.201	HDPE white	-40 - 80	1.5	28
78.202	HDPE white	-40 - 80	1.5	38.5
78.203	HDPE white	-40 - 80	1.5	48
78.204	HDPE white	-40 - 80	1.5	70.5
78.205	HDPE white	-40 - 80	1.5	113
78.206	HDPE white	-40 - 80	1.5	147

Filter discs - SZ-FIN

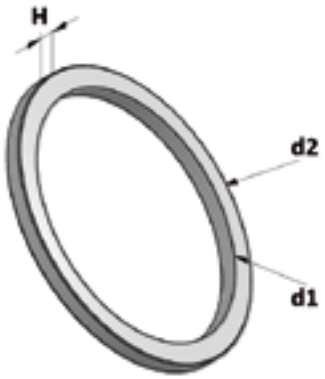
For insertion into vacuum cup fold



Technical data			Dimensions	
Item no.	Material	Usage temperature [°C]	H [mm]	Ø D [mm]
78.214	Nylon canvas / TPE	-40 - 50	1	20
78.215	Nylon canvas / TPE	-40 - 50	1.6	26
78.216	Nylon canvas / TPE	-40 - 50	3	40
78.217	Nylon canvas / TPE	-40 - 50	3	58

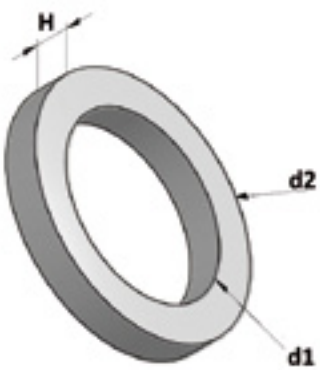
Reinforcement rings - SZ-STAB

For stabilising bellows vacuum cups



Technical data		Dimensions		
Item no.	Material	H [mm]	Ø d1 [mm]	Ø d2 [mm]
78.000	PA6	1	13.5	17.5
78.001	PA6	1.1	22	26.5
78.002	PA6	1.2	30	35.5
78.003	PA6	1.5	36	45.5

Retaining rings - SZ-HR

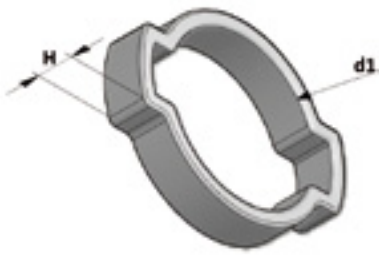


Technical data		Dimensions		
Item no.	Material	H [mm]	Ø d1 [mm]	Ø d2 [mm]
78.011	TPU	1.9	9.7	14
78.012	TPU	2.5	13	20
78.013	TPU	3.2	19	26

Adapter plates - SZ-ASC

Technical data		Dimensions				
Item no.	Material	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
78.080	Aluminium	5	2.8	15	11	6.2
78.081	Aluminium	4.3	2.8	20	12	6.2
78.082	Aluminium	7	4	28	23	10.2

Gripper clamps - SZ-KS



Technical data			Dimensions	
Item no.	Ø range [mm]	Material	H [mm]	Ø d1 [mm]
78.030	7 - 9	Steel galvanised	4	9.3
78.031	9 - 11	Steel galvanised	3	11.3
78.032	11 - 13	Steel galvanised	4	13.2
78.033	15 - 18	Steel galvanised	4	18.2
78.034	17 - 20	Steel galvanised	4	20.2

Vacuum and bag grippers at a glance 478

Vacuum grippers 480

Suction plates 487

Bag grippers 488

Accessories 490

FIPA Vacuum and bag grippers

> Handling of individual products or sites without gripper changing and regardless of workpiece positioning
> Integrated vacuum generation or external compressor for use with particularly air-permeable workpieces

Vacuum grippers with closing valves - TC

> Very large flow cross-sections for long service life and high process reliability, even if exposed to dust
> Integrated valves, seal uncovered suction openings without loss of gripping force
> No minimum coverage
> Swivel and tilt movements up to < 90°

> See page 480

Vacuum grippers with leakage reduction - TL

> Economical gripper solution for low-dust handling processes
> Recommended minimum coverage: 80 %
> Swivel and tilt movements up to 360°

> See page 484

Suction plates with leakage reduction - SPLT

> Reliable suction with variable product shapes
> Maintain an acceptable vacuum level by reducing leakage by means of integrated flow resistors in vacuum cups without product contact

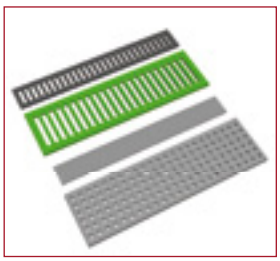
> See page 487

Bag grippers - TG

> Handling of dimensionally unstable bags and shrink wrapping
> Also suitable for other products, if vacuum cell is fully covered
> Swivel and tilt movements possible up to 360°
> External design similar to that of the TL variant

> See page 488

FIPA Vacuum and bag grippers: Accessories

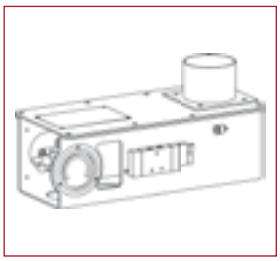


Accessories

Sealing foam for vacuum grippers

> Very good vacuum sealing and surface protection at the interface with the workpiece
> Easy mounting and quick replacement without residue
> Wide standard range
> Quick implentation of customised dimensions and hole patterns suitable for vacuum grippers of other brands

> See page 490



Pick-up and release system

> For TC vacuum grippers from 400 x 600 mm and external vacuum supply
> Minimises energy consumption and maximises service life
> Combination of gripper box and blower box
> Configuration depends on number of vacuum grippers used

> See page 492

Gripper / robot connection elements

> Example for vertical or 3-axis movements or the connection of multiple or longer gripper systems
> Layout depends on gripper system and robots

> See page 494

Vacuum grippers with closing valves

Strong holding force, independent of gripper coverage

MAXIMUM LIFE, MINIMUM MAINTENANCE

Product Description

> Automated handling of individual products or product layers without gripper change
> Suitable for rigid products with an even or uneven surface
> Integrated valves seal unused suction openings without loss of gripping force
> Large valve openings reduce sensitivity to dirt and ensure maximum suction power
> Fast and uniform vacuum distribution ensures short cycle times and high acceleration rates
> Separate compressed air connection for blow-off function for fast product release
> Sealing foam for gentle product contact and optimum vacuum sealing - can be quickly replaced without tools and without leaving any residue

Notes

> Suitable for use with < 90° swivel and tilt movements
> No minimum coverage required
> TC200x400:
  - Gripping area is divided into zones for flexible product pick-up and/or release
  - Available for all vacuum grippers on request
> For vacuum grippers from TC 400x600 and up with external vacuum supply, the pick-up and place system (36.900/36.901) minimises power consumption and extends system service life (see the chapter on accessories)

Ordering notes

> Ordering example vacuum generation
  - TC120x230-P20: integrated via ejectors
  - TC120x230-P20-OV: designed for external vacuum generation e.g. via side channel blower or pump
> EPDM sealing foam, 24 mm thick and vacuum gauge included in scope of delivery
> See the chapter on Accessories for further information on:
  - Sealing foam program for various applications
  - Gripper/robot connection elements

Technical data

Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Number of closing valves	Final vacuum [%]	Width [mm]	Recommended suction power at 35 % vacuum level [m³/h]	Weight [kg]	Suitable sealing foam
TC120x230-P20	105	360	50	85	--	--	2.3	PPF120.230-P20 (p.490)
TC120x230-P40	105	198	15	85	--	--	2.3	PPF120.230-P40 (p.490)
TC120x400-P20	210	396	95	85	--	--	3.55	PPF120.400-P20 (p.490)
TC120x400-P40	105	198	30	85	--	--	3.55	PPF120.400-P40 (p.490)
TC200x400-P20	420	1,440	171	85	--	--	6.15	PPF200.400-P20 (p.490)
TC200x400-P40	210	720	50	85	--	--	6.15	PPF200.400-P40 (p.490)
TC600x400-P20-OV*	--	--	551	--	35	90 - 140	12	PPF-600x400-20 (p.490)
TC600x400-P28-OV*	--	--	260	--	40	90 - 140	12	PPF-600x400-28 (p.490)
TC600x400-P40-OV*	--	--	126	--	55	50 - 90	12	PPF-600x400-40 (p.490)

Technical data

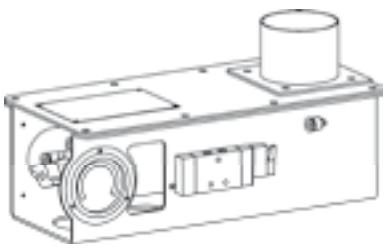
Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Number of closing valves	Final vacuum [%]	Width [mm]	Recommended suction power at 35 % vacuum level [m³/h]	Weight [kg]	Suitable sealing foam
TC1300x260-P20-OV*	--	--	768	--	35	140 - 300	17	PPF-1300x260-20 (p.490)
TC1300x260-P28-OV*	--	--	360	--	40	90 - 140	17	PPF-1300x260-28 (p.490)
TC1300x260-P40-OV*	--	--	192	--	55	50 - 90	17	PPF-1300x260-40 (p.490)
TC1300x500-P20-OV*	--	--	1,536	--	35	140 - 300	32	PPF-1300x500-20 (p.490)
TC1300x500-P28-OV*	--	--	765	--	40	140 - 300	32	PPF-1300x500-28 (p.490)
TC1300x500-P40-OV*	--	--	384	--	55	140 - 300	32	PPF-1300x500-40 (p.490)

* = Depending on external vacuum supply

Large valve openings reduce sensitivity to dirt and ensure maximum suction power

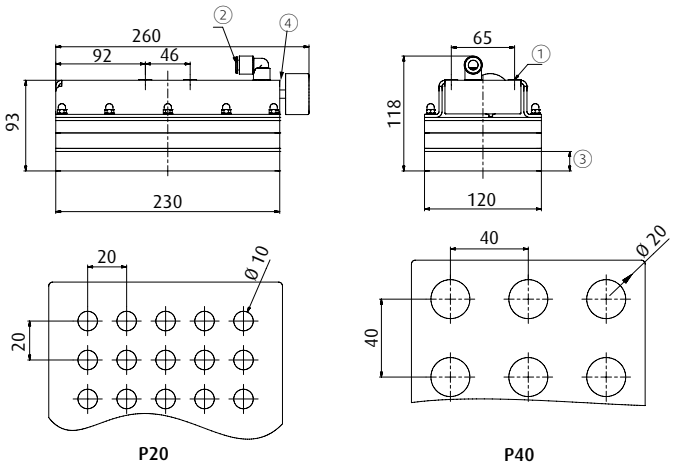
Quick and non-destructive replacement of the sealing foam

Optional gripper box 36.900 for short gripping times

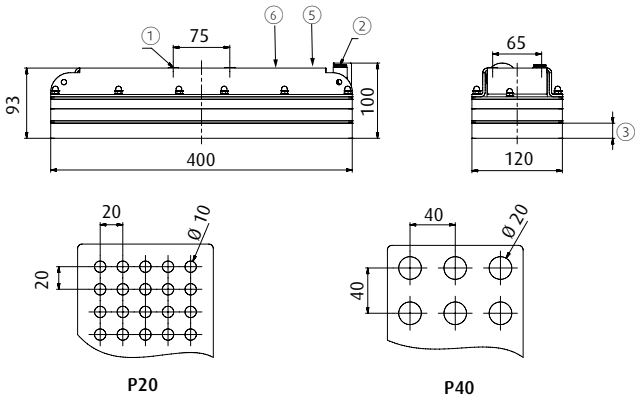


> The vacuum inside the vacuum tubing starts to build up while the workpiece is approached, this reduces the gripping time
> Special valves with excellent suction power for fast evacuation or venting
> Extremely high dirt tolerance for maximum service life and high process reliability

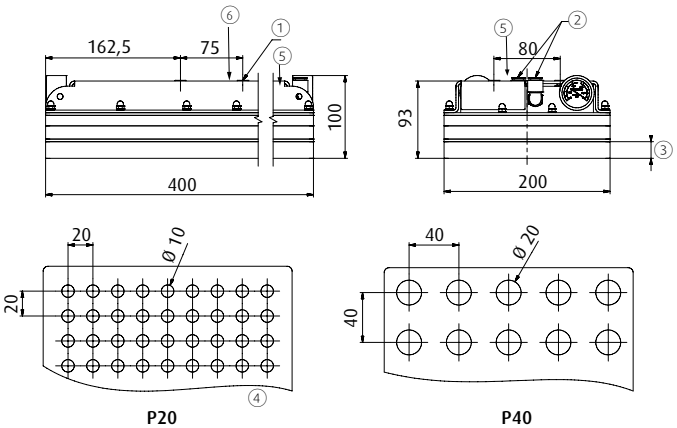
Dimensions



TC120x230-P20 | TC120x230-P40



TC120x400-P20 | TC120x400-P40

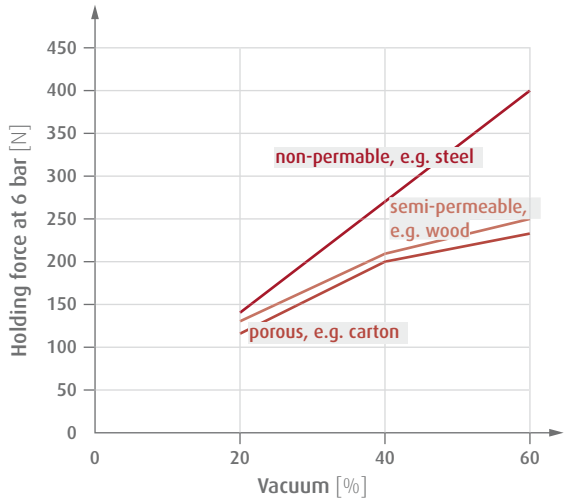


TC200x400-P20 | TC200x400-P40

① = Fixing with M6 screws ② = Compressed air connection G1/8-female with 10 mm quick-fitting ③ = 24 mm sealing foam
④ = Alternative compressed air connection G1/8-female (besides vacuum gauge)
⑤ = Alternative compressed air connection G1/8-female (at the top) ⑥ = Compressed air connection G1/8-female blow-off (at the top)

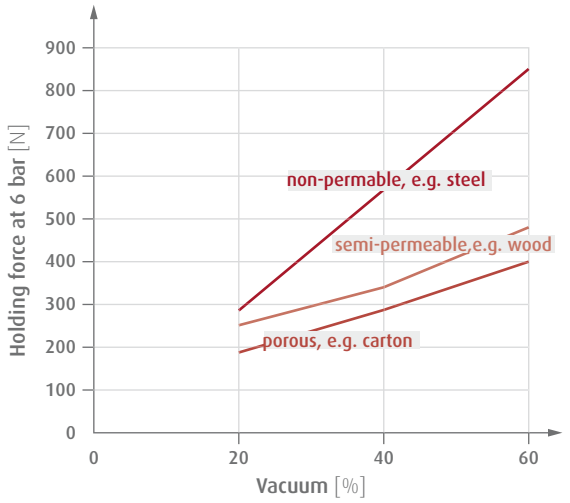
Diagrams

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



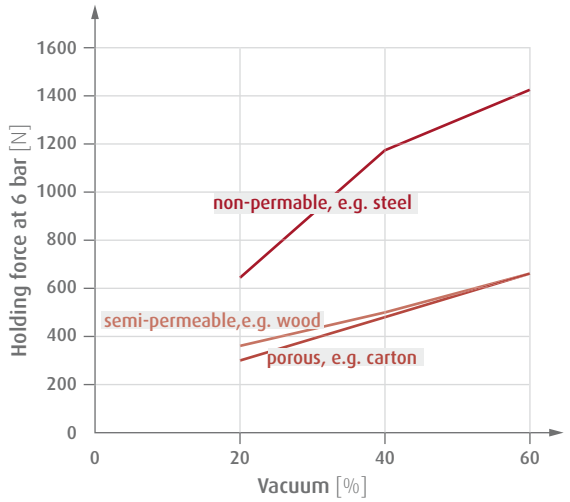
TC120x230-P20 | TC120x230-P40

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TC120x400-P20 | TC120x400-P40

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TC200x400-P20 | TC200x400-P40

Vacuum grippers with reduced leakage

Holding force increases with product coverage

NEW

ECONOMIC GRIPPER SOLUTIONS FOR DUST-FREE HANDLING PROCESSES

Product Description

> Automated handling of individual products or product layers without gripper change
> Suitable for rigid products with an even or uneven surface
> Fast and uniform vacuum distribution ensures short cycle times and high acceleration rates
> Separate compressed air connection for blow-off function for fast product release
> Sealing foam for gentle product contact and optimum vacuum sealing - can be quickly replaced without tools and without leaving any residue

Notes

> Minimum coverage of 80 % recommended
> Suitable for use with > 90° swivel and tilt movements

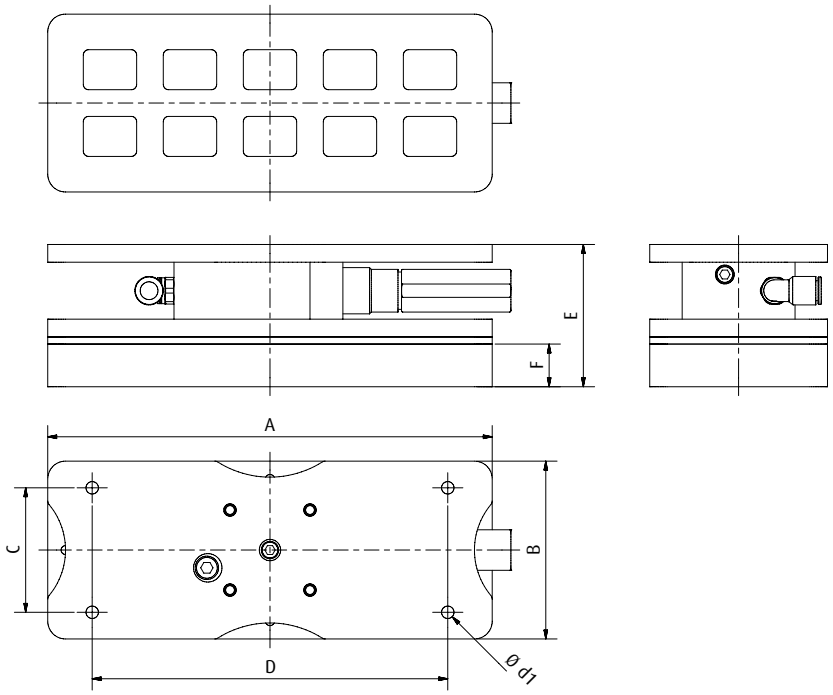
Ordering notes

> Wide range of standard grippers and quick manufacture of customised solutions
> Ordering example vacuum generation
  - TL150x300: integrated via ejectors
  - TL150x300-OV: designed for external vacuum generation e.g. via side channel blower or pump
> Universal EPDM sealing foam, 24 mm thick (Index x24) included in scope of delivery
> Optional: EPDM sealing foam, 12 mm thick (Index x12)
> The gripping area is divided into zones for flexible product pick-up and/or release
> See chapter accessories for more information on:
  - Wide range of sealing foam for different applications
  - Gripper/robot connection elements

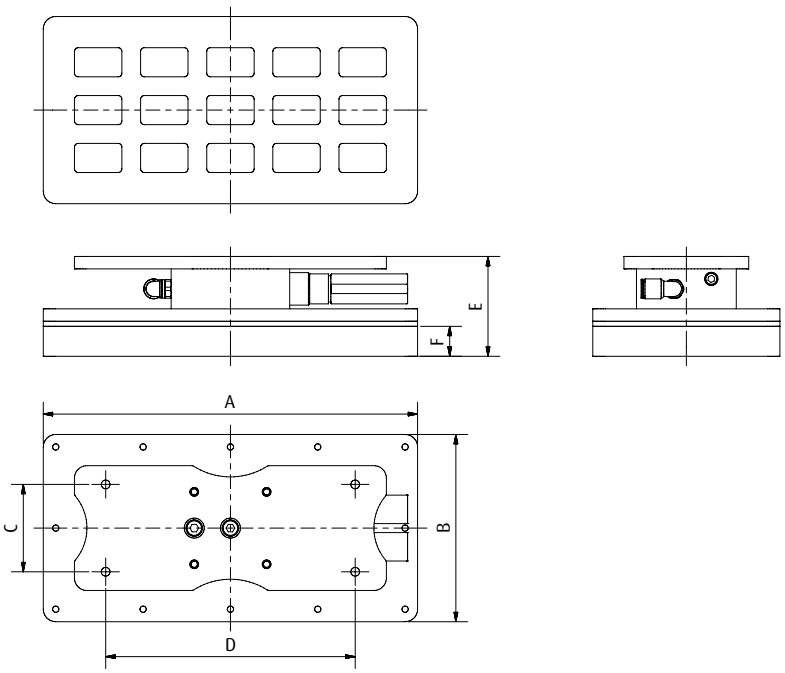
Technical data

Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Final vacuum [%]	Weight [kg]	Suitable sealing foam
TL100x250	105	198	85	1.55	PPF-TL-100x250x12 (p.490) PPF-TL-100x250x24 (p.490)
TL150x300	210	396	85	3.2	PPF-TL-150x300x12 (p.490) PPF-TL-150x300x24 (p.490)
TL200x350	210	396	85	4.2	PPF-TL-200x350x12 (p.490) PPF-TL-200x350x24 (p.490)
TL250x400	210	396	85	4.65	PPF-TL-250x400x12 (p.490) PPF-TL-250x400x24 (p.490)

Dimensions



TL100x250



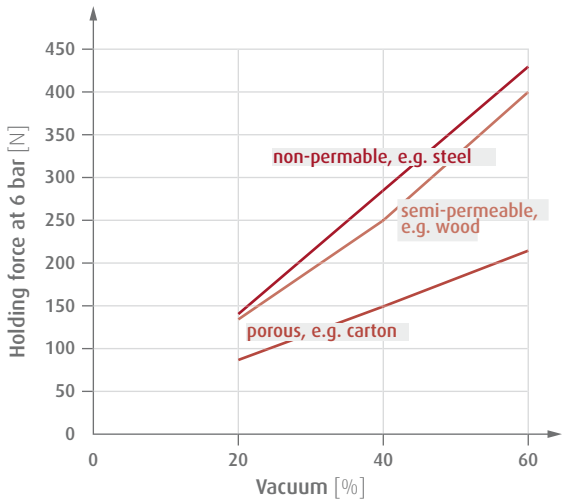
TL150x300 | TL200x350 | TL250x400

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
TL100x250	250	100	70	200	7	78	24
TL150x300	300	150	70	200	7	80	24
TL200x350	350	200	70	200	7	80	24
TL250x400	400	250	70	200	7	69	24

Continued on the next page

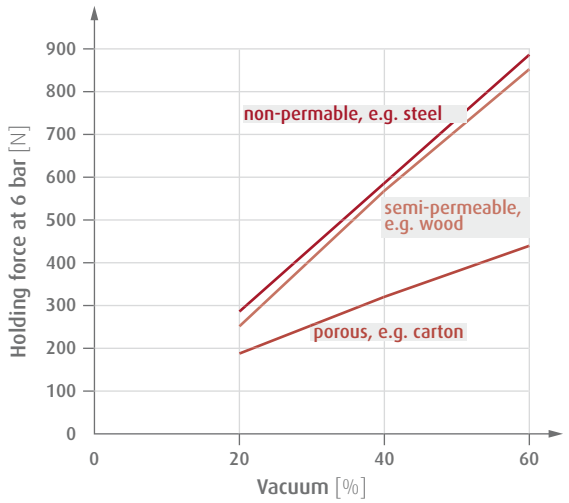
Diagrams

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



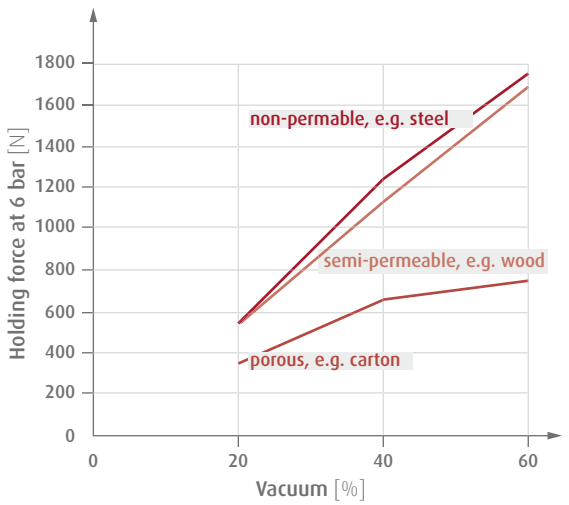
TL100x250

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



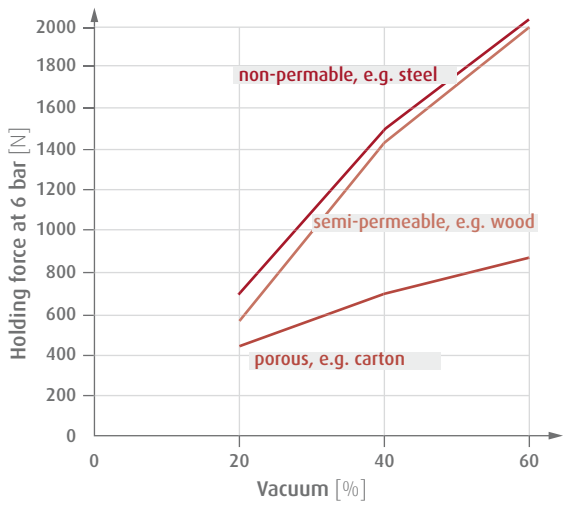
TL150x300

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TL200x350

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TL250x400

Low-leak suction plates - SPLT

NEW

Suction plate 67.010

Product Description

> Combination of 4x4 or 6x6 bellows vacuum cups with 2.5 bellows in oil resistant NBR
> Suction plate suspended using a spring leveler with internal vacuum channel (25 mm stroke)
> Off-center vacuum connection possible
> Reliable suction with variable product geometries

Notes

> Due to the flow cross-section of 0.4 mm per vacuum cup, these suction plates are not suitable for equipment with very short cycle times

Technical data

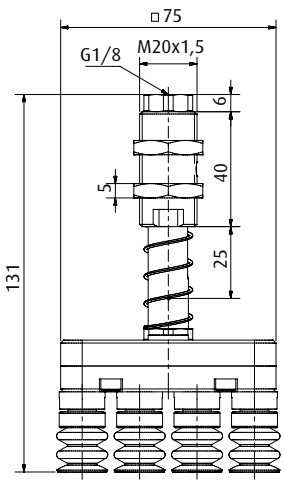
Item no.	Model	Number of Vacuum cups []	Lift Spring leveler [mm]	Cup lift [mm]	Gripping force * [N]	Max. leakage ** (Vacuum cups unassigned) [Nl/min]	Connection to the machine []	Vacuum connection	Suitable accessories
67.010	SPLT-4x4-25	16	25	9.5	190	24	M20x1,5-male	G1/8-female	Spare cup 20.018.125.1 (p.301) Wrench socket for cup assembly 90.008
67.011	SPLT-6x6-25	36	25	9.5	426	54	M30x1,5-male	G3/8-female	Spare cup 20.018.125.1 (p.301) Wrench socket for cup assembly 90.008

* = theoretical value at 60 % vacuum and a dry, smooth product surface. Figure excludes safety factor ** = at 60 % vacuum

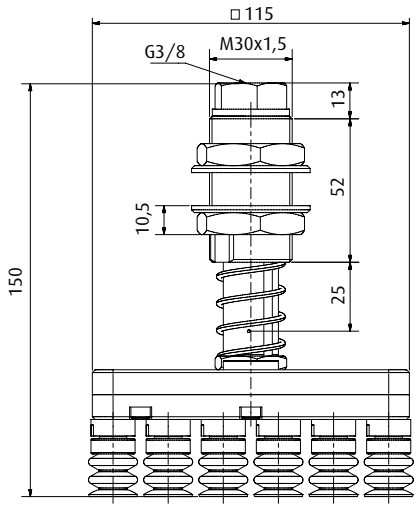
Application:

> Handling of variable product geometries or products with recesses that prevent all vacuum cups from making contact with the product surface (e.g. metal sheet in laser cutting systems)
> Integrated flow resistors reduce leakage and maintain an adequate vacuum level for the remaining vacuum cups covered by product, thus preventing products from being dropped

Dimensions



67.010



67.011

Bag grippers

Handling of non-rigid goods

View of the suction chamber

Product Description

> Handling of limp, non-rigid objects such as bags, shrink-wraps or any product that fully covers the suction chamber
> On board vacuum generation via high performance ejectors for optimum suction power
> Dust-resistant design
> Sealing foam with optimum adjustment to product surface - easy to replace
> Optional side channel blower for handling very porous goods

Notes

On request:
> Splitting of suction chamber for multi-zone picking and release or product adjustment
> Depth of the suction chamber can be adjusted for optimum handling of specific products (standard 40 mm)

Ordering notes

Ordering example vacuum generation
> TG150x300: integrated via ejectors
> TG150x300-OV: designed for external vacuum generation e.g. via side channel blower or pump

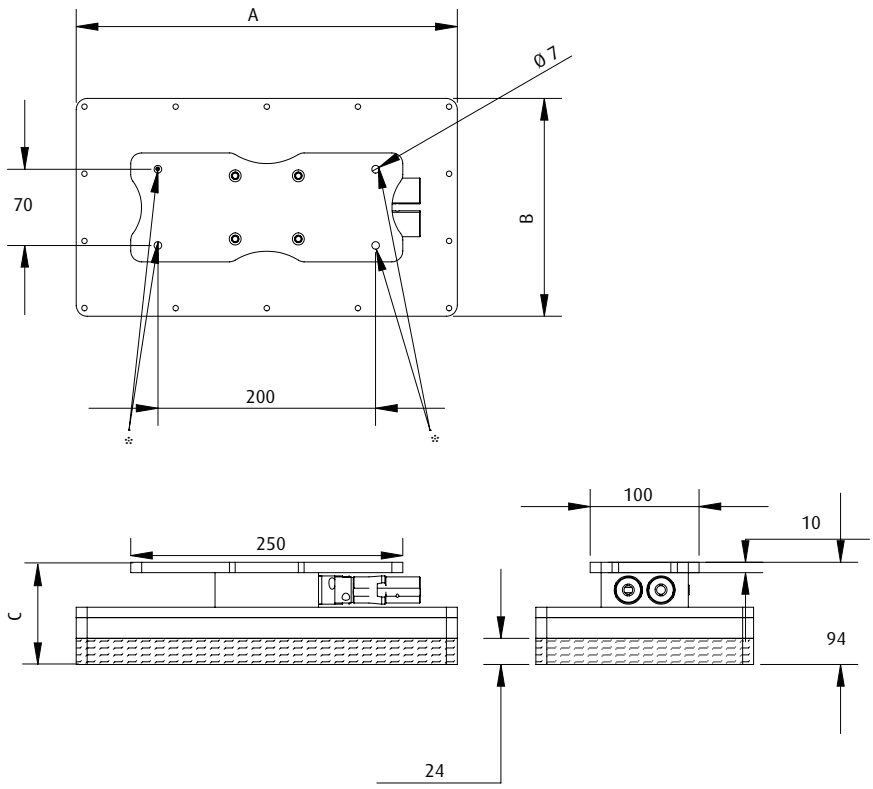
Technical data

Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Max. gripping force at 60 % vacuum (-600 mbar) safety factor 1.5			Weight [kg]	Suitable sealing foam
			Dense products (e.g. steel) [N]	Semi-porous products (e.g. wood) [N]	Porous products (e.g. carton boxes) [N]		
TG100x250	105	198	280	170	70	1.5	PPF100x250
TG150x300	210	396	500	300	125	2.5	PPF150x300
TG200x350	210	396	770	470	190	3.5	PPF200x350
TG250x400	210	396	1,100	670	270	4.7	PPF250x400
TG300x500	210	396	1,670	1,000	400	6.7	PPF300x500
TG400x600	210	396	2,670	1,600	625	14.7	PPF400x600

Sealing foam

Easy replacement of sealing foam

Dimensions



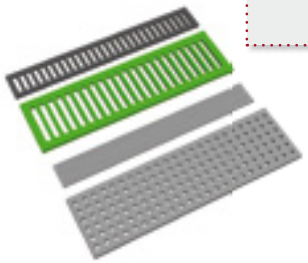
* = Fixing holes for connection to gripper system

Item no.	**A** [mm]	**B** [mm]	**C** [mm]
TG100x250	100	250	62
TG150x300	150	300	62
TG200x350	200	350	62
TG250x400	250	400	93
TG300x500	300	500	93
TG400x600	400	600	93

Sealing foam for vacuum grippers

Suitable for all vacuum grippers

EASY INSTALLATION - FAST, RESIDUE-FREE REPLACEMENT!



Easy replacement of the sealing foam without tools

Product Description

> Firm grip on the gripper bottom
> Quick, residue-free replacement without pre-handling or tools
> Different foams for a broad range of applications

Notes

> For information on the relevant hole patterns, see the chapter on vacuum grippers

Ordering notes

> Custom sizes and hole patterns available, quick and easy to implement
> The indicated item no. pertain to the universal sealing foam type

Technical data

Item no.	Suction area [mm]	Thickness [mm]	Material
PPF120.230-P20	120x230	24	EPDM
PPF120.230-P40	120x230	24	EPDM
PPF120.400-P20	120x400	24	EPDM
PPF120.400-P40	120x400	24	EPDM
PPF200.400-P20	200x400	24	EPDM
PPF200.400-P40	200x400	24	EPDM
PPF160.600-P20	160x600	24	EPDM
PPF160.600-P40	160x600	24	EPDM
PPF-TL-100x250x12	100x250	12	EPDM
PPF-TL-150x300x12	150x300	12	EPDM
PPF-TL-200x350x12	200x350	12	EPDM
PPF-TL-250x400x12	250x400	12	EPDM
PPF-TL-100x250x24	100x250	24	EPDM
PPF-TL-150x300x24	150x300	24	EPDM
PPF-TL-200x350x24	200x350	24	EPDM
PPF-TL-250x400x24	250x400	24	EPDM
PPF-600x400-20	600x400	24	EPDM
PPF-600x400-28	600x400	24	EPDM
PPF-600x400-40	600x400	24	EPDM
PPF-1300x260-20	1,300x260	24	EPDM
PPF-1300x260-28	1,300x260	24	EPDM
PPF-1300x260-40	1,300x260	24	EPDM
PPF-1300x500-20	1,300x500	24	EPDM
PPF-1300x500-28	1,300x500	24	EPDM
PPF-1300x500-40	1,300x500	24	EPDM

Available sealing foam and their properties

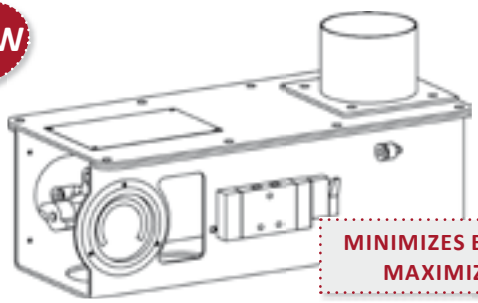
Suction mat type	Material	Properties	Example applications
Universal	EPDM	> Very soft structure > Very short reset time	> Porous workpieces such as cardboard boxes or untreated wooden palletes > Dense workpieces such as coated wooden boards > Suitable for short cycle times
Valve foam	EPDM	> Very soft structure > Very short reset time	> Handling of open glass jars (in combination with foam gripper TL) > Suitable for short cycle times
NR green	Natural rubber	> More rigid structure > Cut-resistant > Short reset time	> Building material, ceramics > Untreated wooden palletes > Wet pallets > Sharp-edged or abrasive products

On request, the preparation of composite sealing foams is possible to combine, for example, short reset times and cut-resistance.

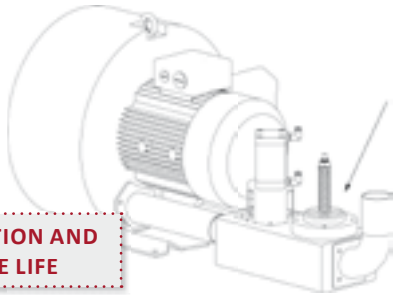
Pick-up and release system

For vacuum grippers from size 400x600 and external vacuum supply with side channel blower

NEW



MINIMIZES ENERGY CONSUMPTION AND MAXIMIZES SYSTEM SERVICE LIFE



Pick-up Box 36.900

Blower box 36.901 (shown with side channel blower)

Product Description

> Combination of gripper box mounted on vacuum gripper and blower box
> One pneumatically powered cylinder each ensures a high value for the rated flow and proactive vacuum control
> This enables short gripping times and minimises blower power consumption
> In addition to reducing power consumption, automatic venting after release also ensures long service life as blower is not continously exposed to vacuum

Notes

> The number of pick-up boxes depends on the gripping system used

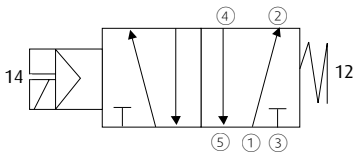
Ordering notes

Included in scope of delivery:
> 1 x aluminium housing, 5/2-way solenoid valve, pneumatically powered cylinder
> Control cable with plug, 24 VDC, 1.28 W, IP65, 2-pin, 5m length, open end

Technical data

Item no.	Feed pressure [bar]	Tubing diameter vacuum connection [mm]	Operating temperature [°C]
36.900	3 - 8	60	-5 - 50
36.901	3 - 8	60	-5 - 50

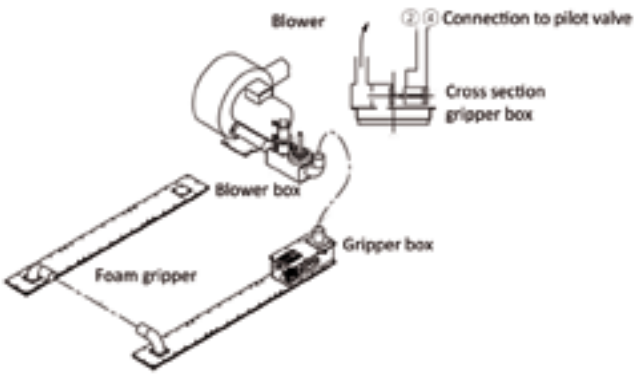
Schematic of 5/2-way solenoid valve for pneumatic cylinder control



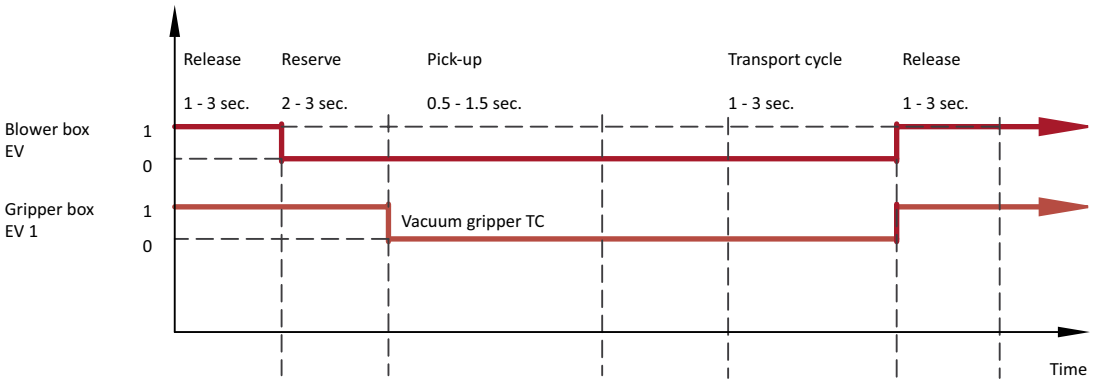
Assignment
① Compressed air inlet
② Working connection (Cylinder open)
④ Working connection (Cylinder closed)
③, ⑤ Ventilation

FIPA Material in Motion
Phone +49 (0)89 / 96 24 89-0

Diagram of pick-up and release system



Example diagram of pick-up and release system for vacuum gripper with two TC gripper heads



Process description

Vacuum build-up:
> The gripper/vacuum tubing connection is interrupted. The required vacuum is built up in the tubing during approach of gripper to workpiece.

Pick-up:
> The gripper/vacuum tubing connection is made
> The vacuum becomes operational on the gripper. This significantly reduces gripping time.

Transport cycle:
> The workpiece is securely moved by the gripper to its destination

Release:
> The gripper is connected to atmospheric pressure, thus the workpiece is quickly released
> The blower is vented with atmospheric air, which reduces power consumption and significantly increases service life as the blower is not continuously exposed to vacuum

Connection elements gripper - robot

Application specific interface to the robot

Product Description

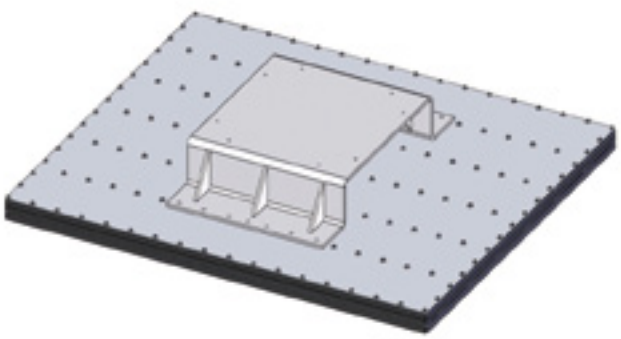
> Example A: Installation of grippers on robots without removal of the plate
> Example B: For vertical movements between robot and gripper
> Example C: For 3-axis movements between robot and gripper
> Example D: For connection of multiple or longer gripper systems, 3-axis movement

Ordering notes

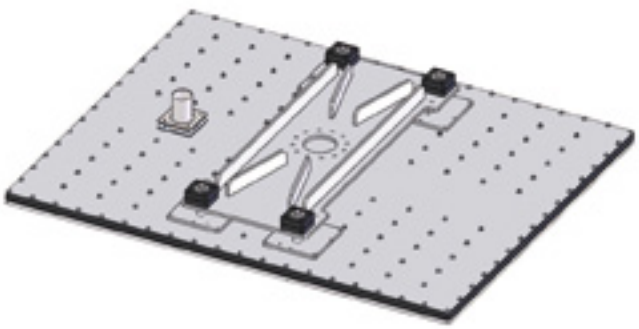
> Layout dependent on gripper system and robots used
> We will be happy to customize the interfaces for your application

Examples of application

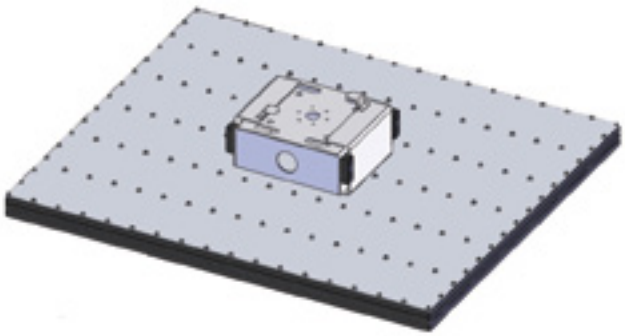
> Example A: Robot/gripper interface, raised



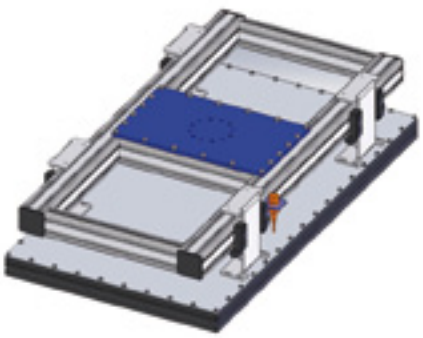
> Example B: Robot/gripper interface, type 1



> Example C: Robot/gripper interface, type 2



> Example D: Robot/gripper interface, type 3



Special grippers 496

Bernoulli vacuum cups 498

Vacuum tweezers 502

Magnetic grippers 503

Customised grippers 506

Gripper components 509

FIPA Special grippers - Standard

Bernoulli vacuum cups - SX-B and SX-B-PK

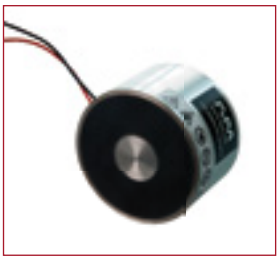
> Non-contact, deformation-resistant transport of thin and sensitive products
> No ejector, requires compressed air only
> Suitable for porous products thanks to high volume flow
> Series for direct contact with food (approval in accordance with FDA/EC1935/2004)

> See page 498

Vacuum tweezers

> Compressed air or vacuum operated pick-up tool for the assembly of small parts
> Delivery includes set of miniature vacuum cups

> See page 502



Magnetic grippers

> Secure handling of sheet metal and ferromagnetic workpieces with and without recesses

MG series

> Combination of electronic and permanent magnet
> High cycle times for thin and/or alloyed metal sheets thanks to negligible residual magnetism after switching off the magnetic force
> Holding force up to 700 N
> No piping required
> Very energy-efficient, as a short electrical pulse is only required for product release

> See page 503

PMG series

> Pneumatic dual-action with permanent magnet
> Holding force up to 400 N
> Extremely wear-resistant, quick-change friction rings made from low-marking NBR (hardness 70° Shore) prevent scratching as a result of contact between the workpiece and grippers
> Part control by monitoring piston position

> See page 504

FIPA Special grippers - Customised

Insert grippers

> Gripper tools for insert components such as threaded bushes
> Gripper shape can be matched exactly to the component to be gripped
> Flexible control systems available, e.g. with pneumatic dual-action or vacuum-operated
> Simple integration into the overall system using gripper components such as spring levelers or clamping elements

> See page 506

Modular gripper

> Development of individual gripper tools according to customer demands
> Constructed using a polyamide-based, high-performance plastic
> Short cycle times thanks to a lightweight design and a gripper that can be adapted precisely to fit the component shape
> Minimal set-up times thanks to integrated robot-gripper interface
> Minimal cycle times thanks to integrated vacuum generation
> Fewer tubing due to integrated media channels (pressure/vacuum)
> Combi-grippers available, e.g. pneumatic finger gripper with vacuum cups or vacuum grippers
> FDA-approved materials for direct contact with foodstuffs
> Cost-effective production, starting with a batch size of one unit

> See page 508

Modular grippers are individually customised according to customer demands:
Our technical sales department will be happy to advise you via e-mail (info@fipa.com) or phone on +49 (0) 89/96 24 89-0

FIPA Components for gripper assembly

FIPA gripper component range

> Selection includes extrusion systems, clamping elements, vacuum and finger grippers, parallel, angular and needle grippers
> FIPA supplies individual components as well as complete gripper systems
> Typical applications include extraction of plastic parts from injection molding machines or handling of textiles

> See page 509

Bernoulli vacuum cups SX-B

Low-contact and gentle product transport

Housing made of anodised aluminium

Product Description

> Integrated vacuum generation on the Bernoulli principle
> Non-contact, deformation-resistant transport of thin and sensitive products
> High holding force: Bernoulli vacuum cups can grip up to 600 g of mass
> Suitable for porous products thanks to high volume flow at low vacuum level
> Easy to install, system flexibly expandable through lateral compressed air inlets
> Long life cycle due to maintenance-free operation

Notes

> Only run with unoiled, dry compressed air

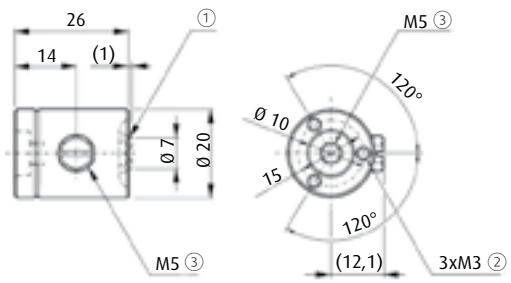
Ordering notes

> With 65.530 and 65.540, the pads can be removed for contact-free applications
> Silicone pads (pads SI) are included in scope of delivery

Technical data

Item no.	Model	Operating pressure [bar]	Holding force at 5 bar [N]	Air consumption at 5 bar [Nl/min]	Ambient air temperature [°C]	Weight [g]	Suitable accessories
65.510	SX-B-20	1 - 7	0.9	100	5 - 60	50	Pads NBR 78.509 Pads SI 78.510
65.520	SX-B-30	1 - 7	1.3	100	5 - 60	70	Pads NBR 78.509 Pads SI 78.510
65.530	SX-B-40	1 - 7	2	110	5 - 60	120	Pads NBR 78.511 Pads SI 78.512
65.540	SX-B-60	1 - 7	6	210	5 - 60	260	Pads NBR 78.511 Pads SI 78.512

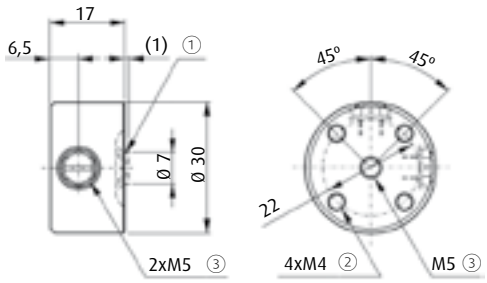
Dimensions



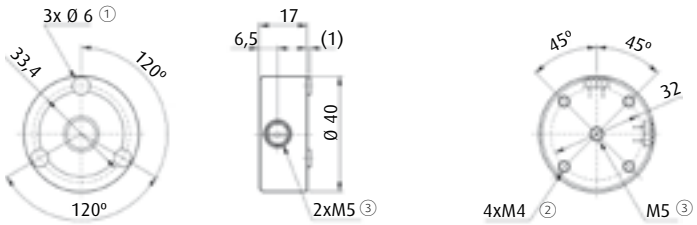
65.510

① = Pads ② = Depth 5 mm ③ = Compressed air connection

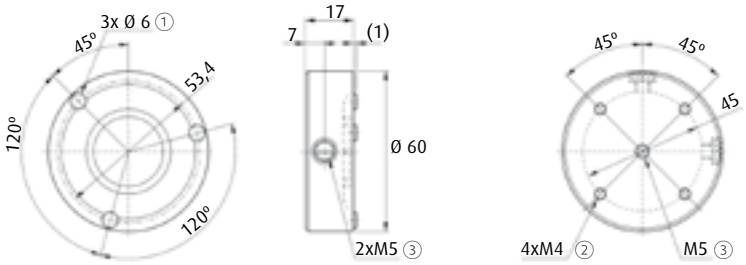
Dimensions



65.520



65.530

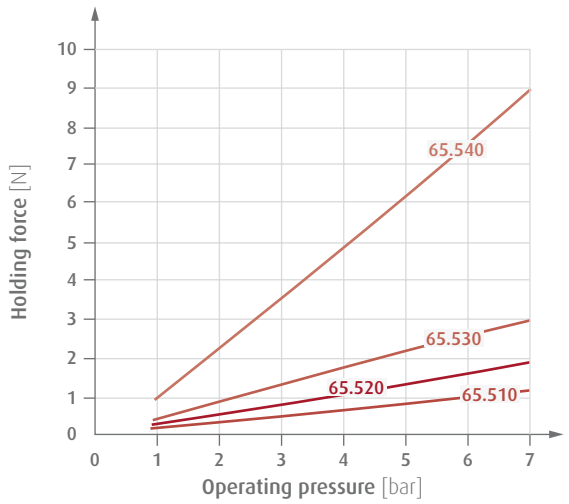


65.540

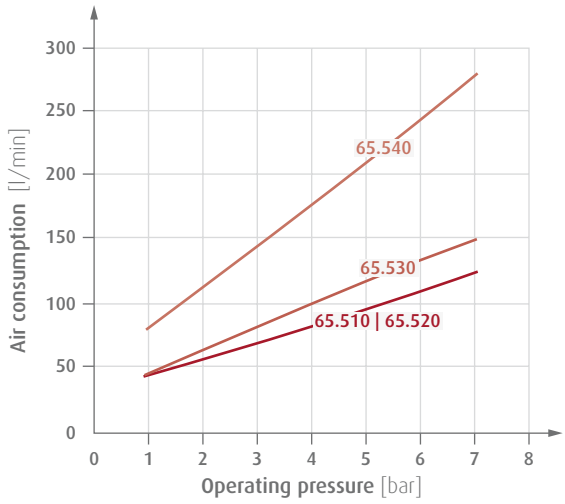
① = Pads ② = Depth 5 mm ③ = Compressed air connection

Diagrams

> Holding force as a function of operating pressure



> Air consumption as a function of operating pressure



Bernoulli vacuum cups SX-B-PK

Non-contact vacuum suction grippers for direct food contact

SUITABLE FOR FOODSTUFFS

Housing made of FDA-approved plastic

Product Description

> Integrated vacuum generation on the Bernoulli principle
> No ejector, requires compressed air only
> Non-contact, deformation-resistant transport of thin and sensitive products
> Suitable for direct contact with food products (Approval by FDA/EC1935/2004)
> High holding force: Bernoulli vacuum cups can grip up to 1,200 g of mass
> Suitable for porous products thanks to high volume flow at low vacuum level
> Easy to install, system flexibly expandable through lateral compressed air inlets
> Long life cycle due to maintenance-free operation

Notes

> Only be operated with oil-free, dry compressed air

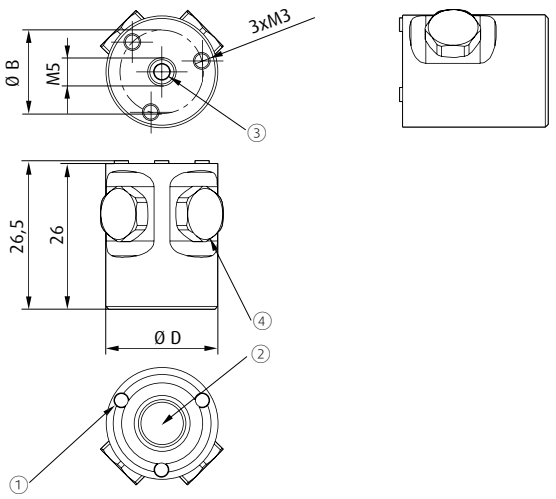
Technical data

Item no.	Model	Operating pressure [bar]	Holding force at 5 bar [N]	Air consumption at 5 bar [Nl/min]	Max. Particle size [µm]	Medium	Ambient air temperature [°C]	Weight [g]	Suitable silicone pads
65.510-PK	SX-B-PK-20	1 - 7	2.5	150	40	Compressed air	5 - 60	10	78.510
65.520-PK	SX-B-PK-30	1 - 7	3	150	40	Compressed air	5 - 60	20	78.510
65.530-PK	SX-B-PK-40	1 - 7	5.5	150	40	Compressed air	5 - 60	30	78.512
65.540-PK	SX-B-PK-60	1 - 7	12	220	40	Compressed air	5 - 60	70	78.512

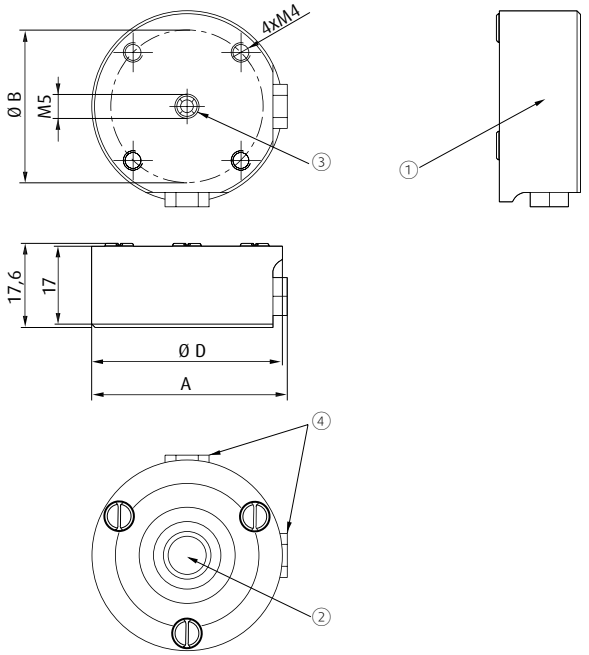
Technical specifications

> Highly resistant against diverse chemicals used in the food industry
> Suitable for all conventional CIP (Cleaning-In-Place) and SIP (Sterilisation-In-Place) processes
> Hygienic product design enables quick and easy cleaning
> Materials:
- Housing: Polyetheretherketone
- Pad: Silicone caoutchouc
- Nozzle: Stainless steel
- Seals: Fluorocaoutchouc
- Blanking screw: Polyetheretherketone

Dimensions



65.510-PK



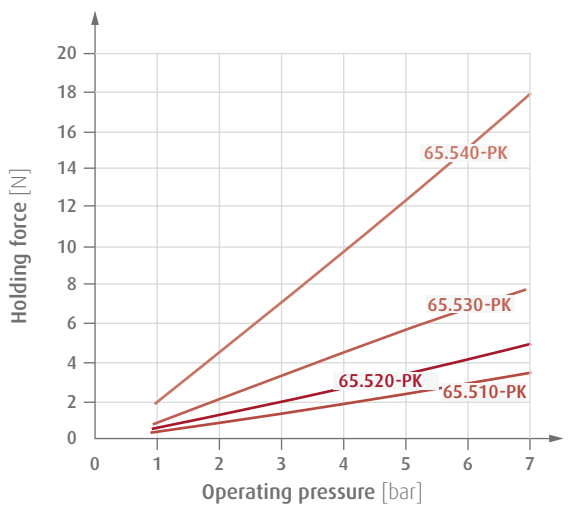
65.520-PK | 65.530-PK | 65.540-PK

① = Silicone rubber pads ② = Nozzle ③ = Compressed air connection ④ = Alternative pneumatic connection

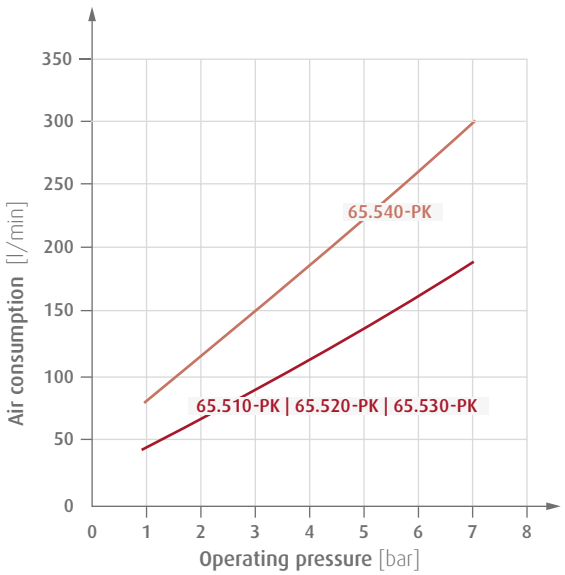
Item no.	**A** [mm]	**Ø B** [mm]	**Ø D** [mm]
65.510-PK	--	15	20
65.520-PK	31	22	30
65.530-PK	41	32	40
65.540-PK	61	45	60

Diagrams

> Holding force as a function of operating pressure



> Air consumption as a function of operating pressure



Vacuum tweezers

Assembly of small parts

Product Description

> **VTA-Set:**
Vacuum tweezers with built-in ejector, without valve and with air vent. To pick up the object, close the air vent with the fingertip and release to place the object.
> **VTB-Set:**
Vacuum tweezers with built-in ejector, compressed air valve and built-in silencer - hence, very low-noise. The built-in compressed air valve is used to switch on the vacuum only when needed.
> **VTA-Set-1:**
Vacuum tweezers without ejector and with air vent. To pick up the object, close the air vent with the fingertip and release to place the object.

Ordering notes

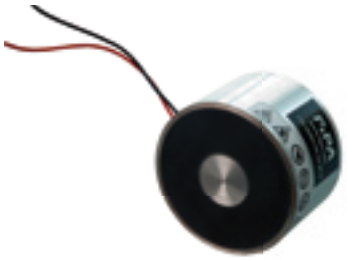
The set contains:
> Vacuum squeezers, spiral tubing, one each per vacuum cup (Silicone) Ø 2, 4, 6 and 8 mm
> Adapter curved for vacuum cup Ø 2 and 4 mm
> Adapter curved for vacuum cup Ø 6 and 8 mm

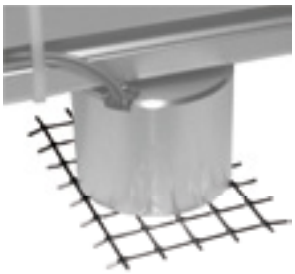
Technical data

Item no.	Operating principle	Operating pressure [bar]	Nominal supply pressure [bar]	Final vacuum [%]	Operating temperature [°C]	Weight [g]	Suitable accessories
VTA-Set	Operated with compressed air	1.5 - 7	5	90	0 - 60	22	Adapter straight for vacuum cups Ø 2, 4 mm VPZ-2-S Adapter straight for vacuum cups Ø 6, 8 mm VPZ-6-S Spare cup NBR Ø 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)
VTB-Set	Operated with compressed air	1.5 - 7	5	90	0 - 60	16	Adapter for vacuum cups - bended Ø 2, 4 mm VPZ-2 Adapter for vacuum cups - bended Ø 6, 8 mm VPZ-6 Spare cup NBR Ø 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)
VTA-Set-1	Vacuum-operated	0 - 1	5	90	0 - 60	22	Adapter for vacuum cups - bended Ø 2, 4 mm VPZ-2 Adapter for vacuum cups - bended Ø 6, 8 mm VPZ-6 Spare cup NBR Ø 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)

Magnetic grippers - electrical controlled

Secure handling by permanent magnets





Product Description

> Safe handling of sheet metal or ferromagnetic workpieces with or without recesses
> Very high holding force thanks to high-performance electromagnet / permanent magnet
> Short cycle times for thin and/or alloyed metal sheets thanks to negligible residual magnetism after switching off the magnetic force
> No piping required
> Very energy-efficient as a short electrical pulse is only required for product release
> Robust design

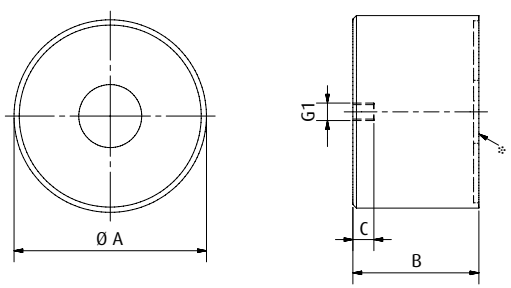
Notes

> Indicated holding forces are valid direct placement, without air gap, on the flat holding surface

Technical data

Item no.	Principle of operation	Rated power [W]	Gripping force [N]	Residual gripping force [N]	Operating voltage of the switch-off coil [V]	Power-on time [ED]	Protection class	Max. operating temperature [°C]	Weight [g]	Suitable holder
MG35	Electrical	4.6	160	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	200	270.448
MG55	Electrical	9	420	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	500	270.449
MG70	Electrical	13.3	720	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	900	270.450

Dimensions



* = Holding surface

Item no.	G1	Ø A [mm]	B [mm]	C [mm]
MG35	M4	35	30	5
MG55	M5	55	36	6
MG70	M8	70	45	8

Magnetic grippers - pneumatically controlled

Safe handling by permanent magnets

Fast replacement NBR sealing rings (70° Shore A hardness)

Product Description

> Safe handling of sheet metal or ferromagnetic workpieces with or without recesses
> Very high holding force thanks to powerful permanent magnets
> Robust and compact aluminium body, anodised, red
> Very wear-resistant and fast replacement NBR sealing rings (70° Shore A hardness) to avoid scratches due to contact between gripper and workpiece
> Optional magnetic PNP and NPN sensors from model PMG40 for part control by monitoring the piston position

Notes

> The recommended working load includes safety factor of 3

Ordering notes

> Sealing ring included in scope of delivery

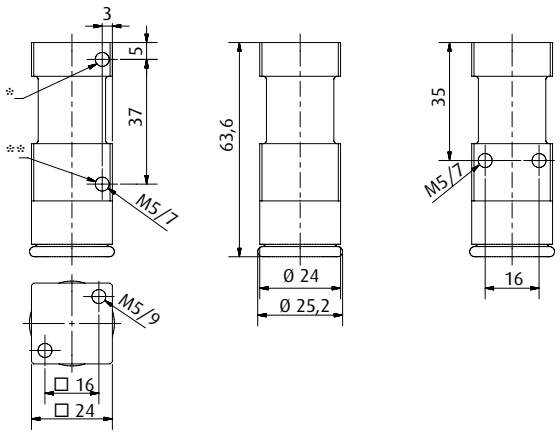
Technical data

Item no.	Principle of operation	Pressure range [bar]	Gripping force [N]	Recommended workload [N]	Air consumption [l/stroke]	Min. recommended sheet thickness [mm]	Protection class	Operating temperature [°C]	Weight [g]	Suitable accessories
PMG24	Double	4 - 6	40	13	0.013	0.5	IP67	0 - 70	100	Sealing ring PMG24-NBR
PMG40	Double	4 - 6	170	57	0.04	0.5	IP67	0 - 70	200	Sensor GR04.199 Sensor GR04.199/NPN Sealing ring PMG40-NBR
PMG70	Double	4 - 6	400	135	0.142	0.5	IP67	0 - 70	800	Sensor GR04.199 Sensor GR04.199/NPN Sealing ring PMG70-NBR

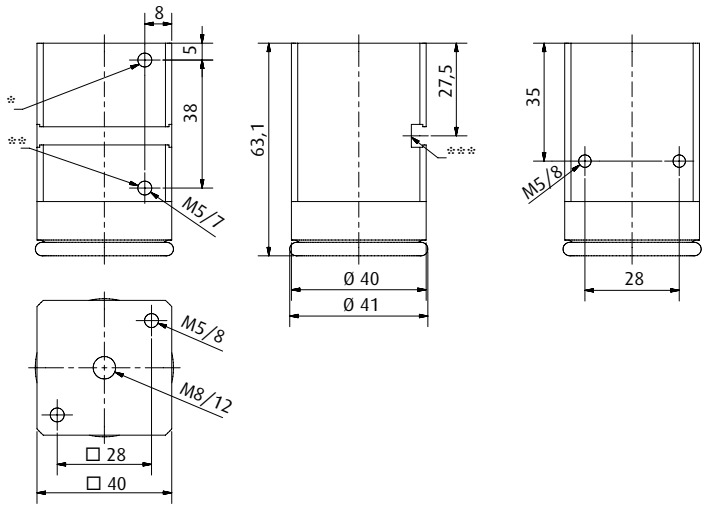
Optional: with magnetic sensor

Magnetic gripper PMG70 with PNP sensor GR04.199

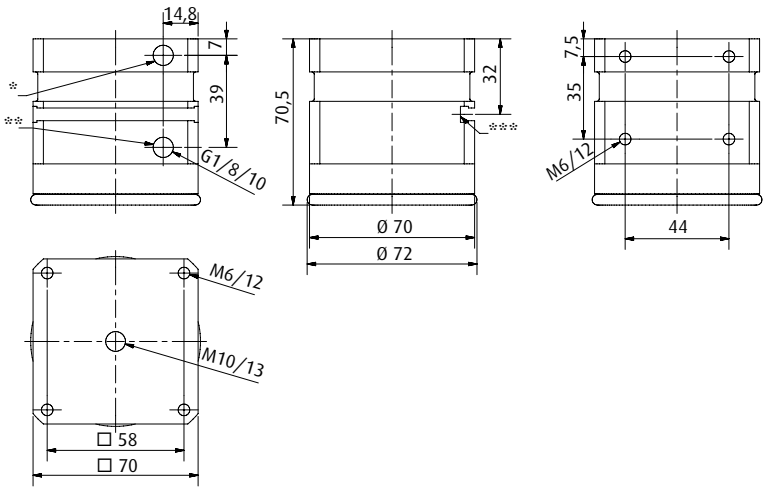
Dimensions



PMG24



PMG40



PMG70

* = Magnetic force "on" ** = Magnetic force "off" *** = Sensor slot

Insert gripper - compressed-air controlled

Customised design example

Application example with insert part

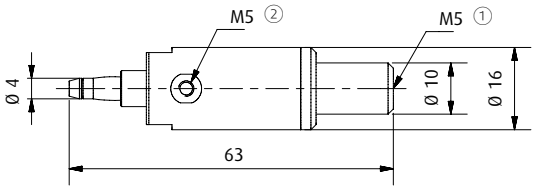
Product Description

> Inserting (e.g. M5 nuts) threaded bushings thanks to “internal gripping”
> Precisely tailored to the workpiece
> Dual-action
> Connection via Ø 10 mm clamp
> Housing material: brass, other materials on request
> Weight: 115 g

Ordering notes

> The product example displayed is based on customer specifications
> We would be pleased to develop a solution optimally customised to your requirements

Dimensions



① = Compressed air connection for extending the piston ② = Compressed air connection for pulling in the piston

Insert gripper - vacuum controlled

Customised design example

Application example with insert part

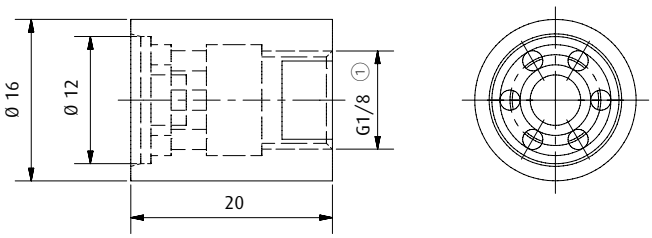
Product Description

> Handling of customer-specific inserts on the face side
> Alternative when internal or external gripping is not permitted
> Gripper diameter precisely adjusted to the workpiece
> Connection via spring leveler
> Weight: 85 g
> Housing material: brass, other materials on request
> Suitable accessories: spring-loaded suction finger GR04.090A, angle clamp GR02.011A
> Patent pending

Ordering notes

> The product example displayed is based on customer specifications
> We would be pleased to develop a solution optimally customised to your requirements

Dimensions



① = Vacuum connection

Modular gripper

Customised design example

SUITABLE FOR FOODSTUFFS

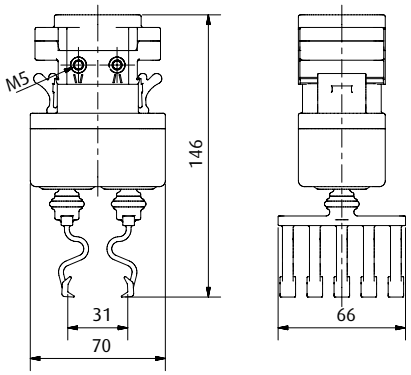
Product Description

> Handling of food - here: chocolate bars
> Gripper is precisely tailored to the workpiece
> Connection to a Delta Robot
> Dual-action
> All components with FDA-certification
> Material: polyamide-based high-performance plastic

Ordering notes

> The product example displayed is based on customer specifications
> We would be pleased to develop a solution optimally customised to your requirements

Dimensions



Examples of application

> Modular gripper for cans - the gripper design follows the contours of the handling good, enables rapid acceleration to enable rapid acceleration

> Modular gripper with integrated ejector EMM and Varioflex® bellows vacuum cups to compensate unevenness of the workpiece

FIPA components for gripper assembly

Suction fingers or spring levelers

Straight suction fingers

Pivoting suction fingers

Spring-loaded, non rotating suction finger

Adjustable spring levelers

Application example

Extrusions and screw connectors

Extrusion systems / framing S, M and XLine

Angle clamps

Angle connectors

Application example

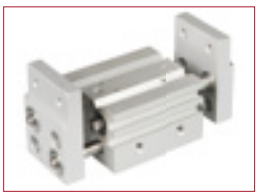
Application example

Active gripping elements

Grippers

Finger grippers

Application example



Parallel grippers

Needle grippers

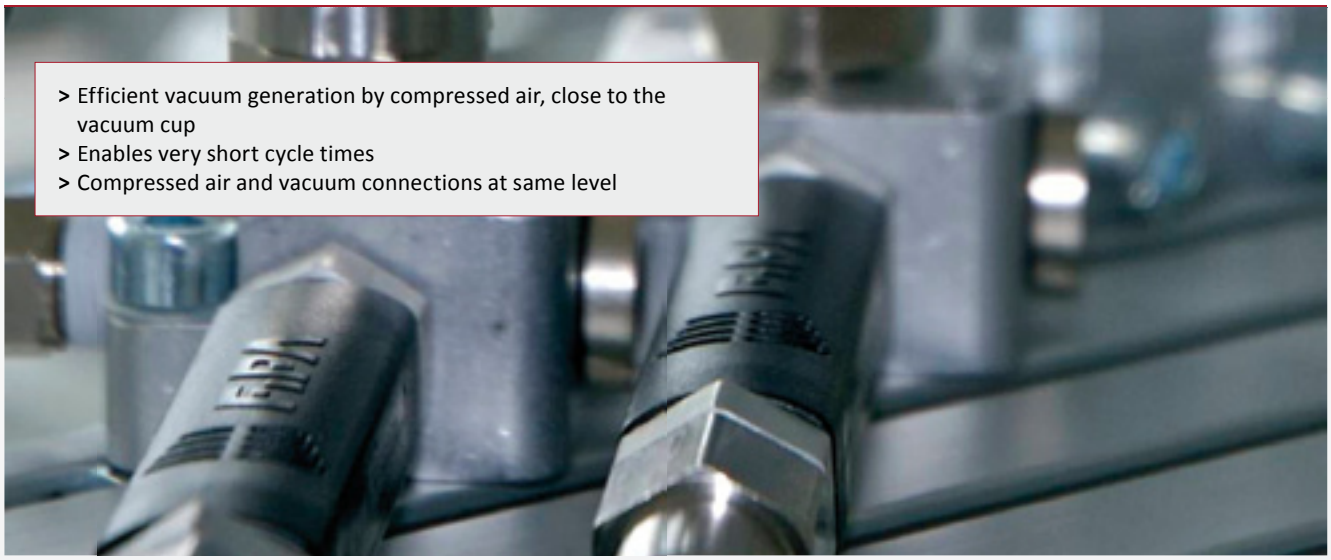
Our End-of-Arm-Tooling (EOAT) catalogue can be found at:
www.fipa.com | Info & Catalogues
or requested by e-mail (info@fipa.com)
or by calling +49 (0)89/96 24 89-0

Notes:

Inline ejectors 513
Base and Heavy-duty ejectors 526
Multi-chamber ejectors 546
Compact ejectors 555
Feed ejectors 569
Silencers for vacuum ejectors 577
Rotary vane vacuum pumps 580
Vacuum units 606
Side channel blowers 614
Accessories 617

Notes:

FIPA Inline ejectors



> Efficient vacuum generation by compressed air, close to the vacuum cup
> Enables very short cycle times
> Compressed air and vacuum connections at same level

Inline ejectors EIL

> Handling of dense workpieces (max. vacuum level 85 % / 90 %): Index H
> Handling of porous workpieces (higher suction power, max. vacuum level 60 % / 68 %): Index L
> Compressed air-saving operation at only 3.5 bar (max. vacuum level 90 %) for the handling of dense workpieces: Index P

> See page 514

Inline ejectors EIL expandable

> Very high mechanical strength
> Application e.g. directly with vacuum suction plates in the wood industry
> Direct vacuum monitoring through simple connection of vacuum switches
> Short cycle times thanks to easy connection with a blow-off unit

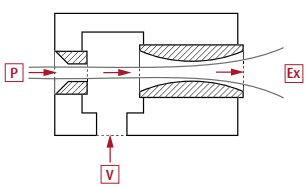
> See page 520

Examples of use

> Handling of lightweight parts
> Pick & place applications
> Separation systems in sheet metal or plastic manufacturing
> Handling of electrical components

Functional principle

Ejectors work according to the Venturi principle and generate vacuum V from compressed air P. Vacuum is created in the subsequent chamber as a result of the high flow speed after the primary nozzle. "Used" compressed air and suctioned air leave the ejector through the secondary nozzle. Either a silencer or an exhaust air duct can be connected to the outlet EX.



Inline ejectors EIL

Compressed air and vacuum connection via quick fittings, lateral exhaust

Series 1

Series 2

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> Easy installation close to the vacuum cup
> High suction power enables short gripping times

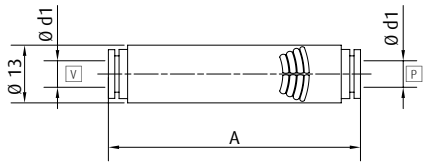
Ordering notes

> Index H: Ejectors for non air permeable products (max. vacuum degree 85 % / 90 %)
> Index L: Ejectors for air permeable products, resp. in case of higher leakage (increased suction, max. vacuum degree 60 % / 68 %)
> Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

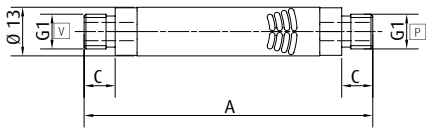
Technical data

Item no.	Series	Nozzle diameter [mm]	Optimal feed pressure [bar]	Suction power at 5 bar [Nl/min]	Air consumption at 5 bar [Nl/min]	Final vacuum at 5 bar [%]	Evacuation time 0 to 70 % [s/l]	Evacuation time 0 to 45 % [s/l]	Weight [g]	Suitable accessories
EIL.05H.1	1	0.5	5	8	14	85	13	--	13	Plug-in filter 71.071 (p.628)
EIL.05H.2	1	0.5	5	8	14	85	13	--	15	--
EIL.05H.4	2	0.5	5	7	11.5	90	10	--	18.5	Plug-in filter 71.070 (p.628) Fitting EIL.05-HO (p.524)
EIL.05L.1	1	0.5	5	14	14	60	--	4	13	Plug-in filter 71.071 (p.628)
EIL.05L.2	1	0.5	5	14	14	60	--	4	15	--
EIL.05L.4	2	0.5	5	12	11.5	68	--	3.2	18.5	Plug-in filter 71.070 (p.628) Fitting EIL.05-HO (p.524)
EIL.07H.1	1	0.7	5	13	28	85	7.5	--	13	Plug-in filter 71.071 (p.628)
EIL.07H.2	1	0.7	5	13	28	85	7.5	--	15	--
EIL.07H.4	2	0.7	5	13	23	90	6	--	20	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07L.1	1	0.7	5	28	28	60	--	2	13	Plug-in filter 71.071 (p.628)
EIL.07L.2	1	0.7	5	28	28	60	--	2	15	--
EIL.07L.4	2	0.7	5	20	23	68	--	1.6	20	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07P.4	2	0.7	3.5	10	17	90	12	--	20.5	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07P.1	2	0.7	3.5	10	17	90	12	--	19	Plug-in filter 71.071 (p.628) Fitting EIL.07-HO (p.524)

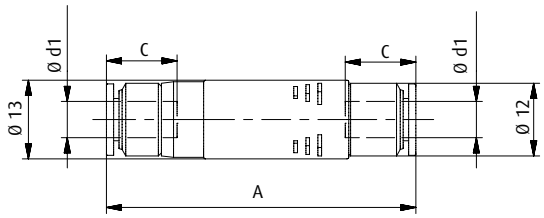
Dimensions



EIL.05H.1 | EIL.05L.1 | EIL.07H.1 | EIL.07L.1



EIL.05H.2 | EIL.05L.2 | EIL.07H.2 | EIL.07L.2



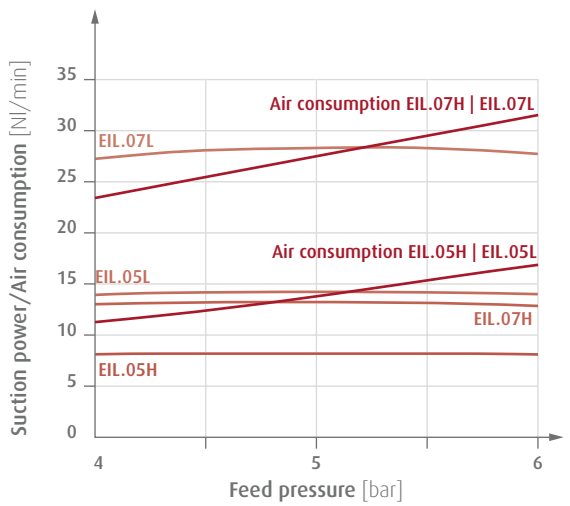
EIL.05H.4 | EIL.05L.4 | EIL.07H.4 | EIL.07L.4 | EIL.07P.4 | EIL.07P.1

V = Vacuum connection P = Compressed air connection

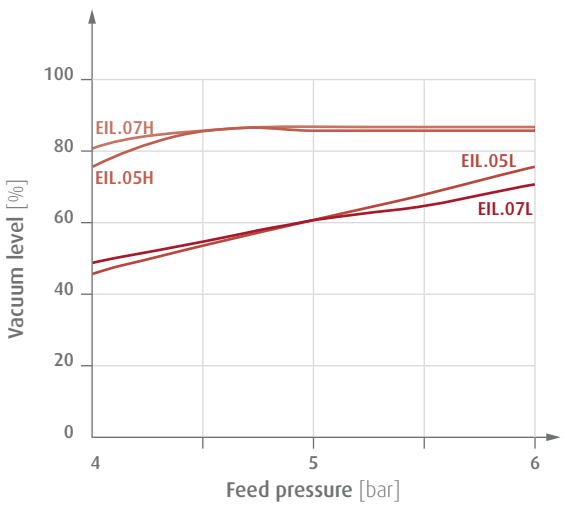
Item no.	G1	d1 [mm]	A [mm]	C [mm]
EIL.05H.1	--	6	61	--
EIL.05H.2	G1/8	--	78	8
EIL.05H.4	--	4	49	11
EIL.05L.1	--	6	61	--
EIL.05L.2	G1/8	--	78	8
EIL.05L.4	--	4	49	11
EIL.07H.1	--	6	61	--
EIL.07H.2	G1/8	--	78	8
EIL.07H.4	--	4	55.5	11
EIL.07L.1	--	6	61	--
EIL.07L.2	G1/8	--	78	8
EIL.07L.4	--	4	55.5	11
EIL.07P.4	--	4	55.5	11
EIL.07P.1	--	6	57	11.5

Diagrams

> Series 1: Suction power and air consumption against feed pressure



> Series 1: Vacuum level against feed pressure



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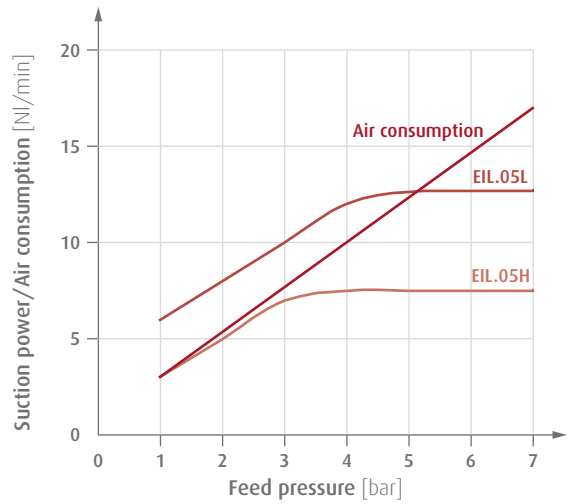
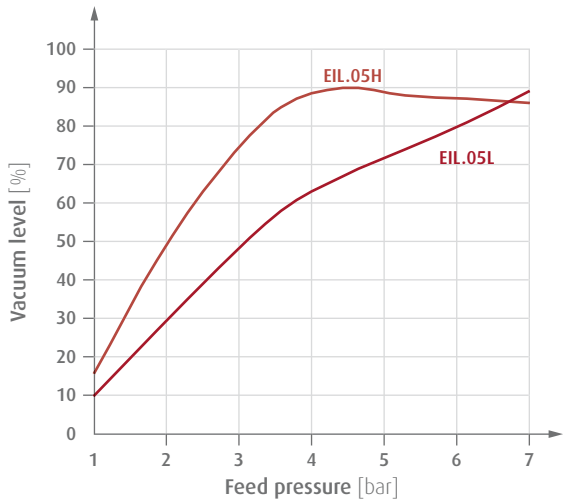
Diagrams

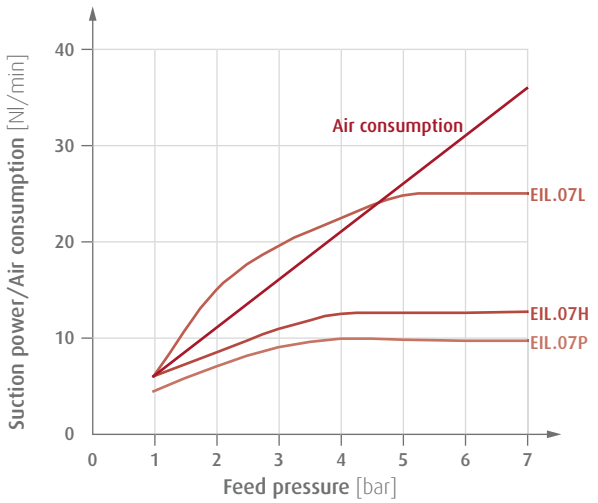
> Series 2: Suction power and air consumption against feed pressure



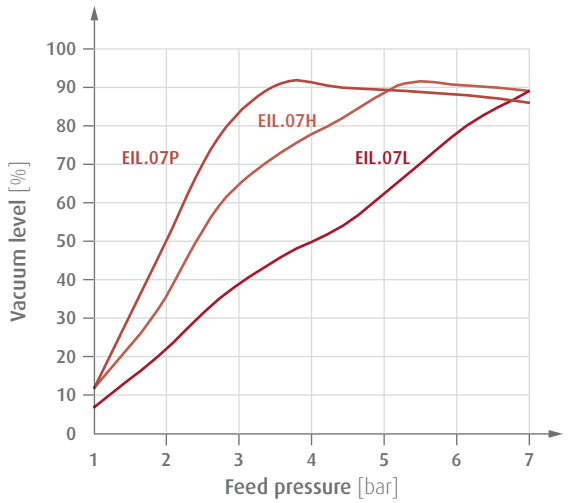
> Series 2: Vacuum level against feed pressure



> Series 2: Suction power and air consumption against feed pressure



> Series 2: Vacuum level against feed pressure



Suction power [Nl/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
EIL.05H.1	8	5.3	4.2	3.9	3.3	2.5	1.3	0.4	0.1
EIL.05H.2	8	5.3	4.8	3.9	3.3	2.5	1.3	0.4	0.1
EIL.05H.4	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
EIL.05L.1	14	11.9	9	6.8	4.3	2.2	0.1	--	--
EIL.05L.2	14	11.9	9	6.8	4.3	2.2	0.1	--	--
EIL.05L.4	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--
EIL.07H.1	13	10.8	9.2	8.1	7	5.2	4.1	2.7	1.1
EIL.07H.2	13	10.8	9.2	8.1	7	5.2	4.1	2.7	1.1
EIL.07H.4	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5
EIL.07L.1	28	26	22.1	17.6	10.8	5.4	1.9	--	--
EIL.07L.2	28	26	22.1	17.6	10.8	5.4	1.9	--	--
EIL.07L.4	22	18.7	15.3	12	8.6	5.3	2	--	--
EIL.07P.4	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1
EIL.07P.1	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1

Inline ejectors EIL

Compressed air, vacuum and exhaust via quick fittings, two fixing holes

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> Easy installation close to the vacuum cup
> High suction power for short gripping time

Ordering notes

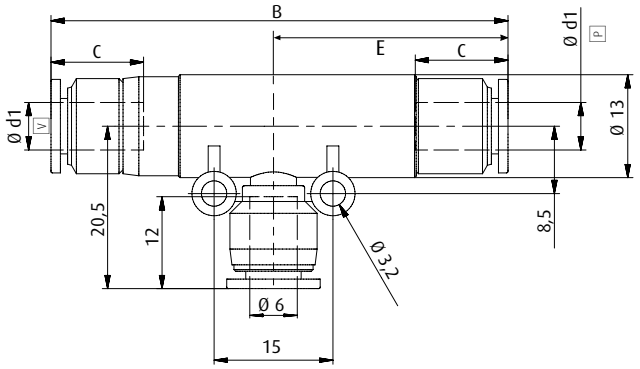
> Index H: Ejectors for dense products (max. vacuum degree 90 %)
> Index L: Ejectors for air permeable products, resp. in case of higher leakage (increased suction, max. vacuum degree 68 %)
> Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum at 5 bar [%]	Suction power at 5 bar [Nl/min]	Air consumption at 5 bar [Nl/min]	Evacuation time 0 to 70 % [s/l]	Evacuation time 0 to 45 % [s/l]	Weight [g]	Suitable accessories
EIL.05H.1-B	0.5	5	90	7	11.5	13	--	19.5	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
EIL.05H.4-B	0.5	5	90	7	11.5	13	--	21	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
EIL.07H.1-B	0.7	5	90	13	23	7	--	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
EIL.07H.4-B	0.7	5	90	13	23	7	--	22.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
EIL.05L.1-B	0.5	5	68	12	11.5	--	4	19.5	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
EIL.05L.4-B	0.5	5	68	12	11.5	--	4	21	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
EIL.07L.1-B	0.7	5	68	22	23	--	1.6	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
EIL.07L.4-B	0.7	5	68	20	23	--	1.6	22	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
EIL.07P.1-B	0.7	3.5	90	10	17	7.5	--	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
EIL.07P.4-B	0.7	3.5	90	10	17	7.5	--	22	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)

Continued on the next page

Dimensions

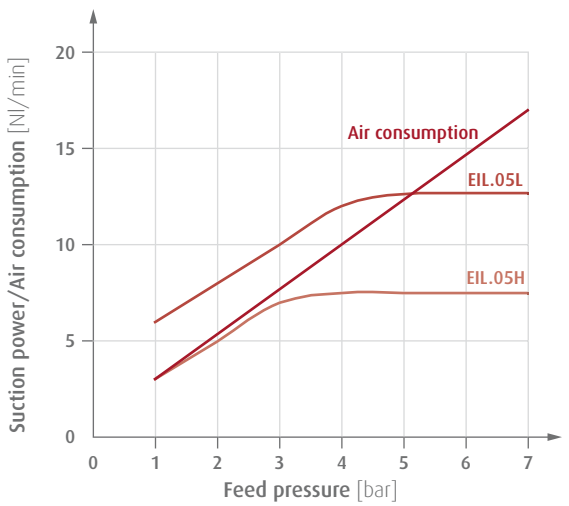


V = Vacuum connection P = Compressed air connection

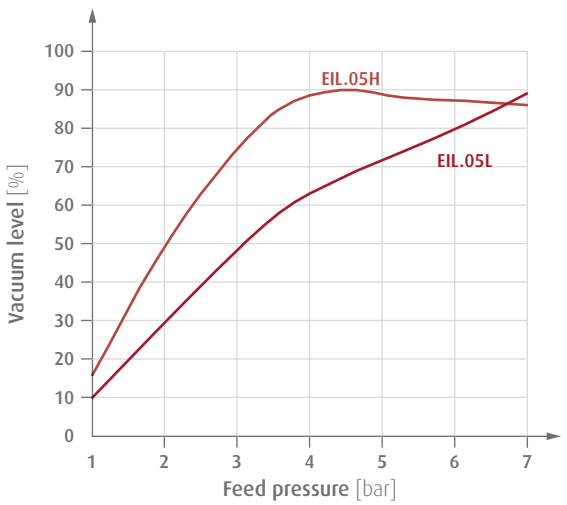
Item no.	Ø d1 [mm]	B [mm]	C [mm]	E [mm]
EIL.05H.1-B	6	50.5	11.5	22.5
EIL.05H.4-B	4	49	11	22
EIL.07H.1-B	6	57	11.5	26
EIL.07H.4-B	4	55.5	11	25.5
EIL.05L.1-B	6	50.5	11.5	22.5
EIL.05L.4-B	4	49	11	22
EIL.07L.1-B	6	57	11.5	26
EIL.07L.4-B	4	55.5	11	25.5
EIL.07P.1-B	6	57	11.5	26
EIL.07P.4-B	4	55.5	11	25.5

Diagrams

> Suction power and air consumption against feed pressure

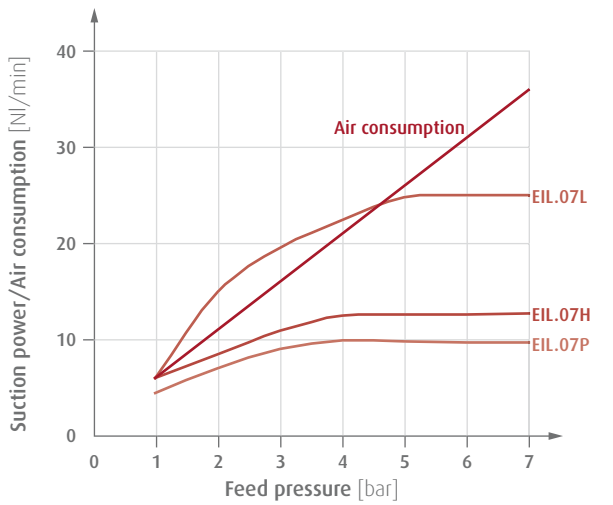


> Vacuum level against feed pressure

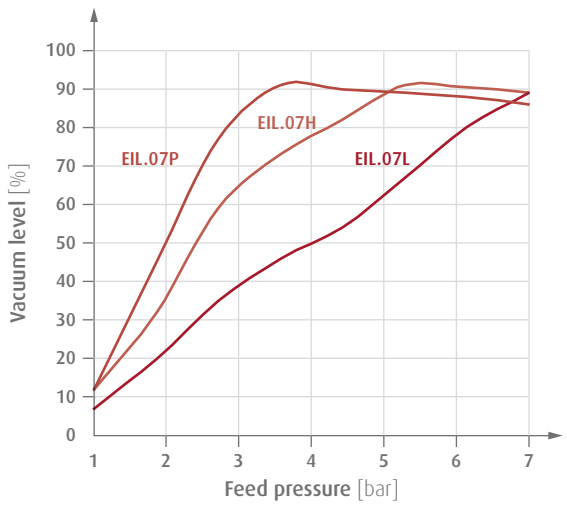


Diagrams

> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure



Suction power [Nl/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EIL.05H.1-B	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7	--
EIL.05H.4-B	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7	--
EIL.07H.1-B	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5	0.1
EIL.07H.4-B	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5	0.1
EIL.05L.1-B	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--	--
EIL.05L.4-B	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--	--
EIL.07L.1-B	22	18.7	15.3	12	8.6	5.3	2	--	--	--
EIL.07L.4-B	22	18.7	15.3	12	8.6	5.3	2	--	--	--
EIL.07P.1-B	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1	--
EIL.07P.4-B	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1	--

Inline ejectors EIL, expandable

Compressed air, vacuum connection and exhaust via G-threads

Series EIL.05 - EIL.09

Series EIL.10 - EIL.14 optionally with silencer

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> High suction power for short gripping time
> Easy installation directly on the vacuum cup
> Compact design for installation where space is limited
> Robust aluminium body
> Very short cycle time using optional blow-off function
> Vacuum switch connection for high process reliability
> Effective noise reduction through open and closed silencers

Ordering notes

Connection blow-off device
> Connection via M5-female
> EIL.05-09: with I18 vacuum connection
> EIL.10-14: always be connected

Connection of check valve with blow-off device 32.638
> Connection to the vacuum outlet

Silencers
> EIL.05-09: Closed diffuser silencer (72.045)
> EIL.10-14: See item number specification

Vacuum monitoring: Connection to the ejector via M5-female
> EIL.05-09: Vacuum switch connection possible with I18 vacuum connection
> EIL.10-14: Vacuum switch can always be connected via M5-female

Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power at 5 bar [Nl/min]	Air consumption at 5 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable accessories
EIL.05	0.5	5	87	7	12	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
EIL.07	0.7	5	90	14	21	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
EIL.09	0.9	5	90	21	36	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
EIL.10	1	5	90	27	44	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)
EIL.12	1.2	5	90	45	66	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)
EIL.14	1.4	5	90	64	108	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)

When ordering please specify

Type + Nozzle diameter + Vacuum output = Item number

Example: EIL.07-M6
(Mini ejector EIL., nozzle diameter 0.7 mm, with vacuum output M6-female)

1.: Type
EIL.

2.: Nozzle diameter	
05	Ø 0.5 mm
07	Ø 0.7 mm
09	Ø 0.9 mm

3.: Vacuum output	
M6	M6
A18	G1/8-male
A14	G1/4-male
I18	G1/8-female
I14	G1/4-female

Type + Nozzle diameter + Vacuum output + Silencer = Item number

Example: EIL.12-M10G
(Inline ejector EIL, nozzle diameter: 1.2 mm, vacuum output M10x125
male thread with silencer 72.000)

1.: Type
EIL.

2. Nozzle diameter	
10	Ø 1 mm
12	Ø 1.2 mm
14	Ø 1.4 mm

3.: Vacuum output	
A14	G1/4-male
M10	M10x125-male

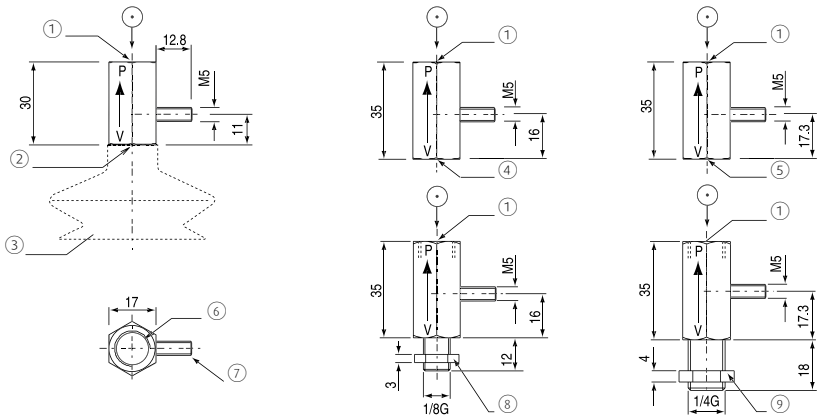
4.: Silencer	
G	72.000 (closed diffusor silencer)
O	72.028 (open silencer)

Handling of wooden plates

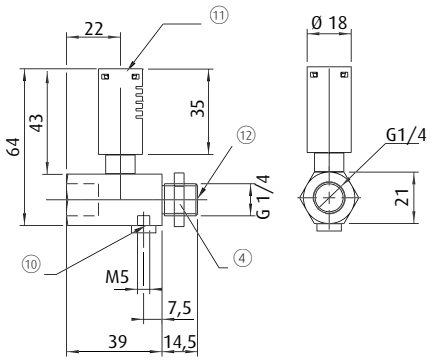
Illustration with check valve 32.638 with blow-off function and vacuum cup 102.070.234.9 for wood handling

Continued on the next page

Dimensions



EIL.05 | EIL.07 | EIL.09

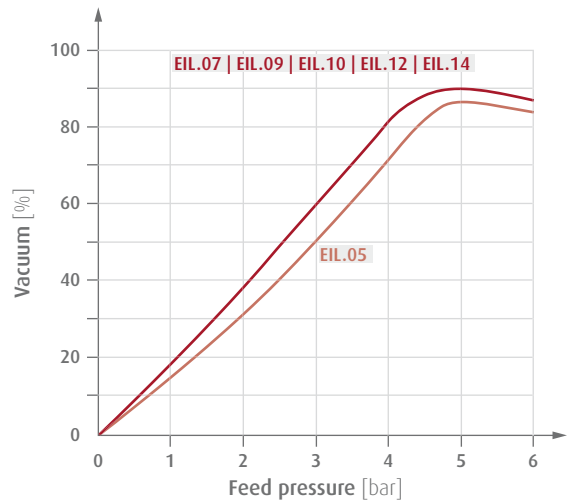


EIL.10 | EIL.12 | EIL.14

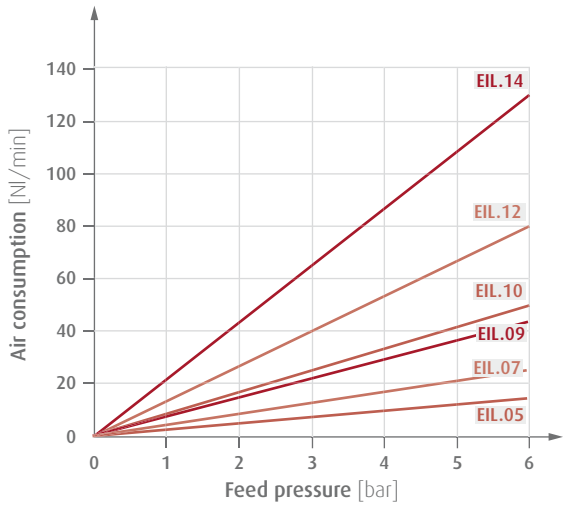
① = Compressed air input G1/4, depth 10 mm ② = Vacuum output M6, depth 6 mm ③ = Vacuum cup example
④ = Vacuum output G1/4-female, depth 7.5 mm ⑤ = Vacuum output G1/8-female, depth 10 mm ⑥ = Compressed air
⑦ = Exhaust ⑧ = Hex nut (SW14) ⑨ = Hex nut (SW19) ⑩ = Blow-off or vacuum switch connection ⑪ = Silencers ⑫ = Vacuum

Diagrams

> Vacuum level against feed pressure

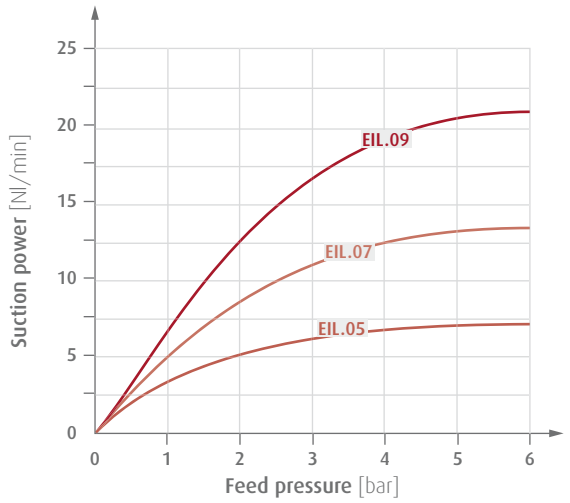


> Air consumption against feed pressure

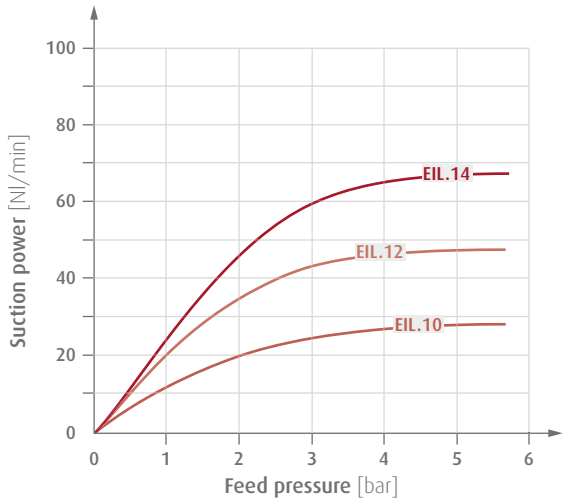


Diagrams

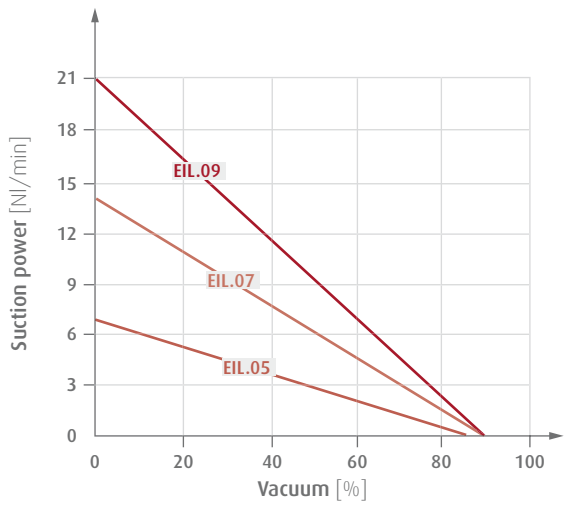
> Suction power against feed pressure



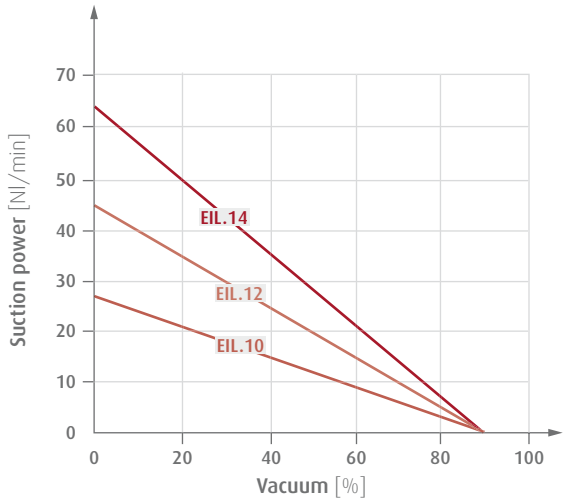
> Suction power against feed pressure



> Suction power against vacuum



> Suction power against vacuum



Evacuation time [sec.] for 1 liter at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	85 %
EIL.05	0.92	1.96	3.18	4.63	6.38	8.79	12.17	18.96	27.39
EIL.07	0.46	0.98	1.58	2.28	3.13	4.27	5.8	8.55	11.01
EIL.09	0.31	0.65	1.05	1.52	2.09	2.85	3.87	5.7	7.34
EIL.10	0.24	0.51	0.82	1.18	1.62	2.21	3.01	4.43	5.71
EIL.12	0.14	0.3	0.49	0.71	0.97	1.33	1.81	2.66	3.42
EIL.14	0.1	0.21	0.34	0.5	0.68	0.93	1.27	1.85	2.44

Inline ejectors EIL - accessories

Ejector bracket

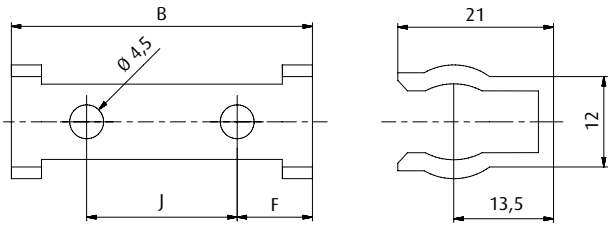
Technical data

Item no.	Weight [g]
EIL.05-HO	2
EIL.07-HO	2

Dimensions

Item no.	B [mm]	F [mm]	J [mm]
EIL.05-HO	33	9	15
EIL.07-HO	39	10	20

Dimensions



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Blow-off device for ejectors

32.660 enables blow-off with check valve 32.638

Product Description

> Short cycle times thanks to direct connection to ejectors via M5 external thread
> Suitable e.g. for inline ejectors EIL, expandable

Notes

> Blow-off device is part of check valve 32.638 with blow-off function

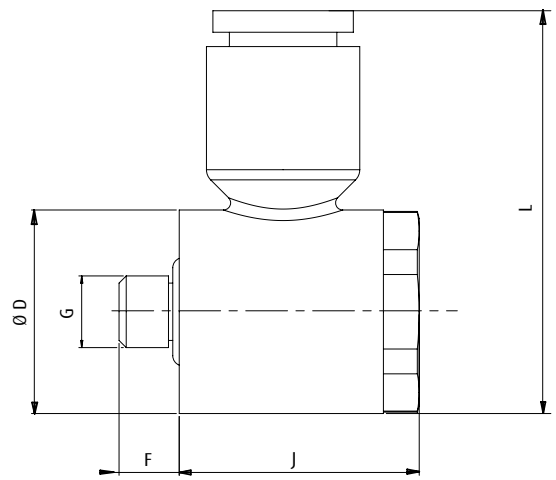
Technical data

Item no.	Plug connection [mm]	Blow-off capacity at 5 bar [Nl/min]
32.660	6	100

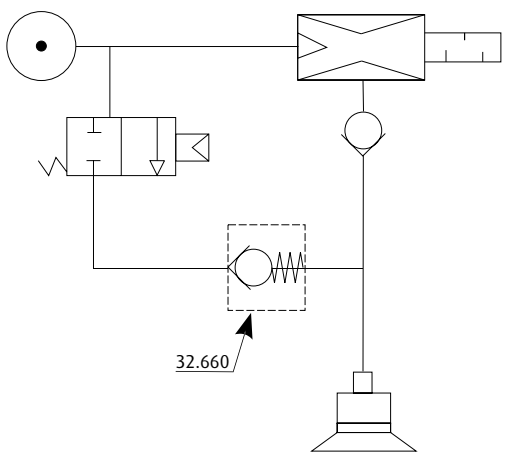
Dimensions

G	Ø D [mm]	F [mm]	J [mm]	L [mm]
M5	14.2	4.2	16.75	28.1

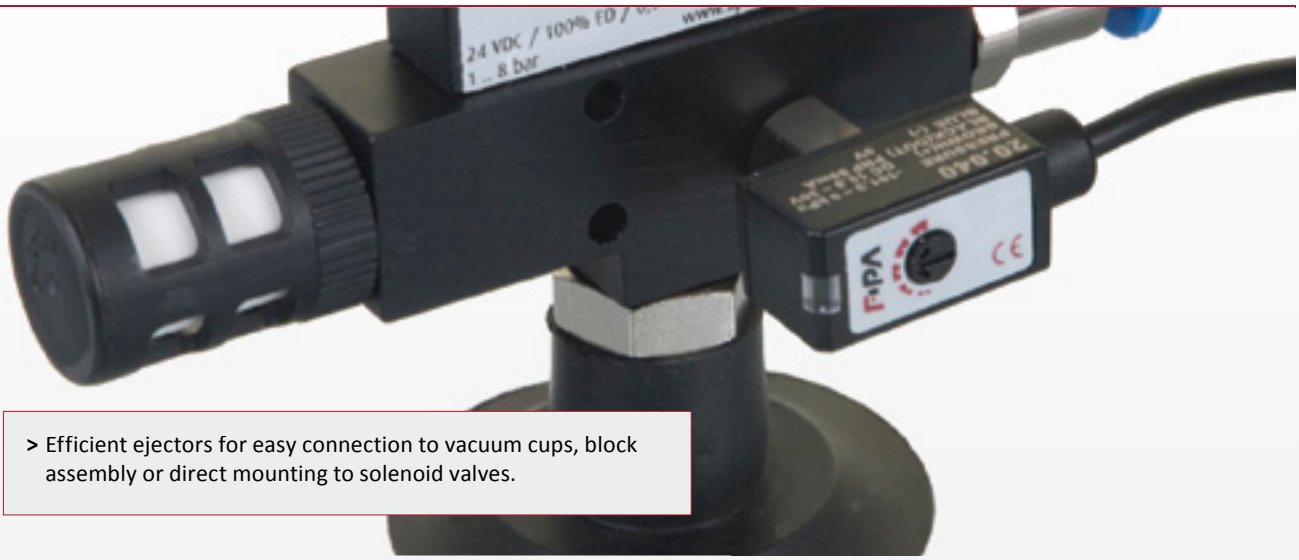
Dimensions



Wiring diagram



FIPA Basic and Heavy-duty ejectors



> Efficient ejectors for easy connection to vacuum cups, block assembly or direct mounting to solenoid valves.

Base ejectors with graded blow-off

> Very short cycle times thanks to fast-reacting micro valve
> Ideally suited for robotic applications, such as Delta robots (e.g. FlexPickers)

> See page 528

Ejector boxes EBO

> Rectangular design for space-saving parallel connection in centralised or decentralised vacuum systems
> For handling dense workpieces (max. vacuum level 93 %): Index H
> For handling porous workpieces (higher suction power, max. vacuum level 68 %): Index L
> Special compressed air-saving operation for handling dense workpieces at only 3.5 bar (max. vacuum level 90 %): Index P

> See page 530

Base ejectors EBA

> For handling dense workpieces (max. vacuum level 93 %): Index H
> For handling porous workpieces (higher suction power, max. vacuum level 68 %): Index L
> Special compressed air-saving operation for handling dense workpieces at only 3.5 bar (max. vacuum level 90 %): Index P

> See page 533

Base ejectors EBM

> Easy installation directly on the vacuum cup
> Small dimensions for installation where space is limited
> Miniature silencer that can be dismantled for fast servicing and short downtimes

> See page 541

FIPA Base and Heavy-duty ejectors

Heavy-duty ejectors 65.102A - 65.130

> Robust and compact aluminium housing
> Compensation of compressed air fluctuations between 3 to 6 bar
> Additional inlet for blow-off for short cycle times or vacuum switch connection for process monitoring (65.111, 65.130)
> Rectangular design for space-saving parallel connection in centralised or decentralised vacuum systems

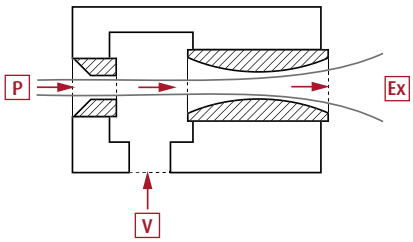
> See page 544

Examples of use

> Handling of lightweight parts
> Pick & place applications
> Separation systems in sheet metal handling or plastic manufacturing
> Handling of electrical components

Functional principle

Ejectors work according to the Venturi principle and generate vacuum V from compressed air P. Vacuum is created in the subsequent chamber as a result of the high flow speed to the primary nozzle. "Used" compressed air and suctioned air leave the ejector through the secondary nozzle. Either a silencer or an exhaust air duct can be connected to the outlet EX.



Base ejectors with graded blow-off

NEW

VERY SHORT RESPONSE TIME, SAFE AND GENTLE PRODUCT RELEASE

Example: Ejector EBA.08H.2-A with digital mini vacuum switch 20.040, closed diffusor silencer 72.000 and flat vacuum cup Ø 40 mm

Product Description

> Small and very light for installation directly on vacuum cups for fast vacuum build-up and short gripping times
> Blow-off pulse from a fast-reacting micro valve enables very short cycle times
> Graded blow-off boost effect: Initially the blow-off is supported by ambient air, for placement that is both quick and gentle
> Robust design and long service life of > 100 million switching cycles
> M5 connection for digital mini vacuum switch to ensure reliable process monitoring
> Ideally suited for robotic applications with very short cycles such as Delta robots (e.g. FlexPickers)

Ordering notes

> Included in delivery: control cable 20.550, lenght 1,5 meter, 2-wire, free end

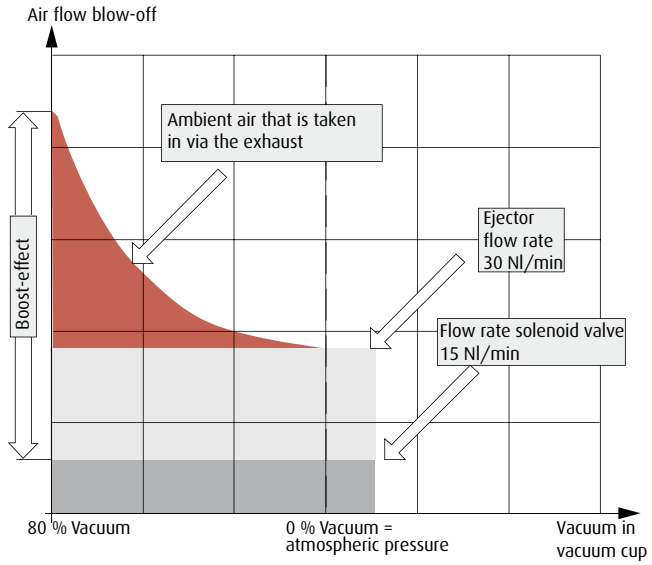
Technical data

Item no.	**EBA.08H.2-A**
Nozzle diameter [mm]	0.8
Optimal feed pressure [bar]	5
Max. feed pressure [bar]	8
Final vacuum [%]	85
Suction power at 5 bar [Nl/min]	25
Air consumption at 5 bar [Nl/min]	30
Flow rate solenoid valve [Nl/min]	15
Blow-off volumes of flow [Nl/min]	110 - 45
Power-on time solenoid valve (ED) [%]	100
Power-on/ -off time solenoid valve [ms]	5
Power consumption solenoid valve [W]	0.9
Protection class	IP40
Operating temperature [°C]	-10 - 50
Weight [g]	35
Suitable accessories	Connector cable 20.550 (p.717), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)

Control cable 20.550

Cable assignment: red (+), black (-)

Graded blow-off with boost-effect

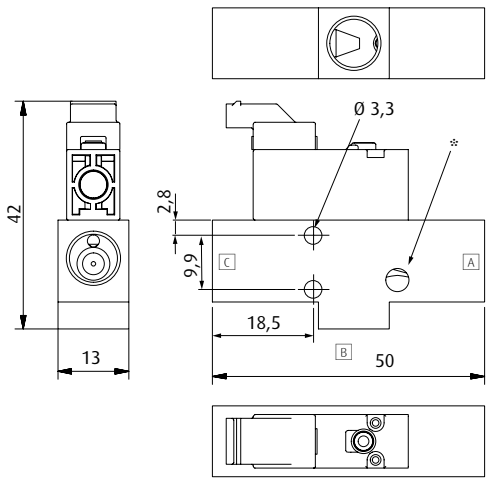


Evacuation / Blow-off time

Evacuation / Blow-off time 1 liter volume up to % vacuum / atmospheric pressure [sec.]		
0 → 50 % / 50 % → 0	0 → 60 % / 60 % → 0	0 → 70 % / 70 % → 0
1.8 / 0.5	2.5 / 0.56	3.9 / 0.61

Evacuation / Blow-off time: example with Ø 30 mm flat suction cups, volume 1.7 cm³ up to % vacuum / atmospheric pressure [ms]		
0 → 50 % / 50 % → 0	0 → 60 % / 60 % → 0	0 → 70 % / 70 % → 0
3 / < 1	4 / < 1	7 / 1

Dimensions



A = Compressed air connection G1/8-female B = Vacuum connection G1/8-female C = Exhaust outlet G1/8-female
* = M5 connection for vacuum switches

Ejector boxes EBO

Compressed air and vacuum connection via quick fittings, exhaust via rectangular silencer

Series "-S" with mechanical vacuum switch

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> High suction power for fast evacuation and short gripping time
> Easy installation directly in the vacuum line
> Rectangular design enables space-conserving parallel mounting of several ejector boxes
> Replaceable silencer filter element
> "-S" series with mechanical / electrical vacuum switch
- Monitoring of vacuum circuits for high process reliability
- NO / NC switching function

Notes

"-S" series with mechanical / electrical vacuum switch:
> Factory setting: -534 mbar
> Contact capacity: 3 A at 250 V
> Regulating range: -200 to -667 mbar
> Repeat accuracy: ± 50 mbar
> Hysteresis: -200 mbar

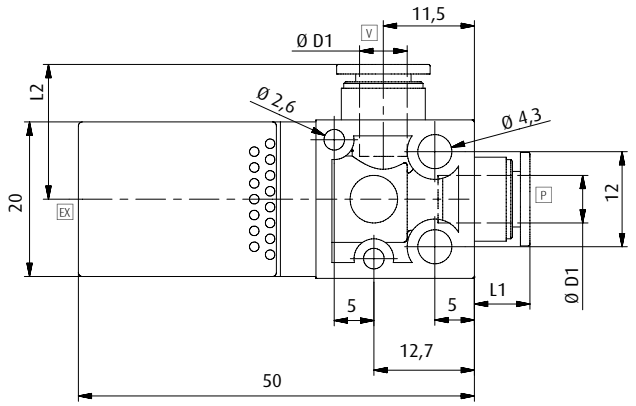
Ordering notes

> Index H: Ejectors for dense products (max. vacuum degree 90 %)
> Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction, max. vacuum degree 68 %)
> Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

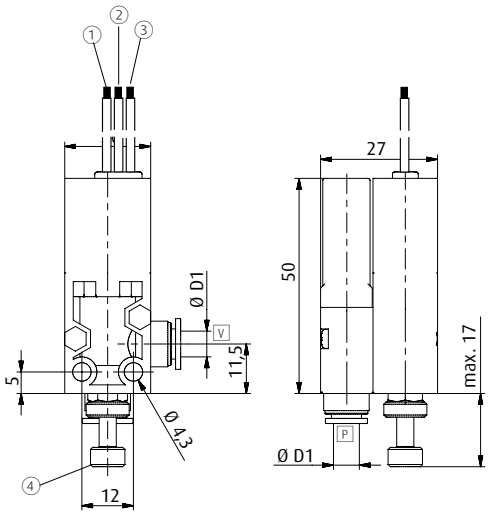
Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable filter and silencer set
EBO.05H.4	0.5	5	90	7	11.5	0 - 60	18	72.105
EBO.07H.1	0.7	5	93	13	23	0 - 60	18.5	72.105
EBO.10H.1	1	5	93	28	46	0 - 60	18.5	72.105
EBO.12H.1	1.2	5	93	38	70	0 - 60	18	72.105
EBO.05L.4	0.5	5	68	12	11.5	0 - 60	18	72.105
EBO.07L.1	0.7	5	68	26	23	0 - 60	18.5	72.105
EBO.10L.1	1	5	68	42	46	0 - 60	17.5	72.105
EBO.07P.1	0.7	3.5	90	10.5	17	0 - 60	18.5	72.105
EBO.10P.1	1	3.5	90	21	34	0 - 60	18.5	72.105
EBO.12P.1	1.2	3.5	90	27	47	0 - 60	18	72.105
EBO.05H.4-S	0.5	5	90	7	11.5	0 - 60	46.5	72.105
EBO.07H.1-S	0.7	5	93	13	23	0 - 60	46	72.105
EBO.10H.1-S	1	5	93	28	46	0 - 60	47	72.105
EBO.12H.1-S	1.2	5	93	38	70	0 - 60	47.5	72.105
EBO.05L.4-S	0.5	5	68	12	11.5	0 - 60	46.5	72.105
EBO.07L.1-S	0.7	5	68	26	23	0 - 60	48	72.105
EBO.10L.1-S	1	5	68	42	46	0 - 60	46.5	72.105
EBO.07P.1-S	0.7	3.5	90	10.5	17	0 - 60	48.5	72.105
EBO.10P.1-S	1	3.5	90	21	34	0 - 60	48.5	72.105
EBO.12P.1-S	1.2	3.5	90	27	47	0 - 60	47.5	72.105

Dimensions



EBO.05H.4 | EBO.07H.1 | EBO.10H.1 | EBO.12H.1 | EBO.05L.4 | EBO.07L.1 | EBO.10L.1 | EBO.07P.1 | EBO.10P.1 | EBO.12P.1



EBO.05H.4-S | EBO.07H.1-S | EBO.10H.1-S | EBO.12H.1-S | EBO.05L.4-S | EBO.07L.1-S | EBO.10L.1-S | EBO.07P.1-S | EBO.10P.1-S | EBO.12P.1-S

P = Compressed air side with tubing connection V = Vacuum side with tubing connection EX = Exhaust outlet ① = White ② = Red (NC) ③ = Black (NO) ④ = knurled screw

Item no.	Ø **D1** [mm]	**L1** [mm]	**L2** [mm]
EBO.05H.4	4	6.6	6.6
EBO.07H.1	6	7	7
EBO.10H.1	6	7	7
EBO.12H.1	6	7	7
EBO.05L.4	4	6.6	6.6
EBO.07L.1	6	7	7
EBO.10L.1	6	7	7
EBO.07P.1	6	7	7
EBO.10P.1	6	7	7
EBO.12P.1	6	7	7
EBO.05H.4-S	4	--	--
EBO.07H.1-S	6	--	--
EBO.10H.1-S	6	--	--
EBO.12H.1-S	6	--	--
EBO.05L.4-S	4	--	--
EBO.07L.1-S	6	--	--
EBO.10L.1-S	6	--	--
EBO.07P.1-S	6	--	--
EBO.10P.1-S	6	--	--
EBO.12P.1-S	6	--	--

Continued on the next page

Suction power [Nl/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EBO.05H.4	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBO.07H.1	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBO.10H.1	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBO.12H.1	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBO.05L.4	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBO.07L.1	26	22	18.2	14	10	6.3	2.4	--	--	--
EBO.10L.1	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBO.07P.1	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBO.10P.1	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBO.12P.1	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBO.05H.4-S	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBO.07H.1-S	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBO.10H.1-S	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBO.12H.1-S	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBO.05L.4-S	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBO.07L.1-S	26	22	18.2	14	10	6.3	2.4	--	--	--
EBO.10L.1-S	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBO.07P.1-S	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBO.10P.1-S	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBO.12P.1-S	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3

Diagrams see pages 542 - 543

Base ejectors EBA for vacuum cups

Compressed air connection via quick fittings, vacuum connection via R-threads, exchangeable silencer

Series with fixed air connection

Series with rotatable, angular air connection

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> High suction power for short gripping time
> Easy installation directly on the vacuum cup
> Robust aluminium body
> Replaceable silencer filter element for short downtimes

Ordering notes

> Index H: Ejectors for dense products (max. vacuum degree 93 %)
> Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction power, max. vacuum degree 68 %)
> Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)
> Index -W: Order code for rotatable, angular air connection

Technical data

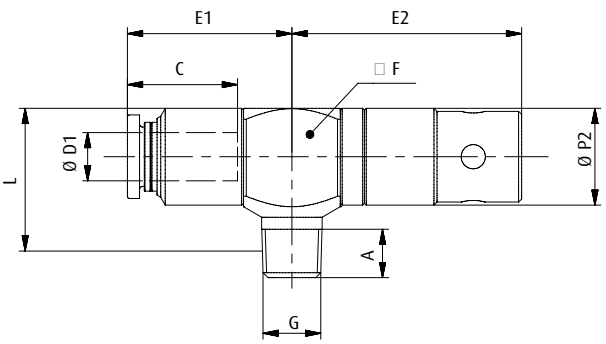
Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.07H.1	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.07H.2	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.10H.1	1	5	93	28	46	5 - 50	31.5	72.102
EBA.10H.2	1	5	93	28	46	5 - 50	31.5	72.102
EBA.12H.1	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.12H.2	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.15H.1	1.5	5	93	63	100	5 - 50	87	72.103
EBA.15H.2	1.5	5	93	63	100	5 - 50	88	72.103
EBA.20H.1	2	5	93	110	200	5 - 50	92.5	72.104
EBA.15L.1	1.5	5	68	95	100	5 - 50	85	72.103
EBA.15L.2	1.5	5	68	95	100	5 - 50	86	72.103
EBA.20L.1	2	5	68	180	200	5 - 50	88	72.104
EBA.07P.1	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.07P.2	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.10P.1	1	5	90	21	34	5 - 50	31.5	72.102
EBA.10P.2	1	5	90	21	34	5 - 50	31.5	72.102
EBA.12P.1	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.12P.2	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.15P.1	1.5	5	90	42	70	5 - 50	87.5	72.103
EBA.15P.2	1.5	5	90	42	70	5 - 50	88.5	72.103

Continued on the next page

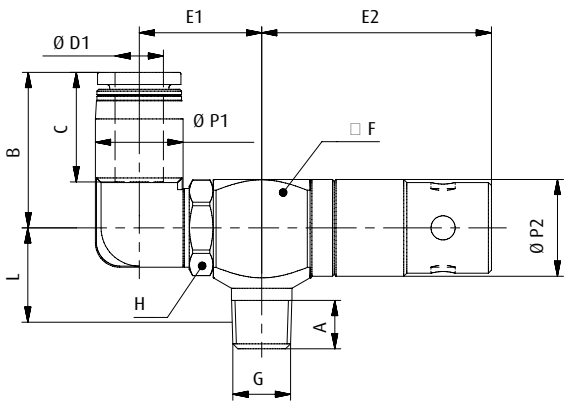
Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.20P.1	2	5	90	84	150	5 - 50	94	72.104
EBA.07H.1-W	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.07H.2-W	0.7	5	93	13	23	5 - 50	34	72.102
EBA.10H.1-W	1	5	93	28	46	5 - 50	31.5	72.102
EBA.10H.2-W	1	5	93	28	46	5 - 50	34	72.102
EBA.12H.1-W	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.12H.2-W	1.2	5	93	38	70	5 - 50	34	72.102
EBA.15H.1-W	1.5	5	93	63	100	5 - 50	85.5	72.103
EBA.15H.2-W	1.5	5	93	63	100	5 - 50	86.5	72.103
EBA.20H.1-W	2	5	93	110	200	5 - 50	95	72.104
EBA.15L.1-W	1.5	5	68	95	100	5 - 50	84	72.103
EBA.15L.2-W	1.5	5	68	95	100	5 - 50	85	72.103
EBA.20L.1-W	2	5	68	180	200	5 - 50	90.5	72.104
EBA.07P.1-W	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.07P.2-W	0.7	5	90	10.5	17	5 - 50	34	72.102
EBA.10P.1-W	1	5	90	21	34	5 - 50	31.5	72.102
EBA.10P.2-W	1	5	90	21	34	5 - 50	34	72.102
EBA.12P.1-W	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.12P.2-W	1.2	5	90	27	47	5 - 50	34	72.102
EBA.15P.1-W	1.5	5	90	42	70	5 - 50	86.5	72.103
EBA.15P.2-W	1.5	5	90	42	70	5 - 50	87.5	72.103
EBA.20P.1-W	2	5	90	84	150	5 - 50	96.5	72.104

Dimensions



EBA.07H.1 - EBA20P.1



EBA.07H.1-W - EBA20P.1-W

Material in Motion
Phone +49 (0)89 / 96 24 89-0

Item no.	G	Ø D1 [mm]	A [mm]	B [mm]	C [mm]	E1 [mm]	E2 [mm]	□ F [mm]	H [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]
EBA.07H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.07H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.10H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.10H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.12H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.12H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.15H.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15H.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20H.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.15L.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15L.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20L.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.07P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.07P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.10P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.10P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.12P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.12P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.15P.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15P.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20P.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.07H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.07H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.10H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.10H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.12H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.12H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.15H.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15H.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20H.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24
EBA.15L.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15L.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20L.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24
EBA.07P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.07P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.10P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.10P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.12P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.12P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.15P.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15P.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20P.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24

Continued on the next page

Suction power [Nl/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EBA.07H.1	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.07H.2	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.15H.2	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.20H.1	110	98.1	86.3	74.5	62.7	50.8	39	27.2	15.3	3.5
EBA.15L.1	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.15L.2	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.20L.1	180	153.1	126.3	99.4	72.5	45.6	18.8	--	--	--
EBA.07P.1	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.07P.2	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.15P.2	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.20P.1	84	74.7	65.5	56.3	47	37.8	28.6	19.4	10.1	0.9
EBA.07H.1-W	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.07H.2-W	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-W	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-W	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-W	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-W	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-W	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.15H.2-W	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.20H.1-W	110	98.1	86.3	74.5	62.7	50.8	39	27.2	15.3	3.5
EBA.15L.1-W	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.15L.2-W	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.20L.1-W	180	153.1	126.3	99.4	72.5	45.6	18.8	--	--	--
EBA.07P.1-W	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.07P.2-W	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-W	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-W	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-W	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-W	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-W	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.15P.2-W	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.20P.1-W	84	74.7	65.5	56.3	47	37.8	28.6	19.4	10.1	0.9

Diagrams see pages 542 - 543

Base ejectors EBA for solenoid valves

Compressed air connection via R-threads, vacuum connection via quick fittings

Series with exhaust outlet via silencer

Series with exhaust outlet via quick fitting

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> Suitable for direct fitting to solenoid valves
> High suction power for short gripping times
> Flexible installation thanks to rotatable, angled vacuum connection
> Replaceable silencer for fast servicing and short downtimes
> Avoidance of product contamination with exhaust outlet through quick fitting (index MV-I)

Ordering notes

> Index H: Ejectors for dense products (max. vacuum degree 93 %)
> Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction power, max. vacuum degree 68 %)
> Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)
> Index MV-I: Order code with exhaust outlet via quick fitting: Example: EBA.10H.1-MV-I

Technical data

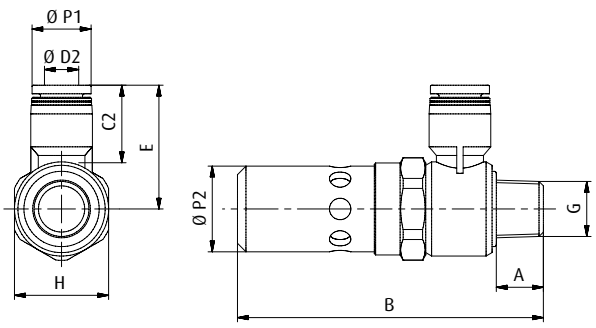
Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.05H.1-MV	0.5	5	90	7	11.5	0 - 60	13	SEE0802
EBA.05H.2-MV	0.5	5	90	7	11.5	0 - 60	36.5	SE01
EBA.07H.1-MV	0.7	5	93	13	23	0 - 60	37	SE01
EBA.10H.1-MV	1	5	93	28	46	0 - 60	36.5	SE01
EBA.10H.2-MV	1	5	93	28	46	0 - 60	38	SE01
EBA.12H.1-MV	1.2	5	93	38	70	0 - 60	36.5	SE01
EBA.12H.2-MV	1.2	5	93	38	70	0 - 60	37.5	SE01
EBA.15H.1-MV	1.5	5	93	63	100	0 - 60	77	SE02
EBA.05L.1-MV	0.5	5	65	12	11.5	0 - 60	13	SEE0802
EBA.05L.2-MV	0.5	5	65	11	11.5	0 - 60	36.5	SE01
EBA.07L.1-MV	0.7	5	68	26	23	0 - 60	37	SE01
EBA.07L.2-MV	0.7	5	68	26	23	0 - 60	38.5	SE01
EBA.10L.1-MV	1	5	68	42	46	0 - 60	36	SE01
EBA.10L.2-MV	1	5	68	42	46	0 - 60	37.5	SE01
EBA.15L.1-MV	1.5	5	68	95	100	0 - 60	75	SE02
EBA.07P.1-MV	0.7	3.5	90	10.5	17	0 - 60	36.5	SE01
EBA.10P.1-MV	1	3.5	90	21	34	0 - 60	37	SE01
EBA.10P.2-MV	1	3.5	90	21	34	0 - 60	38.5	SE01

Continued on the next page

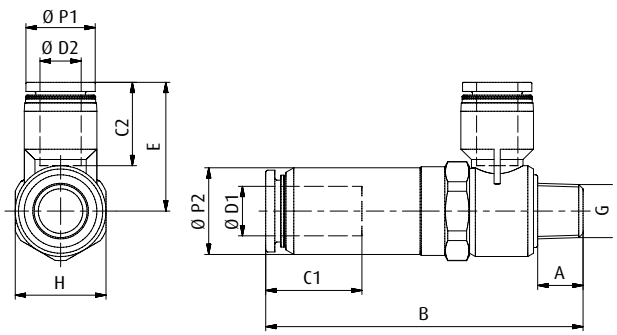
Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.12P.1-MV	1.2	3.5	90	27	47	0 - 60	36.5	SE01
EBA.12P.2-MV	1.2	3.5	90	27	47	0 - 60	38	SE01
EBA.15P.1-MV	1.5	3.5	90	37	74	0 - 60	78	SE02
EBA.05H.1-MV-I	0.5	5	90	7	11.5	0 - 60	18	--
EBA.05H.2-MV-I	0.5	5	90	7	11.5	0 - 60	44.5	--
EBA.07H.1-MV-I	0.7	5	90	13	23	0 - 60	45.5	--
EBA.10H.1-MV-I	1	5	93	28	46	0 - 60	44.5	--
EBA.10H.2-MV-I	1	5	93	28	46	0 - 60	45.5	--
EBA.12H.1-MV-I	1.2	5	93	38	70	0 - 60	44	--
EBA.12H.2-MV-I	1.2	5	93	38	70	0 - 60	46	--
EBA.15H.1-MV-I	1.5	5	93	63	100	0 - 60	92	--
EBA.05L.1-MV-I	0.5	5	65	12	11.5	0 - 60	18	--
EBA.05L.2-MV-I	0.5	5	65	11	11.5	0 - 60	44.5	--
EBA.07L.1-MV-I	0.7	5	68	26	23	0 - 60	45	--
EBA.07L.2-MV-I	0.7	5	68	26	23	0 - 60	46	--
EBA.10L.1-MV-I	1	5	68	42	46	0 - 60	44	--
EBA.10L.2-MV-I	1	5	68	42	46	0 - 60	45	--
EBA.15L.1-MV-I	1.5	5	68	95	100	0 - 60	89.4	--
EBA.07P.1-MV-I	0.7	3.5	90	10.5	17	0 - 60	45	--
EBA.10P.1-MV-I	1	3.5	90	23	34	0 - 60	44.5	--
EBA.10P.2-MV-I	1	3.5	90	23	34	0 - 60	46.5	--
EBA.12P.1-MV-I	1.2	3.5	90	27	47	0 - 60	44.5	--
EBA.12P.2-MV-I	1.2	3.5	90	27	47	0 - 60	45.5	--
EBA.15P.1-MV-I	1.5	3.5	90	37	74	0 - 60	92	--

Dimensions



EBA.05H.1-MV - EBA15P.1-MV



EBA.05H.1-MV-I - EBA15P.1-MV-I

Material in Motion
Phone +49 (0)89 / 96 24 89-0

Item no.	G	Ø D1 [mm]	Ø D2 [mm]	A [mm]	B [mm]	C2 [mm]	C1 [mm]	E [mm]	H [mm]	Ø P1 [mm]	Ø P2 [mm]
EBA.05H.1-MV	M5	--	4	4	35	15	--	21.5	8	10	9.5
EBA.05H.2-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10H.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.12H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.12H.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15H.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.05L.1-MV	M5	--	4	4	35	15	--	21.5	8	10	9.5
EBA.05L.2-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07L.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07L.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.10L.1-MV	R1/8	--	--	8	48	--	--	25	17	12.5	16
EBA.10L.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15L.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.07P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10P.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.12P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.12P.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15P.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.05H.1-MV-I	M5	6	4	4	35	15	12.5	21.5	8	9.5	10
EBA.05H.2-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10H.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.12H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.12H.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15H.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5
EBA.05L.1-MV-I	M5	6	4	4	35	15	12.5	21.5	8	9.5	10
EBA.05L.2-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07L.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07L.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.10L.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10L.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15L.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5
EBA.07P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10P.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.12P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.12P.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15P.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5

Continued on the next page

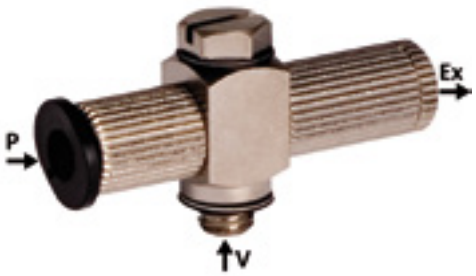
Suction power [Nl/min] at vacuum level

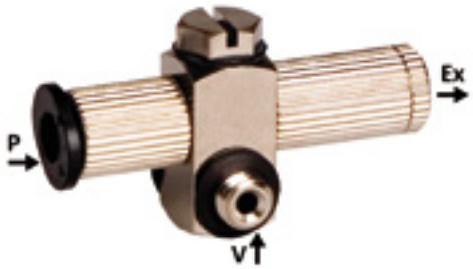
Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EBA.05H.1-MV	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.05H.2-MV	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.07H.1-MV	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-MV	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-MV	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-MV	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-MV	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-MV	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.05L.1-MV	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.05L.2-MV	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.07L.1-MV	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.07L.2-MV	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.10L.1-MV	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.10L.2-MV	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.15L.1-MV	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.07P.1-MV	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-MV	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-MV	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-MV	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-MV	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-MV	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.05H.1-MV-I	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.05H.2-MV-I	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.07H.1-MV-I	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-MV-I	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-MV-I	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-MV-I	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-MV-I	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-MV-I	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.05L.1-MV-I	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.05L.2-MV-I	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.07L.1-MV-I	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.07L.2-MV-I	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.10L.1-MV-I	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.10L.2-MV-I	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.15L.1-MV-I	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.07P.1-MV-I	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-MV-I	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-MV-I	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-MV-I	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-MV-I	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-MV-I	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4

Diagrams see pages 542 - 543

Base ejectors EBM - miniature size

Compressed air connection via quick fittings, vacuum connection via M-threads, exchangeable silencer element





Series with fixed tubing connection

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

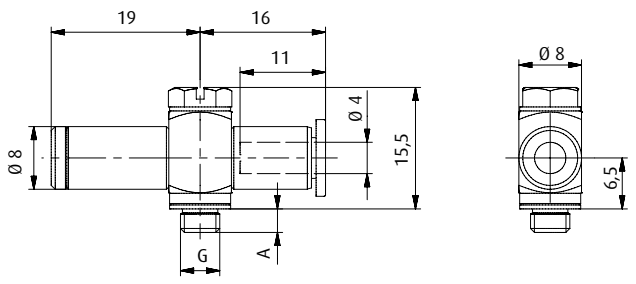
Product Description

> High suction power for fast evacuation and short gripping time
> Easy installation directly on the vacuum cup
> Small dimensions for installation where space is limited
> Robust design with nickel-plated brass body
> Miniature silencer that can be dismantled for fast servicing and short downtimes

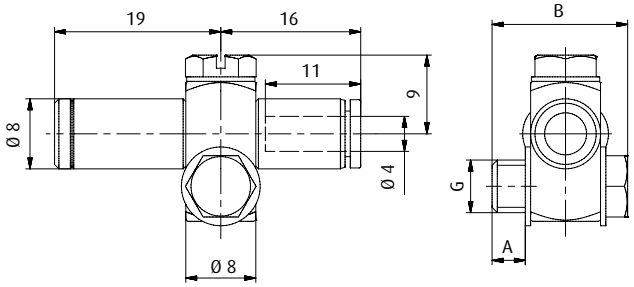
Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption at 5 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable spare silencer element
EBM.05H.5	0.5	5	90	7	11.5	0 - 60	14.5	EBA.05-S
EBM.05H.6	0.5	5	90	7	11.5	0 - 60	14.5	EBA.05-S
EBM.05H.5-W	0.5	5	90	7	11.5	0 - 60	17	EBA.05-S
EBM.05H.6-W	0.5	5	90	7	11.5	0 - 60	17.5	EBA.05-S

Dimensions



EBM.05H.5 | EBM.05H.6



EBM.05H.5-W | EBM.05H.6-W

Item no.	G	A [mm]	B [mm]
EBM.05H.5	M5	3.5	--
EBM.05H.6	M6	4	--
EBM.05H.5-W	M5	4	14.5
EBM.05H.6-W	M6	6	15.5

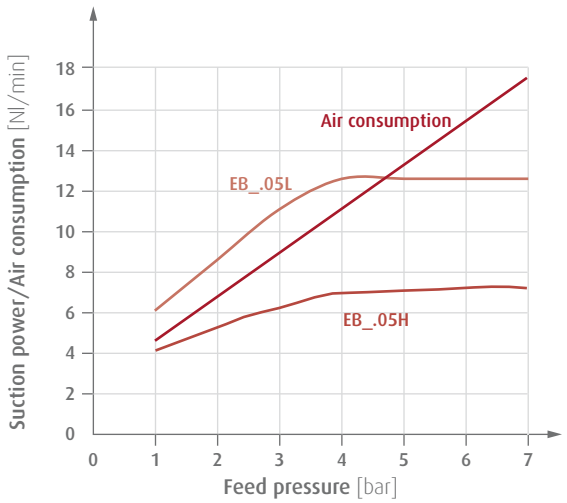
Suction power [Nl/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
EBM.05H.5	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
EBM.05H.6	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
EBM.05H.5-W	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
EBM.05H.6-W	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7

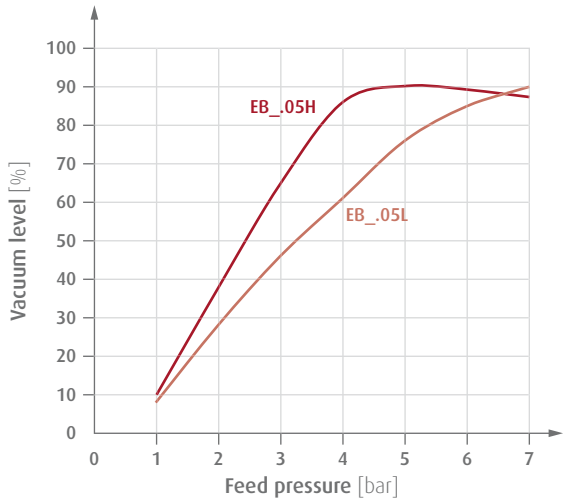
Diagrams see pages 542 - 543

Diagrams

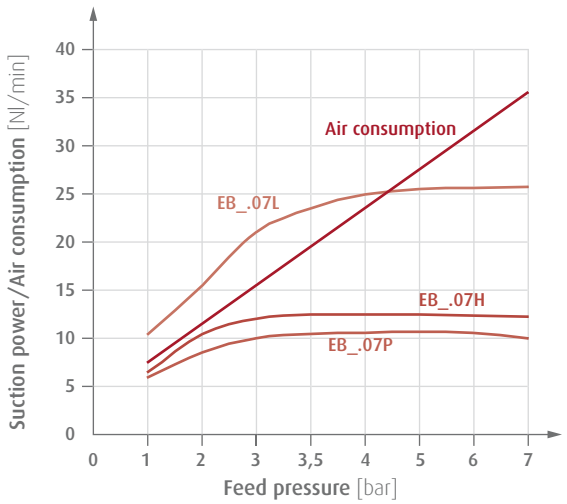
> Suction power and air consumption against feed pressure



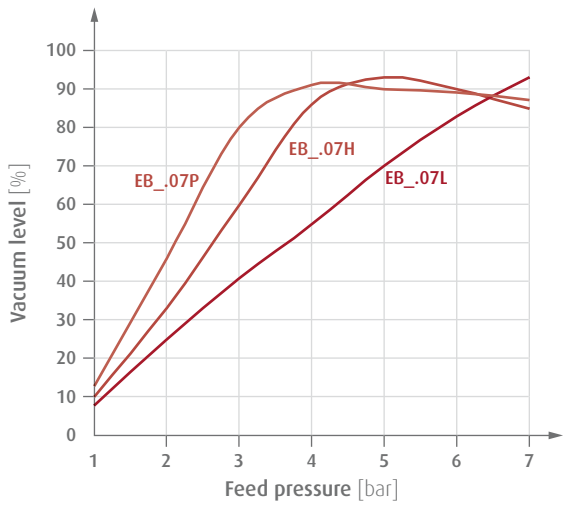
> Vacuum level against feed pressure



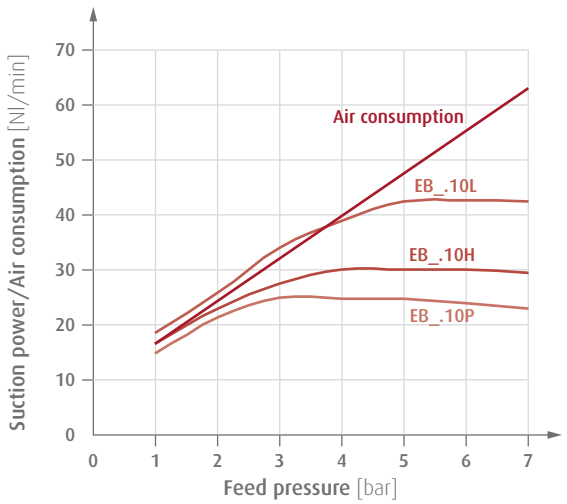
> Suction power and air consumption against feed pressure



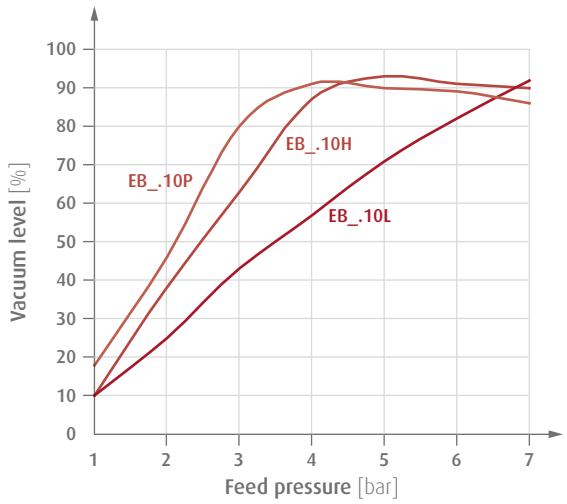
> Vacuum level against feed pressure



> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure

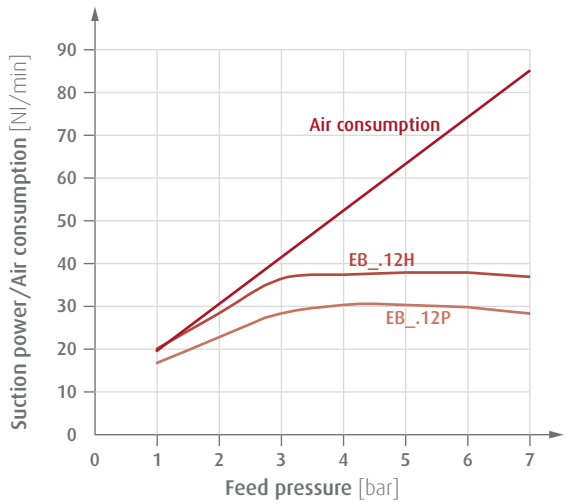


Material in Motion

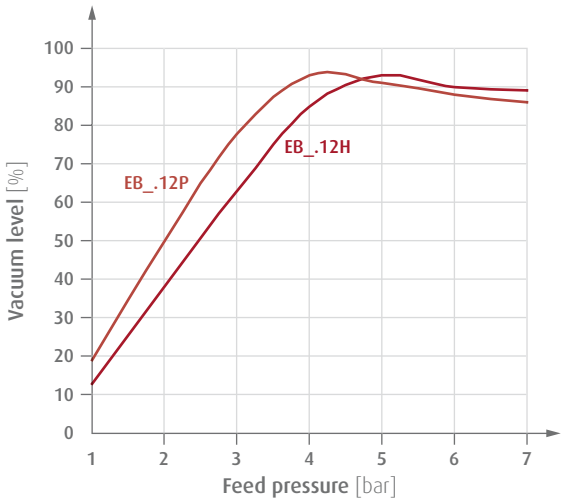
Phone +49 (0)89 / 96 24 89-0

Diagrams

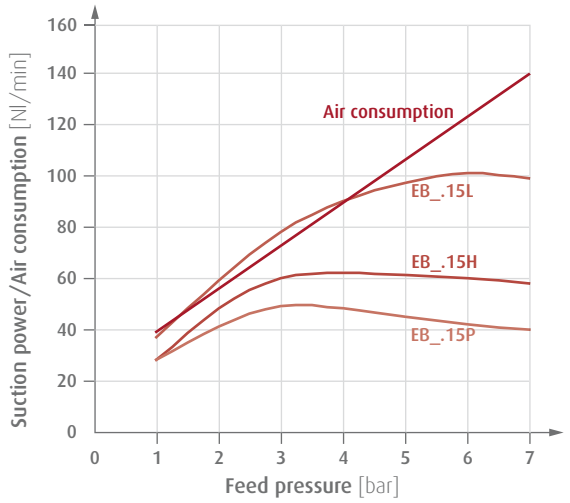
> Suction power and air consumption against feed pressure



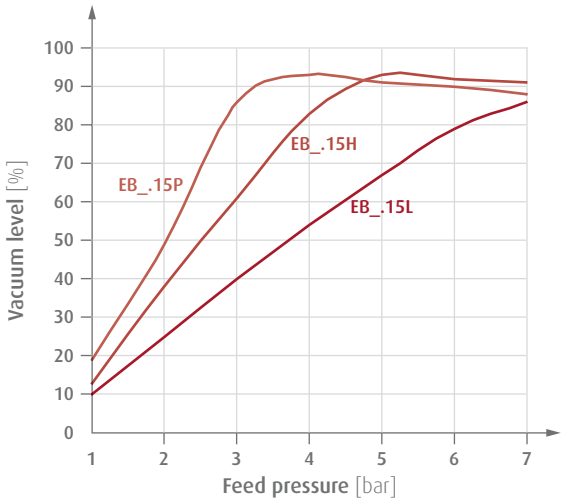
> Vacuum level against feed pressure



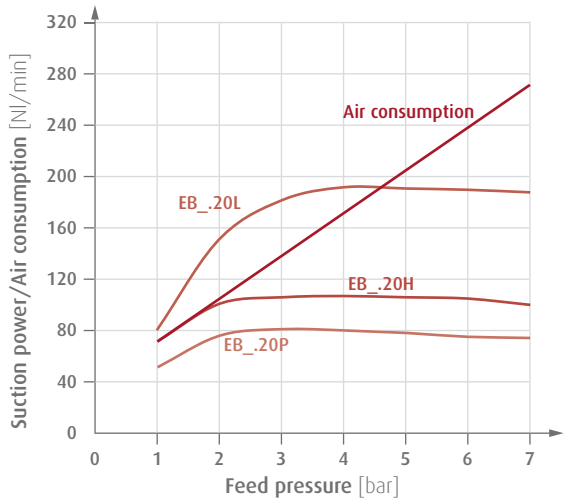
> Suction power and air consumption against feed pressure



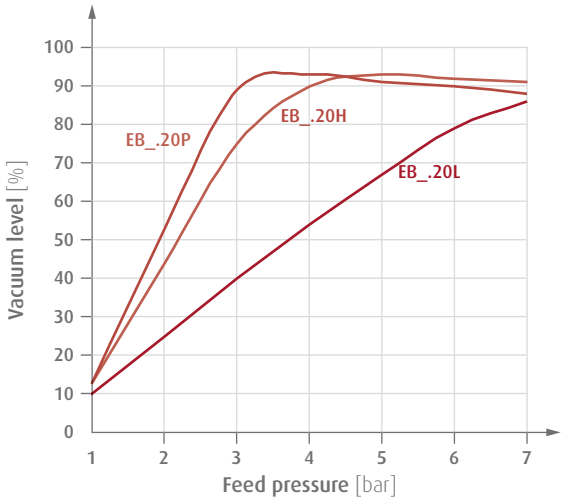
> Vacuum level against feed pressure



> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure



Heavy-duty ejectors

Vacuum generation under harsh conditions of use

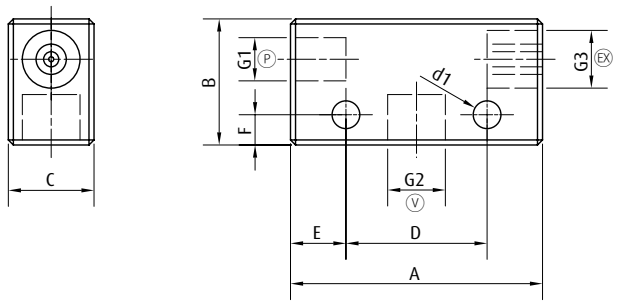
Product Description

> Robust and compact aluminium housing
> Compensation of compressed air fluctuations between 3 and 6 bar
> Additional inlet for blow-off for fast product release or vacuum switch connection for process monitoring (65.111, 65.130)
> Rectangular design enables block assembly in centralised or decentralised vacuum systems

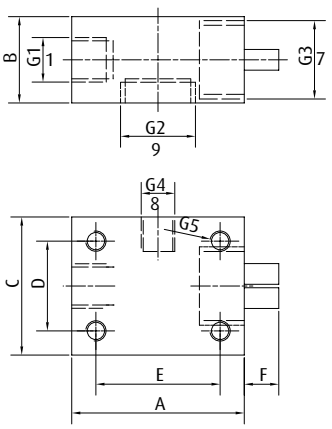
Technical data

Item no.	Optimal feed pressure [bar]	Max. feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption to 4 bar [Nl/min]	Evacuation time 0 to 70 % [s/l]	Weight [g]	Suitable accessories
65.102A	4	6	85	30	50	3.5	48	Silencer 72.001 (p.578) Silencer 72.029 (p.577)
65.111	4	6	85	33	60	3	120	Silencer 72.002 (p.578) Silencer 72.030 (p.577)
65.120	4	6	85	85	130	1.5	125	Silencer 72.031 (p.577)
65.130	4	6	85	130	240	0.7	225	--

Dimensions



65.102A



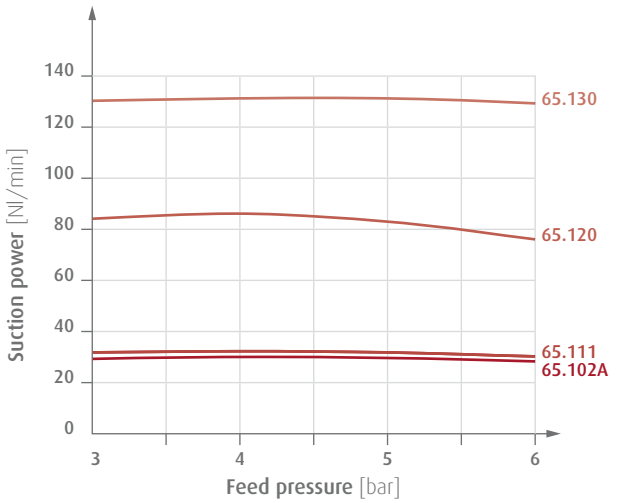
65.111 | 65.120 | 65.130

P = Compressed air connection V = Vacuum connection EX = Exhaust BO = Blow-off (65.111 and 65.130)

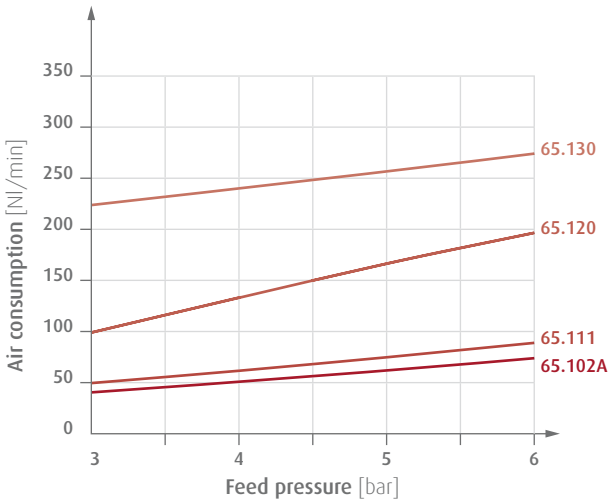
Item no.	G1	G2	G3	G4	G5	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
65.102A	G1/8	G1/4	G1/4	--	--	50	25	17	28	5.5	11	6
65.111	G1/4	G1/2	G3/8	G1/8	6.5	50	25	40	25	--	34	8
65.120	G1/4	G1/2	G1/2	G1/8	M6	50	25	40	25	--	34	10
65.130	G1/4	G1/2	G1	G1/8	M6	60	40	40	25	--	34	--

Diagrams

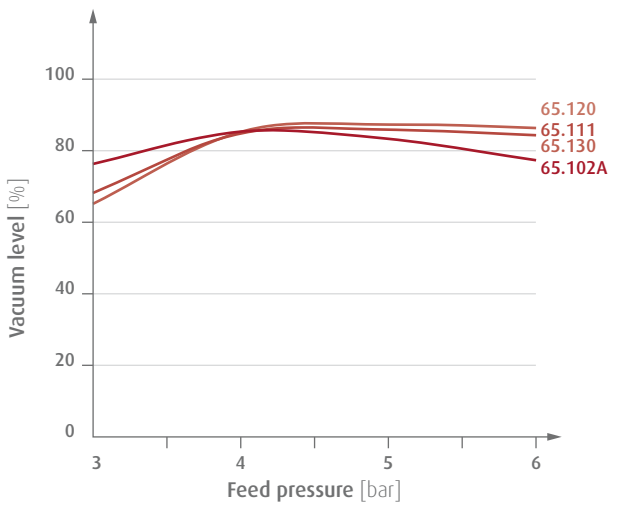
> Suction power against feed pressure



> Air consumption against feed pressure



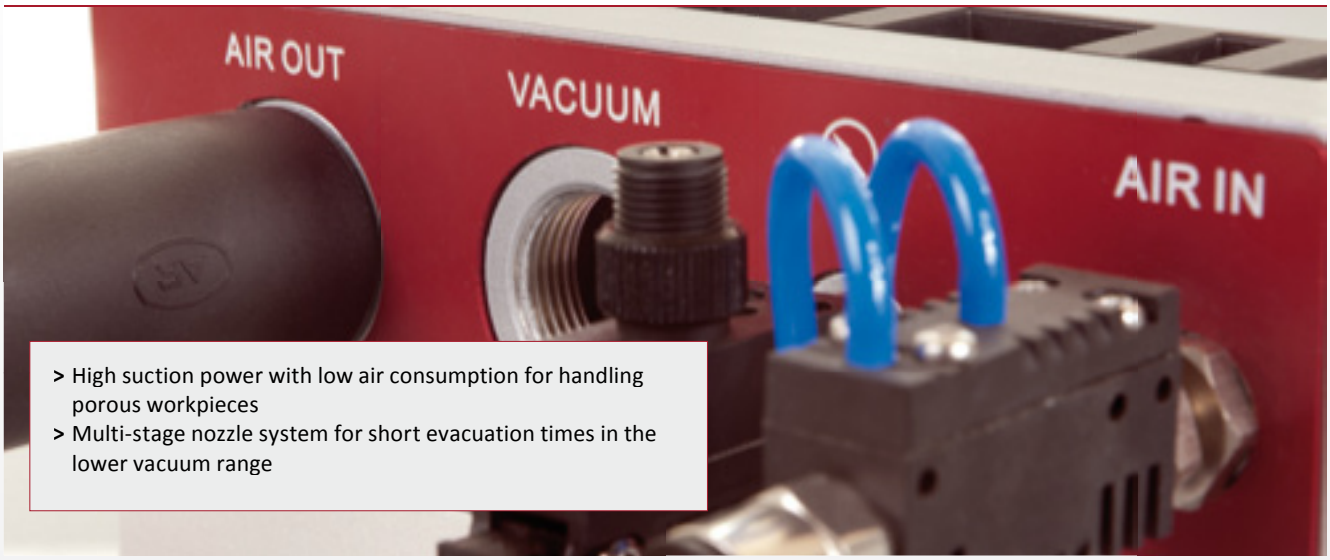
> Vacuum level against feed pressure



Suction power [Nl/min] at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
65.102A	25	23	19	15	13	8	4	1
65.111	25	23	20	17	13	8	4	1
65.120	76	66	55	41	34	22	12	3
65.130	182	160	135	69	52	33	17	6

FIPA Multi-chamber ejectors



> High suction power with low air consumption for handling porous workpieces
> Multi-stage nozzle system for short evacuation times in the lower vacuum range

Multi-chamber ejectors 65.310 - 65.330

> Robust aluminium construction
> Very compact design for space-saving installation in handling systems
> Low weight allows for high handling dynamics

> See page 548

Multi-chamber ejectors 65.410

> Robust aluminium construction
> Particularly fast product release due to additional compressed air inlet for blow-off

> See page 548

Multi-chamber ejectors 65.340 - 65.390

> Robust aluminium construction
> Compensation of fluctuations in compressed air supply
> Compressed air inlet for blow-off enables fast release of the workpiece (65.410)
> Optional air-saving function when handling dense products

> See page 550

FIPA Multi-chamber ejectors

Examples of use

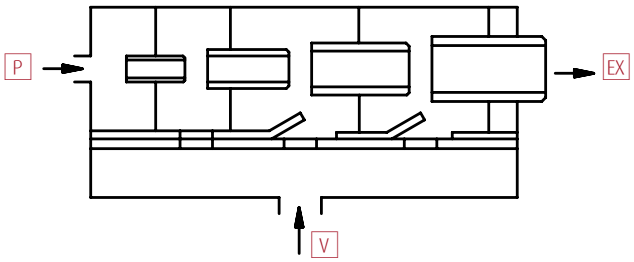
> Handling porous materials (cardboard, wood fiber boards, insulation materials, etc.)
> Handling dense workpieces at moderate cycle times (single-stage ejectors such as basic or compact ejectors are generally preferable for short cycle times in the handling of heavy products, as these more quickly achieve high vacuum levels)

Multi-chamber ejectors with air-saving function (65.340-LSE - 65.390-LSE)

> Handling of products with different air permeabilities (activation of the air-saving function for heavy products)
> Switch-off of vacuum generation while assuming a “waiting position” in the event of a delay in downstream processes
> Saving compressed air when using multi-chamber ejectors for the supply of vacuum tanks

Functional principle

Prior to discharge into the atmosphere, the compressed air flows through a series of several connected nozzle chambers. In this way the kinetic energy of the supplied compressed air generates a partial vacuum in each of the chambers. These ejectors set themselves apart from single-stage ejectors such as basic or compact ejectors thanks to their lower consumption of compressed air despite the same suction power.



Multi-chamber ejectors

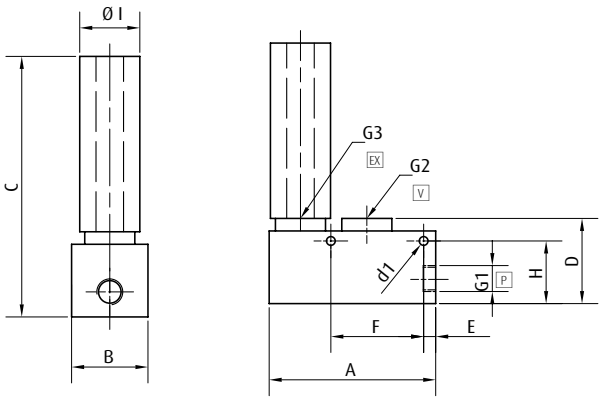
Product Description

> Handling of air-permeable products, or for high leakages
> High suction power for short evacuation times and fast vacuum build-up
> Low space requirements due to small construction size (65.310 - 65.330)
> Particularly fast product release due to additional compressed air inlet for blow-off (65.410)
> Noise-optimised operation due to open silencer
> Industry examples: packaging and printing

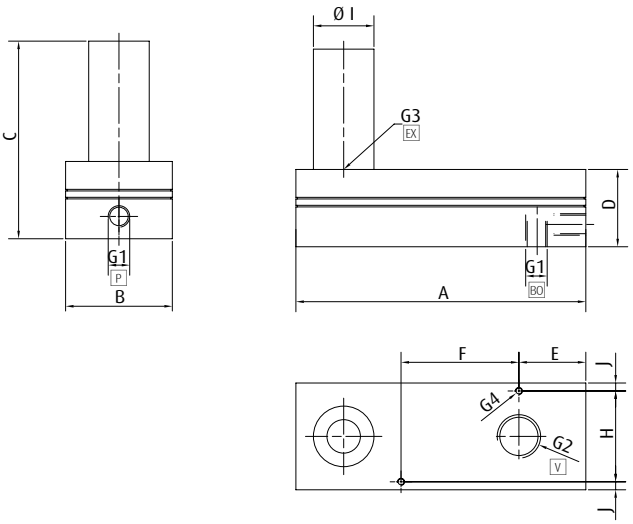
Technical data

Item no.	Optimal feed pressure [bar]	Max. feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption at 6 bar [Nl/min]	Evacuation time 0 to 70 % [s/l]	Weight [g]
65.310	6	7	85	120	56	1.95	111
65.320	6	7	85	180	108	1.07	111
65.330	6	7	85	250	144	0.5	169
65.410	6	7	85	320	95	1.15	1,006

Dimensions



65.310 | 65.320 | 65.330



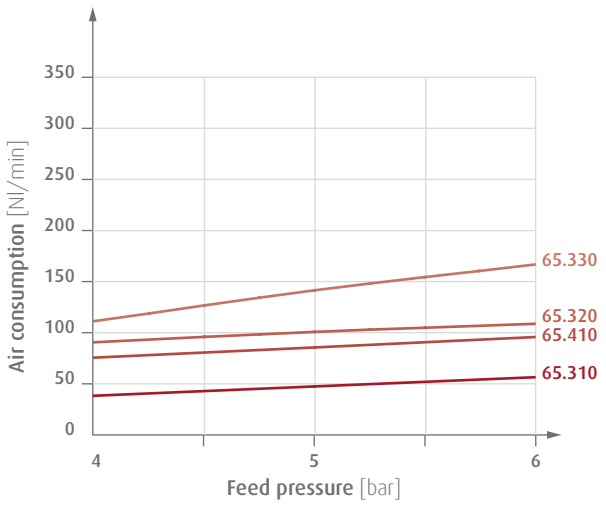
65.410

P = Compressed air connection V = Vacuum connection EX = Exhaust BO = Compressed air connection for blow-off

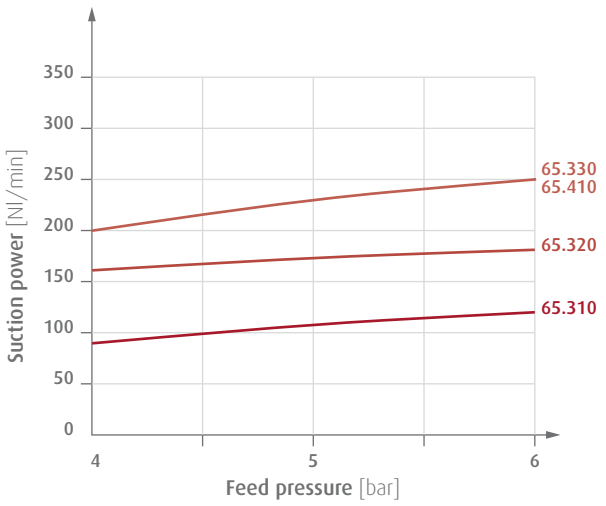
Item no.	G1	G2	G3	G4	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	Ø I [mm]	J [mm]
65.310	G1/8	G3/8	G3/8	--	67	31	104	34	3.7	9.6	32.5	24	24	--
65.320	G1/8	G1/8	G3/8	--	67	31	104	34	3.7	9.6	32.5	24	24	--
65.330	G1/8	G1/2	G3/8	--	67	45	114	44	3.7	10.5	46.5	13.3	24	--
65.410	G1/4	G1/2	G1/2	M4	182	67	124.5	49	--	41.5	74	57	38	5

Diagrams

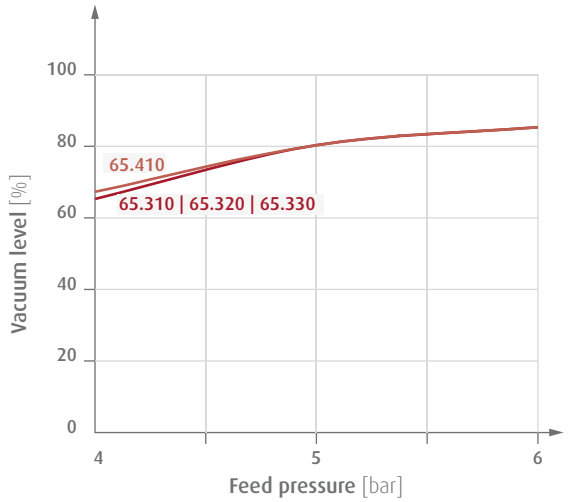
> Air consumption against feed pressure



> Suction power against feed pressure



> Vacuum level against feed pressure



Suction power [Nl/min] at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
65.310	89	62	38	22	18	10	5	--
65.320	130	81	52	30	22	14	8	--
65.330	178	116	91	63	44	15	6	--
65.410	175	118	58	42	33	23	16	10

Multi-chamber ejectors

High suction power for fast vacuum build up with porous workpieces

NEW

Application example: Multi-chamber ejector
with vacuum gauge 91.001 (mounting on front or rear side)

Application example: Multi-chamber ejector 65.340-LSE
with air saving function

Product Description

> High vacuum level at low feed pressures, and thus particularly efficient use of compressed air as well as suitability for fluctuating air pressure levels
> Handling of porous products, or for high leakages
> High suction power for short evacuation times in the lower vacuum range
> Noise-optimised operation due to open silencer
> Industry examples: packaging and printing

Air saving function (Index LSE)
> Saving compressed air during handling of dense workpieces
> Examples of use:
Automatic switching off of vacuum generation during pick-and-place applications of dense workpieces if e.g. downstream processes are delayed.
Saving compressed air when using the multi-chamber ejectors for feeding vacuum tanks.

Notes

Construction / operation (Index -LSE):
> Combination of pneumatic control valve with spring return and normally closed (NC) pneumatic vacuum switch
> Setting target vacuum values by means of setting screw
> Compressed air is conveyed through the valve to the compressed-air inlet of the injector; there is a partial airflow at input 1 of the vacuum switch
> When set target vacuum is reached, vacuum switch opens, compressed air from input 1 is conducted to the control valve via output 2 and closes it - the vacuum generation is stopped
> If the vacuum level has reached the hysteresis value (see table), the vacuum switch closes again and the spring opens the control valve - vacuum generation is activated again
> Please note: The air saving function does not work with porous products, or in the case of high leakage

Ordering notes

> Seals optionally available in NBR as standard
> Optionally available in EPDM or Viton upon request
> Included in scope of delivery: two mounting brackets and G1/4“-AG - Ø 10 mm quick fitting for compressed air connection

Technical data

Item no.	65.340	65.350	65.360	65.370	65.380	65.390
Optimal feed pressure [bar]	3.4	3.4	3.4	3.4	3.4	3.4
Max. feed pressure [bar]	7	7	7	7	7	7
Final vacuum at 3.4 bar [%]	92	92	92	92	92	92
Final vacuum at 6 bar [%]	89	89	89	89	89	89
Suction power at 3.4 bar [Nl/min]	360	600	760	850	1,150	1,200
Suction power at 6 bar [Nl/min]	420	700	950	1,010	1,400	1,500
Air consumption at 3.4 bar [Nl/min]	116	230	365	445	545	655
Air consumption at 6 bar [Nl/min]	185	370	610	720	780	810
Evacuation time 1 liter from 0 to 70 % at 3.4 bar [s]	0.95	0.5	0.46	0.27	0.2	0.23

Technical data

Item no.	65.340	65.350	65.360	65.370	65.380	65.390
Evacuation time 0 to 70 % at 6 bar [s]	0.62	0.35	0.31	0.19	0.19	0.2
Vacuum switch hysteresis at LSE [mbar]	120	120	120	120	120	120
Noise level with silencer [dB]	60 - 65	60 - 65	60 - 65	60 - 65	60 - 65	60 - 65
Usage temperature [°C]	-20 - 80	-20 - 80	-20 - 80	-20 - 80	-20 - 80	-20 - 80
Weight incl. silencer [g]	690	690	880	880	1,160	1,160
Suitable accessories	Vacuum gauge 91.001 (p.696) Vacuum switch 20.021 (p.691) Double nipple 270.138 (p.751) Double nipple 270.148 (p.751)					

When ordering please specify

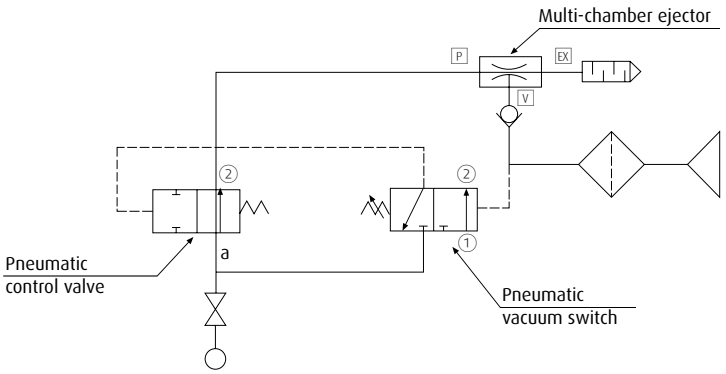
Air saving function

Item no.		Design
65.340		without air saving function
65.340	-LSE	with air saving function

Already built in for 65.340-LSE to 65.390-LSE.
If the LSE is integrated in already delivered structurally identical ejectors without an air saving function, a non-return valve, item no. 32.662, is necessary at the compressed air input. For conversion of existing ejectors please consult the FIPA technical sales department.

For 65-380-LSE and 65.390-LSE:
It is recommended particular to consult FIPA technical sales department as to whether an air saving function is useful in the application.

Wiring diagram air saving function LSE



V = Vacuum connection
EX = Exhaust outlet
P = Compressed air inlet
① = Compressed air inlet
② = Compressed air outlet

Continued on the next page

Suction power [Nl/min] at vacuum level (feed pressure 3.4 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	180	115	80	43	30	22.5	15.5	7.5	1.2
65.350	320	250	135	75	60	46	30	13	1.5
65.360	445	340	175	110	85	70	43	20	1.8
65.370	550	430	280	145	115	85	60	28	2.2
65.380	760	530	350	180	148	115	78	34.5	3.5
65.390	830	550	360	215	170	130	90	36	5

Suction power [Nl/min] at vacuum level (feed pressure 6 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	240	125	100	82	65	38	12.5	3.5	--
65.350	510	290	195	160	115	70	22	8	--
65.360	710	380	285	230	170	100	32	11	--
65.370	800	460	385	310	215	125	42	15.5	--
65.380	1120	560	490	355	260	150	50	25	--
65.390	1110	630	560	385	315	210	65	26	--

Evacuation time [s/l] at vacuum level (operating pressure 3.4 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	0.022	0.06	0.11	0.21	0.4	0.65	0.95	1.6	4
65.350	0.014	0.031	0.06	0.1	0.2	0.34	0.5	0.8	2.5
65.360	0.012	0.029	0.058	0.095	0.18	0.31	0.46	0.89	1.5
65.370	0.01	0.025	0.043	0.075	0.11	0.19	0.27	0.45	1.2
65.380	0.006	0.015	0.029	0.052	0.085	0.145	0.202	0.33	1
65.390	0.005	0.013	0.027	0.045	0.07	0.105	0.23	0.46	0.9

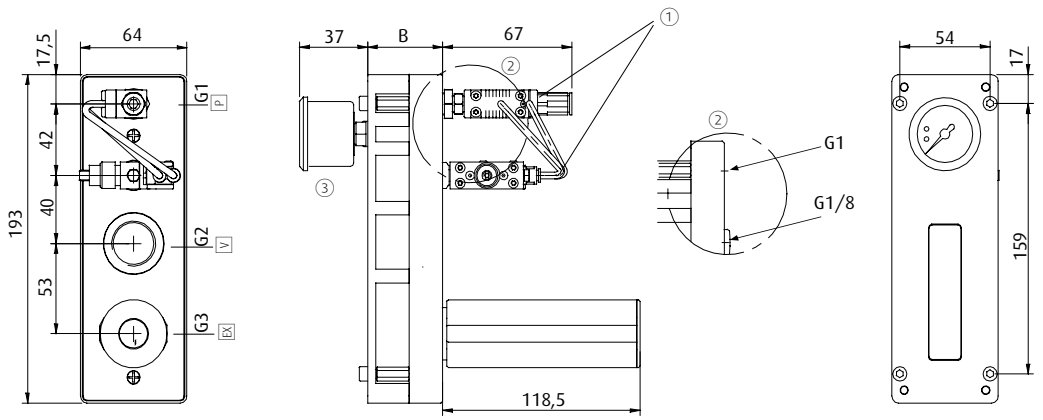
Evacuation time [s/l] at vacuum level (operating pressure 6 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	0.018	0.05	0.08	0.18	0.25	0.4	0.62	1.55	--
65.350	0.01	0.022	0.048	0.08	0.11	0.2	0.35	0.78	--
65.360	0.009	0.019	0.045	0.075	0.13	0.18	0.31	0.7	--
65.370	0.007	0.018	0.038	0.055	0.08	0.12	0.19	0.47	--
65.380	0.005	0.013	0.026	0.045	0.062	0.115	0.194	0.56	--
65.390	0.003	0.009	0.014	0.030	0.060	0.095	0.2	0.8	--

Recommended inner diameter [mm] for tubing up to length of 2 meter

Item no.		Air supply	Vacuum	Exhaust
65.340	65.340-LSE	> 4	> 12	> 12
65.350	65.350-LSE	> 6	> 15	> 15
65.360	65.360-LSE	> 8	> 19	> 22
65.370	65.370-LSE	> 8	> 19	> 22
65.380	65.380-LSE	> 10	> 25	> 32
65.390	65.390-LSE	> 10	> 25	> 32

Dimensions



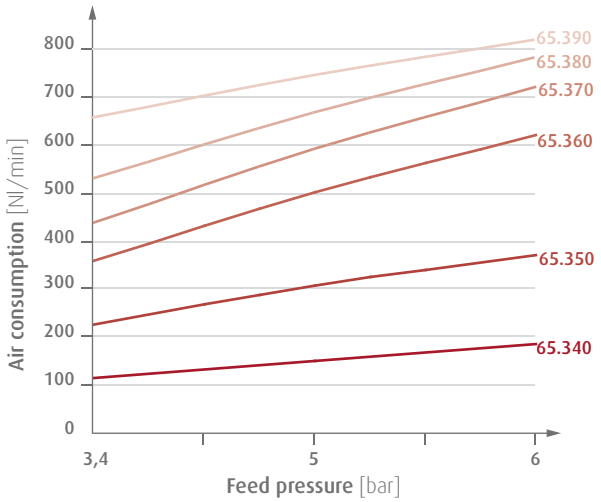
① = Air saving function (optional) ② = Connection vacuum gauge and/or vacuum switch ③ = Vacuum gauge (optional)
P = Compressed air connection V = Vacuum connection EX = Exhaust outlet

Item no.	65.340	65.350	65.360	65.370	65.380	65.390
G2	G3/4	G3/4	G3/4	G3/4	G1	G1
G3	G3/4	G3/4	G3/4	G3/4	G1	G1
A [mm]	163.5	163.5	183.5	183.5	203.5	203.5
B [mm]	45	45	65	65	85	85
G1	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4

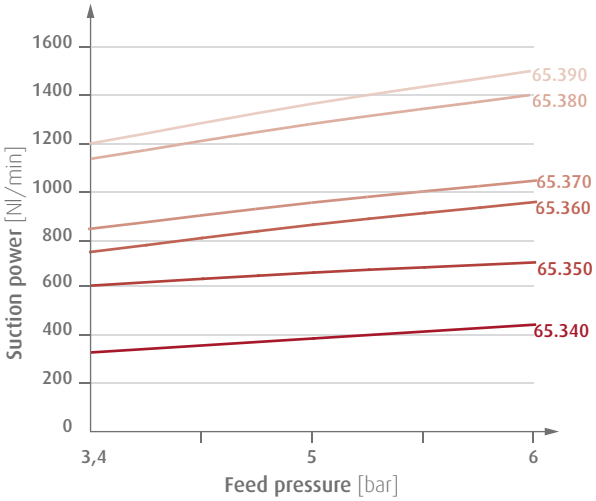
Continued on the next page

Diagrams

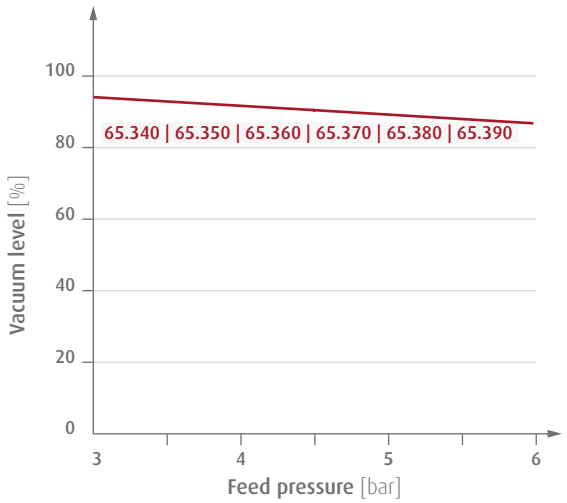
> Air consumption against feed pressure



> Suction power against feed pressure



> Vacuum level against feed pressure



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FIPA Compact ejectors

> Highly efficient vacuum supply, regardless of the air permeability of the workpiece

Compact ejectors EMM / EMA

> Handling of dense and porous workpieces
> Very compact design for in-line installation directly onto the vacuum cup
> Integrated vacuum monitoring
> Integrated pressure-regulating air saving function reduces operating costs by up to 50 %

EMM
> Pressure-regulating air saving function plus valves for electronic vacuum and blow-off control ensure short cycle times

> See page 556

EMA
> Pressure-regulating air saving function and electronic air saving function reduce operating costs by up to 97 % for dense workpieces

> See page 559

Compact ejectors EKPP / EKP

> Handling of dense and porous workpieces
> Integrated pressure-regulating air saving function reduces operating costs by up to 50 %
> Process monitoring via optional vacuum switch

EKPP
> Base version, with pressure-regulating air saving function, no valves
> Performance data identical to that of EKP

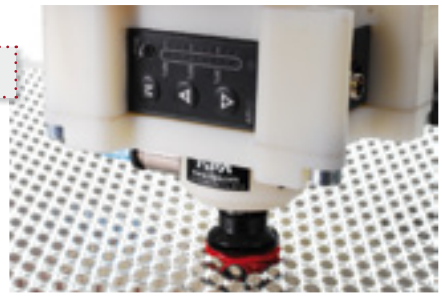
EKP
> Pressure-regulating air saving function plus electronic vacuum and blow-off control for short cycle times

> See page 563

Ejectors with air saving function EMM

Energy saving function by integrated pressure control

SAVES UP TO 50 % OF ENERGY



V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Ejector EMM integrated into gripper housing for Delta robots with Varioflex® bellows vacuum cups and workpiece

Product Description

> Handling of dense and porous workpieces
> Within the supply pressure of 4 - 8 bar, the ejector works at 3.5 bar with same high performance
> Energy saving increases along with the difference between supply pressure and operating pressure
> Electronic vacuum and blow-off control for short cycle times
> Manual adjustment of the blow-off flow rate using a setscrew
> Very compact design with integrated open silencer
> Dust-resistant design, no additional filters required

Ordering notes

> Two model ranges available
  - EMM.90: for dense workpieces, max. vacuum level 90 %
  - EMM.60: Higher suction power for porous workpieces, max. vacuum level 60 %
> Optionally available with integrated check valve to maintain vacuum in case of power failure

Technical data

Item no.	EMM.60x10	EMM.60x12	EMM.60x14	EMM.90x10	EMM.90x12	EMM.90x14
Nozzle diameter [mm]	1	1.2	1.4	1	1.2	1.4
Feed pressure [bar]	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8
Internal working pressure [bar]	3.5	3.5	3.5	3.5	3.5	3.5
Final vacuum [%]	60	60	60	90	90	90
Suction power [Nl/min]	38	72	92	29	45	70
Air consumption [Nl/min]	44	65	90	44	65	90
Protection class	IP65	IP65	IP65	IP65	IP65	IP65
Operating principle	NC	NC	NC	NC	NC	NC
Control voltage	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)
Operating temperature [°C]	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Weight [g]	120	120	120	120	120	120
Suitable connector cable	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)

When ordering please specify

Type + Vacuum level x Nozzle diameter + Composition of module + Vacuum switch = Item number

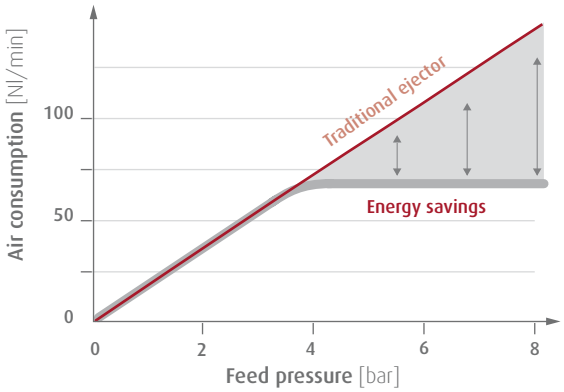
Example: **EMM.90x12-AVA**

(Compact ejector EMM, vacuum level 90 %, nozzle diameter 1.2 mm, with controlled blow-off-function and with electric vacuum switch with display)

1.: Type	2.: Vacuum level			3.: Nozzle diameter			4.: Composition of module			5.: Vacuum switch			6.: Optional
EMM.	60	max. 60 % vacuum (porous products)	x	10	Ø 1.0 mm	-	E	without blow-off-function		VA	digital with display		_CV (with check valve)
	90	max. 90 % vacuum (non-porous products)		12	Ø 1.2 mm		A	with controlled blow-off-function		VO	without vacuum switch		
				14	Ø 1.4 mm								

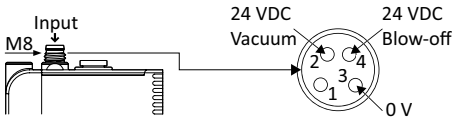
Suitable connector cables for vacuum switch:
20.501: M8 thread, female, 4-pin, straight plug, cable length 5 m
20.502: M8 thread, female, 4-pin, 90° elbow plug, cable length 5 m

Display of the energy saving potential by integrated pressure control

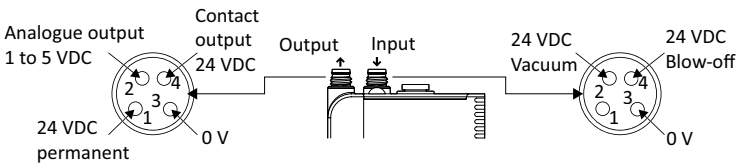


Vacuum switches

Ejectors without vacuum switch



Ejectors with vacuum switch



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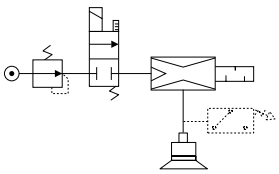
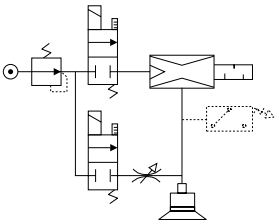
Pneumatic Diagram

Ejector with blow-off-function EMM_ _ X _ _ EV _



> Basic product
> Only one control signal
> Display of vacuum level
> Manual control option

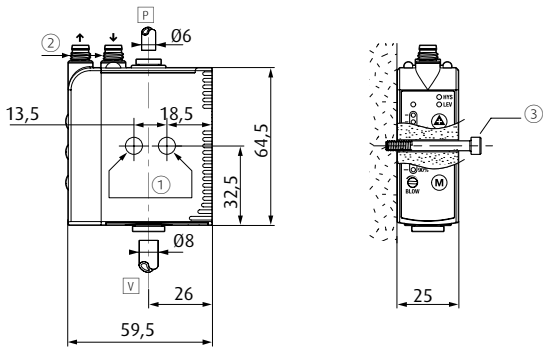
Ejector with controlled blow-off-function EMM_ _ X _ _ AV _



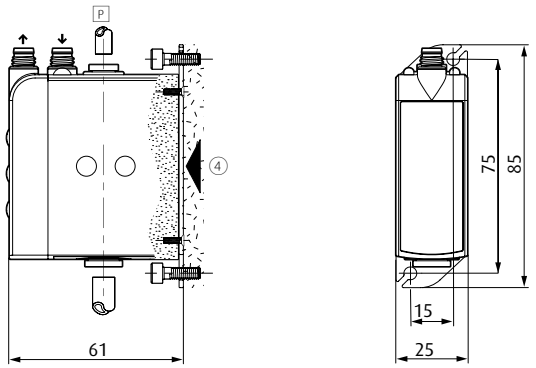
> Automatic blow-off through external signal, with adjusting screw
> Two control signals
> Display of vacuum level and blow-off-function
> Manual control option

Dimensions and mounting options

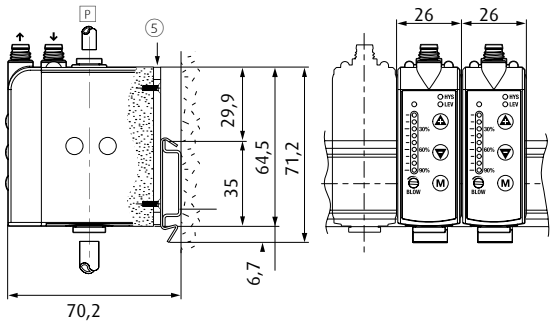
> Mounting sideways



> Mounting in the front



> Block mounting on a DIN rail



P = Compressed air connection V = Vacuum connection ① = 2 Bore holes for 4 mm screws ② = M8 plug ③ = 2 Continuous screws
④ = Mounting plate with 4 screws (Item no. EMM.FIX-V)
⑤ = Mounting plate for DIN rail with 4 screws (Item no. EMM.FIX-D) - on plate per EMM-module

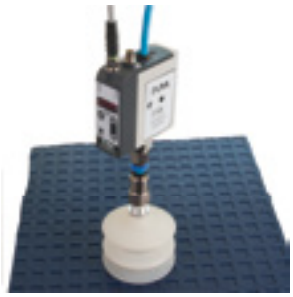
Evacuation time [sec.] for 1 liter at vacuum level

Item no.	30 %	40 %	45 %	50 %	55 %	60 %	65 %	70 %	75 %	80 %
EMM.60x10	0.66	1.04	1.31	1.7	2.35	--	--	--	--	--
EMM.60x12	0.41	1.66	0.83	1.07	1.49	--	--	--	--	--
EMM.60x14	0.27	0.43	0.54	0.7	0.97	--	--	--	--	--
EMM.90x10	--	--	--	--	1.76	2.04	2.38	2.8	3.33	4.09
EMM.90x12	--	--	--	--	1.13	1.31	1.8	2.15	2.15	2.64
EMM.90x14	--	--	--	--	0.73	0.85	0.99	1.16	1.38	1.7

Ejectors with air saving function EMA

Double energy efficient by integrated pressure control and electronic air saving function

SAVES UP TO 97 % OF ENERGY



Ejector EMA with bellows vacuum cup and workpiece

Product Description

> Electronic air saving function reduces operating costs by up to 97 % with dense workpieces
> Pressure regulation energy-saving function at constant 3.5 bar reduces operating costs by up to 50 % with porous workpieces
- Energy saving increases along with the difference between supply pressure and operating pressure
> Electronic vacuum and blow-off control for short cycle times
> Manual adjustment of the blow-off flow rate using a setscrew
> Very compact design with integrated open silencer
> Dust-resistant design, no additional filters required

Notes

> If the ejector experiences power failure, the workpiece is only held by the vacuum between non-return valve and product surface
> Vacuum and blow-off are controlled using a single signal

Technical data

Item no.	EMA.90x14
Nozzle diameter [mm]	1.4
Feed pressure [bar]	4 - 8
Internal working pressure [bar]	3.5
Final vacuum [%]	90
Suction power [Nl/min]	70
Air consumption [Nl/min]	90
Protection class	IP65
Operating principle	NC
Control voltage	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)
Operating temperature [°C]	10 - 60
Weight [g]	130
Suitable connector cable	20.502 (p.717) 20.501 (p.717)

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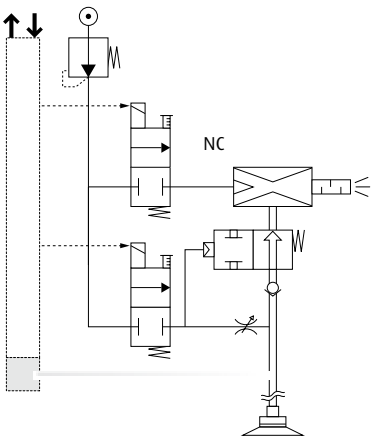
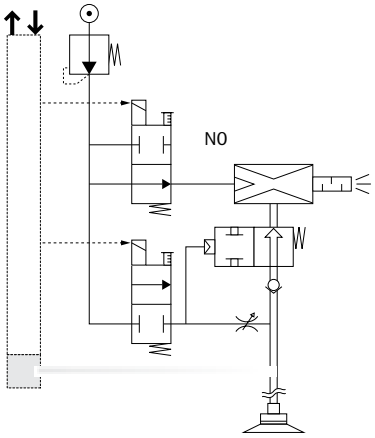
Pneumatic diagram

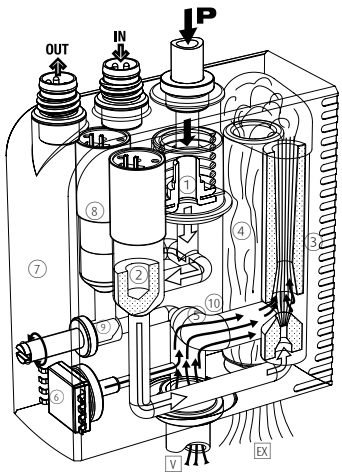
Solenoid valve NC

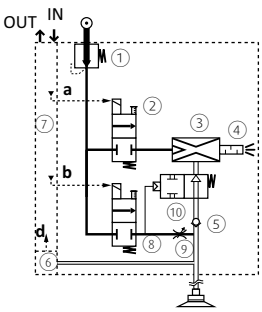


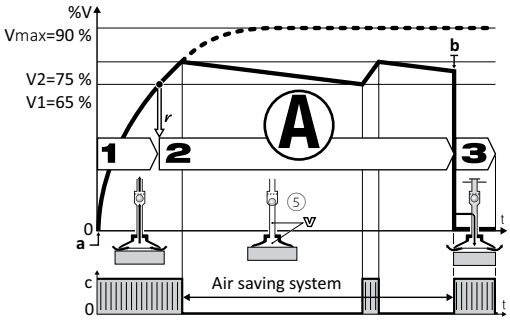
Solenoid valve NO



Operating principle EMA series







1. Gripping the workpiece
The vacuum solenoid valve ② starts the cycle. Venturi nozzle ③ is supplied with compressed air and generates the vacuum to grip the item quickly with the vacuum cup → short-term energy consumption.

2. Operations on the suctioned item
The vacuum level is continually monitored by the vacuum switch ⑥. When the vacuum threshold limit V1 (65 %) is reached the signal “Item gripped“ is triggered. This gives a green light for the scheduled operation (transfer, processing etc.). When the vacuum reaches the threshold limit V2 (75 %), the compressed air supply to the venturi nozzles via the solenoid valve ⑤ is interrupted. Energy consumption falls to zero. The item remains gripped because of the vacuum that remains because of the closed non-return valve. Tiny leakages often lead to a slow release of the vacuum. If the vacuum falls to the threshold limit of 65 %, new vacuum is briefly generated, i.e. until the threshold limit V2 (75 %) is reached.

3. Releasing the workpiece
At the end of the procedures blow-off is triggered. The blow-off valve ⑧ generates an air jet that closes the closing valve ⑩. This blows off the item using the air pressure regulator ⑨ so that it can be released more quickly.

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Nozzle diameter and energy saving potential

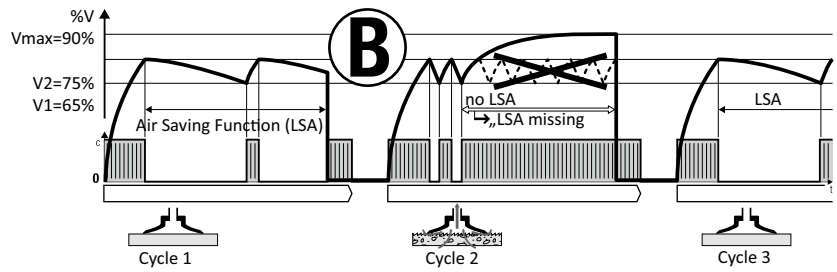
Air saving control cycle self-adaptation

Cycle 1:
Deals with an air tight product under the influence of LSA, resulting in optimum energy savings.

Cycle 2:
The porous product generates leaks that provoke repeated intermittent vacuum regeneration. The anomaly is automatically detected, and the cycle goes on but without LSA. An LSA missing signal is then emitted and displayed, and production goes on.

Cycle 3:
Illustrates the automatic return to the LSA cycle as soon as leaks are eliminated due to air tight products. Vacuum level will be maintained.

The compact-ejektor EMA thus provides maximum energy saving, without any limitations to the performance and functioning of the overall production system.



Without automatic air saving system			With automatic air saving system		
Nozzle diameter [mm]	Suction power [Nl/min]	Air consumption [Nl/min]	Suction duration (65 % vacuum) [sec]	Suction duration (75 % vacuum) [sec]	Air consumption [Nl/min]
1	29	44	2.38	3.33	2.2
1.2	45	65	1.53	2.15	2.2
1.4	70	90	0.99	1.38	2.2

> Automatic air saving system activation allows a larger tube diameter to grip more quickly without increased consumption.

Example of the air saving potential

The examples show how the automatic air saving function reduces the energy demand:
> 75 % energy saved during product transfer
> 97 % energy saved during holding products while they are further processed or treated
The investment will often amortise itself within a couple of months.

Gripping + Transfer (Nozzle Ø 1.4 mm, Evacuation of 0.2 l)

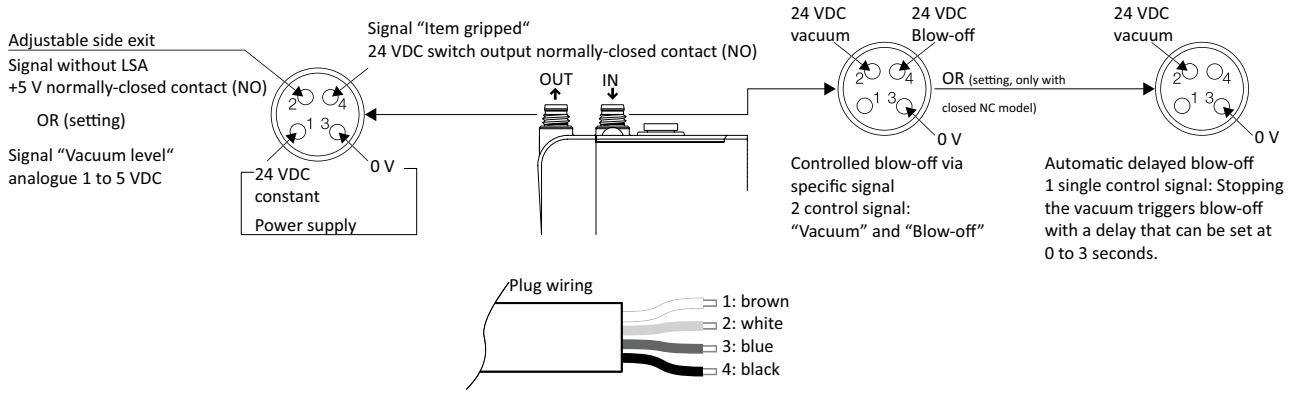
Phase	Duration	Air consumption		
		without "LSA"	with "LSA"	
Grip	0.28 s	0.4 Nl	0.4 Nl	air saving potential
Transfer	1.20 s	1.8 Nl	0	
Placement	0.14 s	0.2 Nl	0.2 Nl	
		2.4 Nl →	0.6 Nl →	75 %

Fixation + Operation process (Nozzle Ø 1.4 mm, Evacuation of 0.4 l)

Phase	Duration	Air consumption		
		without "LSA"	with "LSA"	
Fixation	0.55 s	0.8 Nl	0.8 Nl	air saving potential
Operation process	60 s	90 Nl	0	
Placement	0.14 s	0.2 Nl	0.2 Nl	
		91 Nl →	1.0 Nl →	97 %

Continued on the next page

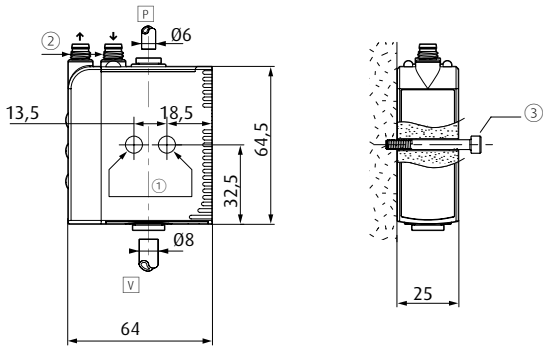
Wiring diagram



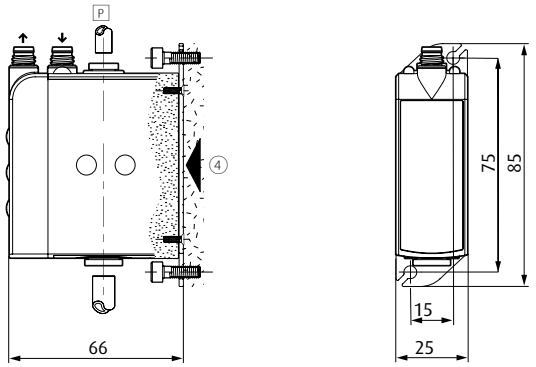
> Output signal "object gripped", 24 VDC, switching output NO, switching current 125 mA, PNP
> Adjustable side output:
1. Signal without air saving function, +5 V switching output NO: eg. signal for failure indication
2. Signal "vacuum level", analogue, 1-5 VDC of measuring range

Dimensions and mounting options

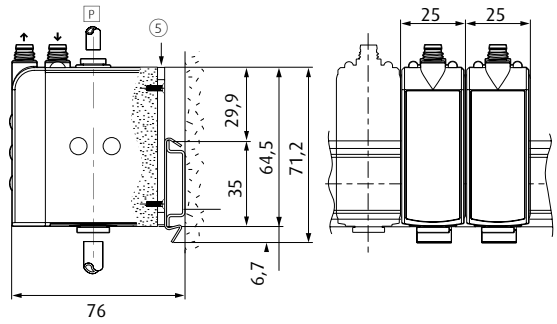
> Mounting sideways



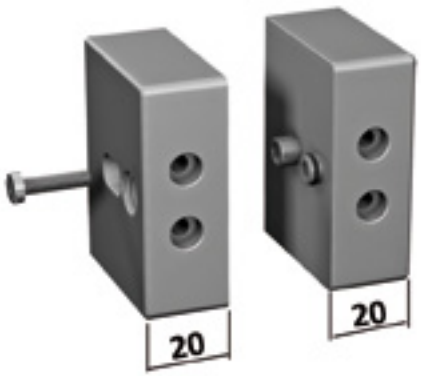
> Mounting in the front



> Block mounting on a DIN rail



> EMA.FIX-B endpieces, with connecting screws and closing pins for collecting main



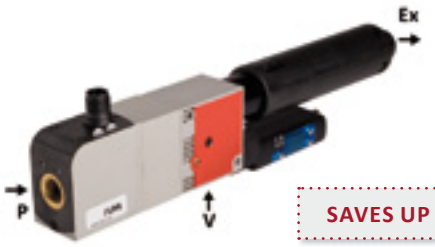
P = Compressed air connection V = Vacuum connection ① = 2 Bore holes for 4 mm screws ② = M8 plug ③ = 2 Continuous screws
④ = Mounting plate with 4 screws (Item no. EMM.FIX-V)
⑤ = Mounting plate for DIN rail with 4 screws (Item no. EMM.FIX-D) - on plate per EMM-modul

Evacuation time [sec.] for 1 liter at vacuum level

Item no.	55 %	60 %	65 %	70 %	75 %	80 %
EMA.90x14	0.73	0.85	0.99	1.16	1.38	1.7

Ejectors with air saving function EKP and EKPP

Energy saving function by integrated pressure control



SAVES UP TO 50 % OF ENERGY

Check valve with wire mesh to keep out impurities

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Product Description

> Handling of dense and porous workpieces
> Within the supply pressure of 4 - 8 bar, the ejector works at 3.5 bar with same high performance
> Electronic vacuum and blow-off control for short cycle times
> Manual adjustment of the blow-off flow rate using a setscrew
> Low noise emissions as, starting from 4 bar, outlet pressure is independent of inlet pressure
> Open silencer further reduces the noise level and is completely maintenance-free

Notes

> Ejector with digital vacuum switch 20.021 for process monitoring (Index „-VA“)
> The vacuum switch can be freely adjusted after mounting the ejector

Ordering notes

> Index EKP: with control valves
> Index EKPP: without control valves
> The performance data are identical for the two series
> The optional check valve maintains the vacuum in cases of compressed air failure for a certain period of time to prevent sudden dropping of the workpiece
> On request, ejectors are also available normally (current free) open (NO):
In case of power failure, compressed air line remains open and workpiece is held by the gripper

Technical data

Item no.	EKP.60x12	EKP.60x15	EKP.60x20	EKP.60x25	EKP.60x30	EKP.90x12	EKP.90x15	EKP.90x20	EKP.90x25	EKP.90x30
Nozzle diameter [mm]	1.2	1.5	2	2.5	3	1.2	1.5	2	2.5	3
Feed pressure [bar]	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8
Internal working pressure [bar]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Final vacuum [%]	60	60	60	60	60	90	90	90	90	90
Suction power [Nl/min]	72	110	189	275	385	50	75	125	200	245
Air consumption [Nl/min]	65	97	179	200	385	65	97	179	260	385
Protection class	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Operating principle	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Control voltage	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)

Continued on the next page

Technical data

Item no.	EKP.60x12	EKP.60x15	EKP.60x20	EKP.60x25	EKP.60x30	EKP.90x12	EKP.90x15	EKP.90x20	EKP.90x25	EKP.90x30
Operating temperature [°C]	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Weight [g]	250	250	250	250	250	250	250	250	250	250
Suitable accessories	Connector cable 20.518 (p.717) Connector cable 20.519 (p.717) Check valve 32.658									

When ordering please specify

Type + Vacuum level + Nozzle diameter + Composition of module + Vacuum switch = Item number

Example: **EKP.90x12-AVA**
(Compact ejector EKP., vacuum level 90 %, nozzle diameter 1.2 mm, with controlled blow-off function and with electric vacuum switch with display)

1.: Type	2.: Vacuum level			3.: Nozzle diameter			4.: Composition of module		5.: Vacuum switch		6.: Optional
EKP.	60	max. 60 % vacuum (porous products)	X	12	Ø 1.2 mm		-E	without blow-off-function	VA	digital with display	-NO (normally open)
	90	max. 90 % vacuum (non-porous products)		15	Ø 1.5 mm		-A	with controlled blow-off-function	VO	without vacuum switch	
				20	Ø 2 mm		-Z	with automatic blow-off-function with time release 0-3 sec.			
				25	Ø 2.5 mm						
				30	Ø 3 mm						

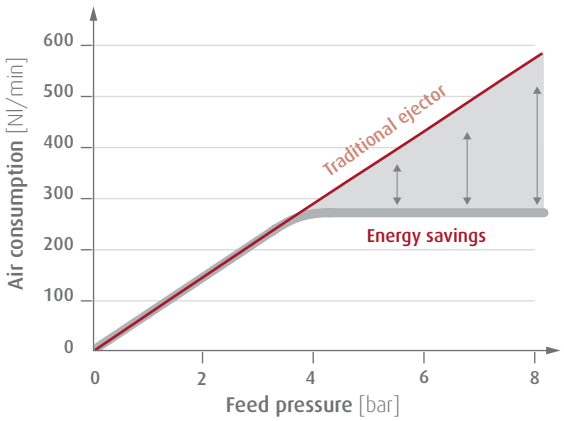
Example: **EKPP.60x15-VA:**
(Compact ejector EKPP vacuum level 60 %, nozzle diameter 1.5 mm, without additional function)

1.: Model without vacuum- / blow-off control	2.: Vacuum level			3.: Nozzle diameter		4.: Vacuum switch	
EKPP.	60	max. 60 % vacuum (porous products)	X	12	Ø 1.2 mm	-VA	digital with display
	90	max. 90 % vacuum (non-porous products)		15	Ø 1.5 mm		
				20	Ø 2 mm	-VO	without vacuum switch
				25	Ø 2.5 mm		
				30	Ø 3 mm		

Suitable connector cables for vacuum switch:
20.501: M8 thread, female, 4-pin, straight plug, cable length 5 m
20.502: M8 thread, female, 4-pin, 90° elbow plug, cable length 5 m

Suitable connector cables for EKP for vacuum valve and blow-off control:
20.518: M12 thread, female, 4-pin, straight plug, cable length 2 m
20.519: M12 thread, female, 4-pin, 90° elbow plug, cable length 2 m

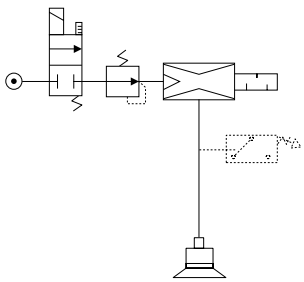
Display of the energy saving potential by integrated pressure control



Example of EKP.90x25 resp. EKP.60x25

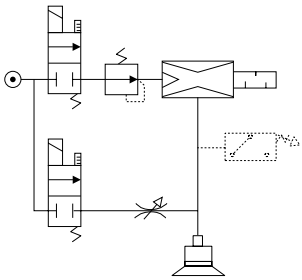
Pneumatic Diagram

Ejector
without blow-off-function
EKP_ _ X _ _ EV _



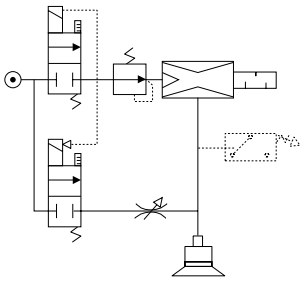
> Basic product
> Only one control signal

Ejector with controlled
blow-off-function
EKP_ _ X _ _ AV _



> Control of blow-off-function through outer signal with screw to adjust blow-off-volume
> Two control signals

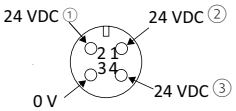
Ejector with automatic
blow-off-function with time release
EKP_ _ X _ _ ZV _



> Automatic blow-off when ejector is switched off, delay of blow-off can be manually set between 0 and 3 s, with adjusting screw
> Only one control signal

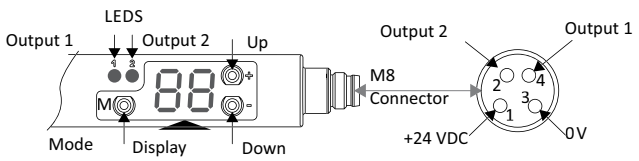
Electric plug / Vacuum switch

Electric connection EKP



① = Control of vacuum
② = Permanent (version Z)
③ = Blow-off-control (version A)

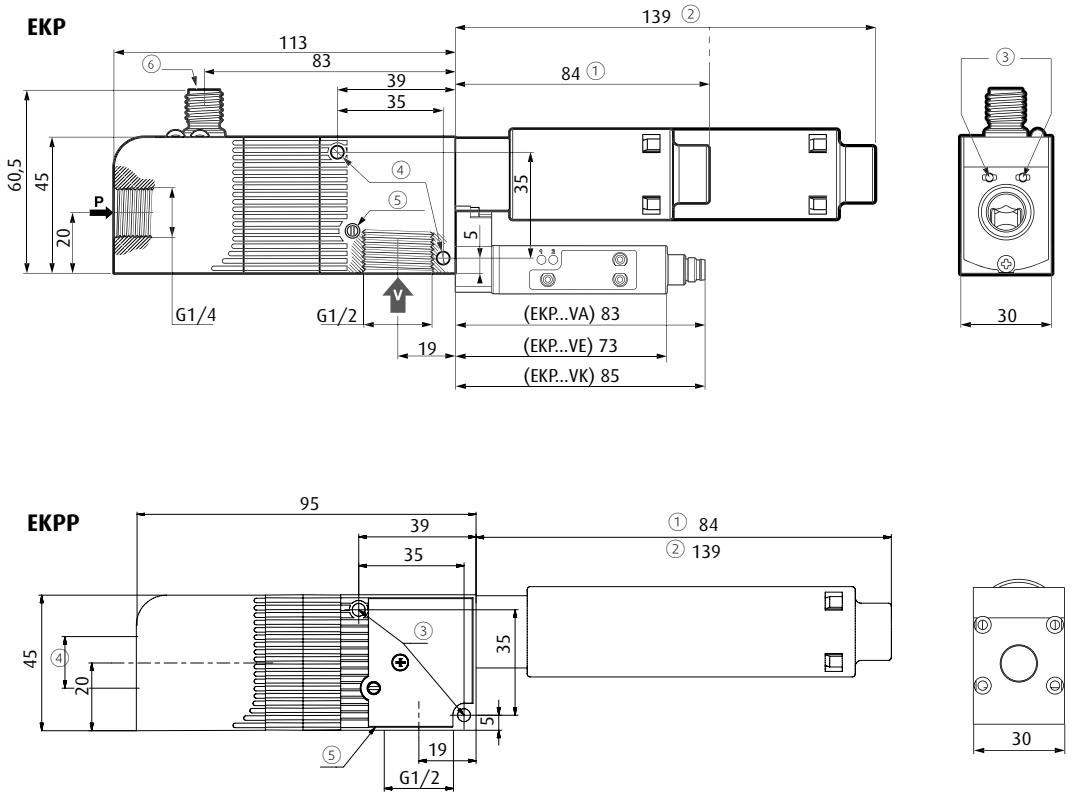
Ejectors with electronic (digital) vacuum switch
EKP-VA with display, 2 outputs



> Ejectors without vacuum switch **EKP-VO**: This type needs to be complemented by an independent vacuum switch in the vacuum system or, during evacuation of a manually controlled volume, by a vacuum gauge.

Continued on the next page

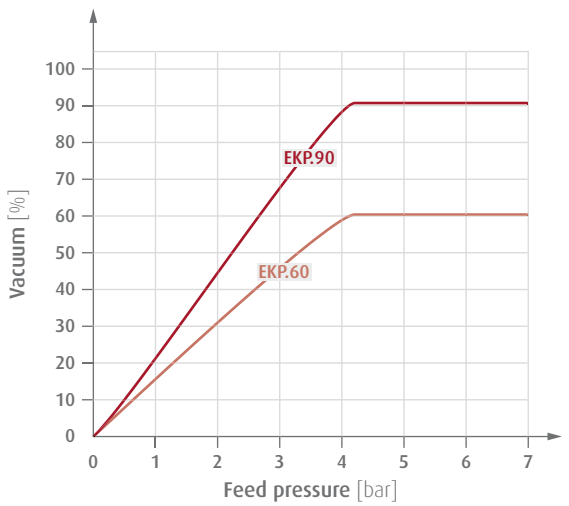
Dimensions



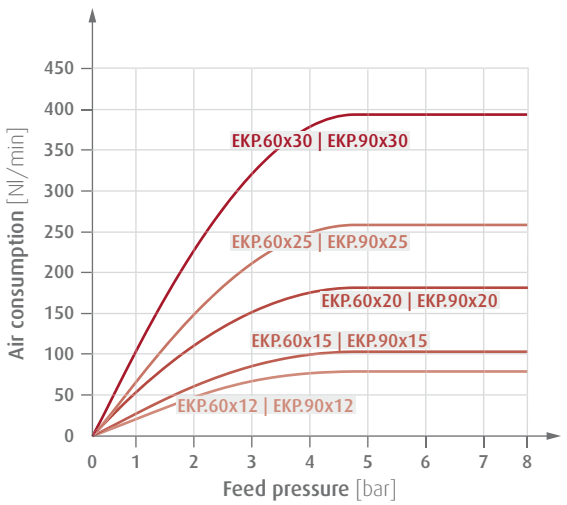
① = Silencers for nozzle Ø 1.2 or 1.5 mm ② = Silencers for nozzle Ø 2 - 2.5 or 3 mm ③ = Manual vacuum and blow-off control
④ = Mounting Ø 4.2 mm ⑤ = Adjusting blow-off power

Diagrams

> Vacuum level against feed pressure



> Air consumption against feed pressure



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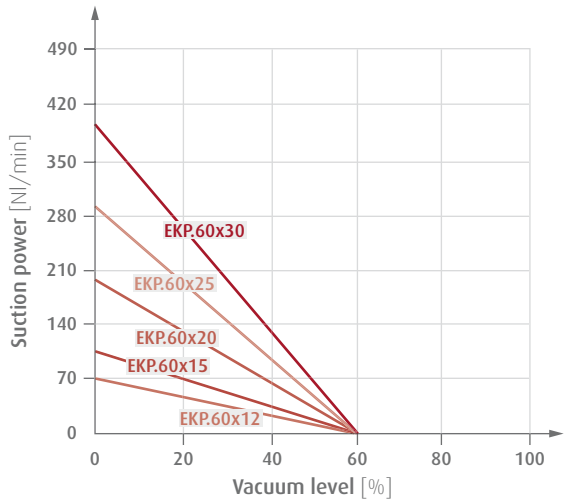
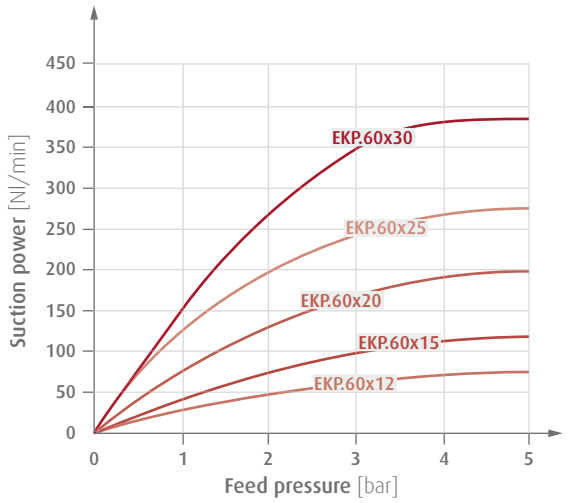
Diagrams

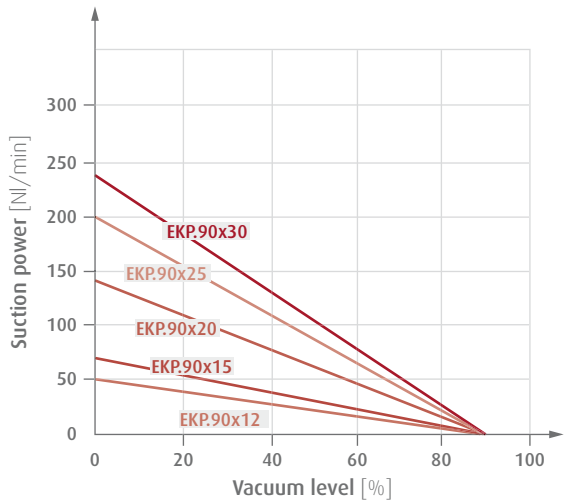
> Suction power against vacuum level



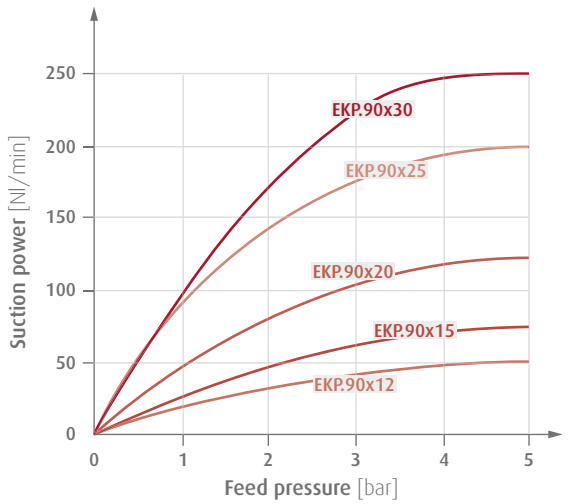
> Suction power against feed pressure



> Suction power against vacuum level



> Suction power against feed pressure



Evacuation time [sec.] for 1 liter at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	85 %
EKP.60x12	0.09	0.2	0.35	0.55	0.9	--	--	--	--
EKP.60x15	0.06	0.14	0.23	0.36	0.59	--	--	--	--
EKP.60x20	0.04	0.08	0.13	0.21	0.34	--	--	--	--
EKP.60x25	0.03	0.05	0.09	0.14	0.24	--	--	--	--
EKP.60x30	0.01	0.04	0.07	0.1	0.17	--	--	--	--
EKP.90x12	0.13	0.27	0.44	0.64	0.88	1.19	1.62	2.37	3.12
EKP.90x15	0.09	0.18	0.29	0.42	0.58	0.79	1.08	1.59	2.08
EKP.90x20	0.05	0.11	0.18	0.25	0.35	0.46	0.65	0.95	1.25
EKP.90x25	0.03	0.07	0.11	0.16	0.22	0.3	0.41	0.59	0.78
EKP.90x30	0.03	0.06	0.09	0.13	0.18	0.24	0.33	0.48	0.64

Notes:

FIPA Feed ejectors

> Secure transport of bulk material
> Extraction of non-aggressive gases or steams
> Ideal source of vacuum in applications with high leakage

Feed ejectors for large throughput

> Contamination-resistant construction for reliable operation, even under harsh operating conditions

65.701 - 65.731
> High vacuum level
> For overcoming larger height differences
> Suction volume and vacuum level can be adapted to level of compressed air pressure

65.742 - 85.802
> Low vacuum level
> For overcoming smaller height differences
> Suction volume and vacuum level dependent on level of compressed air pressure

> See page 570

Feed ejectors for small throughput EFO

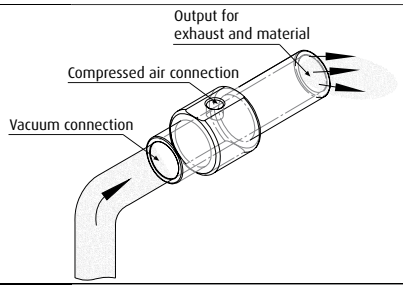
> Low suction power due to medium vacuum levels
> Various connections for inlets and outlets as well as for compressed air supply
> Suitable filters or collection vessels available as accessories

> See page 574

Examples of use

> Gentle product feeding thanks to axial arrangement of inlet and outlet
> Vacuum supply for vacuum cups used to handle porous workpieces, or for a high degree of leakage
> Electricity-free alternative to motor-driven vacuum pumps or side channel blowers
> Continual operation without heat development as there are no moving parts

Functional principle



Feed ejectors - rotatable

High suction power for handling with high leakage

ALSO AVAILABLE IN STAINLESS STEEL FOR FOOD INDUSTRY OR ABRASIVE MEDIA

Product Description

> High suction power for safe handling of air-permeable products or generally in the presence of high leakage
> Gentle transportation of powdery substances or small-size products such as granular material, coffee, flour
> Extraction of non-aggressive vapors and gases
> Volume of suction air and required vacuum level can be adjusted by turning the suction pipe, allowing for an energy efficient increase in performance without increasing air consumption
> Can even be used in rough conditions thanks to the robust, maintenance-free construction without moving parts
> No build-up of heat because of no moving parts and therefore no risk of ignition during transport
> High maximum vacuum level for over coming larger height differences
> Stainless steel designs for easy cleaning when transporting foods and for handling abrasive media
> Extremely flexible integration into gripper systems thanks to any mounting position

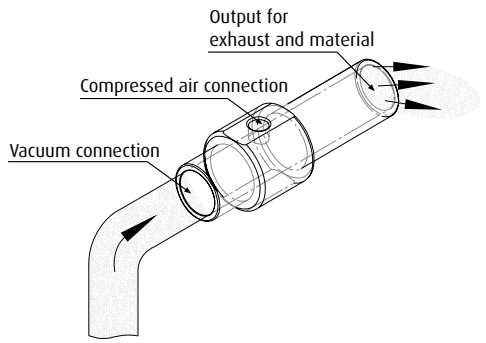
Notes

> The transport length depends on the feed pressure, the transport volume and the transport goods
> Rule of thumb:
- Tubing length from suction point to ejector ~ 2/3 of the total tubing length
- Tubing length from ejector to point of use ~ 1/3 of the total tubing length
> Prior to installation a test at customer site is recommended
> For longer distances, multiple ejectors can be serially connected

Technical data

Item no.	Nozzle diameter [mm]	Pressure range [bar]	Optimal feed pressure [bar]	Final vacuum [mbar]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Material	Suitable silencers
65.701	7	4 - 7	5	850	0 - 284	0 - 235	-20 - 80	105	Aluminium anodised	72.029 (p.577)
65.711	10	4 - 7	5	850	0 - 848	0 - 481	-20 - 80	275	Aluminium anodised	72.031 (p.577)
65.731	20	4 - 7	5	850	0 - 3,402	0 - 1,246	-20 - 80	550	Aluminium anodised	72.033 (p.577)
65.701-S	7	4 - 7	5	850	0 - 284	0 - 235	-20 - 80	300	Stainless steel	72.029 (p.577)
65.711-S	10	4 - 7	5	850	0 - 848	0 - 481	-20 - 80	700	Stainless steel	72.031 (p.577)
65.731-S	20	4 - 7	5	850	0 - 3,402	0 - 1,246	-20 - 80	1,500	Stainless steel	72.033 (p.577)

Functional principle



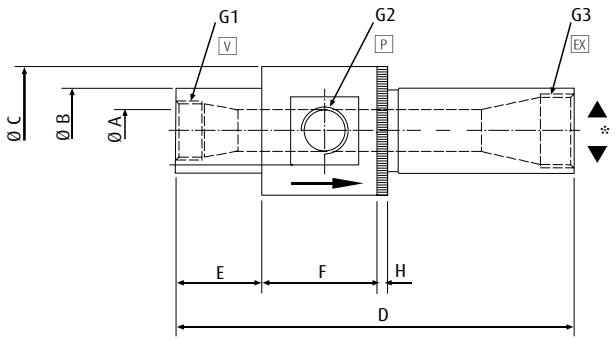
Air consumption [Nl/min] at vacuum level (feed pressure 5.5 bar)

Item no.	17 %	34 %	50 %	68 %	84 %
65.701	112	169	233	276	342
65.711	176	327	485	595	825
65.731	650	875	1250	1790	2550
65.701-S	112	169	233	276	342
65.711-S	176	327	485	595	825
65.731-S	650	875	1250	1790	2550

Suction power [Nl/min] at vacuum level (feed pressure 5.5 bar)

Item no.	17 %	34 %	50 %	68 %	84 %
65.701	280	240	200	162	125
65.711	846	735	620	520	395
65.731	3390	2460	1970	1440	1130
65.701-S	280	240	200	162	125
65.711-S	846	735	620	520	395
65.731-S	3390	2460	1970	1440	1130

Dimensions



V = Vacuum connection P = Compressed air connection EX = Exhaust outlet * = rotatable

Item no.	G1	G2	G3	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	H [mm]
65.701	G1/4	G1/8	G1/4	7	18.8	32	94 - 105	22	31.5	5
65.711	G1/2	G3/8	G1/2	10	25.1	51	155 - 165	38.1	44.2	5
65.731	G3/4	G1/2	G1	20	37.8	58	175 - 189	38.1	56.4	5
65.701-S	G1/4	G1/8	G1/4	7	18.8	32	94 - 105	22.1	31.5	5
65.711-S	G1/2	G3/8	G1/2	10	25.1	51	155 - 165	38.1	44.2	5
65.731-S	G3/4	G1/2	G1	20	37.8	58	175 - 189	38.1	56.4	5

Feed ejectors - with a large passage

Very high suction power for high transportation throughput

Product Description

> Very high suction power for high transportation throughput
> Gentle transportation of powdery substances or small-size products such as granular material, pills, chippings
> Extraction of non-aggressive vapors and gases
> Can even be used in rough conditions thanks to the robust, maintenance-free construction
> No build-up of heat because of no moving parts and therefore no risk of ignition during transport
> Extremely flexible integration into gripper systems thanks to any mounting position

Notes

> The transport length depends on the feed pressure, the transport volume and the transport goods
> Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
> Prior to installation a test at customer site is recommended
> For longer distances, multiple ejectors can be serially connected

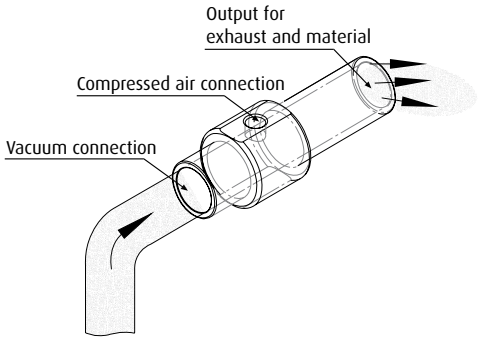
Ordering notes

> Mounting options:
65.752: Connections for vacuum and outlet on both sides using G3/8 female thread (see drawing)

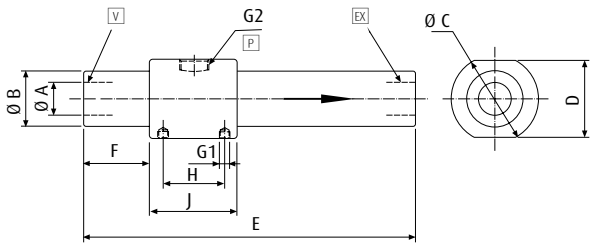
Technical data

Item no.	Nozzle diameter [mm]	Pressure range [bar]	Max. feed pressure [bar]	Final vacuum [mbar]	Suction power at 5.5 bar [Nl/min]	Air consumption at 2.8 bar [Nl/min]	Air consumption at 5.5 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Material	Suitable silencers
65.742	7	2.5 - 6	7	260	295	85	160	-10 - 80	92	Aluminium anodised	--
65.752	10	2.5 - 6	7	160	425	95	170	-10 - 80	81	Aluminium anodised	72.030 (p.577)
65.762	13	2.5 - 6	7	350	870	395	680	-10 - 80	177	Aluminium anodised	--
65.772	19	2.5 - 6	7	280	1,825	790	1,365	-10 - 80	380	Aluminium anodised	--
65.792	38	2.5 - 6	7	90	4,400	405	695	-10 - 80	607	Aluminium anodised	--
65.802	38	2.5 - 6	7	90	5,610	790	1,356	-10 - 80	777	Aluminium anodised	--

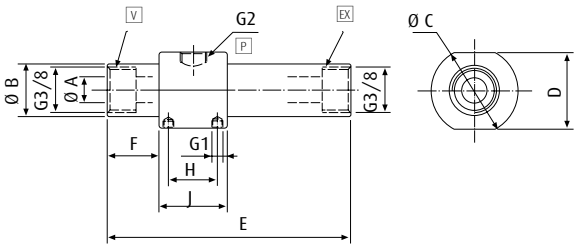
Functional principle



Dimensions



65.742 | 65.762 | 65.772 | 65.792 | 65.802



65.752

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Item no.	G1	G2	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	H [mm]	J [mm]
65.742	M4	G1/8	6.5	18.5	32	30	89	19	18	25
65.752	M4	G1/8	9.5	18.5	32	30	89	19	18	25
65.762	M4	G1/4	12.5	24	38	34	140	25.5	23	32
65.772	M6	G3/8	19	32	50	45	190	38	35	50
65.792	M6	G3/8	38	50	69	65	205	40	42	60
65.802	M6	G3/8	38	50	69	65	205	40	42	60

Feed ejectors EFO - with a small passage

Compressed air connection via quick fittings, outlet via R-threads, exhaust via R-threads or quick fittings

Exhaust via R-threads

Exhaust via tubing connection

V = Vacuum connection P = Compressed air connection EX = Output

Product Description

> Transport of powdery or granular materials
> Extraction of non-aggressive vapors and gases
> Medium vacuum level for overcoming larger height differences
> No build-up of heat because of no moving parts and therefore no risk of ignition during transport
> Maximum availability thanks to robust, maintenance-free design
> Rotatable, angled compressed air connection and any mounting position for flexible system integration

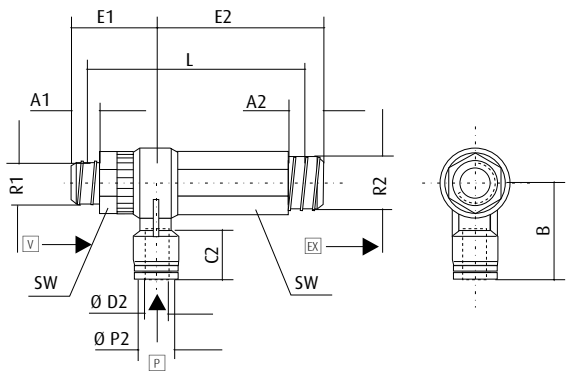
Notes

> The transport length depends on the feed pressure, the transport volume and the transport goods
> Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
> Prior to installation a test at customer site is recommended
> For longer distances, multiple ejectors can be serially connected

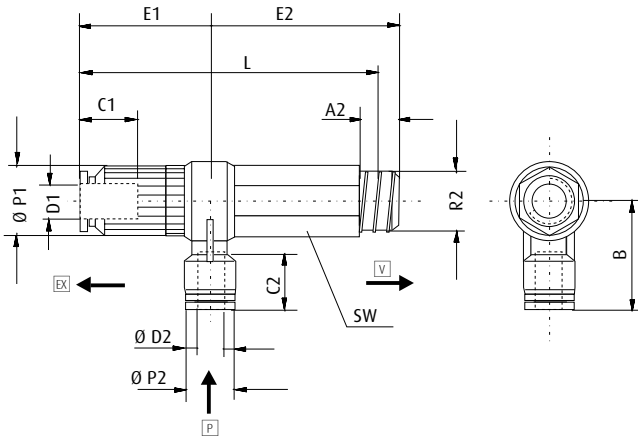
Technical data

Item no.	Series	Nozzle diameter [mm]	Optimal feed pressure [bar]	Pressure range [bar]	Ø Free passage [mm]	Final vacuum [%]	Suction power at 5 bar [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Material
EFO.30L.1	With R-thread	3	5	0 - 10	2.3	52	50	50	0 - 60	41	Aluminium anodised
EFO.40L.1	With R-thread	4	5	0 - 10	3.6	52	100	100	0 - 60	81	Aluminium anodised
EFO.60L.1	With R-thread	6	5	0 - 10	5.5	52	200	200	0 - 60	190	Aluminium anodised
EFO.75L.1	With R-thread	7.5	5	0 - 10	7	52	300	300	0 - 60	193	Aluminium anodised
EFO.30L.2	With tubing connection	3	5	0 - 10	2.3	52	50	50	0 - 60	37.5	Aluminium anodised
EFO.40L.2	With tubing connection	4	5	0 - 10	3.6	52	100	100	0 - 60	77	Aluminium anodised
EFO.60L.2	With tubing connection	6	5	0 - 10	5.5	52	200	200	0 - 60	182	Aluminium anodised
EFO.75L.2	With tubing connection	7.5	5	0 - 10	7	52	300	300	0 - 60	183	Aluminium anodised

Dimensions



EFO.30L.1 | EFO.40L.1 | EFO.60L.1 | EFO.75L.1



EFO.30L.2 | EFO.40L.2 | EFO.60L.2 | EFO.75L.2

V = Vacuum connection P = Compressed air connection EX = Output

Item no.	R1	R2	A1 [mm]	A2 [mm]	B [mm]	C1 [mm]	C2 [mm]	Ø D1 [mm]	Ø D2 [mm]	E1 [mm]	E2 [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]	SW
EFO.30L.1	R1/8	R1/8	8	8	25	--	16.5	--	6	23	36	51	--	12.5	14
EFO.40L.1	R1/4	R1/4	11	11	29	--	17.5	--	8	29.5	53	70	--	14.5	17
EFO.60L.1	R3/8	R1/2	12	15	34	--	20	--	10	35	69.5	90	--	17.5	22
EFO.75L.1	R1/2	R1/2	15	15	34	--	20	--	10	38	69.5	91.5	--	17.5	24
EFO.30L.2	--	R1/8	--	8	25	17.5	16.5	8	6	30	36	62	16	12.5	14
EFO.40L.2	--	R1/4	--	11	29	20	17.5	10	8	35.5	53	82.5	20	14.5	17
EFO.60L.2	--	R1/2	--	15	34	23.5	20	12	10	43.5	69.5	105	25	17.5	24
EFO.75L.2	--	R1/2	--	15	34	25	20	16	10	45	69.5	106.5	25	17.5	24

Feed ejectors EFO - with a small passage

Compressed air, vacuum and exhaust side with quick fittings

V = Vacuum connection P = Compressed air connection EX = Output

Product Description

> Transport of powdery or granular materials
> Extraction of non-aggressive vapors and gases
> Medium vacuum level for overcoming larger height differences
> No build-up of heat because of no moving parts and therefore no risk of ignition during transport
> Maximum availability thanks to robust, maintenance-free design
> Rotatable, angled compressed air connection and any mounting position for flexible system integration

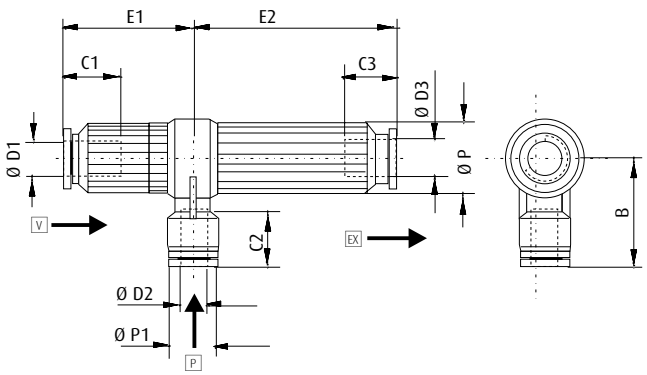
Notes

> The transport length depends on the feed pressure, the transport volume and the transport goods
> Rule of thumb:
- Tubing length from suction point to ejector ~ 2/3 of the total tubing length
- Tubing length from ejector to point of use ~ 1/3 of the total tubing length
> Prior to installation a test at customer site is recommended
> For longer distances, multiple ejectors can be serially connected

Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Pressure range [bar]	Ø Free passage [mm]	Final vacuum [%]	Suction power at 5 bar [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]
EFO.30L.3	3	5	0 - 10	2.3	52	50	50	0 - 60	49
EFO.40L.3	4	5	0 - 10	3.6	52	100	100	0 - 60	101.5
EFO.60L.3	6	5	0 - 10	5.5	52	200	200	0 - 60	186
EFO.75L.3	7.5	5	0 - 10	7	52	300	300	0 - 60	176.5

Dimensions



V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Item no.	Ø D1 [mm]	Ø D2 [mm]	Ø D3 [mm]	B [mm]	C1 [mm]	C2 [mm]	C3 [mm]	E1 [mm]	E2 [mm]	Ø P [mm]	Ø P1 [mm]
EFO.30L.3	8	6	8	25	17.5	16.5	17.5	30	55	16	12.5
EFO.40L.3	10	8	12	29	20	17.5	23.5	35.5	76.5	20	14.5
EFO.60L.3	12	10	16	34	23.5	20	25	43.5	74.5	25	17.5
EFO.75L.3	16	10	16	34	25	20	25	45	74.5	25	17.5

Open silencers for ejectors

Product Description

> Suitable for Heavy-duty ejectors or inline ejectors EIL, expandable
> Open design, specially suitable for dusty, high-particle environments (e.g. wood industry)

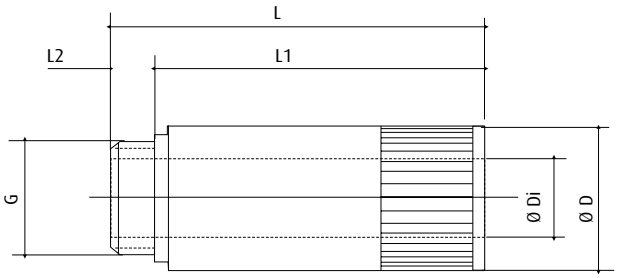
Technical data

Item no.	Weight [g]
72.028	3
72.029	20
72.030	25
72.031	35
72.032	55
72.033	175

Dimensions

G	Ø D [mm]	Ø Di [mm]	L [mm]	L1 [mm]	L2 [mm]
G1/8	14	7	46	41	5
G1/4	20	11	73	65	8
G3/8	24	11	72	64	8
G1/2	30	17	128	121	7
G3/4	40	17	126	119	7
G1	49	26	126	119	7

Dimensions



Closed silencers for ejectors

Product Description

> Closed diffusor / silencer specially designed for dust-free environments
> Suitable for Heavy-duty ejectors or inline ejectors EIL, expandable

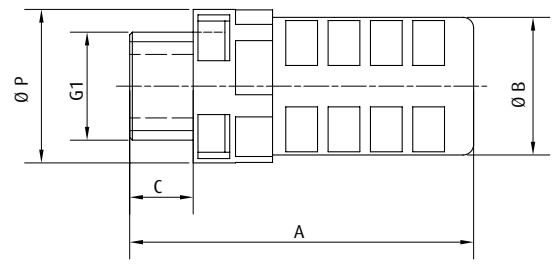
Technical data

Item no.	Weight [g]
72.045	5
72.000	2
72.001	3.5
72.002	12
72.003	15
72.007	5.5
72.008	3
72.009	6.5

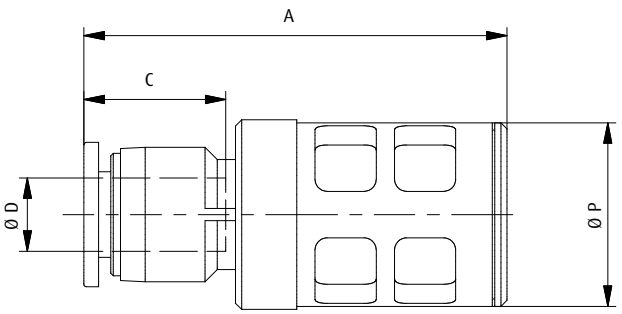
Dimensions

G1	Ø D [mm]	A [mm]	Ø B [mm]	C [mm]	Ø P [mm]
M5	--	36	18	5.1	--
G1/8	--	28	15.5	6	15.5
G1/4	--	38	17.5	8	17.5
G3/8	--	58	26	10	26.5
G1/2	--	66	29	12	29
--	4	30	--	11	10.5
--	6	34.5	--	11.5	15.5
--	8	48.5	--	17.5	17.5

Dimensions



72.045 | 72.000 | 72.001 | 72.002 | 72.003



72.007 | 72.008 | 72.009

Phone +49 (0)89 / 96 24 89-0

Silencers with filter function

Series 1: Brass construction with stainless steel wire fabric

Series 2: Brass construction with sintered material

Product Description

> Combination of silencer and air filter
> 72.015 - 72.021: Also suitable as protective filter for 3/2-way valves at ventilation / blow-off inlet (under contaminated environmental conditions)
> 72.022 - 72.027: Can be mounted directly into the vacuum cup or the fitting, temperature resistant up to 120 °C

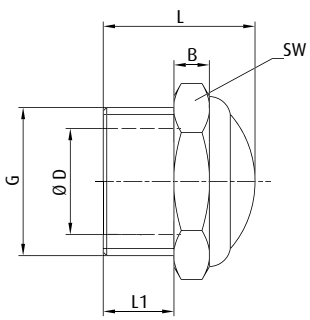
Technical data

Item no.	Series	Weight [g]
72.015	1	2
72.016	1	6
72.017	1	10
72.018	1	15
72.019	1	25
72.020	1	38
72.021	1	56
72.022	2	1
72.022-1*	2	1
72.023	2	3
72.024	2	6
72.025	2	12
72.026	2	16
72.027	2	29

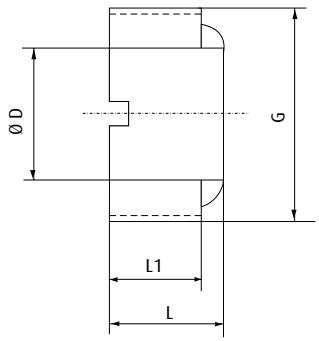
Dimensions

G	B [mm]	Ø D [mm]	L [mm]	L1 [mm]	SW
M5	3.5	2.5	9.5	4	8
G1/8	4	6	14	6	13
G1/4	5	8.5	18.5	8	16
G3/8	6	11	19.5	8	19
G1/2	5	15	22.5	10	24
G3/4	6	20	25.5	10	30
G1	6.5	26	31	11.5	36
G1/8	--	5.5	4.5	3.5	--
G1/8	--	5.5	5	3.5	--
G1/4	--	7	6.8	4.5	--
G3/8	--	9.5	6.8	5	--
G1/2	--	12	9	7	--
G3/4	--	18	9	6.5	--
G1	--	23.5	10.5	7.5	--

Dimensions



72.015 | 72.016 | 72.017 | 72.018 | 72.019 | 72.020 | 72.021



72.022 | 72.022-1* | 72.023 | 72.024 | 72.025 | 72.026 | 72.027

* = Special design: Coarse filter with mesh opening size 0.4 mm

FIPA Rotary vane vacuum pumps

Rotary vane vacuum pumps - oil-free

> Handling of dense workpieces in dry areas
> Suitable for load alternation and continuous operation
> Available in single-phase and three-phase designs
> Any installation position
> Very low maintenance

> See page 582

Piston pumps

> Small output at compact design
> Suitable for dry and wet areas
> Long-life and low maintenance thanks to the permanently lubricated piston seals
> Oil-free operation
> Also suitable as compressors

> See page 592

Rotary vane vacuum pumps - oil-lubricated

> Handling dense and porous workpieces
> Partially suitable for applications in wet areas
> Suitable for continuous operation in product-dependent vacuum levels
> Available in single-phase and three-phase designs
> Horizontal installation position

> See page 594

Centralised vacuum units

> Supply of several modules via a central station
> Made up of one to three oil-lubricated vacuum pumps
> Incl. vacuum tank and electronic control

> See page 606

FIPA rotary vane vacuum pumps

Accessories

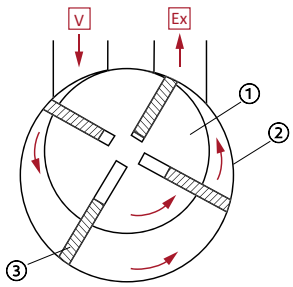
Vacuum tanks

> As storage device for compressed air, vacuums and non-aggressive liquids
> Efficient compressed air/vacuum usage (energy saving, protection of the unit)
> For compressed air/vacuum systems with highly fluctuating consumption

> See page 617

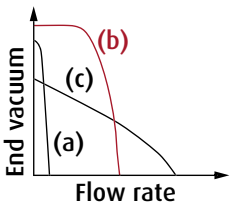
Vacuum generation according to the displacement principle

> A cylindrical rotor ① rotates eccentrically in a circular cavity ②.
> The rotary vanes ③ are pushed against the outer walls of the cavity by centrifugal force, sealing the chambers that are created by this motion.
> During rotation, the expanding chambers draw in air on the vacuum side V.
> The suctioned aspirated air is then released via the exhaust EX.



Performance characteristics

(a) Characteristic of ejectors
(b) Rotary vane vacuum pumps achieve a very good ultimate vacuum along with a high flow volume
(c) Characteristic of side channel blowers



Rotary vane vacuum pumps - oil-free

Handling in dry areas

Product Description

> High reliability and low maintenance costs owing to simple design
> Universal application: Continuous operation at different vacuum levels
> Compact design and low weight

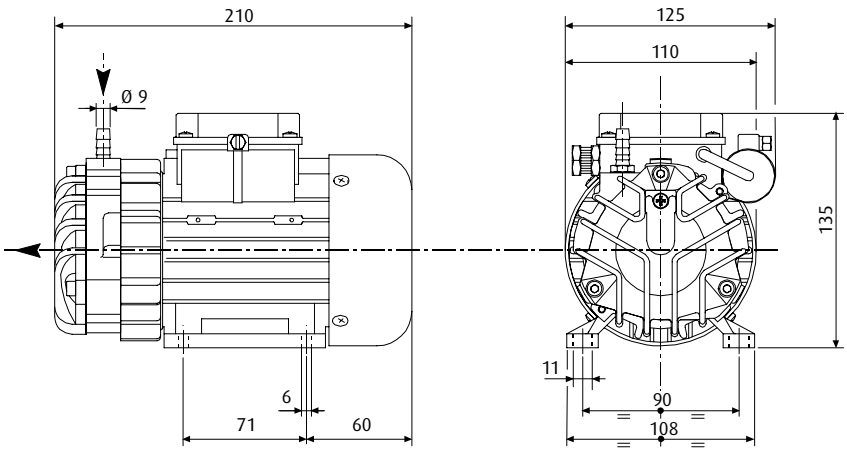
Ordering notes

> Available in single-phase and three-phase designs (Index -1 or -3)
> Included in scope of delivery:
  - Silencer on suction side
  - DT.3C-1: Thermal protection 130 °C
  - DT.6, DT.10: Safety filter on suction side
> Delivery without electric cables

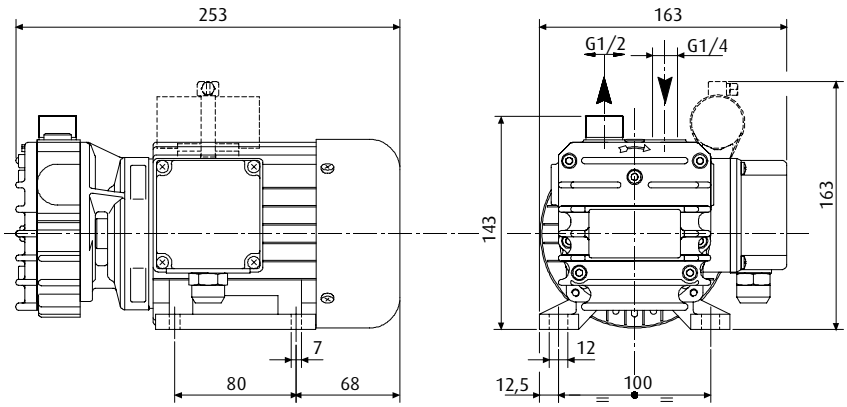
Technical data

Item no.	DT.3A-1	DT.3A-3	DT.6B-1	DT.6B-3	DT.10B-1	DT.10B-3
Suction power at 50 Hz [m³/h]	3	3	6	6	10	10
Suction power at 60 Hz [m³/h]	3.3	3.3	7	7	12	12
Final vacuum [%]	88	88	88	88	88	88
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	1 (1.1)	Delta: 0.7-0.8 (0.7) Star: 0.4-0.46 (0.38-0.42)	2.3 (2.5)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)	2.9 (2.7)	Delta: 1.8-2.3 (1.6-2.3) Star: 1-1.3 (0.9-1.3)
Rated power at 50 Hz [kW]	0.12	0.12	0.25	0.25	0.37	0.37
Rated power at 60 Hz [kW]	0.15	0.14	0.3	0.3	0.45	0.45
Noise level at 50 Hz [dB(A)]	62	62	60	60	64	64
Noise level at 60 Hz [dB(A)]	65	65	65	65	66	66
Operating temperature at 50 Hz [°C]	65 - 70	65 - 70	65 - 70	65 - 70	70 - 75	70 - 75
Operating temperature at 60 Hz [°C]	70 - 75	70 - 75	70 - 75	70 - 75	80 - 85	80 - 85
Weight [kg]	5	5	8.5	7.5	15.5	14
Suitable accessories	Spare part kit KIT-DT.3A* Vacuum regulator 73.002 (p.640) Pre-filter FC 10F (p.624) Pre-filter 71.032 (p.625)		Spare part kit KIT-DT.6B** Vacuum regulator 73.002 (p.640) Pre-filter FC 10F (p.624) Pre-filter 71.032 (p.625)		Spare part kit KIT-DT.10B*** Vacuum regulator 73.002 (p.640) Pre-filter FC 20F (p.624) Pre-filter 71.034 (p.625)	

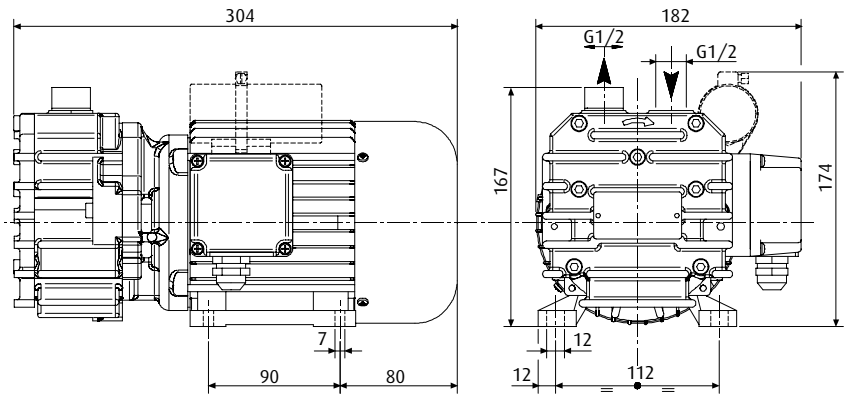
Dimensions



DT.3A-1 | DT.3A-3



DT.6B-1 | DT.6B-3



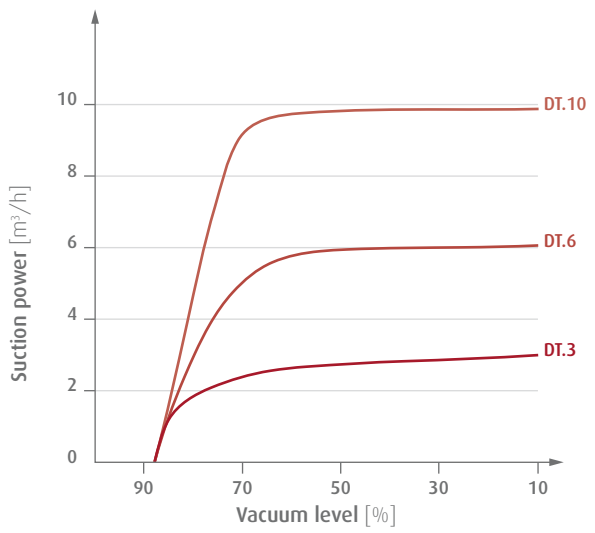
DT.10B-1 | DT.10B-3

* = 3 vanes, rotor ** = 4 vanes, rotor *** = 6 vanes, rotor

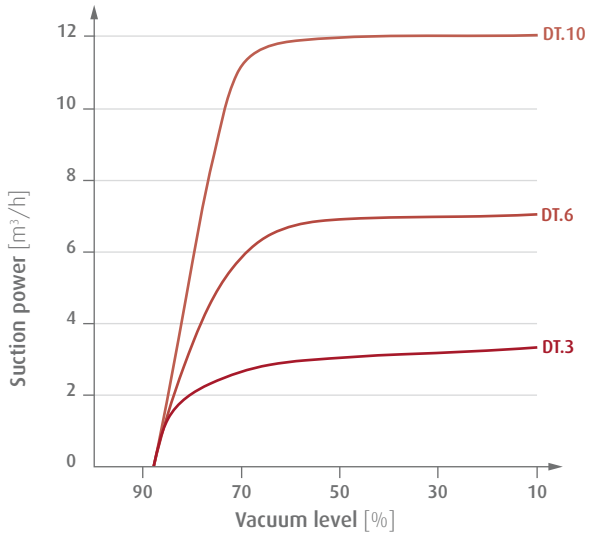
Continued on the next page

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-free

Handling in dry areas

Product Description

> High reliability and low maintenance costs owing to simple design
> Universal application: Continuous operation at different vacuum levels
> Cooling with powerful fan at the rear of the motor
> Compact design and low weight

Ordering notes

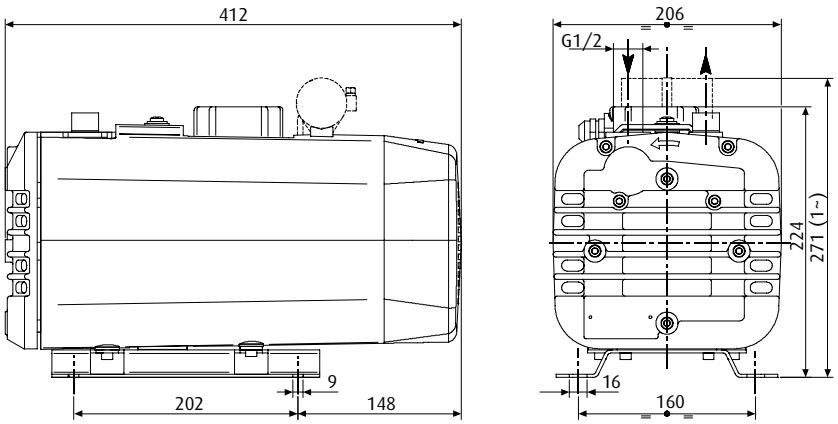
> Available in single-phase and three-phase designs (Index -1 or -3)
> Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
> Electric cables not included

Technical data

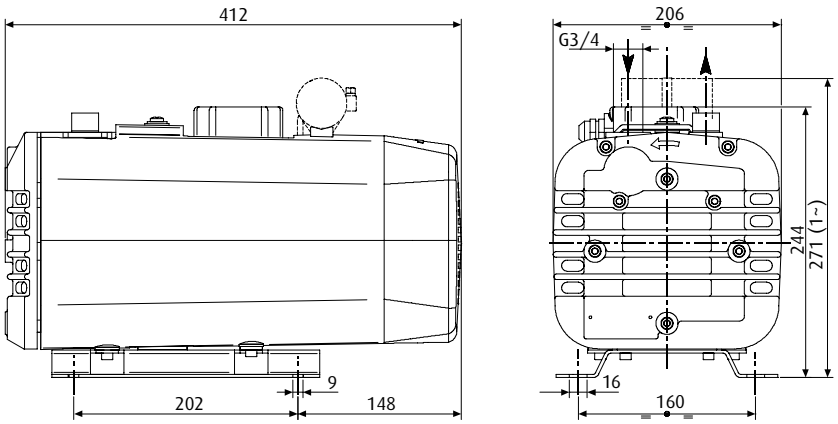
Item no.	DT.16B-1	DT.16B-3	DT.25B-1	DT.25B-3	DT.40B-1	DT.40B-3
Suction power at 50 Hz [m^3/h]	16	16	25	25	40	40
Suction power at 60 Hz [m^3/h]	19	19	29	29	46	46
Final vacuum [%]	88	88	88	88	88	88
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	5.6 (5)	Delta: 2,8-3 (3.8-3.2) Star: 1.6-1.7 (2.2-1.8)	5.8 (6.2)	Delta: 3.8-4.2 (4.4-4.2) Star: 2.2-2.4 (2.5-2.4)	9.8 (9)	Delta: 7 (7.1-7) Star: 4 (4.1-4.0)
Rated power at 50 Hz [kW]	0.66	0.55	0.75	0.75	1.5	1.5
Rated power at 60 Hz [kW]	0.72	0.66	0.9	0.9	1.8	1.8
Noise level at 50 Hz [dB(A)]	63	63	65	65	68	68
Noise level at 60 Hz [dB(A)]	65	65	67	67	70	70
Operating temperature at 50 Hz [°C]	55 - 60	55 - 60	65 - 70	65 - 70	75 - 80	75 - 80
Operating temperature at 60 Hz [°C]	60 - 65	60 - 65	70 - 75	70 - 75	80 - 85	80 - 85
Weight [kg]	29.5	27.5	29	28.5	40	37.5
Suitable accessories	Spare part kit KIT-DT.16B* Vacuum regulator 73.002 (p.640) Pre-filter FC 20F (p.624)		Spare part kit KIT-DT.25B* Vacuum regulator 73.003 (p.640) Pre-filter FC 25F (p.624)		Spare part kit KIT-DT.40B* Vacuum regulator 73.003 (p.640) Pre-filter FC 30F (p.624)	

Continued on the next page

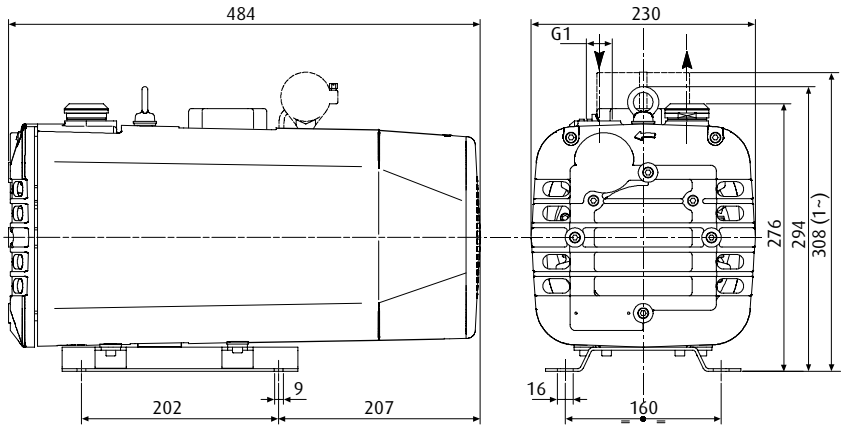
Dimensions



DT.16B-1 | DT.16B-3



DT.25B-1 | DT.25B-3



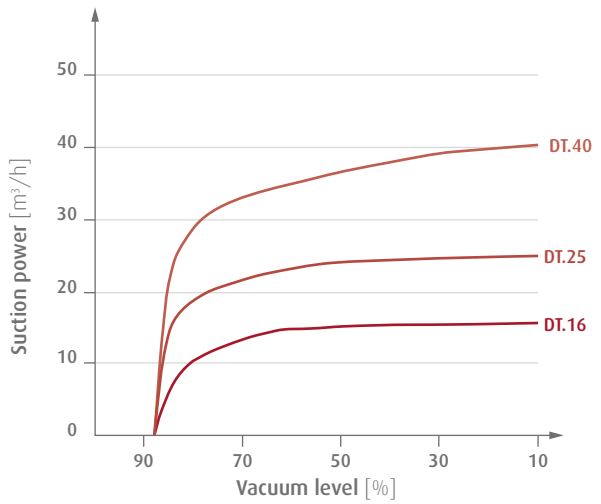
DT.40B-1 | DT.40B-3

* = 4 vanes, filter cartridge

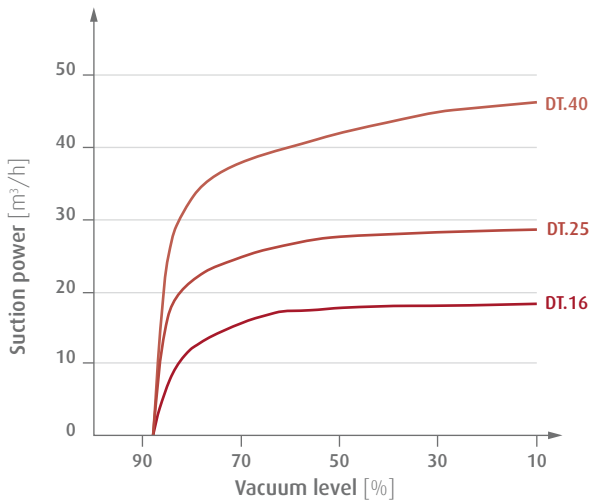
Phone +49 (0)89 / 96 24 89-0

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-free

Handling in dry areas

Product Description

> High reliability and low maintenance costs owing to simple design
> Universal application: Continuous operation at different vacuum levels
> Compact design due to robust protective housing that also reduces the sound level
> DT.60C-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use

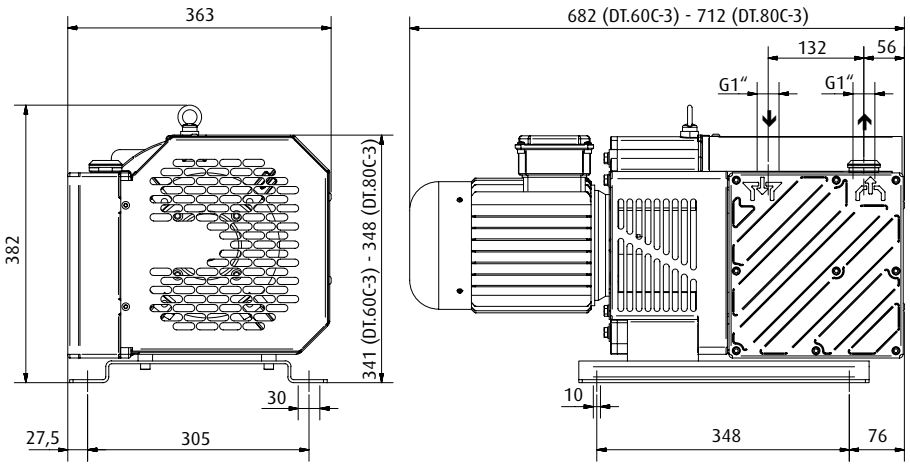
Ordering notes

> Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
> Electric cables not included

Technical data

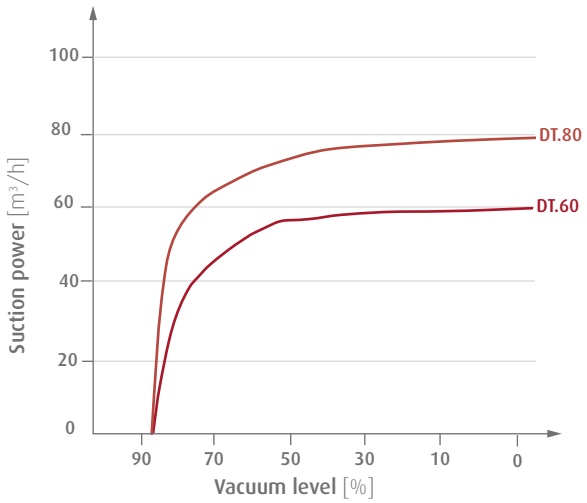
Item no.	DT.60C-3	DT.80C-3
Suction power at 50 Hz [m^3/h]	60	80
Suction power at 60 Hz [m^3/h]	70	90
Final vacuum [%]	88	88
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 5.91 (5.6) Star: 3.4 (3.23)	Delta: 8.8 (9) Star: 5.1 (5.2)
Rated power at 50 Hz [kW]	1.5	2.2
Rated power at 60 Hz [kW]	1.8	2.7
Noise level at 50 Hz [dB(A)]	70	72
Noise level at 60 Hz [dB(A)]	72	74
Operating temperature at 50 Hz [°C]	70 - 73	72 - 78
Operating temperature at 60 Hz [°C]	72 - 75	75 - 80
Weight [kg]	66	71
Suitable accessories	Spare part kit KIT-DT.60C Silencer 72.003 (p.578) Pre-filter FC 30F (p.624)	Spare part kit KIT-DT.80C Silencer 72.003 (p.578) Pre-filter FC 35F (p.624)

Dimensions

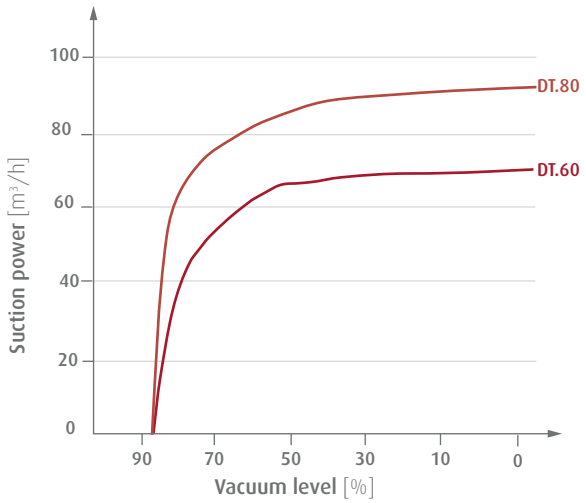


Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-free

Handling in dry areas

Product Description

> High reliability and low maintenance costs owing to simple assembly
> Universal application: Continuous operation at different vacuum levels
> Compact design due to robust protective housing that also reduces the sound level
> Universal motor according to IE class 2 with wide voltage spectrum for worldwide use

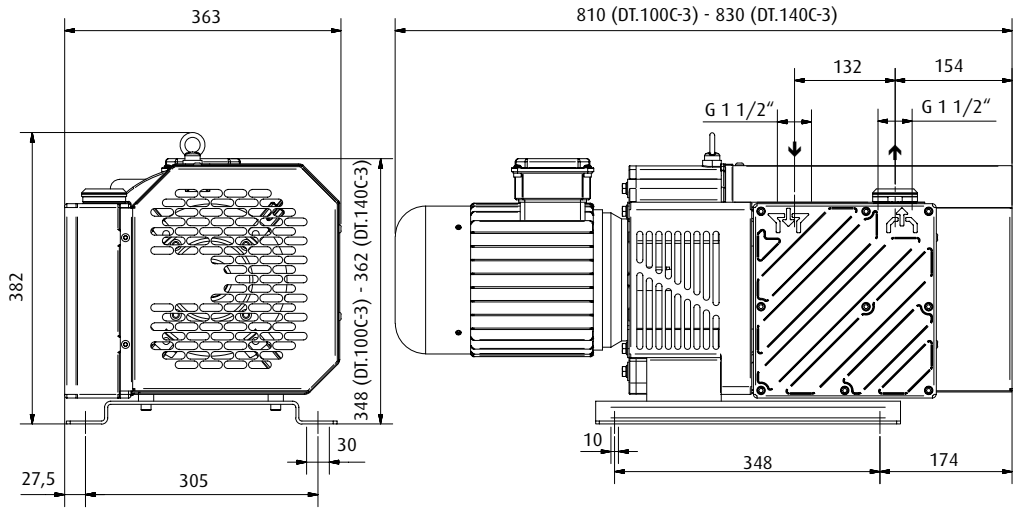
Ordering notes

> Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
> Electric cables not included

Technical data

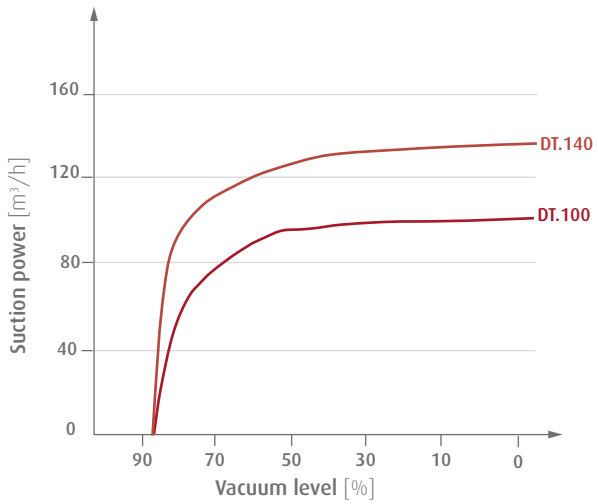
Item no.	DT.100C-3	DT.140C-3
Suction power at 50 Hz [m^3/h]	100	130
Suction power at 60 Hz [m^3/h]	115	150
Final vacuum [%]	88	88
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 11.8 (11.4) Star: 6.8 (6.6)	Delta: 14.7 (13.5) Star: 8.5 (7.8)
Rated power at 50 Hz [kW]	3	4
Rated power at 60 Hz [kW]	3.6	4.8
Noise level at 50 Hz [dB(A)]	75	76
Noise level at 60 Hz [dB(A)]	77	78
Operating temperature at 50 Hz [°C]	78 - 82	80 - 83
Operating temperature at 60 Hz [°C]	80 - 85	85 - 90
Weight [kg]	87	95
Suitable accessories	Spare part kit KIT-DT.100C Pre-filter FC 40F (p.624)	Spare part kit KIT-DT.140C Pre-filter FC 50F (p.624)

Dimensions

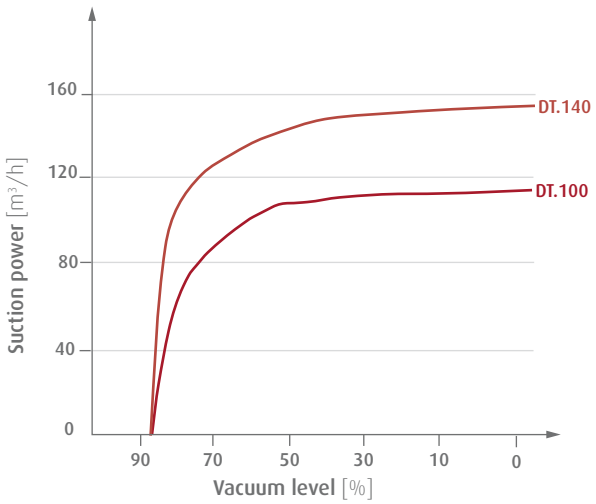


Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Piston pumps

Product Description

> High volume flow and high vacuum level at low installation space
> Can also be used as compressor
> Low-vibration operation
> Robust design
> Long service life and maintenance-free operation due to permanently lubricated piston seals
> Suitable for dry and moist air

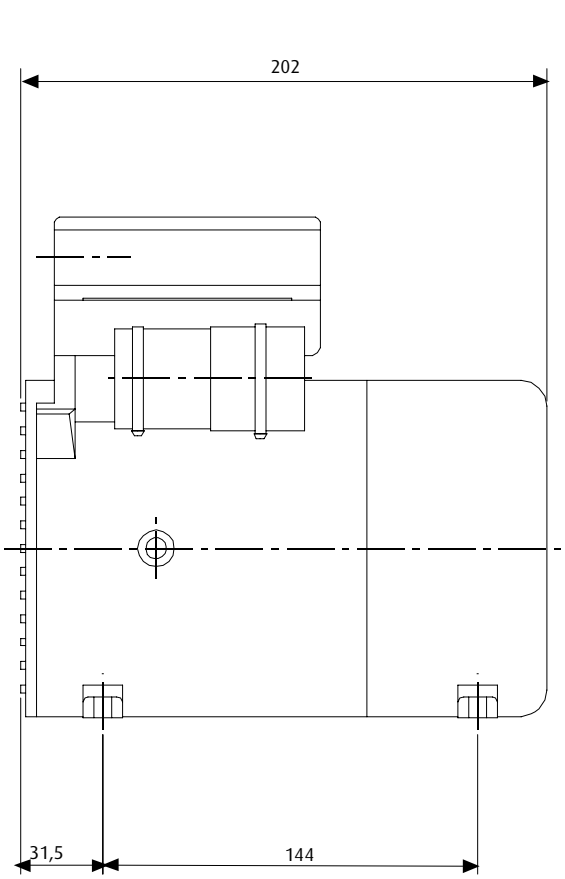
Notes

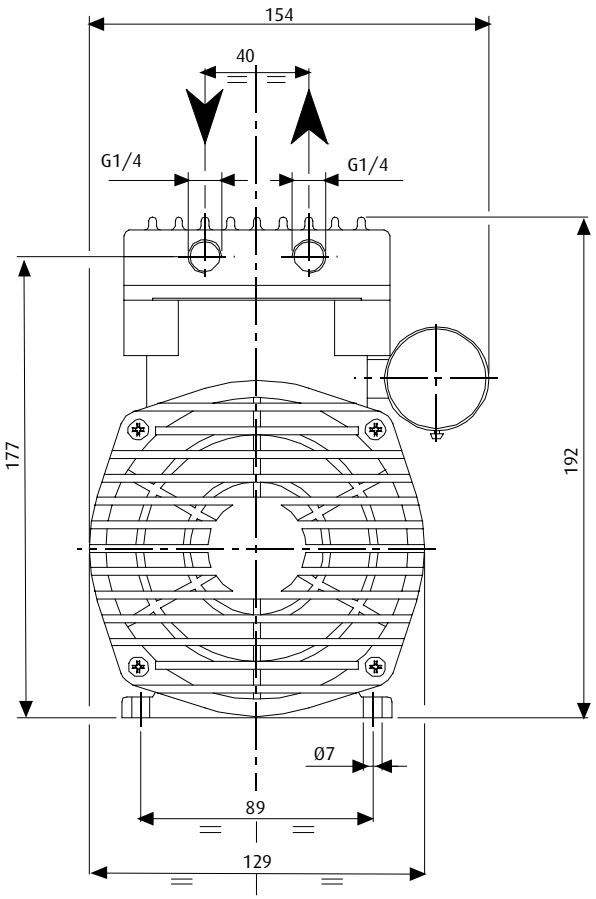
> A 3/2-way valve must be installed at the inlet in case of pressure-vacuum alternating operation

Technical data

Item no.	KE.1.9A-1
Suction power at 50 Hz [m³/h]	1.9
Suction power at 60 Hz [m³/h]	2.2
Final vacuum [%]	89
Power supply [V]	220 - 240
Rated power at 50 Hz [kW]	0.2
Noise level at 50 Hz [dB(A)]	50
Noise level at 60 Hz [dB(A)]	52
Operating temperature [°C]	40 - 45
Weight [kg]	7.1
Suitable Pre-filters	FB 5 (p.626)

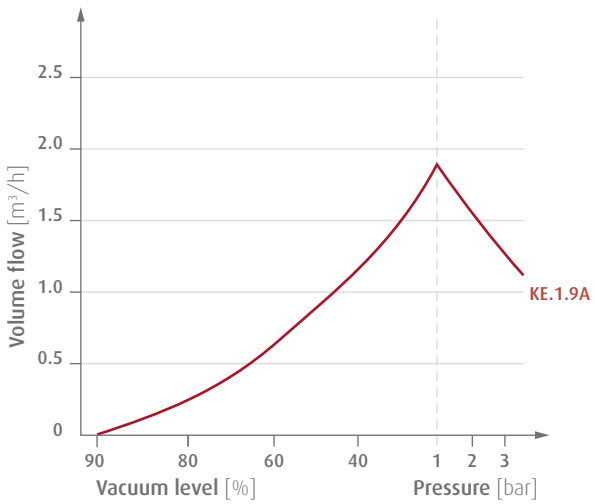
Dimensions





Diagrams

> Volume flow against pressure



Rotary vane vacuum pumps - oil-lubricated

Product Description

> Very high final vacuum level
> Drives with multi-range voltages
> Especially suited for the evacuation of small closed containers
> Efficient damping and oil recovery system prevents oil mist and reduces sound level
> Compact and lightweight design for low space requirements or installation on moving devices (sufficient ventilation needs to be ensured)
> Pump is cooled via mounting fan
> Horizontal mounting position

Notes

> Continuous operation only under full load (min. 99.8 % vacuum), otherwise, risk of oil discharge, no gas ballast
> For operation under moist conditions please consult FIPA

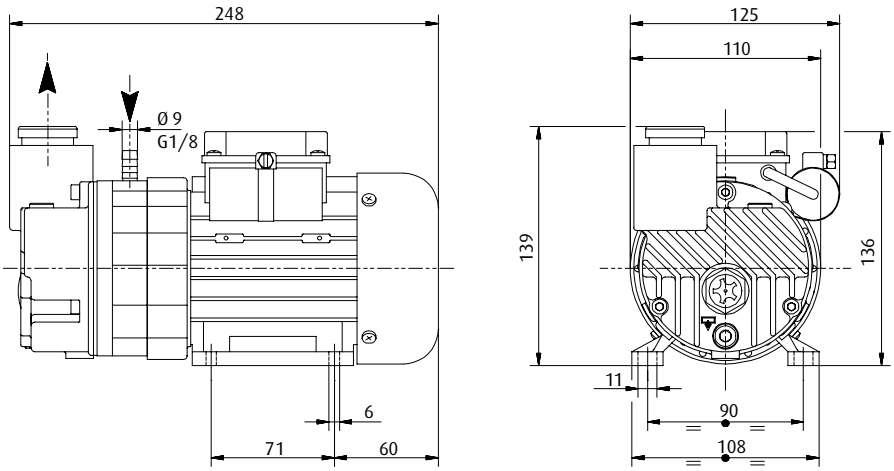
Ordering notes

> Available in single-phase and three-phase designs (Index -1 to -3)
> Included in scope of delivery: Condensate exhaust filter oil SW 40, thermal protection 130 °C (with single-phase motor)

Technical data

Item no.	DO.3B-1	DO.3B-3	DO.4B-1	DO.4B-3
Suction power at 50 Hz [m^3/h]	3	3	4	4
Suction power at 60 Hz [m^3/h]	3.2	3.2	4.4	4.4
Final vacuum [%]	99.8	99.8	99.8	99.8
Power supply +/- 5 % at 50 Hz [V]	220 - 240	Delta: 220-255 Star: 380-440	220 - 240	Delta: 220-255 Star: 380-440
Power supply +/- 5 % at 60 Hz [V]	220 - 240	Delta: 220-266 Star: 380-460	220 - 240	Delta: 220-266 Star: 380-460
Current consumption at 50 Hz [A]	1	Delta: 0.7-0.8 Star: 0.4-0.46	1	Delta: 0.7-0.8 Star: 0.4-0.46
Current consumption at 60 Hz [A]	1.1	Delta: 0.7 Star: 0.38-0.42	1.1	Delta: 0.7 Star: 0.38-0.42
Rated power at 50 (60) Hz [kW]	0.12 (0.15)	0.12 (0.14)	0.12 (0.15)	0.12 (0.14)
Noise level at 50 Hz [dB(A)]	56	56	57	57
Noise level at 60 Hz [dB(A)]	58	58	59	59
Operating temperature at 50 Hz [°C]	60 - 65	60 - 65	60 - 65	60 - 65
Operating temperature at 60 Hz [°C]	65 - 70	65 - 70	65 - 70	65 - 70
Weight [kg]	5.4	5.4	5.4	5.4
Suitable accessories	Spare part kit KIT-DO.3B/K*** Spare part kit KIT-DO.3B/G* Pre-filter FB 5 (p.626)		Spare part kit KIT-DO.4B/K*** Spare part kit KIT-DO.4B/G** Pre-filter FB 5 (p.626)	

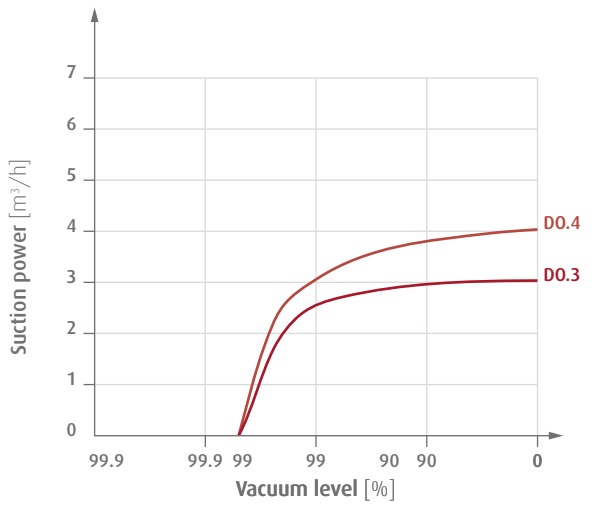
Dimensions



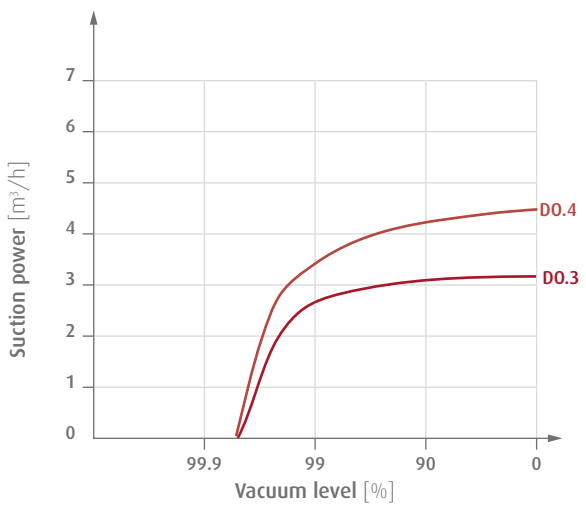
* = 6 x vanes, FKM O-Rings, oil recirculation valve, oil mist separator, filter
** = 6 x vanes, FKM O-Rings, seal, oil recirculation valve, oil mist separator, filter
*** = Oil mist separator, rubber washer, follower, 1 x filter cartridge, 1 x O-ring FKM

Diagrams

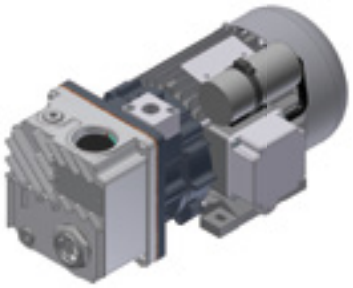
> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-lubricated



Product Description

> Very high final vacuum level
> Suitable for moist environments
> Effective damping and recovery system prevents oil mist and reduces sound level
> Innovative sealing system prevents oil recirculation at standstill under vacuum
> Compact design and low weight
> Horizontal mounting position

Notes

> Designed for continuous operation under vacuum levels of 60 % to 99 %, integrated gas ballast, water vapor tolerance

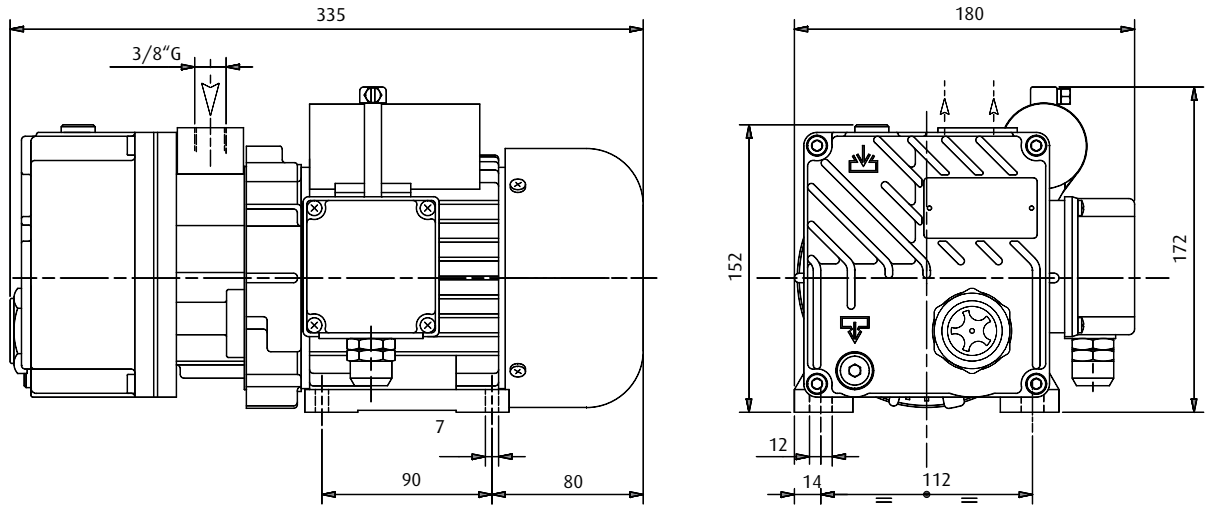
Ordering notes

> Available in single-phase and three-phase designs (Index -1 to -3)
> Included in scope of delivery: Condensate exhaust filter, gas ballast, oil SW 60, oil non-return valve

Technical data

Item no.	DO.5B-1	DO.5B-3
Suction power at 50 Hz [m^3/h]	5	5
Suction power at 60 Hz [m^3/h]	6	6
Final vacuum [%]	99	99
Gas ballast	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	30
Steam capacity [l/h]	0.11	0.11
Check valve	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	1.7 - 2.1	Delta: 1.8-2.3 (1.6-2.3) Star: 1-1.3 (0.9-1.3)
Rated power at 50 (60) Hz [kW]	0.25 (0.25)	0.37 (0.45)
Noise level at 50 (60) Hz [dB(A)]	58 (60)	58 (60)
Operating temperature [°C]	65 - 75	65 - 75
Weight [kg]	13	11.5
Suitable Spare-part-kits	KIT-DO.5B/G** KIT-DO.5B/K*	KIT-DO.5B/G** KIT-DO.5B/K*

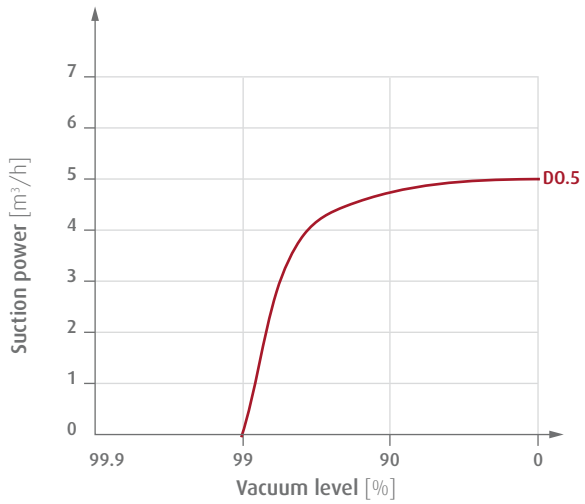
Dimensions



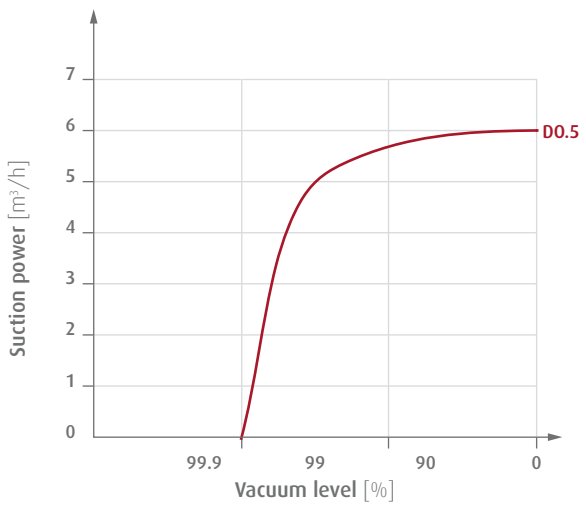
* = O-Ring 121 FKM, filter element ** = Shaft seal, 2 x O-Ring 3300 NBR, 3 x vanes, 2 x ejector, inlet shield, inlet rubber NBR, filter disk, NBR rubber for exhaust valve, 3 x copper washer, O-Ring 121 FKM, filter element, gasket, sintered filter G1/8

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-lubricated

Product Description

> Very high final vacuum level
> Effective damping and recovery system prevents oil mist and reduces sound level
> Innovative sealing system prevents oil recirculation at standstill under vacuum
> Compact design and low weight
> Horizontal mounting position

Notes

> DO.8: Continuous operation only under full load (min. 99.8 % vacuum), otherwise, risk of oil discharge, no gas ballast
> DO.8: For operation under moist conditions please consult FIPA
> DO.12: Designed for continuous operation for vacuum levels between 60 and 99.9 %, gas ballast available, can tolerate water vapor

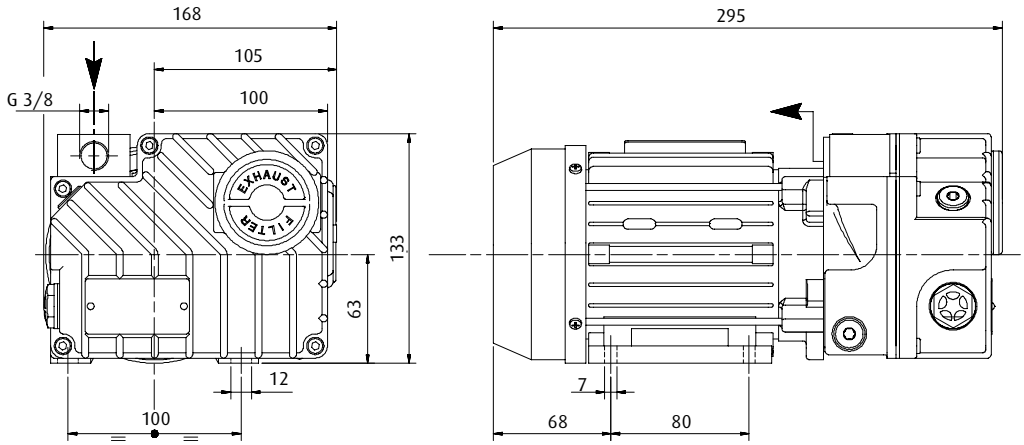
Ordering notes

> Available in single-phase and three-phase designs (Index -1 or -3)
> Included in scope of delivery: Condensate exhaust filter, gas ballast (with DO.12C-3), oil SW 40, oil non-return valve

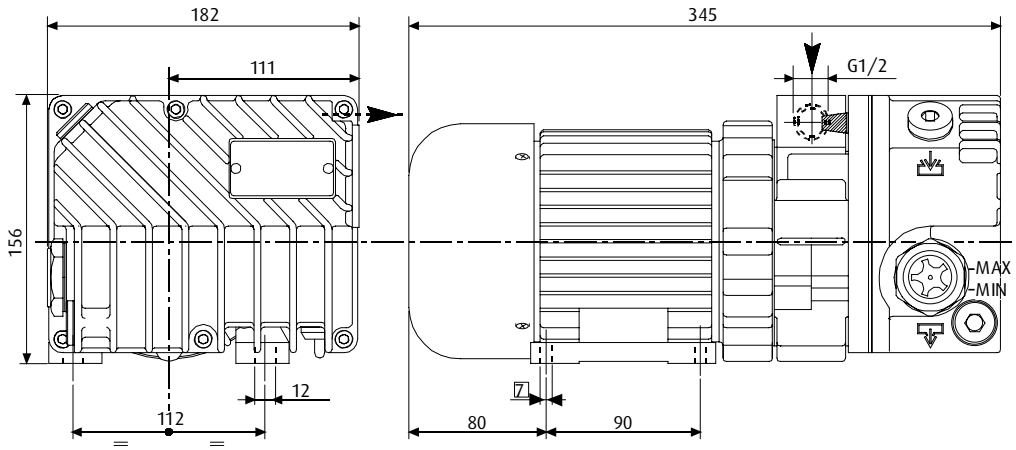
Technical data

Item no.	DO.8B-1	DO.8B-3	DO.12C-1	DO.12C-3
Suction power at 50 Hz [m³/h]	8	8	12	12
Suction power at 60 Hz [m³/h]	9	9	14	14
Final vacuum [%]	99.8	99.8	99.8	99.8
Gas ballast	--	--	Yes	Yes
Max. inlet pressure for water vapour [mbar]	--	--	40	40
Steam capacity [l/h]	--	--	0.3	0.3
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	2.3 (2.5)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)	3-3.6 (3.3-3.1)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)
Rated power at 50 (60) Hz [kW]	0.37 (0.45)	0.25 (0.3)	0.45 (0.55)	0.37 (0.45)
Noise level at 50 (60) Hz [dB(A)]	58 (60)	58 (60)	60 (62)	60 (62)
Operating temperature [°C]	65 - 75	65 - 75	65 - 75	65 - 75
Weight [kg]	10	9	14	12.5
Suitable accessories	Spare part kit KIT-DO.8B/G** Spare part kit KIT-DO.8B/K* Pre-filter FB 10 (p.626)	Spare part kit KIT-DO.8B/G** Spare part kit KIT-DO.8B/K* Pre-filter FB 10 (p.626)	Spare part kit KIT-DO.12C/G**** Spare part kit KIT-DO.12C/K*** Pre-filter FB 20 (p.626)	Spare part kit KIT-DO.12C/G**** Spare part kit KIT-DO.12C/K*** Pre-filter FB 20 (p.626)

Dimensions



DO.8B-1 | DO.8B-3

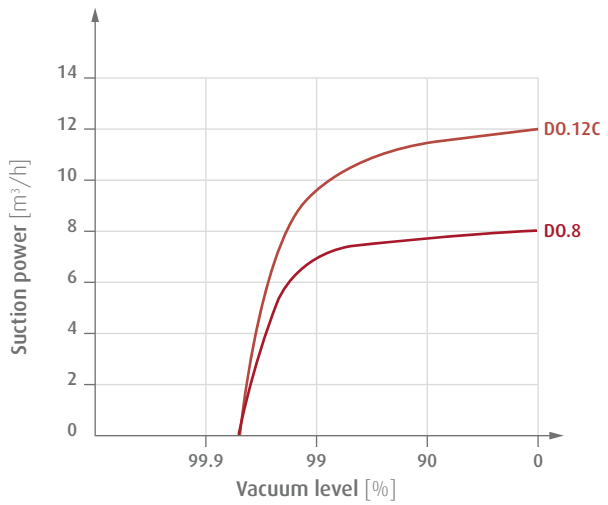


DO.12C-1 | DO.12C-3

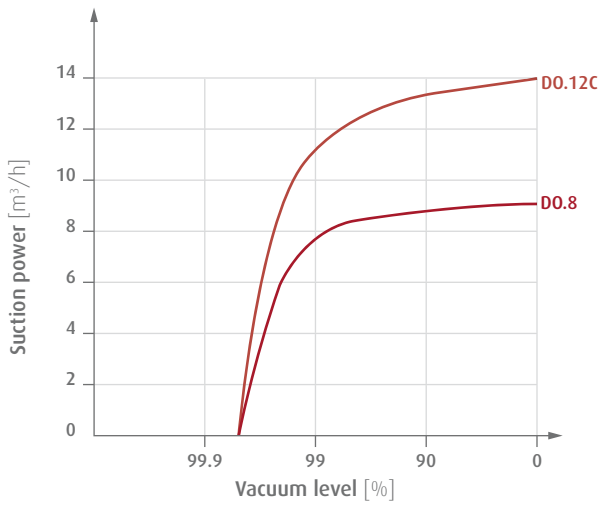
* = FKM O-Rings, outlet filter ** = 3 vanes, FKM-O rings, seal, valve, inlet and outlet filter, oil recirculation valve
*** = FKM O-rings, oil mist separator **** = 3 vanes, FKM o-rings, seal, filter, oil mist separator, spring

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-lubricated

Product Description

> Very high level of final vacuum
> Suitable for moist environments
> Effective damping and recovery system prevents oil mist and reduces sound level
> Innovative sealing system prevents oil recirculation at standstill under vacuum
> DO.20C-3 und DO.25C-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
> Horizontal mounting position

Notes

> DO.20: Designed for continuous operation for vacuum level between 60 % and 99.8 %, gas ballast available, can tolerate water vapor
> DO.25: Designed for continuous operation for vacuum level between 60 % and 99.95 %, gas ballast available, can tolerate water vapor

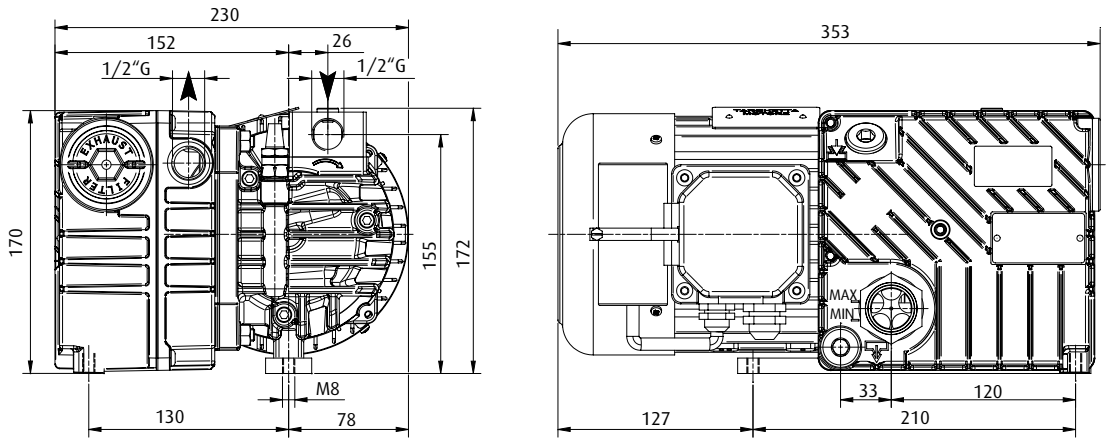
Ordering notes

> Available in single-phase and three-phase designs (Index -1 or -3)
> Included in scope of delivery: Gas ballast, oil non-return valve, oil SW 40 (with DO.20), oil SW 60 (with DO.25)

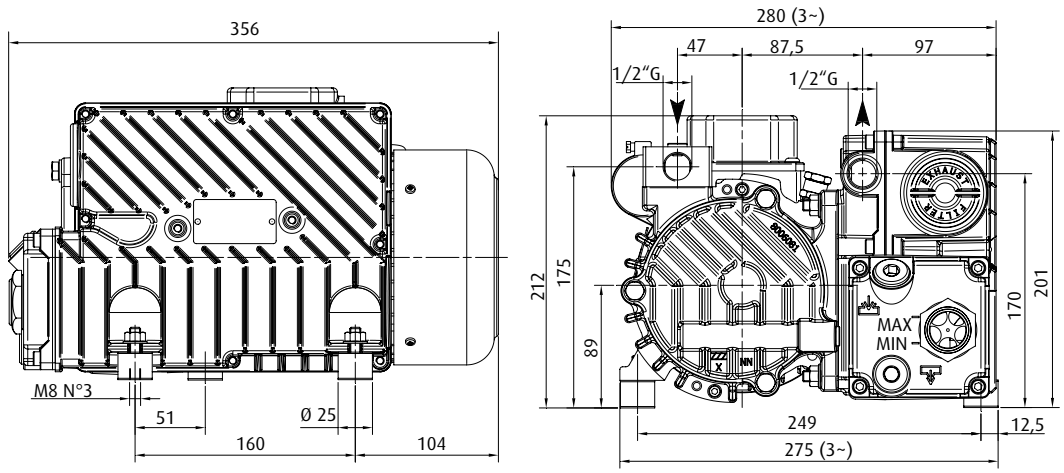
Technical data

Item no.	DO.20C-1	DO.20C-3	DO.25C-1	DO.25C-3
Suction power at 50 Hz [m^3/h]	20	20	25	25
Suction power at 60 Hz [m^3/h]	24	24	29	29
Final vacuum [%]	99.8	99.8	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	15	15	40	40
Steam capacity [l/h]	0.25	0.25	0.7	0.7
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 175-260 (200-300) Star: 300-450 (346-520)	220 - 240	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	4-4.1 (5.7-5.6)	Delta: 3.4-3.3 (4.1-3.3) Star: 2.0-1.9 (2.4-1.9)	3 (3)	Delta: 3.0 (3.0) Star: 1.7 (1.7)
Rated power at 50 (60) Hz [kW]	0.75 (0.90)	0.75 (0.90)	0.75 (0.90)	0.75 (0.90)
Noise level at 50 (60) Hz [dB(A)]	64 (67)	64 (67)	62 (65)	62 (65)
Operating temperature [°C]	60 - 70	60 - 70	80 - 90	80 - 90
Weight [kg]	19	17	26	25
Suitable accessories	Spare part kit KIT-DO.20C/G** Spare part kit KIT-DO.20C/K* Pre-filter FB 20 (p.626)		Spare part kit KIT-DO.25C/G**** Spare part kit KIT-DO.25C/K*** Pre-filter FB 25 (p.626)	

Dimensions



DO.20C-1 | DO.20C-3

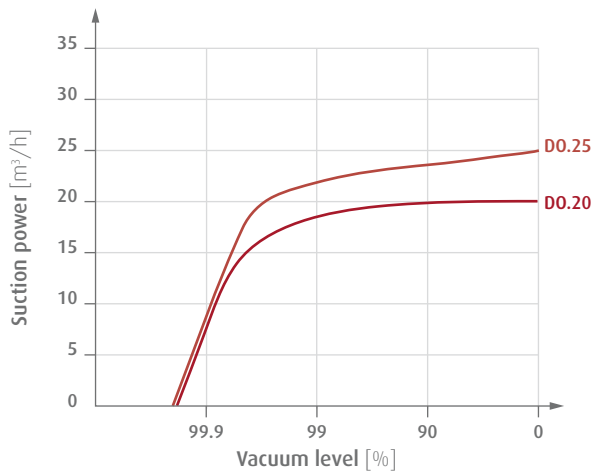


DO.25C-1 | DO.25C-3

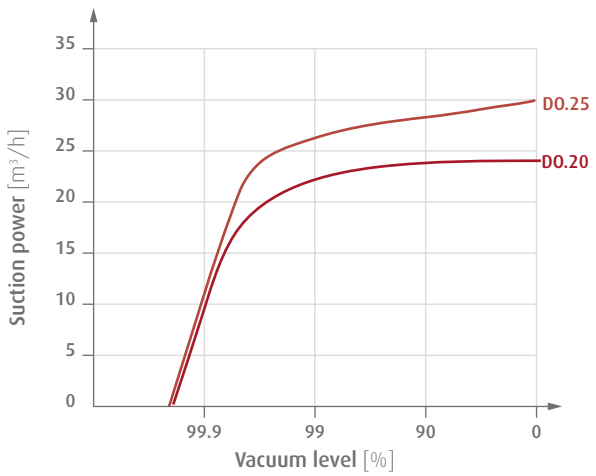
* = FKM O-rings, oil mist separator ** = 3 x vanes, FKM O-rings, valve, filter, copper washer G1/8'' *** = FKM and NBR O-rings, outlet filter
**** = 2x FKM shaft seals, FKM O-rings, filter, valve, 3 vanes

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-lubricated

Product Description

> Very high level of final vacuum
> Suitable for moist environments
> Effective damping and recovery system with by-pass and novel float valve guarantees oil-free exhaust air
> Innovative sealing system prevents oil recirculation at standstill under vacuum
> DO.40B-3 und DO.60B-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
> Horizontal mounting position

Notes

> Designed for continuous operation for vacuum level between 60 % to 99,95 %, gas ballast available, can tolerate water vapor

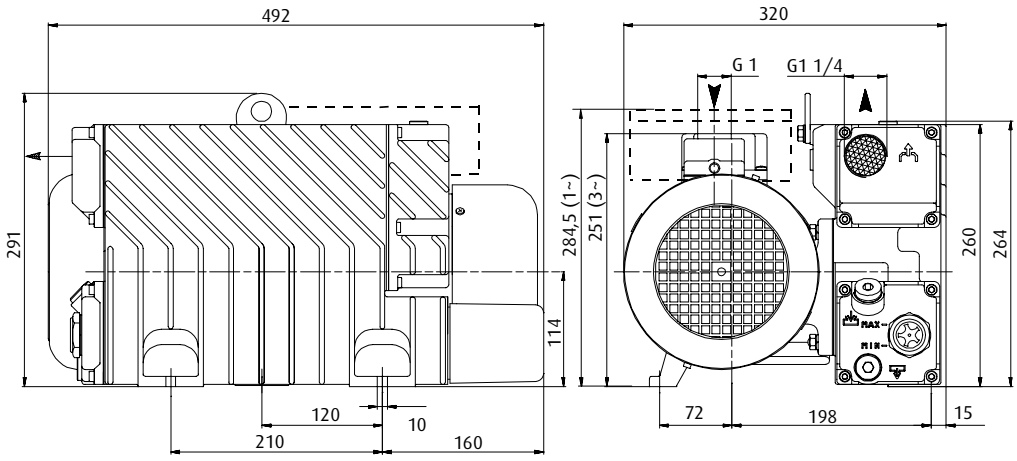
Ordering notes

> Available in single-phase and three-phase designs (Index -1 or -3)
> Included in scope of delivery: Condensate exhaust filter, gas ballast, oil SW 60, oil non-return valve

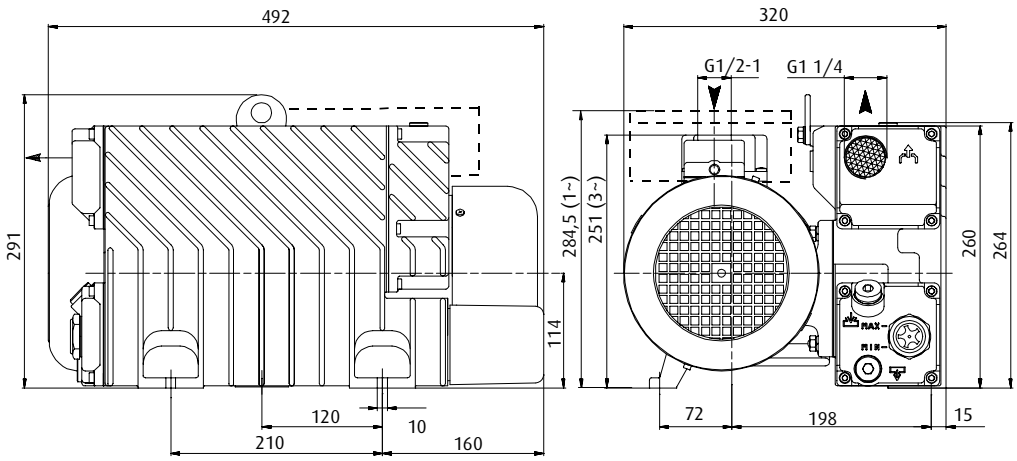
Technical data

Item no.	DO.40B-1	DO.40B-3	DO.60B-1	DO.60B-3
Suction power at 50 Hz [m^3/h]	40	40	60	60
Suction power at 60 Hz [m^3/h]	48	48	72	72
Final vacuum [%]	99.95	99.95	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	30	40	40
Steam capacity [l/h]	0.9	0.9	1.8	1.8
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 230 (265) Star: 400 (460)	220 - 240	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	4.1 (2.37)	Delta: 4.1 (4.3) Star: 2.37 (2,49)	5.76 (3.33)	Delta: 5.76 (5.72) Star: 3.33 (3.31)
Rated power at 50 (60) Hz [kW]	1.1 (1.35)	1.1 (1.35)	1.5 (1.8)	1.5 (1.8)
Noise level at 50 (60) Hz [dB(A)]	66 (68)	66 (68)	68 (70)	68 (70)
Operating temperature [°C]	70 - 80	70 - 80	75 - 85	75 - 85
Weight [kg]	49.5	43.5	50	44.5
Suitable accessories	Spare part kit KIT-DO.40B/G** Spare part kit KIT-DO.40B/K* Pre-filter FB 30 (p.626)		Spare part kit KIT-DO.60B/G** Spare part kit KIT-DO.60B/K* Pre-filter FB 30 (p.626)	

Dimensions



DO.40B-1 | DO.40B-3

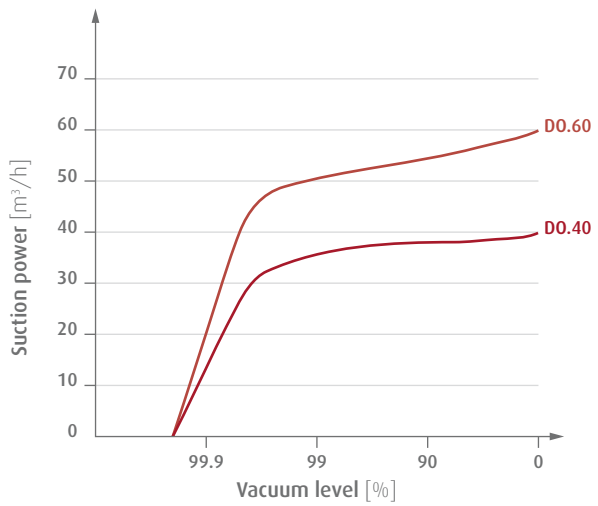


DO.60B-1 | DO.60B-3

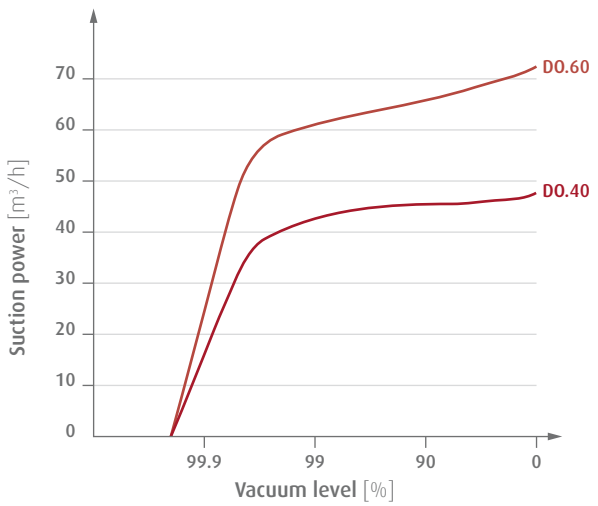
* = Seal, Oil mist separator, Oil filter ** = 2 x FKM shaft seals, FKM O-rings, seals, filter, 3 x vanes

Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Rotary vane vacuum pumps - oil-lubricated

Product Description

> Very high final vacuum
> Suitable for moist environments
> Effective damping and recovery system with by-pass and novel float valve guarantees oil-free exhaust air
> Innovative sealing system prevents oil recirculation at standstill under vacuum
> Elastic motor coupling effectively absorbs shocks
> Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
> Horizontal mounting position

Notes

> Designed for continuous operation for vacuum level between 60 % to 99.95 %, gas ballast available, can tolerate water vapor

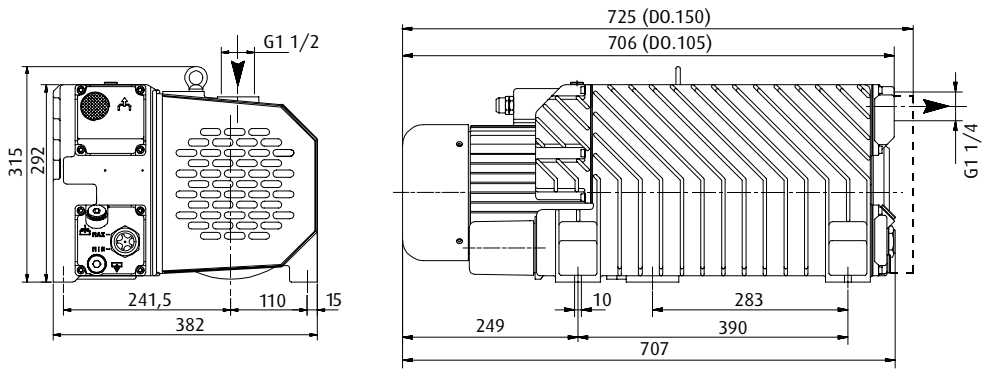
Ordering notes

> Scope of supply: Condensate exhaust filter, gas ballast, oil non-return valve, oil SW 100

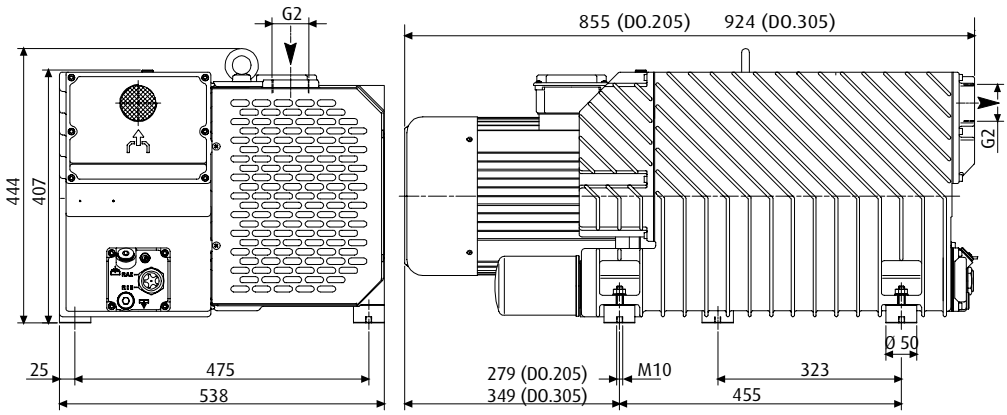
Technical data

Item no.	DO.105C-3	DO.150C-3	DO.205C-3	DO.305C-3
Suction power at 50 Hz [m^3/h]	105	150	205	305
Suction power at 60 Hz [m^3/h]	125	180	245	365
Final vacuum [%]	99.95	99.95	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	25	25	25
Steam capacity [l/h]	2.2	2.5	3.5	5
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 8.8 (9.0) Star: 5.1 (5.2)	Delta: 8.8 (9.0) Star: 5.1 (5.2)	Delta: 20 (20.3) Star: 11.6 (11.7)	Delta: 27.7 (26.8) Star: 16 (15.5)
Rated power at 50 (60) Hz [kW]	2.2 (2.7)	3 (3.6)	4 (4.8)	7.5 (8.6)
Noise level at 50 (60) Hz [dB(A)]	68 (70)	70 (72)	72 (74)	74 (76)
Operating temperature [°C]	75 - 85	75 - 85	70 - 80	75 - 85
Weight [kg]	70	82	154	164
Suitable accessories	Spare part kit KIT-DO.105C/K*** Spare part kit KIT-DO.105C/G* Pre-filter FB 40 (p.626)	Spare part kit KIT-DO.150C/K*** Spare part kit KIT-DO.150C/G* Pre-filter FB 50 (p.626) Pre-filter FB 60 (p.626)	Spare part kit KIT-DO.205C/K*** Spare part kit KIT-DO.205C/G** Pre-filter FB 50 (p.626) Pre-filter FB 60 (p.626)	Spare part kit KIT-DO.305C/K*** Spare part kit KIT-DO.305C/G** Pre-filter FB 60 (p.626)

Dimensions



DO.105C-3 | DO.150C-3

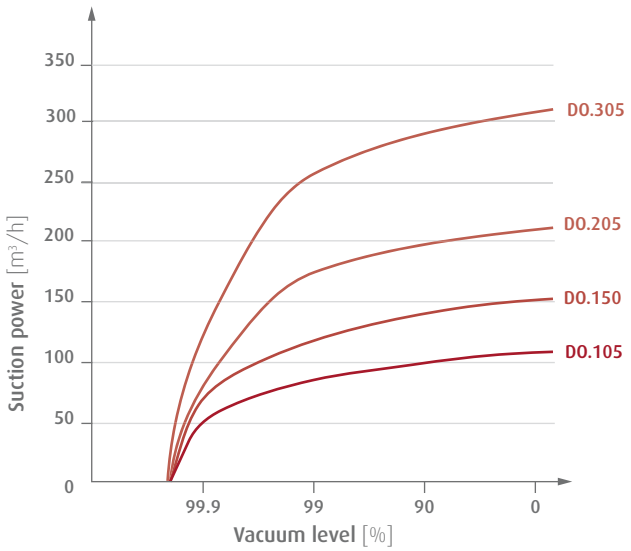


DO.205C-3 | DO.305C-3

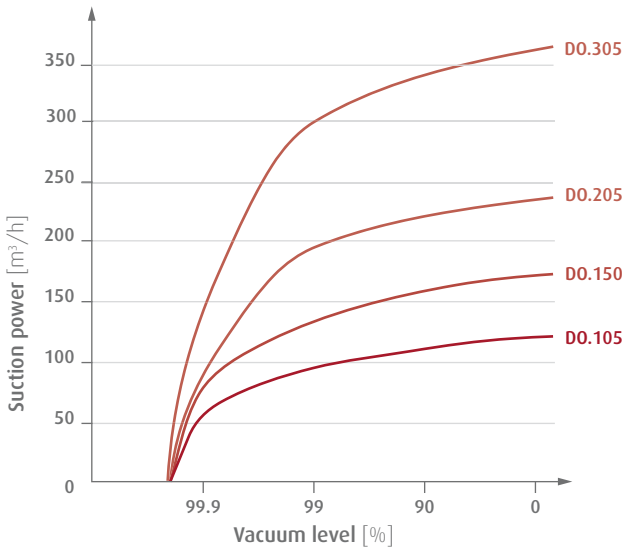
* = Rubber link, seals, 3 vanes, FKM shaft seal, FKM O-rings, oil filter with bypass
** = Rubber link, FKM and NBR O-rings, 3 x vanes, oil recirculation pipe, gas ballast pipe, filters, oil inspection glas
*** = Oil filter with bypass valve, exhaust filter, gasket

Diagrams

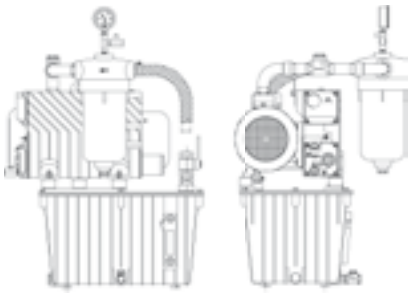
> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz



Portable vacuum units with condensate discharge for liquids



Product Description

> Portable system for vacuum supply for i.e. suction cups or fixing tools
> Specially developed for the extraction of non-aggressive liquids such as e.g. cooling lubricants in the glass, marble and CNC machine markets

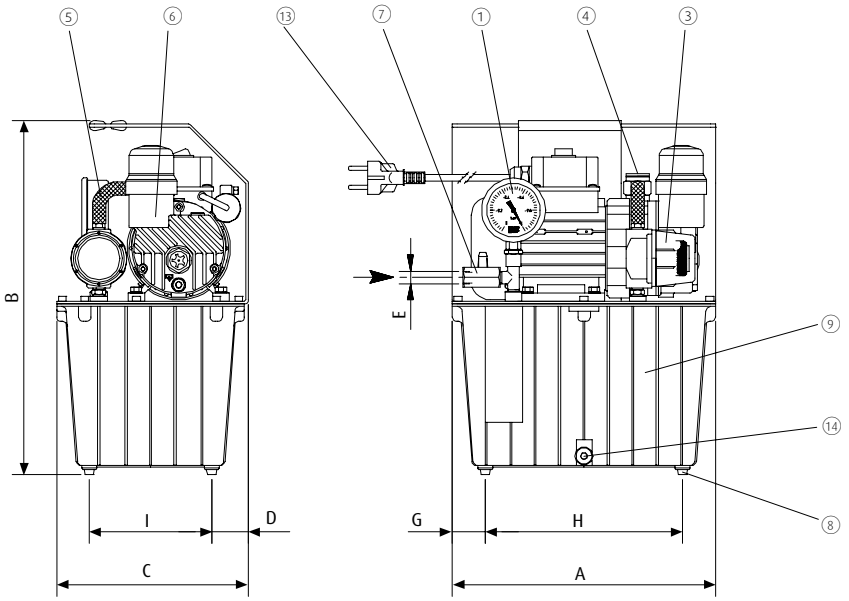
Ordering notes

Included in scope of delivery:
> Vacuum tank
> Oil-lubricated vacuum pump
> Vacuum gauge
> Condensate trap filter
> Non-return valve at the tank inlet to separate the pump for maintenance
> Float level control for automatic discharge of the collected liquid
> Condensate discharge
> Non-return valve and gas ballast for trapping and discharge the condensed water from the oil at standstill

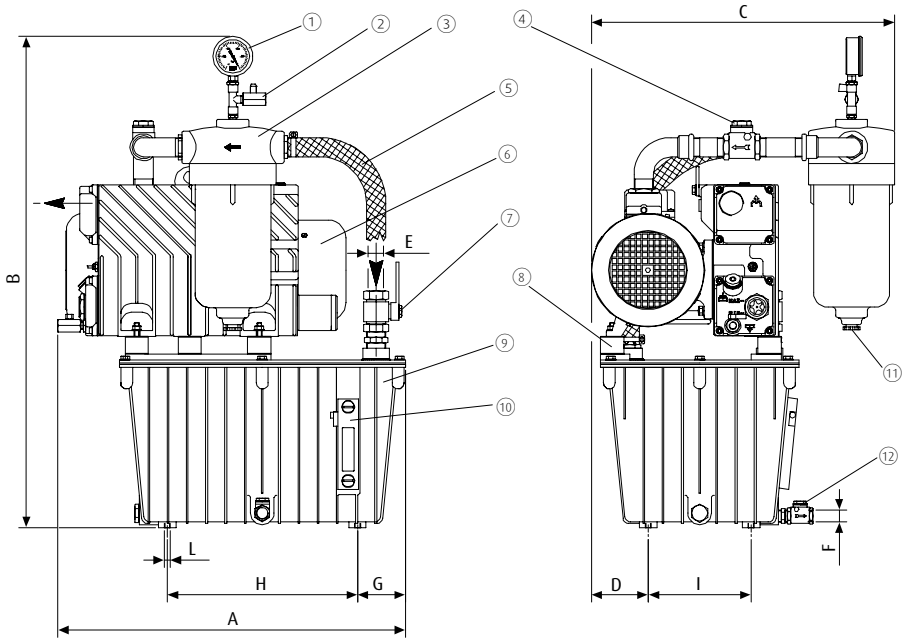
Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m³/h]	Suction power at 60 Hz [m³/h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.DO.4B-1/8L	8	4	4.4	99.8	0.12	0.15	11
VZ.DO.5B-1/25L	25	5	6	99	0.25	0.25	31
VZ.DO.25C-3/25L	25	25	29	99.5	0.75	0.9	55
VZ.DO.40C-3/25L	25	40	48	99.5	1.1	1.35	71
VZ.DO.60C-3/25L	25	60	75	99.5	1.5	1.8	72

Dimensions



VZ.DO.4B-1/8L

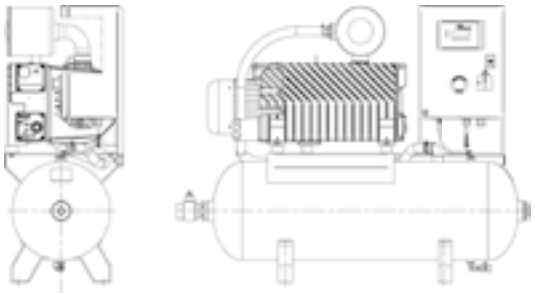


VZ.DO.5B-1/25L | VZ.DO.25C-3/25L | VZ.DO.40C-3/25L | VZ.DO.60C-3/25L

① = Vacuum gauge ② = Blow-off valve ③ = Filter ④ = Check valve ⑤ = Reinforced PVC tubing ⑤ = Vacuum pump
⑦ = Connection valve of the system ⑧ = Vibration absorber ⑨ = Vacuum tank ⑩ = Liquid display ⑪ = Condensate blow-off valve
⑫ = Automatic blow-off valve ⑬ = Power cable ⑭ = Blow-off vacuum tank

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E	F	G [mm]	H [mm]	I [mm]	L
VZ.DO.4B-1/8L	280	371	204	39	G1/4	--	35	210	130	--
VZ.DO.5B-1/25L	490	712	362	82	G1	G1/2	82	326	176	4xM10
VZ.DO.25C-3/25L	526	703	437	82	G1	G1/2	82	326	176	4xM10
VZ.DO.40C-3/25L	595	831	520	98	G1	G1/2	82	326	176	4xM10
VZ.DO.60C-3/25L	595	841	520	98	G1	G1/2	82	326	176	4xM10

Vacuum units with one pump



Product Description

> Centralised vacuum supply with horizontal buffer tank

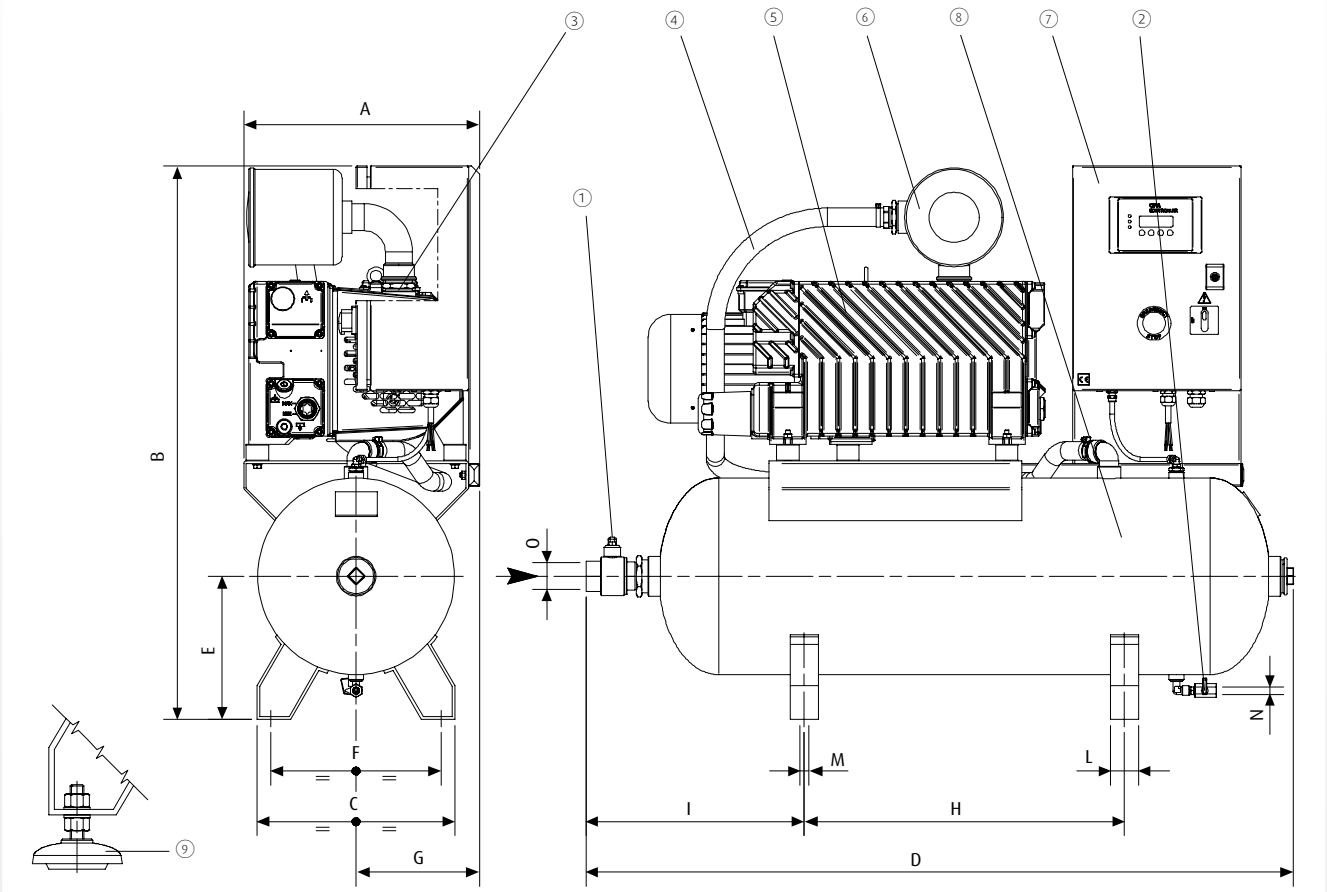
Ordering notes

Included in scope of delivery:
> Oil-lubricated rotary vane pump with integrated oil mist separator at the outlet
> Horizontal vacuum tank with condensate discharge valve
> Particle filter to protect the pump
> Non-return valve to maintain the vacuum when the pump is at standstill
> Control panel (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
> Switching cabinet IP 55
> On request: Optional filter between the non-return valve and the vacuum system

Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m^3/h]	Suction power at 60 Hz [m^3/h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.1xDO.25C-3/100L	100	25	29	99	0.75	0.9	88
VZ.1xDO.25C-3/300L	300	25	29	99	0.75	0.9	133
VZ.1xDO.40B-3/100L	100	40	48	99	1.1	1.35	109
VZ.1xDO.40B-3/300L	300	40	48	99	1.1	1.35	154
VZ.1xDO.40B-3/500L	500	40	48	99	1.1	1.35	214
VZ.1xDO.60B-3/100L	100	60	75	99	1.5	1.8	112
VZ.1xDO.60B-3/300L	300	60	75	99	1.5	1.8	157
VZ.1xDO.60B-3/500L	500	60	75	99	1.5	1.8	217
VZ.1xDO.105C-3/100L	100	105	125	99	2.2	2.7	137
VZ.1xDO.105C-3/300L	300	105	125	99	2.2	2.7	182
VZ.1xDO.105C-3/500L	500	105	125	99	2.2	2.7	242
VZ.1xDO.205C-3/500L	500	205	245	99	4	4.8	400
VZ.1xDO.305C-3/500L	500	305	365	99	5.5	6.5	410

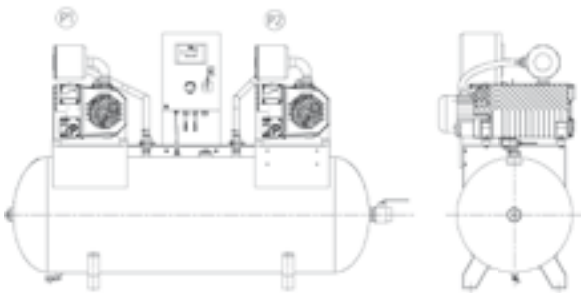
Dimensions



① = Connection valve of the system ② = Condensate blow-off valve ③ = Check valve ④ = Reinforced PVC tubing ⑤ = Vacuum pump
⑥ = Filter ⑦ = Switchbox ⑧ = Vacuum tank ⑨ = Vibration absorber (on request)

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.1xDO.25C-3/100L	488	985	353	1,235	255	295	220	570	364	50	4xØ13	G1/4	G1
VZ.1xDO.25C-3/300L	493	1,220	512	1,626	330	454	245	895	410	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/100L	493	985	353	1,260	255	295	236	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/300L	502	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/500L	624	1,329	540	2,020	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.1xDO.60B-3/100L	493	985	353	1,260	255	295	236	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.60B-3/300L	502	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.60B-3/500L	624	1,329	540	2,025	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.1xDO.105C-3/100L	420	985	353	1,260	255	295	220	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.105C-3/300L	450	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.105C-3/500L	707	1,329	540	2,025	385	480	396	1,020	548	60	4xØ13	G1/4	G1 1/2
VZ.1xDO.205C-3/500L	600	1,412	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2
VZ.1xDO.305C-3/500L	600	1,412	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2

Vacuum units with two pumps



Product Description

> Centralised vacuum supply with two pumps and horizontal buffer tank
> Redundant system that enables maintenance work to be done during operation

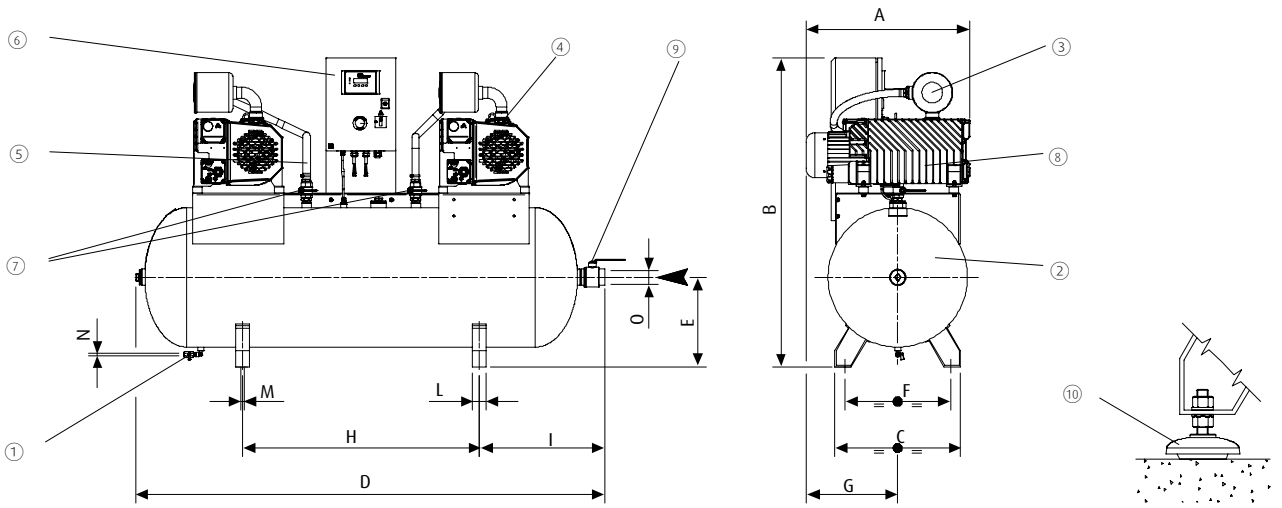
Ordering notes

Included in scope of delivery:
> Two oil-lubricated rotary vane pumps with integrated oil mist separator at the outlet
> Integrated non-return valve at the suction inlet to maintain the vacuum at standstill
> Horizontal vacuum tank with condensate discharge valve
> Two manual valves at the tank inlet to separate the pump from the system for maintenance
> Particle filter to protect the pump
> Control panel (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
> Switching cabinet IP 55
> On request: Optional filter between non-return valve and load end

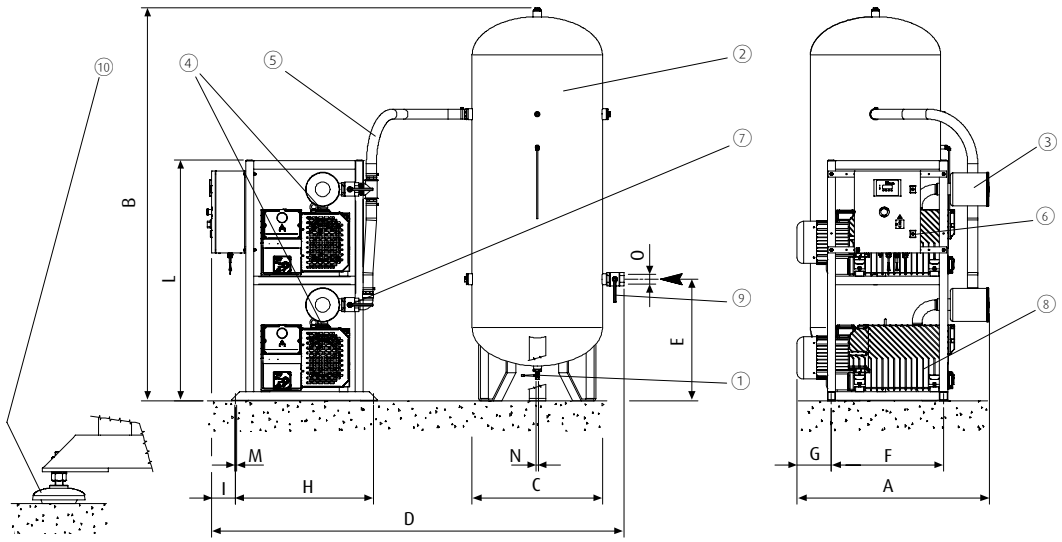
Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m³/h]	Suction power at 60 Hz [m³/h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.2xDO.25C-3/300L	300	50	58	99	2x0.75	2x0.90	165
VZ.2xDO.40B-3/300L	300	80	96	99	2x1.1	2x1.35	195
VZ.2xDO.40B-3/500L	500	80	96	99	2x1.1	2x1.35	280
VZ.2xDO.60B-3/300L	300	120	150	99	2x1.5	2x1.8	200
VZ.2xDO.60B-3/500L	500	120	150	99	2x1.5	2x1.8	285
VZ.2xDO.105C-3/500L	500	210	250	99	2x2.2	2x2.7	340
VZ.2xDO.205C-3/1000L	1,000	410	490	99	2x4	2x4.8	580
VZ.2xDO.305C-3/1000L	1,000	610	730	99	2x7.5	2x9	600

Dimensions



VZ.2xDO.25C-3/300L | VZ.2xDO.40B-3/300L | VZ.2xDO.40B-3/500L | VZ.2xDO.60B-3/300L | VZ.2xDO.60B-3/500L | VZ.2xDO.105C-3/500L



VZ.2xDO.205C-3/1000L | VZ.2xDO.305C-3/1000L

① = Condensate blow-off valve ② = Vacuum tank ③ = Filter ④ = Check valve ⑤ = Reinforced PVC tubing ⑥ = Switchbox
⑦ = Vacuum pump blocking valve ⑧ = Vacuum pump ⑨ = Connection valve of the system ⑩ = Vibration absorber

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.2xDO.25C-3/300L	498	1,322	512	1,626	330	454	245	895	410	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.40B-3/300L	502	1,320	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.40B-3/500L	624	1,329	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2
VZ.2xDO.60B-3/300L	502	1,320	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.60B-3/500L	624	1,429	540	2,020	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.2xDO.105C-3/500L	707	1,429	540	2,020	385	480	396	1,020	541	60	4xØ13	G1/4	G2
VZ.2xDO.205C-3/1000L	1,068	2,381	790	2,500	738	680	109	835	145	1,460	4xØ13	G1/2	G2
VZ.2xDO.305C-3/1000L	1,138	2,381	790	2,500	738	680	179	835	145	1,460	4xØ13	G1/2	G2

Vacuum units with three pumps

Product Description

> Centralised vacuum supply with three pumps and vertical buffer tank
> Redundant system that enables maintenance work to be done during operation

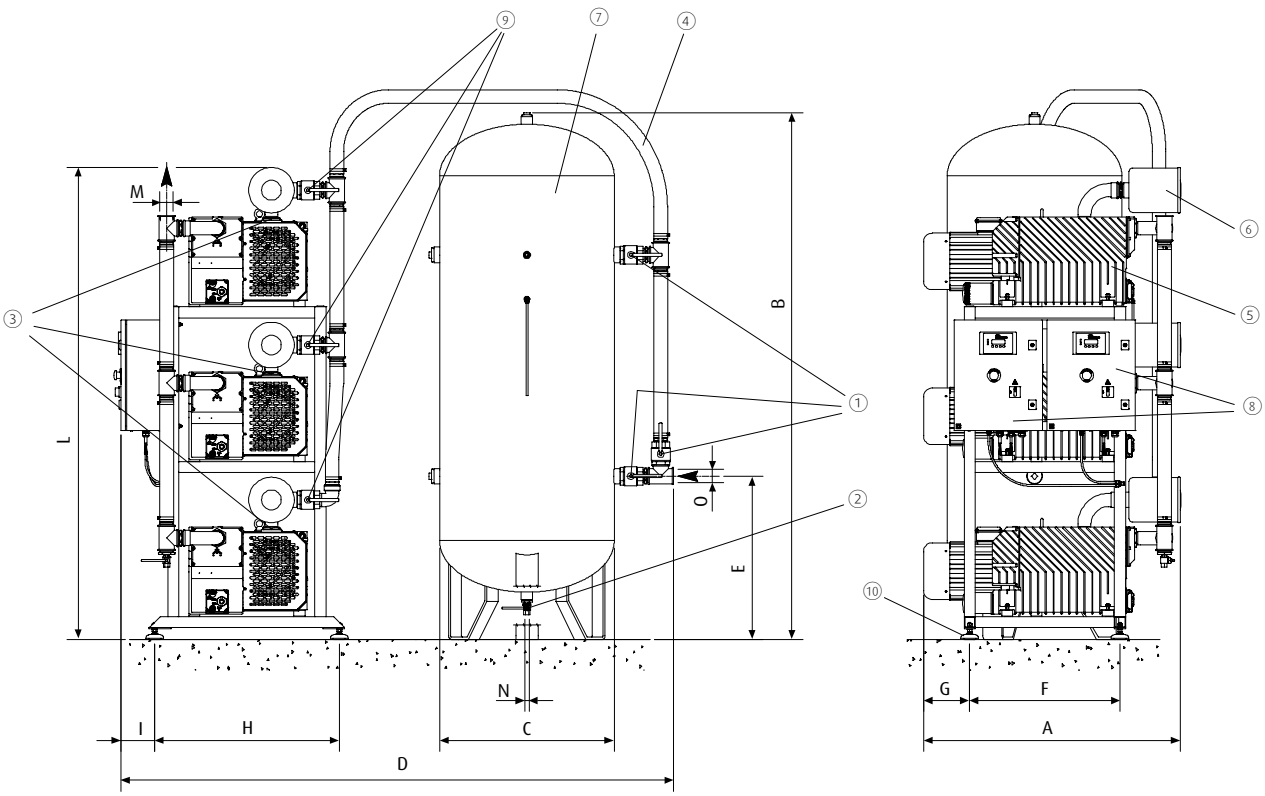
Ordering notes

Included in scope of delivery:
> Three oil-lubricated rotary vane pumps mounted on one frame to conserve space
> One vertical vacuum tank with condensate discharge valve and additional bypass system to separate the system
> Three non-return valves integrated in the suction line of the pumps to maintain vacuum at standstill
> Three particle filter elements to protect the pumps
> Two independent control panels (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
> Switching cabinet IP 55
> Optional GFB hygiene filter element (Standard EN 773/3) with bypass system between the non-return valve and the load

Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m^3/h]	Suction power at 60 Hz [m^3/h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.3xDO.25C-3/300L	300	75	87	99	3x0.75	3x0.90	240
VZ.3xDO.25C-3/500L	500	75	87	99	3x0.75	3x0.90	300
VZ.3xDO.40B-3/500L	500	120	144	99	3x1.1	3x1.35	395
VZ.3xDO.60B-3/500L	500	180	125	99	3x1.5	3x1.8	410
VZ.3xDO.105C-3/500L	500	315	375	99	3x2.2	3x2.7	520
VZ.3xDO.105C-3/1000L	1,000	315	375	99	3x2.2	3x2.7	580
VZ.3xDO.150C-3/1000L	1,000	450	540	99	3x3	3x3.6	620
VZ.3xDO.205C-3/1000L	1,000	615	735	99	3x4	3x4.8	850
VZ.3xDO.305C-3/1000L	1,000	915	1,095	99	3x7.5	3x9	880

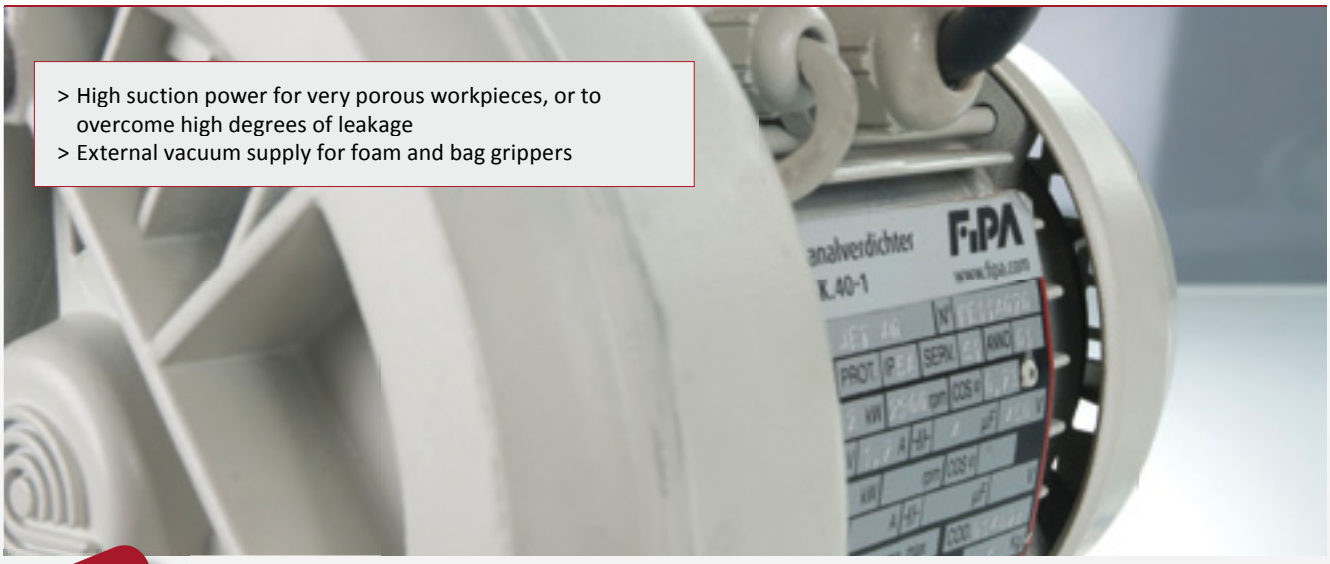
Dimensions



① = Vacuum tank bypass valve ② = Condensate blow-off valve ③ = Check valve ④ = Reinforced PVC tubing ⑤ = Vacuum pump
⑥ = Filter ⑦ = Vacuum tank ⑧ = Switchbox ⑨ = Vacuum pump blocking valve ⑩ = Vibration absorber

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.3xDO.25C-3/300L	750	1,677	500	1,821	612	670	40	550	245	1,407	G1	G1/2	G1
VZ.3xDO.25C-3/500L	750	2,139	600	1,810	708	670	40	550	245	1,407	G1	G1/2	G1
VZ.3xDO.40B-3/500L	750	2,142	600	2,071	708	670	40	550	245	1,567	G1	G1/2	G1 1/2
VZ.3xDO.60B-3/500L	796	2,142	600	2,045	708	670	40	550	245	1,592	G1	G1/2	G1 1/2
VZ.3xDO.105C-3/500L	874	2,142	600	2,515	708	670	109	550	245	1,643	G1 1/2	G1/2	G1 1/2
VZ.3xDO.105C-3/1000L	874	2,381	790	2,509	738	670	109	550	245	1,643	G1 1/2	G1/2	G1 1/2
VZ.3xDO.150C-3/1000L	897	2,381	790	2,453	738	670	129	550	245	1,643	G1 1/2	G1/2	G2
VZ.3xDO.205C-3/1000L	1,068	2,381	790	2,504	738	680	109	835	145	2,133	G2	G1/2	G2
VZ.3xDO.305C-3/1000L	1,138	2,381	790	2,500	738	680	179	835	145	2,133	G2	G1/2	G2

FIPA Side channel blowers



> High suction power for very porous workpieces, or to overcome high degrees of leakage
> External vacuum supply for foam and bag grippers

On request

Side channel blowers - single-stage and double-stage

> Handling of porous workpieces, such as cardboard boxes or untreated wooden plates
> Double-stage design offers higher suction power at the same vacuum level for effective leak compensation
> Suitable for use in wet and dry areas
> Suitable for continuous operation
> Horizontal and vertical installation
> Practically maintenance free

Accessories

Additional silencer for side channel blowers

> Open silencer for "further processing" of the exhaust air

> See page 618

Vacuum pressure changeover valve

> Fast switching between vacuum mode (vacuum) and pressure mode (blow-off)
> Enables short cycle times
> Installation of a vacuum relief valve at the suction inlet is recommended

> See page 619

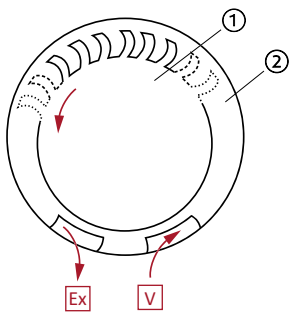
FIPA Side channel blowers

Examples of use

> Vacuum generation for the TC/TL series foam grippers or TG series bag grippers
> Handling of cardboard packaging with vacuum cups
> Pneumatic conveying
> Extraction of particles which are not too coarse, such as wood dust in woodworking

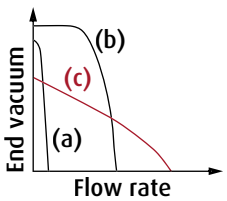
Principle of operation

> Side channel blowers use the momentum principle for generating vacuums or compressed air
> The rapidly rotating blade wheel ① accelerates the air within the annular housing ②
> In addition, a swirling motion is created in the side channels which increases efficiency
> The shape of the inlet channel V or the outlet channel EX allows air to be suctioned in or expelled



Performance characteristics

(a) Characteristic of ejectors
(b) Characteristic of vacuum pumps
(c) Side channel blowers have an extremely high output, but achieve only a low ultimate vacuum



Notes:

Vacuum tanks 5 - 60 liters

Product Description

> Storage for compressed air, vacuum and non-aggressive liquids
> Energy saving assembly of compressed air and vacuum
> For compressed air / vacuum networks with fluctuating demand
> For preventing frequent startup of the compressor system
> To cover high demands short-term
> As supplement to screw / piston compressors, rotary compressors or vacuum pumps

Notes

> 92.001: Two fittings in line with G1/2-female with 90° offset
One fitting per front face with G1/4-female
> 92.002 to 92.004: One fitting in line with G1/2-female
2 x one fitting with G3/4-female and distance 120 mm and 1 x one fitting with G3/4-female on the front faces

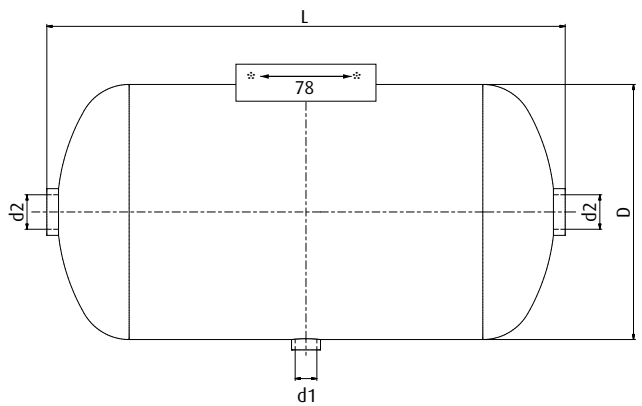
Technical data

Item no.	Safety tank volume [l]	Operating pressure [bar]	Medium	Design	Weight [kg]
92.001	5	0 - 11	Compressed air / vacuum	Aluminium	1.7
92.002	10	0 - 11	Compressed air / vacuum	Aluminium	2.4
92.003	20	0 - 11	Compressed air / vacuum	Aluminium	3.7
92.004	60	0 - 11	Compressed air / vacuum	Aluminium	9.3

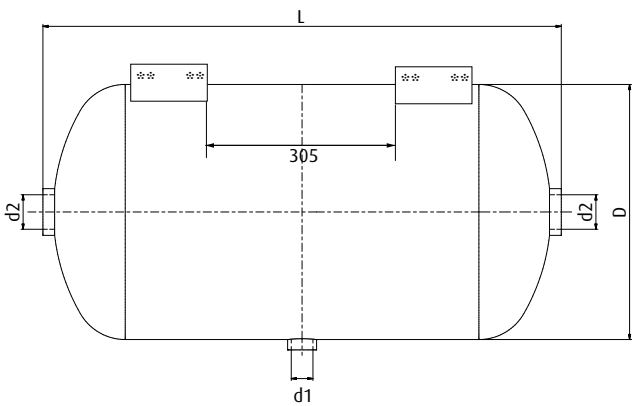
Dimensions

d1	d2	D [mm]	L [mm]
G1/2	G3/4	152	356
G1/2	G3/4	206	355
G1/2	G3/4	245	500
G1/2	G3/4	276	1,111

Dimensions



92.001 | 92.002 | 92.003



92.004

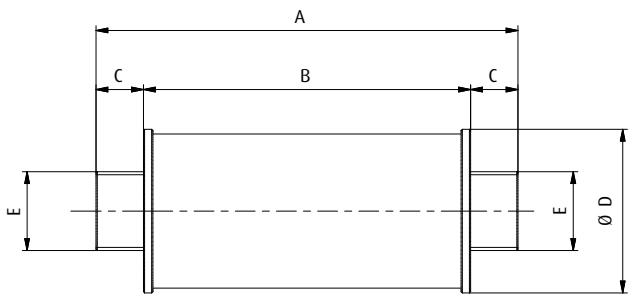
* = Two pairs of fixing bores, each with 2x M12x14 ** = Two pairs of fixing bores, each with 4x M12x14

Additional silencer for side channel blowers

Product Description

> Silencer with direct opening
> Suitable for "processing" of the exhaust air: e.g. ventilation or heating of halls or use as silencer and release into the open

Dimensions



Item no.	E	A [mm]	B [mm]	C [mm]	Ø D [mm]
72.038	G1	178	138	20	69
72.039	G1 1/4	242	138	52	69
72.040	G1 1/2	232	168	32	80
72.041	G2	262	198	32	89
72.042	G2 1/2	262	198	32	100

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Electro-pneumatic reversing valves for side channel blowers

Product Description

> Operation of a side channel blower as a vacuum pump for suction or compressor for blow-off
> Blow-off volume flow is directed to the vacuum cup / load, without reversing the direction of rotation of the blower
> Three settig positions: Suction, blow-off, neutral
> Working principle: Rotation of a cylinder, which is operated by an electrical motor-driven actuator

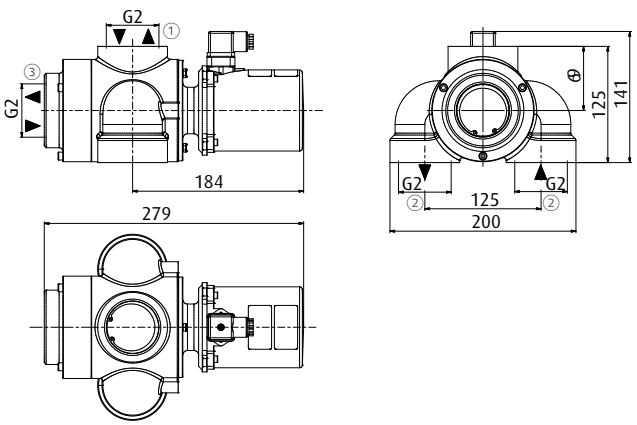
Notes

Please note for the neutral position (0°):
> If operation with closed suction inlets cannot be excluded, a vacuum limiting valve (safety valve) must be installed before the suction inlet

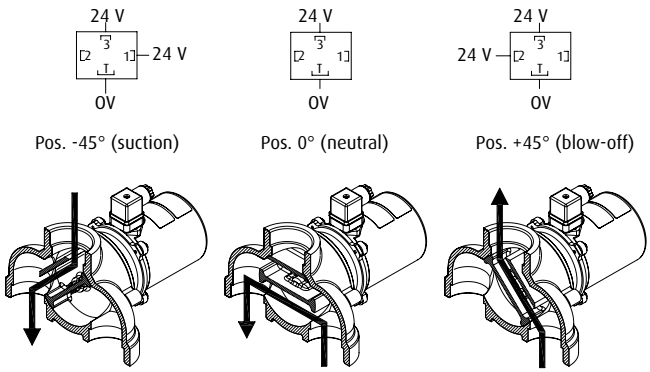
Technical data

Item no.	Suction power [m³/h]	Power supply [VDC]	Power consumption [W]	Duty ratio [%]	Direction of rotation [°]	Mean control time [s]	Minimum time interval between successive cycles [s]	Protection class	Weight [kg]
33.074	300	24	10	100	-45 / 0 / +45	0.5	0.1	IP55	3.2

Dimensions



Wiring diagrams



① = System connection ② = Side channel blower connection ③ = Air inlet / outlet

Notes:

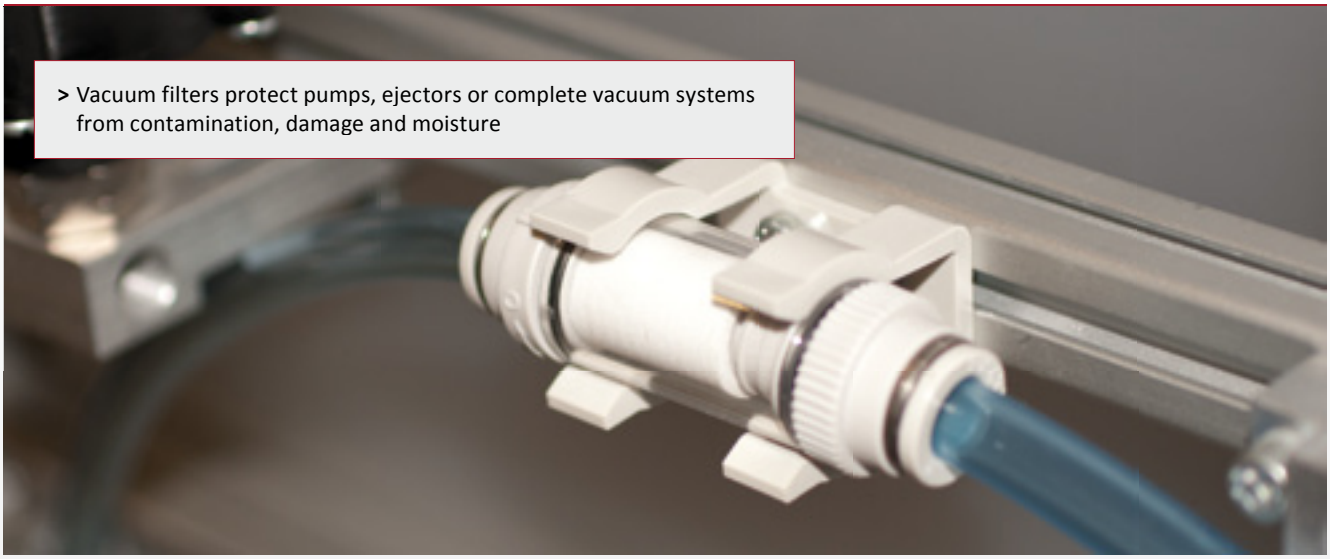
Vacuum filters at a glance 622

Universal filters for large volume flows 624

Filters for wet areas 627

Inline filters 628

FIPA Vacuum filters



> Vacuum filters protect pumps, ejectors or complete vacuum systems from contamination, damage and moisture

Pump filters / pre-filters with paper cartridge

> Installation at suction inlet of vacuum pumps or side channel blowers
> Separation of fine particles using a very fine filter mesh of 5 to 7 µm
> Suitable for dry areas

FC 10F - FC 100F
> Aluminium housing with quick release for filtration control or for cartridge change

> See page 624

71.032 - 71.043
> Plastic housing with sight glass for checking the filtration effect

> See page 625

Universal filters with steel cartridge (FB 5 - FB 60)

> Installation at the suction inlet or in the suction line of vacuum pumps or side channel blowers
> Suitable for wet and dry areas
> Separation of coarse particles, dust and dirt using a 60 µm filter mesh
> Robust filter inserts made of stainless steel
> Filter bowl and connection cover made from die-cast aluminium
with the exception of FB 5 - FB 20: filter bowl made from transparent plastic

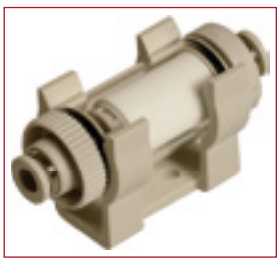
> See page 626

FIPA Vacuum filters

Filters / condensate traps

> Installation at suction inlet of vacuum pumps or side channel blowers
> Suitable for wet and dry areas
> Protects vacuum generators from excessive water uptake
> Separation of coarse particles, dust and dirt using a filter mesh of between 30 and 100 µm
> Plastic housing with sight glass for checking the filtration effect
> Drainage screw on the bottom for draining the collected liquid

> See page 627



Inline, plug-in and ring filters

> Installation between vacuum cup and ejector or generally in the tubing line of vacuum systems
> Separation of fine particles and moisture using a 10 µm filter mesh
> Suitable for wet and dry areas

> See page 628

Disposable filters

> Installation between vacuum cup and ejector or generally in the tubing of vacuum systems
> Suitable for wet and dry areas

71.030
> Separation of very fine particles using a 7 µm filter mesh

71.031
> Separation of coarse particles, dust and dirt using a 152 µm filter mesh

> See page 630

Filters for feed ejectors

> Separation of fine particles using a 10 µm filter mesh

71.012 - 71.016
> Mounting in front of compressed air inlet on ejector

> See page 631

71.017 - 71.021
> Mounting behind ejector as collection or separation vessel

> See page 632

Pump filters / pre-filters with paper cartridge

Suitable for dry areas

Product Description

> For use directly on the suction opening of dry-running rotary-vane pumps
> To protect vacuum pumps from damage or excessive wear
> High filtration efficiency due to large filter surface
> Robust metallic housing for long service life
> Quick fastener for prompt checking or replacement of the filter cartridge

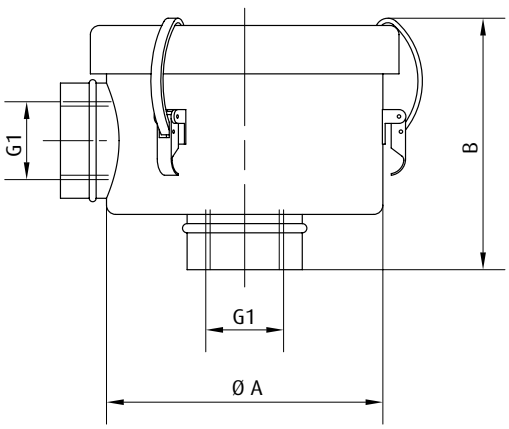
Technical data

Item no.	Max. volume flow [m³/h]	Grade of filtration [µm]	Weight [kg]	Suitable spare cartridges
FC 10F	25	5 - 7	0.36	FC 10F-Kartusche
FC 20F	45	5 - 7	0.72	FC 20F/25F-Kartusche
FC 25F	50	5 - 7	0.73	FC 20F/25F-Kartusche
FC 30F	90	5 - 7	1	FC 30F/35F-Kartusche
FC 35F	110	5 - 7	1	FC 30F/35F-Kartusche
FC 40F	150	5 - 7	1.88	FC 40F-Kartusche
FC 50F	200	5 - 7	2.5	FC 50F-Kartusche
FC 60F	320	5 - 7	3.75	FC 60F-Kartusche
FC 80F	360	5 - 7	3.3	FC 80F-Kartusche
FC 100F	540	5	5	FC 100F-Kartusche

Dimensions

G1	Ø A [mm]	B [mm]
G3/8	83	80
G1/2	108	93
G3/4	108	93
G1	133	96
G1 1/4	133	96
G1 1/4	176	161
G1 1/2	176	200
G2	200	258
G3	200	258
G4	305	320

Dimensions



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Pump filters / pre-filters with paper cartridge

Suitable for dry areas

Product Description

> For use directly on the suction opening of dry-running rotary-vane pumps
> To protect vacuum pumps from damage or excessive wear
> High filtration efficiency due to large filter surface
> Light-weight plastic housing
> Inspection glass to monitor the filtration effect
> Examples of use: graphics, textile and pharmaceutical industries

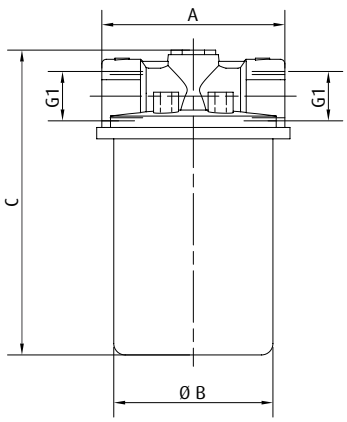
Technical data

Item no.	Max. volume flow [m^3/h]	Grade of filtration [µm]	Weight [g]	Suitable spare cartridges
71.032	12	30	180	71.032-Kartusche
71.033	24	30	370	71.033-Kartusche
71.034	30	30	360	71.033-Kartusche
71.043	100	25	900	71.043-Kartusche

Dimensions

G1	A [mm]	Ø B [mm]	C [mm]
G1/4	62	62	82
G3/8	85	85	138
G1/2	85	85	138
G1	145	145	240

Dimensions



Universal filter with steel cartridge

Suitable for dry and wet areas

FB 25 to FB 60

Product Description

> To protect vacuum pumps from damage or excessive wear
> Separation of coarser particles, dust and dirt
> Resistant filter elements made of stainless steel (INOX)
> Filter incl. condensate trap

Notes

> FB 5 to FB 20: filter bowl made of transparent plastic
> FB 25 to 60: filter bowl made of die cast aluminium

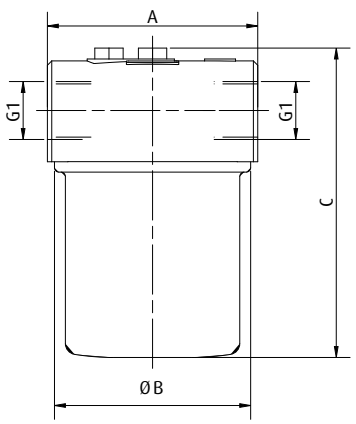
Technical data

Item no.	Max. volume flow [m³/h]	Grade of filtration [µm]	Operating pressure [bar]	Max. operating temperature [°C]	Weight [kg]
FB 5	5	60	2	90	0.14
FB 10	10	60	2	90	0.26
FB 20	20	60	2	90	0.34
FB 25	40	60	4	90	0.87
FB 30	70	60	4	90	0.83
FB 40	150	60	4	90	3
FB 50	200	60	4	90	3.1
FB 60	300	60	4	90	3.2

Dimensions

G1	A [mm]	Ø B [mm]	C [mm]
G1/4	61	59	74.5
G3/8	81	79	89
G1/2	81	79	117
G3/4	120	120	175
G1	120	112	175
G1 1/4	190	182	255
G1 1/2	190	182	300
G2	182	260	420

Dimensions



Material in Motion
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Filter / Condensate trap

Precipitation of condensable vapors

Product Description

> Efficient and reliable separation of water droplets out of vacuum systems
> Easy installation after vacuum pumps or ejectors
> Housing made of transparent plastics for filtration monitoring
> Drainage valve at the bottom to discharge the collected condensate

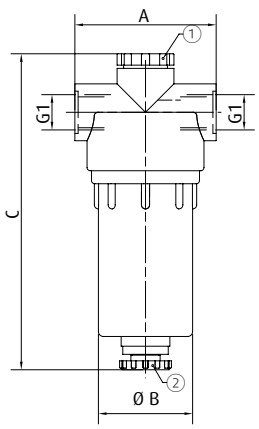
Notes

> Filter needs to be ventilated before opening

Technical data

Item no.	Max. volume flow [m³/h]	Max. filling capacity [cm³]	Grade of filtration [µm]	Filter material	Max. input pressure [bar]	Max. operating temperature [°C]	Weight [kg]	Suitable spare cartridges
71.035	10.6	30	100	Stainless steel mesh	7.3	122	0.6	71.035-Kartusche
71.036	17.7	25	50	Polyethylene - sintered	7.3	122	0.8	71.036-Kartusche
71.037	21.2	40	30	Synthetic felt	7.3	122	1.7	71.037-Kartusche
71.038	35.3	50	30	Synthetic felt	7.3	122	5	71.038-Kartusche
71.039	58.9	100	30	Synthetic felt	7.3	122	9.3	71.039-Kartusche

Dimensions



① = Bleeding screw ② = Blow-off screw

Item no.	G1	A [mm]	Ø B [mm]	C [mm]
71.035	G3/8	80	75	135
71.036	G1/2	87	60	196
71.037	G3/4	125	100	255
71.038	G1	175	150	370
71.039	G1 1/2	220	190	450

Plug-in filters

71.070 and 71.071: Plug-in pipe (Ø d1) fits in Ø 4 mm / 6 mm tubing connections

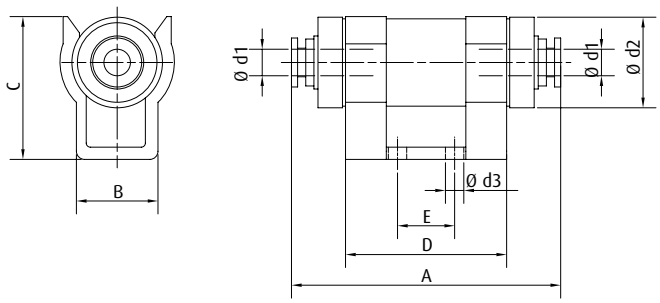
Product Description

> Trapping impurities and liquids, which can be suctioned via the vacuum cup or other systems
> To protect vacuum components (e.g. ejectors) from damage or excessive wear
> 71.000 to 71.004: Economical use due to replaceable filter cartridges

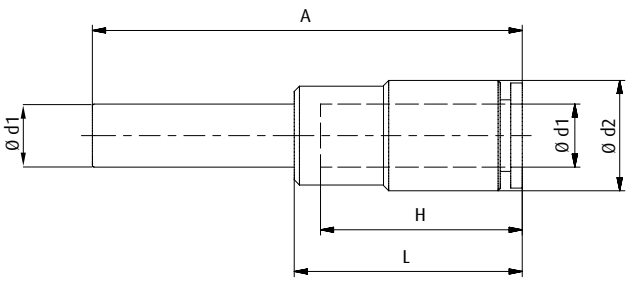
Technical data

Item no.	Filter surface [cm²]	Grade of filtration [µm]	Weight [g]	Suitable accessories
71.000	7.5	10	16	Holder VFUH2 Spare cartridge 71.005-Kartusche
71.001	7.5	10	17	Holder VFUH2 Spare cartridge 71.005-Kartusche
71.002	12.5	10	25	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.003	12.5	10	27	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.004	12.5	10	33	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.070	0.8	10	1.5	--
71.071	1.1	10	2.5	--

Dimensions



71.000 | 71.001 | 71.002 | 71.003 | 71.004



71.070 | 71.071

Item no.	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	H [mm]	L [mm]
71.000	4	18.5	4.5	55	18	29	33	10	--	--
71.001	6	18.5	4.5	58	18	29	33	10	--	--
71.002	6	22.5	4.5	66	20	35	39.5	14	--	--
71.003	8	22.5	4.5	67.5	20	35	39.5	14	--	--
71.004	10	22.5	4.5	75	20	35	39.5	14	--	--
71.070	4	8	--	38.6	--	11	--	--	11	21.5
71.071	6	10.5	--	41	--	11.6	--	--	11.6	21.8

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Ring filters

Used in connection with ejectors

Product Description

> Installation between vacuum cup (IN) and ejector (OUT)
> Absorption of dust and dirt that is introduced by the vacuum cup
> Application primarily for inline and base ejectors
> Economical use due to replaceable filter cartridges

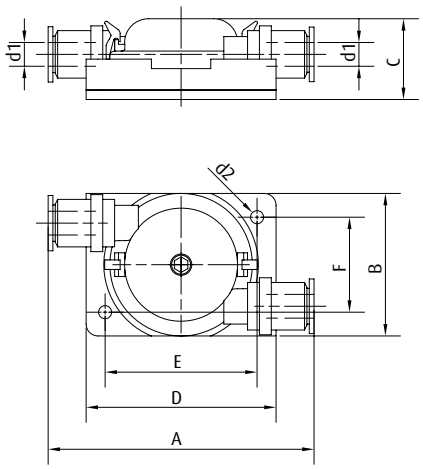
Technical data

Item no.	Filter surface [cm²]	Grade of filtration [µm]	Weight [g]	Suitable spare cartridges
71.007	20	10	206	71.022-Kartusche
71.008	20	10	204.5	71.022-Kartusche
71.009	20	10	198	71.022-Kartusche
71.010	20	10	190.5	71.022-Kartusche
71.011	20	10	231.5	71.022-Kartusche

Dimensions

d1 [mm]	d2 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
6	5.5	113	60	37.5	80	60	40
8	5.5	113	60	37.5	80	60	40
10	5.5	114	60	37.5	80	60	40
12	5.5	113	60	37.5	80	60	40
16	5.5	128	60	37.5	80	60	40

Dimensions



Disposable filters

71.030

71.031

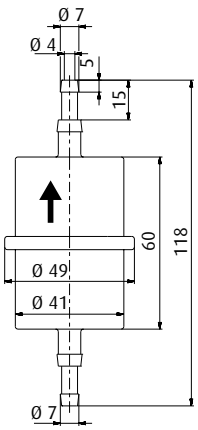
Product Description

> 71.030: Separation of very fine particles with a 7µm filter mesh
> 71.031: Separation of coarse particles, dust and dirt using a 152µm filter unit

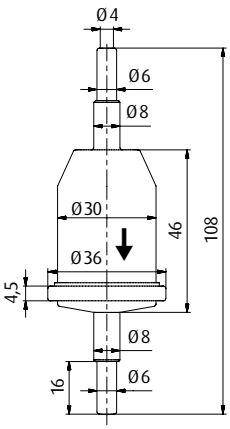
Technical data

Item no.	Max. volume flow [Nl/min]	Grade of filtration [µm]	Filter material	Max. operating temperature [°C]	Weight [g]
71.030	120	7	Paper	50	30
71.031	100	152	PP, PE	50	12

Dimensions



71.030



71.031

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Filters for feed ejectors

Product Description

> Filter is connected, for instance, at the outlet of the feed ejectors, to separate particles out of the transport flow

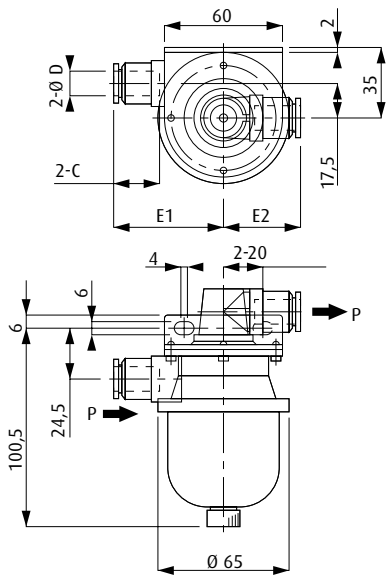
Technical data

Item no.	Filter surface [cm²]	Grade of filtration [µm]	Weight [g]
71.012	20	10	232.2
71.013	20	10	230.5
71.014	20	10	224.5
71.015	20	10	217
71.016	20	10	240

Dimensions

Ø D [mm]	C [mm]	E1 [mm]	E2 [mm]
6	17	48	38
8	18.5	48	38
10	21	48.5	38.5
12	23.5	48	38
16	25	55.5	43.5

Dimensions



Filters for feed ejectors

Product Description

Filter is used at the exhaust outlet of an ejector (IN) to collect the transported particles. The air is released via OUT.

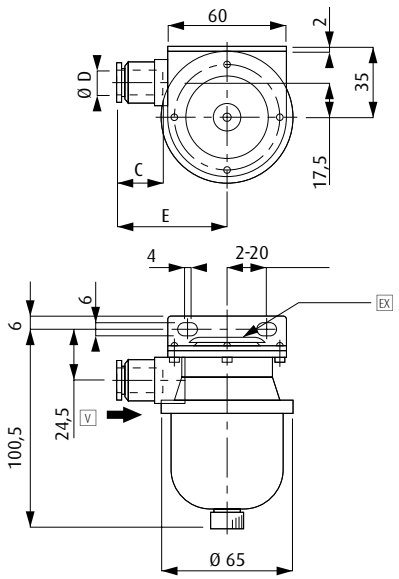
Technical data

Item no.	Filter surface [cm²]	Grade of filtration [µm]	Weight [g]
71.017	20	10	195.5
71.018	20	10	194.5
71.019	20	10	191.5
71.020	20	10	187.5
71.021	20	10	199

Dimensions

Ø D [mm]	C [mm]	E [mm]
6	17	48
8	18.5	48
10	21	48.5
12	23.5	48
16	25	55.5

Dimensions



V = Vacuum connection EX = Output

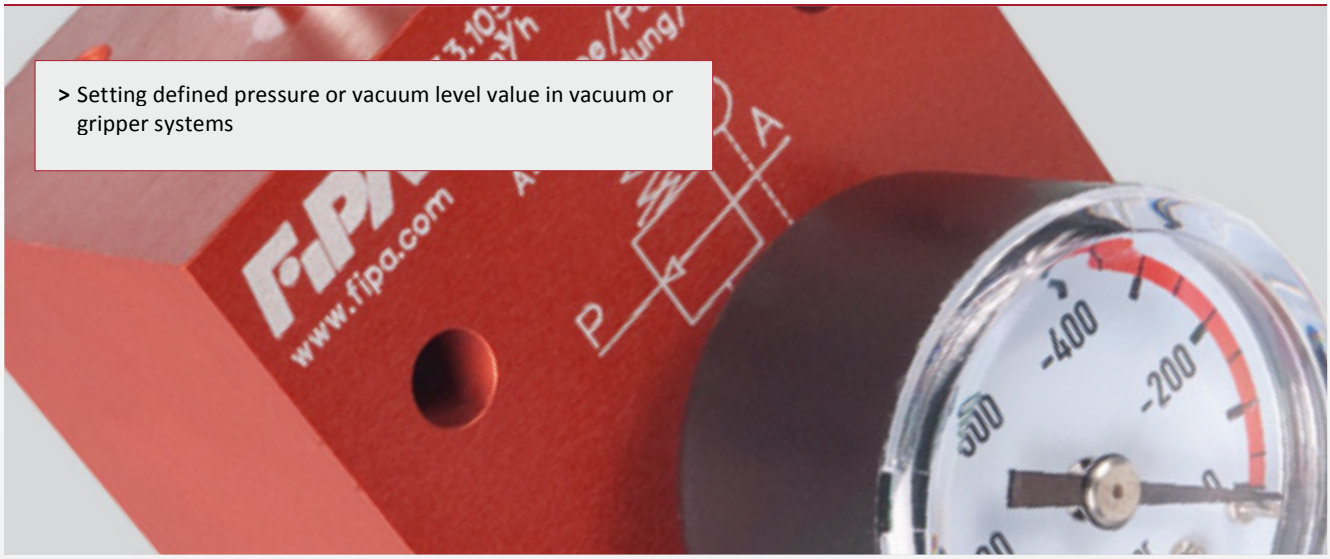
Control technology at a glance 635

Pressure regulators 636

Vacuum regulators 640

Notes:

FIPA control technology



> Setting defined pressure or vacuum level value in vacuum or gripper systems

Pressure regulators

> Defined reduction in operating pressure for compressed air-operated vacuum generators (ejectors)
> Limitation of gripper holding force in End-of-Arm-Tooling
> Simple adjustment
> Models for inline installation available

> See page 636

Vacuum regulators with external leakage

> Limitation of vacuum level, e.g. from rotary-vane pumps or vacuum tanks (safety adjustment)
> Can also be used in dust-contaminated environments
> Simple adjustment

> See page 640

Vacuum regulators

> Maintenance of system vacuum independently of air-permeability of workpiece and of fluctuations in the vacuum supply
> Precise adjustment
> Suitable for measuring or testing purposes

> See page 642

Pressure regulators - screw-in type

Product Description

> Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
> Pressure adjustment by means of knurled screw
> Integrated overpressure protection

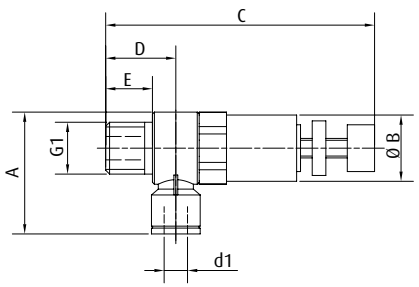
Notes

> Only suitable for compressed air

Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy (±) [%]	Operating temperature [°C]	Weight [g]
32.570	0 - 9	1 - 8	5	0 - 60	16
32.571	0 - 9	1 - 8	5	0 - 60	36
32.572	0 - 9	1 - 8	5	0 - 60	17
32.573	0 - 9	1 - 8	5	0 - 60	37
32.574	0 - 9	1 - 8	5	0 - 60	59
32.575	0 - 9	1 - 8	5	0 - 60	38
32.576	0 - 9	1 - 8	5	0 - 60	60

Dimensions



Item no.	G1	d1 [mm]	A [mm]	Ø B [mm]	C [mm]	D [mm]	E [mm]
32.570	M5	4	20.5	10	48.5	9	3.5
32.571	R1/8	4	28.5	14	60	14.5	8
32.572	M5	6	22.5	10	48.5	9.5	3.5
32.573	R1/8	6	30.5	14	60	14.5	8
32.574	R1/4	6	34	17	65	17.5	11
32.575	R1/8	8	34	14	60	15.5	8
32.576	R1/4	8	37	17	65	18.5	11

Pressure regulators - screw-in type, with pressure gauge

Product Description

> Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
> Pressure adjustment by means of knurled screw, pressure monitoring by means of gauge (readout in MPa)
> Integrated overpressure protection

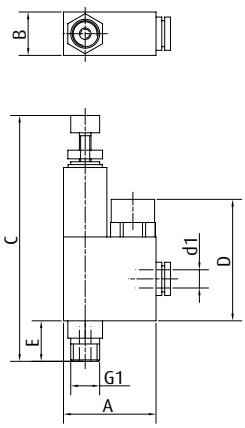
Notes

> Only suitable for compressed air

Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy (±) [%]	Operating temperature [°C]	Weight [g]
32.587	0 - 9	1 - 8	5	0 - 60	28
32.588	0 - 9	1 - 8	5	0 - 60	55
32.589	0 - 9	1 - 8	5	0 - 60	28
32.590	0 - 9	1 - 8	5	0 - 60	55
32.591	0 - 9	1 - 8	5	0 - 60	84
32.592	0 - 9	1 - 8	5	0 - 60	55
32.593	0 - 9	1 - 8	5	0 - 60	84

Dimensions



Item no.	G1	d1 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
32.587	M5	4	27.5	15	57.5	42	3.5
32.588	R1/8	4	36	15	81.5	42	8
32.589	M5	6	28	15	57.5	42	3.5
32.590	R1/8	6	36.5	15	81.5	42	8
32.591	R1/4	6	39.5	19	89.5	42	11
32.592	R1/8	8	36.5	15	81.5	42	8
32.593	R1/4	8	39.5	19	89.5	42	11

"Inline" pressure regulators

Product Description

> Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
> Pressure adjustment by means of knurled screw
> Integrated overpressure protection

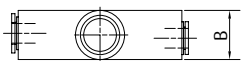
Notes

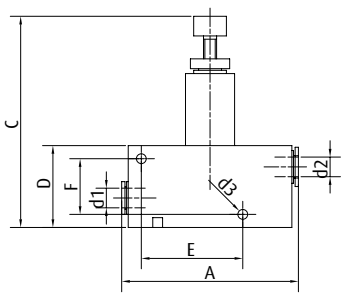
> Only suitable for compressed air

Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy (±) [%]	Operating temperature [°C]	Weight [g]
32.577	0 - 9	1 - 8	5	0 - 60	36
32.578	0 - 9	1 - 8	5	0 - 60	36
32.579	0 - 9	1 - 8	5	0 - 60	36
32.580	0 - 9	1 - 8	5	0 - 60	60
32.581	0 - 9	1 - 8	5	0 - 60	60

Dimensions





Item no.	d1 [mm]	d2 [mm]	d3 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
32.577	4	4	3.2	44	15	63	25	30	17
32.578	6	4	3.2	44.5	15	63	25	30	17
32.579	6	6	3.2	45	15	63	25	30	17
32.580	8	6	3.2	57	19	68	29	39	21
32.581	8	8	3.2	57	19	68	29	39	21

"Inline" pressure regulators with pressure gauge

Product Description

> Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
> Easy installation thanks to vertical and horizontal cross-holes
> Pressure adjustment by means of knurled screw, pressure monitoring by means of gauge (readout in MPa)
> Integrated overpressure protection

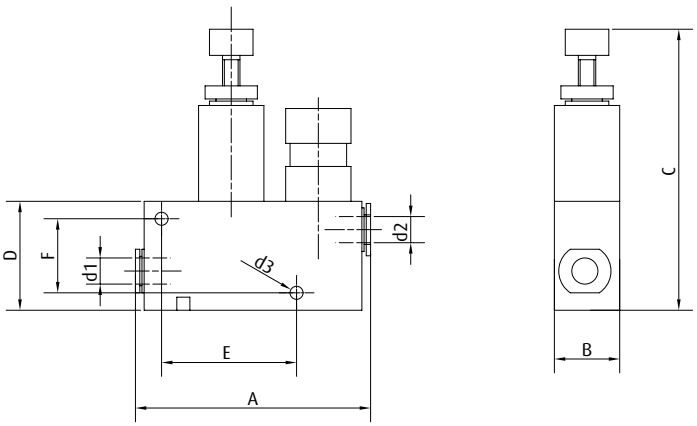
Notes

> Only suitable for compressed air

Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy (±) [%]	Operating temperature [°C]	Weight [g]
32.582	0 - 9	1 - 8	5	0 - 60	48
32.583	0 - 9	1 - 8	5	0 - 60	48
32.584	0 - 9	1 - 8	5	0 - 60	48
32.585	0 - 9	1 - 8	5	0 - 60	73
32.586	0 - 9	1 - 8	5	0 - 60	73

Dimensions



Item no.	d1 [mm]	d2 [mm]	d3 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
32.582	4	4	3.2	55	15	63	25	30	17
32.583	6	4	3.2	55.5	15	63	25	30	17
32.584	6	6	3.2	56	15	63	25	30	17
32.585	8	6	3.2	69	19	67.5	29	39	21
32.586	8	8	3.2	69	19	67.5	29	39	21

Vacuum regulators with external leakage

Safety control valve particularly for oil-free rotary-vane pumps

Product Description

> Setting a constant vacuum level when handling workpieces with varying porosities or leakage
> Suitable as safety valve if dry-running rotary-vane pumps are to run continuously at maximum vacuum
> Control of vacuum through automatic venting when a preset vacuum level is reached
> Manual adjustment via fine thread, mechanical opening via spring load

Notes

> Turn the knob towards the (+) to increase the vacuum threshold value at which the regulator will start drawing in outside air. Turn the knob towards the (-) to reduce this value.

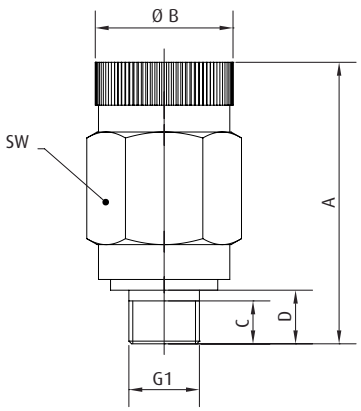
Ordering notes

> On request suitable as safety valve for side channel blowers to limit the max. vacuum level (diameter of regulator and blower inlet should be identical)

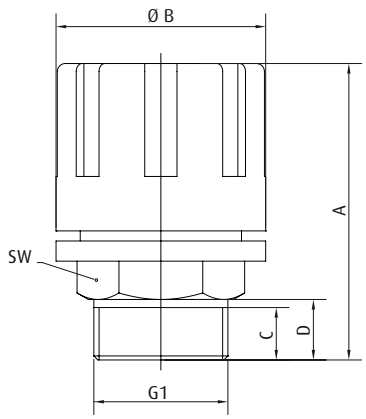
Technical data

Item no.	Maximum control volume [m³/h]	Regulating range [mbar]	Operating temperature [°C]	Weight [g]
73.002	16	-999 - 0	-20 - 80	270
73.003	40	-999 - 0	-20 - 80	658

Dimensions



73.002



73.003

Item no.	G1	A [mm]	Ø B [mm]	C [mm]	D [mm]	SW
73.002	G1/4	63	26	8	10	25
73.003	G1	82	52	13	15	32

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Vacuum regulators

Product Description

> Vacuum adjustment of consumer loads, such as vacuum cups in handling systems
> Automatic compensation of fluctuations in vacuum supply
> Highly precise, continuous vacuum adjustment via a rotary knob with locking mechanism
> Suitable for conducting leakage tests for inspection / measurement purposes

Notes

> Turning the rotary knob clockwise increases the vacuum on the consumer side (SET) with the vacuum generator connected (VAC)

Ordering notes

> Included in scope of delivery: Vacuum gauge incl. connection adapter

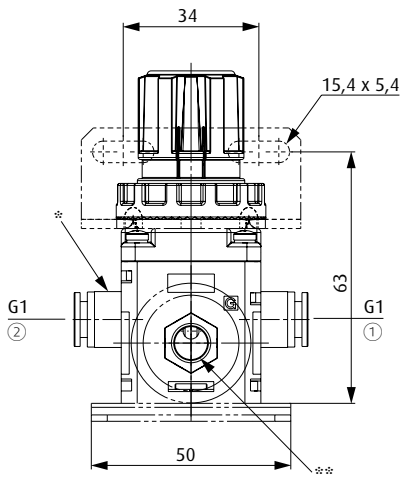
Technical data

Item no.	Maximum flow rate [m³/h]	Regulating range [mbar]	Accuracy [mbar]	Operating temperature [°C]	Weight [g]	Suitable vacuum gauge
33.220	8.4	-999 - 0	< 1.3	5 - 60	135	91.001-R (p.696)
33.220-G1/4	8.4	-999 - 0	< 1.3	5 - 60	135	91.001-R (p.696)
33.230	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)
33.230-G1/2	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)
33.230-G1/4	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)

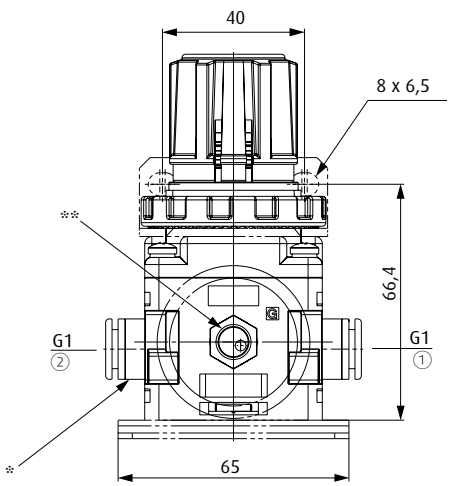
Dimensions

G1	d1 [mm]
--	8
G1/4	--
--	8
G1/2	--
G1/4	--

Dimensions



33.220 | 33.220-G1/4



33.230 | 33.230-G1/2 | 33.230-G1/4

① = Connection to the vacuum cup / product side (description SET) ② = Pump connection (description VAC) * = Plug connection
** = R1/8 Gauge connection

Vacuum regulators

Vacuum regulator 33.105 with vacuum gauge

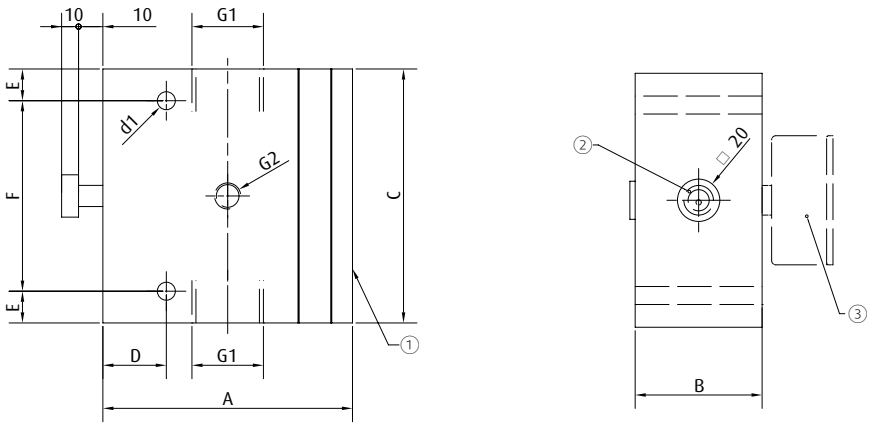
Product Description

> Vacuum adjustment of consumer loads, such as vacuum cups in handling systems
> Integration of a vacuum gauge recommended
> Blow-off is possible if vacuum gauge is not connected
> Any installation position

Technical data

Item no.	Maximum flow rate [m³/h]	Regulating range [mbar]	Operating temperature [°C]	Weight [kg]	Suitable vacuum gauge
33.105	10	-200 - -999	-10 - 80	0.6	91.001 (p.696)
33.120	80	-200 - -999	-10 - 80	2.1	91.003 (p.696)

Dimensions



① = The bottom side must not be covered ② = Adjusting screw ③ = Vacuum gauge (optional)

Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
33.105	G3/8	G1/8	89	40	60	20	6.5	10	40
33.120	G1	G1/4	118	60	120	30	8.5	15	90

Electromagnetic and pneumatic valves at a glance 644
Solenoid valves for vacuum 646
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Solenoid valves for compressed air 660
Base valves at a glance 662
Flow control valves 665
Touch valves 670
Non-return valves 672
Butterfly valves 675
Manual valves 678

FIPA Valve technology

> Control of suction, blow-off or ventilation processes in vacuum systems
> Fast switching between suction and air intake for short cycle times

2/2-way solenoid valves for vacuum, directly controlled

> NC version - closed without current
> No compressed air required
> Short switching times
> Small, compact design for small throughputs

> See page 646

3/2-way solenoid valves for vacuum, directly controlled

> NC version - closed without current, or NO - open without current
> No compressed air connection required
> Short switching times
> Small, compact design for small throughputs
> Optional construction of valve clusters

> See page 648

3/2-way solenoid valves for vacuum, internal vacuum piloted

> NC version - closed without current, or NO - open without current
> No compressed air connection required
> Short switching times
> Minimum vacuum level required: 40 %
> NO: Holds workpiece in the event of a power failure

> See page 652

3/2-way solenoid valve, supported by compressed air

> Suction on/off, blow-off, ventilation
> Short switching times
> NC version - closed without current, or NO - open without current
> NO: Holds workpiece in the event of a power failure

> See page 654

FIPA Valve technology

3/2-way valves, pneumatically controlled

> Suction on/off, blow-off, ventilation
> Shortest switching times compared to vacuum piloted and compressed air supported valves
> No electrical power connection required
> NO: Holds workpiece in the event of a power failure
> Combination with pneumatic vacuum switch: Activation of the "suction" function when the set switching point is reached

> See page 657

3/2-way and 5/2-way solenoid valves for compressed air, indirectly controlled

36.061 (3/2 way)
> Control of compressed air, e.g. for the vacuum generation of ejectors or foam grippers with integrated ejectors
> Control of pneumatically controlled valves, e.g. 36.810 - 36.825

36.060 (5/2 way)
> Vacuum control as with article 36.061
> Additional blow-off function resulting in short release times for ejectors with direct connection between compressed air and vacuum chamber
Examples: Heavy-duty ejectors 65.111 and 65.130

> See page 660

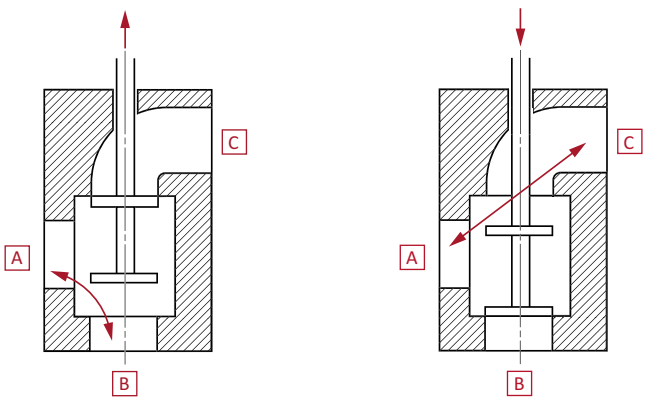
Examples of use

> Packaging machines
> Bottle openers
> Paper feeding
> Robotic applications
> General automation

Construction and functional principle of the 3/2-way valve

A = vacuum cup output | B = compressed air supply | C = to the vacuum pump

> Versions in plastic or metal housings
> Protection class up to IP65
> Directly controlled
> Piloted by internal vacuum
> Supported by compressed air
> Controlled by compressed air
> NC and NO switching functions available



2/2-way electromagnetic vacuum valves, directly controlled

Product Description

> Very high suction power at small size for short evacuation time and fast vacuum build-up
> Short response time
> Robust brass housing and compact design for demanding applications
> Also suitable for positive pressure
> Incl. energy saving coil for minimised power consumption and less heat development

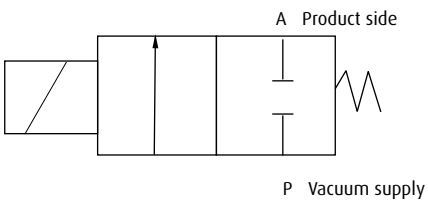
Ordering notes

> Energy saving coil 24 VDV or 230 VAC and DIN plug IP65 included
> Further available voltages:
- VAC: 115, 48, 24
- VDC: 12

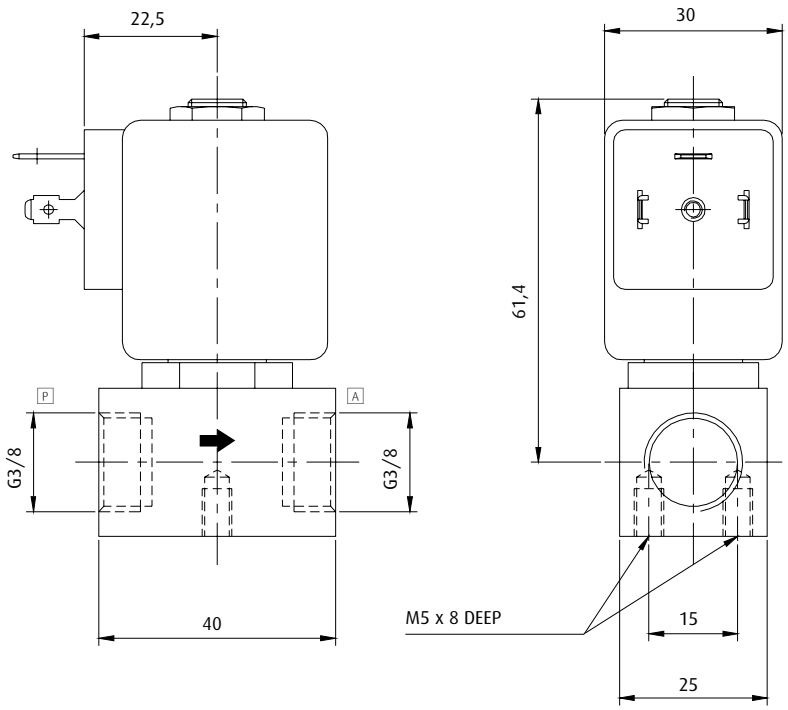
Technical data

Item no.	36.004-24VDC	36.004-230VAC
Nominal width [mm]	7	7
Nominal flow rate [m³/h]	4.8	4.8
Pressure range [bar]	-1 - 4	-1 - 4
Operating principle	NC	NC
Switching time [ms]	20	20
Power-on time [ED]	100 %	100 %
Max. Power consumption [W]	12	9
Protection class	IP65	IP65
Operating temperature [°C]	-10 - 60	-10 - 60
Weight [g]	520	520
Suitable accessories	Plug 10.007 Coil 10.0050/24VDC	Plug 10.007 Coil 10.0050/230VAC

Wiring diagram



Dimensions



A = Product side P = Vacuum supply

3/2-way solenoid vacuum valves, directly controlled

RESISTANCE AGAINST LOW OZONE CONCENTRATIONS

Product Description

> Very high suction power at small size for short evacuation time and fast vacuum build-up
> Small, compact and lightweight
> Suction on/off, blow-off or ventilation of vacuum cups
> HNBR - Diaphragm allows for flexible installation due to resistance against low ozone concentrations
> Fast switching time
> Factory set NO, can be switched to NC by the customer
> To be mounted in any position

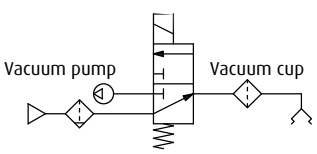
Ordering notes

> Included in scope of delivery: Coil 24 VDC and DIN plug
> Other voltages on request

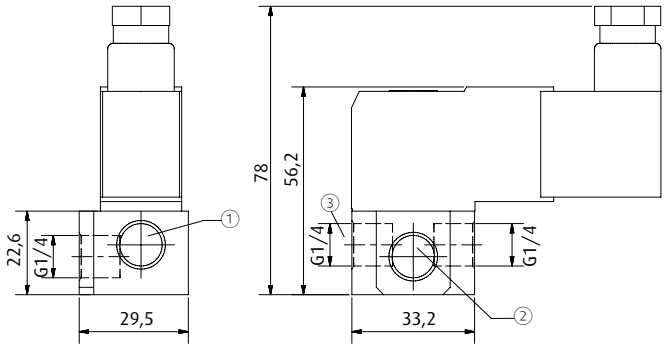
Technical data

Item no.	36.003
Connection	G 1/4
Nominal width [mm]	4.5
Nominal flow rate [m³/h]	2.1
Pressure range [bar]	-1 - 0
Max. switching frequency [Hz]	10
Response time [ms]	20
Protection class	IP65
Operating principle	NC/NO
Duty ratio [%]	75
Operating voltage [VDC]	24
Power consumption [W]	4
DIN-plug	Yes
Operating temperature [°C]	-10 - 50
Weight [g]	155

Wiring diagram



Dimensions



① = Vacuum supply ② = Compressed air, blow-off ③ = Vacuum connection (Product side)

3/2-way solenoid vacuum valves, directly controlled

Product Description

> Very high suction power at small construction size for short evacuation time and fast vacuum build-up
> Fast product release due to integrated vent port
> Suction on/off, blow-off or ventilation of vacuum systems
> Also suitable for positive pressure
> Short response time
> Robust brass housing in compact design for demanding applications
> Incl. energy saving coil for minimised power consumption and less heat development

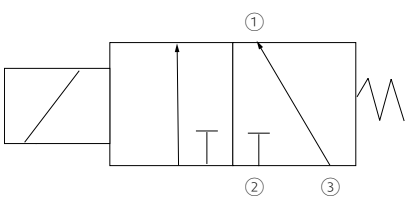
Ordering notes

> Included in scope of delivery: Energy saving coil 24 VDC or 230 VAC for minimised power consumption and less generation of heat and DIN IP65 plug
> Further available voltages:
- VAC: 115, 48, 24
- VDC: 12
> Standard seal is NBR, different material, such as EPDM, for higher temperatures on request

Technical data

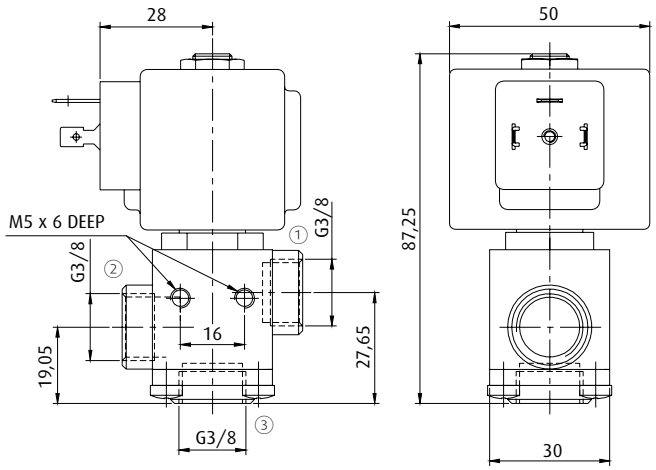
Item no.	36.009-24VDC	36.009-230VAC
Nominal width [mm]	13	13
Nominal flow rate [m^3/h]	8.8	8.8
Pressure range [bar]	-0.99 - 4	-0.99 - 4
Operating principle	NC	NC
Closing time [ms]	21	21
Duty ratio [%]	100	100
Power consumption [W]	12	12
Protection class	IP65	IP65
Operating temperature [°C]	-10 - 60	-10 - 60
Weight [g]	540	540
Suitable accessories	Push-in fitting 30.017 (p.724) Plug 10.007 Coil 10.0050/24VDC	Push-in fitting 30.017 (p.724) Plug 10.007 Coil 10.0050/230VAC

Wiring diagram



Assignment:
① = A (Product side)
② = P (Vacuum supply)
③ = R (Ventilation (Blow-off))

Dimensions



① = Vacuum supply ② = Product side ③ = Ventilation (Blow-off)

3/2-way solenoid vacuum valves, internally vacuum pilot operated

36.610 | 36.611

36.615 to 36.626

Product Description

> Suction on/off, blow-off, ventilation of vacuum cups
> High suction power at small construction for short evacuation time and fast vacuum build-up
> Valve operation requires no compressed air connection due to internal vacuum control
> Required minimum vacuum level 40 %
> Short switching times
> NO: Safe gripping of workpiece during power failure
> Robust and light-weight housing

Ordering notes

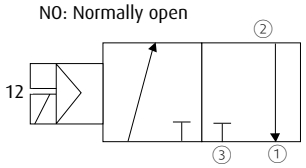
> 36.610 and 36.611: Coil and DIN plug included in scope of delivery
> 36.615 to 36.625: Delivery without coil and plug; please order: Power consumption: 24 VDC: 5 W, 230 VAC: 5 VA

Technical data

Item no.	Nominal width [mm]	Nominal flow rate [m³/h]	Pressure range [bar]	Operating principle	Switching time at -800 mbar [ms]	Material	Operating temperature [°C]	Weight [g]	Suitable accessories
36.610	10	10	-0.99 - 0	NO	30	Aluminium anodised	-5 - 50	420	--
36.611	10	10	-0.99 - 0	NC	30	Aluminium anodised	-5 - 50	420	--
36.615	15	20	-0.99 - 0	NO	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.616	15	20	-0.99 - 0	NC	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.620	20	40	-0.99 - 0	NO	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.621	20	40	-0.99 - 0	NC	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.625	25	90	-0.99 - 0	NO	100	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	520	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.626	25	90	-0.99 - 0	NC	100	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	520	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006

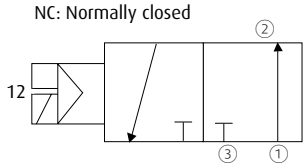
Wiring diagrams

NO: Normally open



Assignment:
① = P (Vacuum supply)
② = A (Product side)
③ = R (Ventilation (Blow-off))

NC: Normally closed

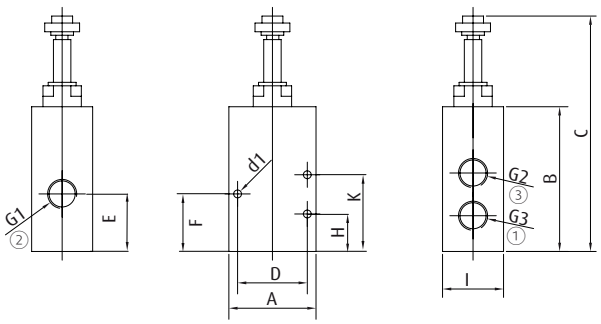


Assignment:
① = P (Ventilation (Blow-off))
② = A (Product side)
③ = R (Vacuum supply)

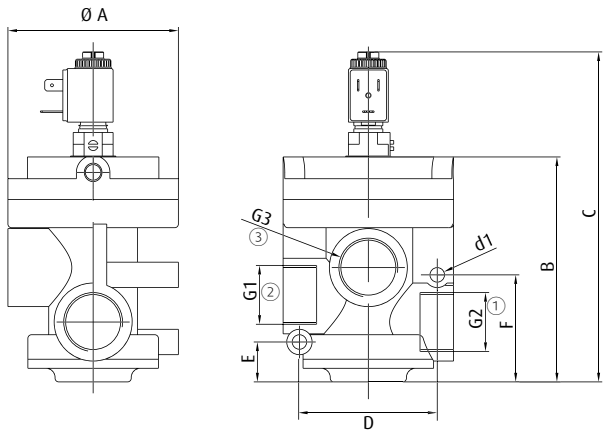
Pilot valve

> Manual mode for functional test: Setscrew in zero position
> Automatic mode: Setscrew in position "1"

Dimensions



36.610 | 36.611



36.615 | 36.616 | 36.620 | 36.621 | 36.625 | 36.626

① = Vacuum supply / Ventilation (Blow-off) ② = Product side ③ = Ventilation (Blow-off) / Vacuum supply

Item no.	G1	G2	G3	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	I [mm]	K [mm]
36.610	G3/8	G3/8	G3/8	--	50	83	137	40	4.5	22.5	33	21.5	35	44
36.611	G3/8	G3/8	G3/8	--	50	83	137	40	4.5	35	33	21.5	35	44
36.615	G1/2	G1/2	G1/2	75	--	101	155	63	6.5	22.5	55	--	--	--
36.616	G1/2	G1/2	G1/2	75	--	101	155	63	6.5	22.5	55	--	--	--
36.620	G3/4	G3/4	G3/4	75	--	101	155	63	6.5	22.5	55	--	--	--
36.621	G3/4	G3/4	G3/4	75	--	101	155	63	6.5	22.5	55	--	--	--
36.625	G1	G1	G1	94	--	124	178	63	8.2	22	58	--	--	--
36.626	G1	G1	G1	94	--	124	178	63	8.2	22	58	--	--	--

3/2-way solenoid vacuum valves, pneumatically supported with spring reset

36.210 | 36.211

36.515 to 36.525

Product Description

> Suction, blow-off, ventilation of vacuum cups
> High suction power at small construction for short evacuation times and fast vacuum build-up
> Short switching times
> Function: NC/NO as vacuum supply and blow-off / ventilation inlets can be exchanged
> NO: Safe gripping of workpiece during power failure
> Robust and lightweight housing

Ordering notes

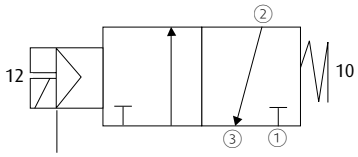
> 36.210 and 36.211: Coil and DIN plug included in scope of delivery
> 36.515 to 36.525: Delivery without coil and plug; please order: Power consumption: 24 VDC: 5 W, 230 VAC: 5 VA

Technical data

Item no.	Nominal width [mm]	Nominal flow rate [m³/h]	Pressure range [bar]	Operating principle	Control pressure [bar]	Switching time [ms]	Material	Operating temperature [°C]	Weight [g]	Suitable accessories
36.210	10	10	-0.99 - 0	NC	2.5	22	Aluminium anodised	-5 - 50	360	--
36.211	10	10	-0.99 - 0	NO	2.5	22	Aluminium anodised	-5 - 50	360	--
36.515	15	20	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.520	20	40	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.525	25	90	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	500	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006

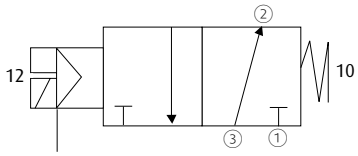
Wiring diagrams

NO: Normally open



Assignment:
① = P (Ventilation (Blow-off))
② = A (Product side)
③ = R (Vacuum supply)

NC: Normally closed



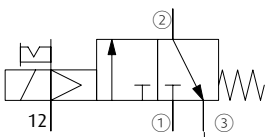
Assignment:
① = P (Vacuum supply)
② = A (Product side)
③ = R (Ventilation (Blow-off))

Pilot valve

> Manual mode for functional test: Setscrew in zero position
> Automatic mode: Setscrew in position "1"

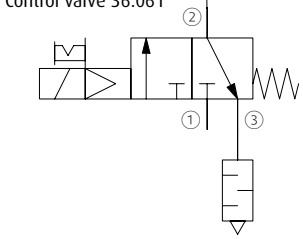
Wiring diagram: how to combine vacuum valve with pneumatic control valve for blow-off

Vacuum valve 36.520



Assignment
① Vacuum supply
② Product side
③ Ventilation (Blow-off)

Control valve 36.061

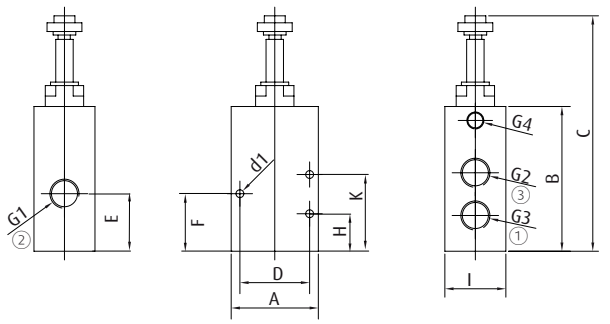


Assignment
① Compressed air inlet
② Compressed air output
③ Use of silencer (e.g. 72.016): this connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line

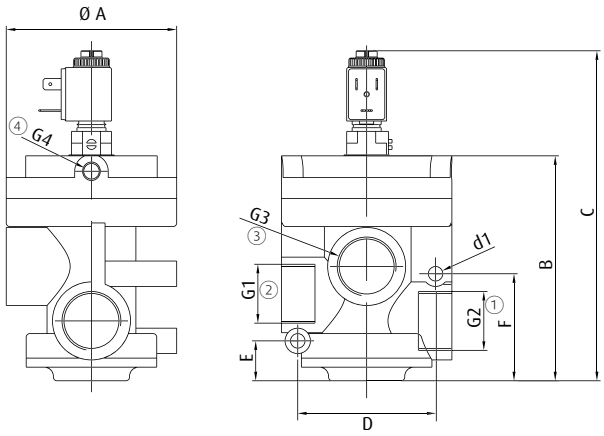
Application example: 3/2-way vacuum valves 36.520 with control valve 36.061

Continued on the next page

Dimensions



36.210 | 36.211



36.515 | 36.520 | 36.525

① = Vacuum supply / Ventilation (Blow-off) ② = Product side ③ = Ventilation (Blow-off) / Vacuum supply ④ = Control pressure connection

Item no.	G1	G2	G3	G4	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	I [mm]	K [mm]
36.210	G3/8	G3/8	G3/8	G1/8	--	50	83	137	40	4.5	33	32.8	22.5	35	44
36.211	G3/8	G3/8	G3/8	G1/8	--	50	83	137	40	4.5	33	32.8	22.5	35	44
36.515	G1/2	G1/2	G1/2	G1/8	75	--	101	155	63	6.5	22.5	55	--	--	--
36.520	G3/4	G3/4	G3/4	G1/8	75	--	101	155	63	6.5	22.5	55	--	--	--
36.525	G1	G1	G1	G1/8	92	--	114.5	168.5	63	6.9	22	58	--	--	--

3/2-way vacuum valve, pneumatically controlled with spring reset

Product Description

> Suction blow-off, ventilation of vacuum cups
> High suction power at small construction for short evacuation time and fast vacuum build-up
> Assembly of pneumatically controlled vacuum systems
> Valve operation requires no electric connection
> Shortest switching times compared to vacuum piloted and compressed air supported valves
> 36.815 to 36.825: Function: NC or NO as vacuum supply and blow-off / ventilation inlets can be exchanged

Ordering notes

> 36.335 to 36.341: Electronic valve for switching control independent of compressed air supply available on request; ordering example for version with electronic valve: 36.335_24VDC, 36.341_230VAC etc.

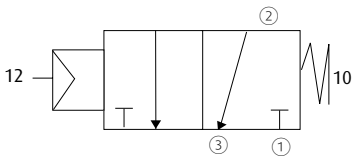
Technical data

Item no.	Nominal width [mm]	Nominal flow rate [m³/h]	Control pressure [bar]	Pressure range [bar]	Operating principle	Switching time [ms]	Material	Operating temperature [°C]	Weight [g]
36.810	10	10	2 - 6	-0.99 - 0	NO	22	Aluminium anodised	-5 - 50	360
36.811	10	10	2 - 6	-0.99 - 0	NC	22	Aluminium anodised	-5 - 50	360
36.815	15	20	2 - 6	-0.99 - 0	NO/NC	60	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	350
36.820	20	40	2 - 6	-0.99 - 0	NO/NC	50	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	330
36.825	25	90	2 - 6	-0.99 - 0	NO/NC	50	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	500
36.335	32	130	4 - 8	-0.99 - 0	NC	200	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	470
36.336	32	130	4 - 8	-0.99 - 0	NO	200	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	470
36.340	50	310	4 - 8	-0.99 - 0	NC	300	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	990
36.341	50	310	4 - 8	-0.99 - 0	NO	300	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	990

Continued on the next page

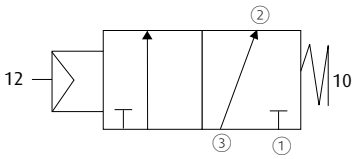
Wiring diagrams

NO: Normally open



Description of connections:
① = R (Compressed air, blow-off)
② = A (Product side)
③ = P (Vacuum supply)

NC: Normally closed

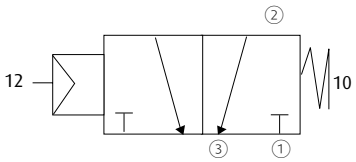


Description of connections:
① = R (Compressed air, blow-off)
② = A (Product side)
③ = P (Vacuum supply)

36.810 | 36.811

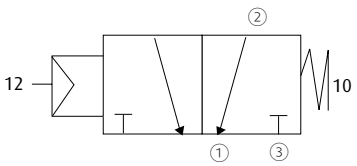
Wiring diagrams

NO: Normally open



Description of connections:
① = R (Compressed air, blow-off)
② = A (Product side)
③ = P (Vacuum supply)

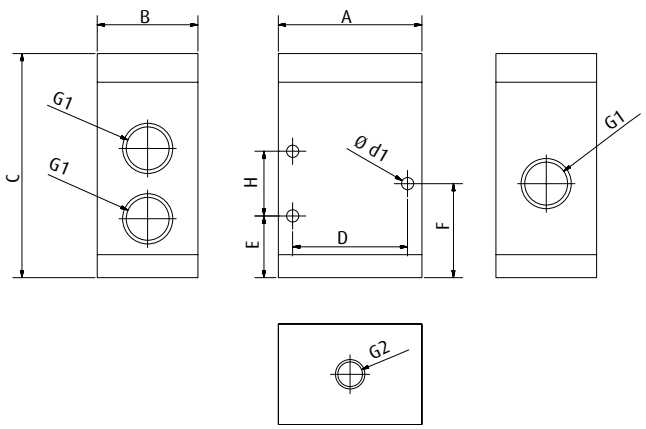
NC: Normally closed



Description of connections:
① = R (Compressed air, blow-off)
② = A (Product side)
③ = P (Vacuum supply)

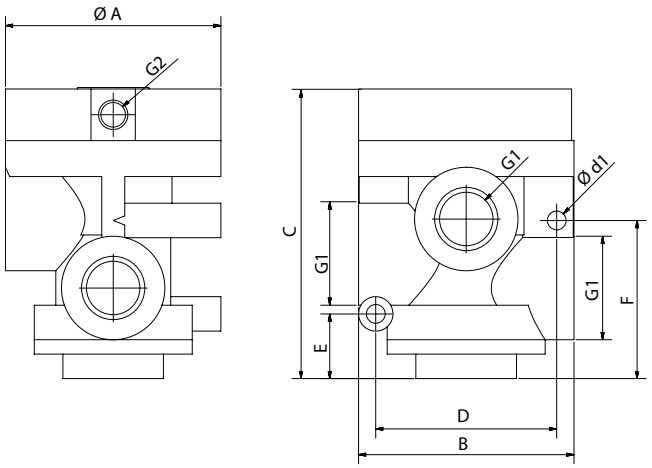
36.815 | 36.820 | 36.825 | 36.835 | 36.836 | 36.840 | 36.841

Dimensions

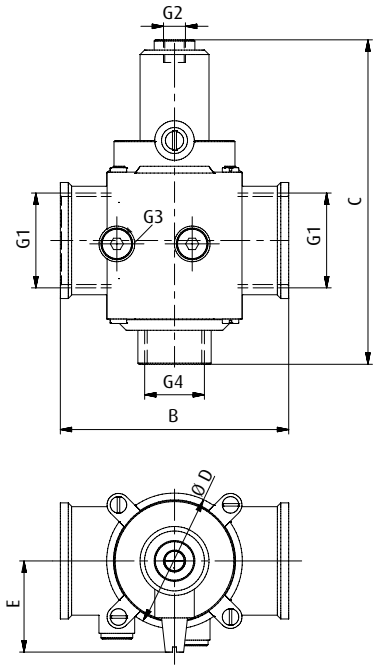


36.810 | 36.811

Dimensions



36.815 | 36.820 | 36.825



36.335 | 36.336 | 36.340 | 36.341

Item no.	G1	G2	G3	G4	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Ø D [mm]	Ø d1 [mm]	E [mm]	F [mm]	H [mm]
36.810	G3/8	G1/8	--	--	--	50	35	78	40	--	4.25	21.5	32.75	22.5
36.811	G3/8	G1/8	--	--	--	50	35	78	40	--	4.25	21.5	32.75	22.5
36.815	G1/2	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.820	G3/4	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.825	G1	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.335	G1 1/4	G1/8	G1/8	G 3/4	--	--	101	144	--	60	--	43	--	--
36.336	G1 1/4	G1/8	G1/8	G 3/4	--	--	101	144	--	60	--	43	--	--
36.340	G2	G1/8	G3/8	G1 1/4	--	--	142	183.5	--	90	--	56	--	--
36.341	G2	G1/8	G3/8	G1 1/4	--	--	142	183.5	--	90	--	56	--	--

Solenoid valves for compressed air

Indirectly controlled, with spring reset

36.060

36.061

Product Description

> Suitable for compressed air
> 36.060: For use e.g. to increase cycle times for ejectors without valve technology
Example: Vacuum and blow-off control for multi-chamber ejectors e.g. 65.410
- 1x compressed air vacuum generation
- 1x compressed air blow-off
> 36.061: For use e.g. as a blow-off control valve for 3/2-way vacuum valves
> Robust and lightweight housing

Ordering notes

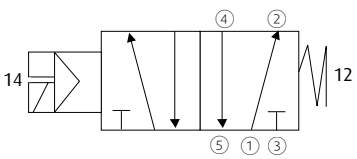
> Included in scope of delivery: Coil and DIN plug 10.006 for 24 VDC, IP65
> Spare part kits available on request

Technical data

Item no.	Nominal width [mm]	Nominal flow rate at 6 bar [m³/h]	Control pressure [bar]	Design	Supply voltage [VDC]	Duty ratio [%]	Max. Power consumption [W]	Protection class	Material	Operating temperature [°C]	Weight [g]
36.060	6	37.2	2.5 - 10	5/2	24	100	3.8	IP 65	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	180
36.061	6	37.2	2.5 - 10	3/2	24	100	3.8	IP 65	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	260

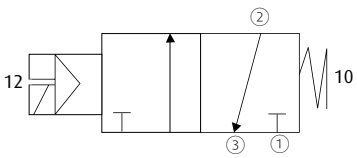
Wiring diagrams

36.060



Assignment
① Compressed air inlet
②, ④ Working connection
③, ⑤ Bleeding

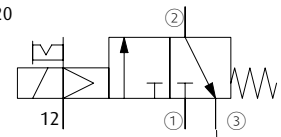
36.061



Assignment
① Compressed air inlet
② Working connection
③ Bleeding (e.g. 72.016): This connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line

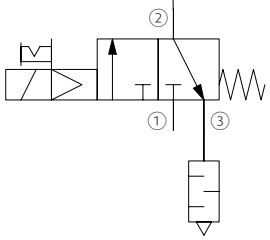
Application example: Usage of 36.061 as control valve to activate blow-off of 3/2-way vacuum valves (here: Valve 36.520)

36.520



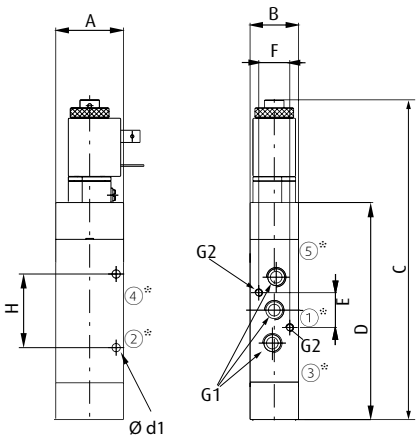
Assignment
① Vacuum supply
② Product side
③ Ventilation (Blow-off)

36.061

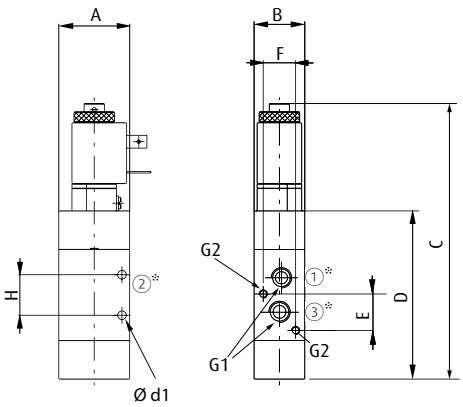


Assignment
① Compressed air inlet
② Compressed air output
③ Use of silencer (e.g. 72.016): This connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line

Dimensions



36.060

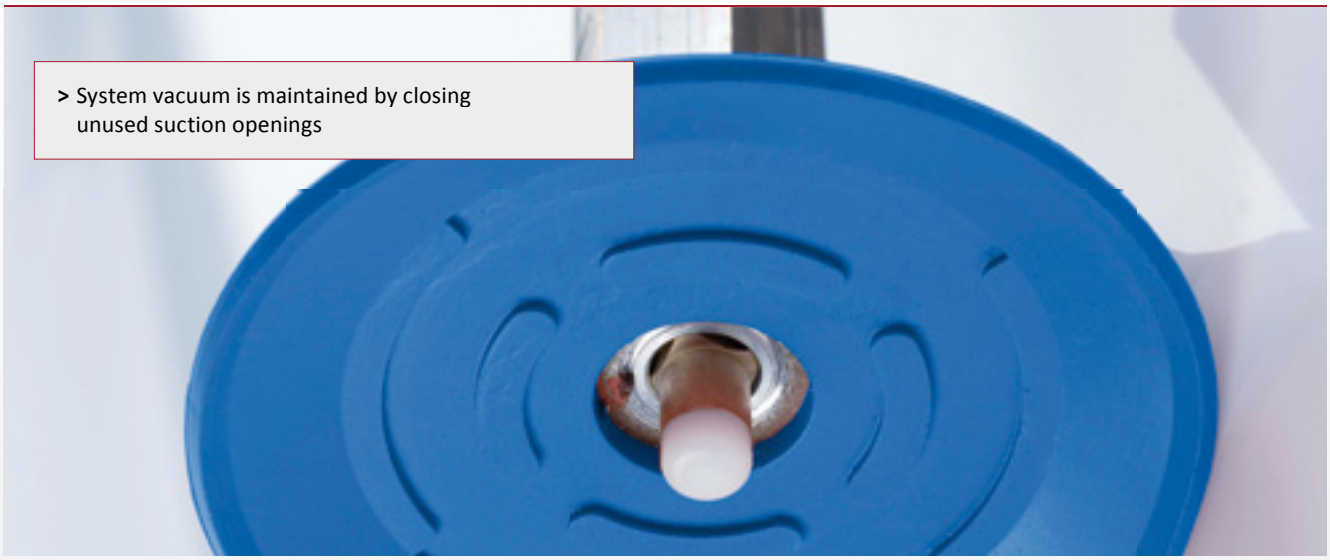


36.061

* = Assignment see wiring diagrams

Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	Ø d1 [mm]	E [mm]	F [mm]	H [mm]
36.060	G1/8	M4	35	25	153	100	4.25	18	16	38
36.061	G1/8	M4	35	25	136	83	4.25	18	16	20

FIPA Base valves



> System vacuum is maintained by closing unused suction openings

Flow control valves with flow pin

> Installation near to vacuum cup
> Sealing of unused suction openings to maintain the system vacuum for vacuum cups still in use
> Handling of porous workpieces, as there is no, or very little leakage
> Suitable for short cycle times
> Partially suited for dusty environments due to basic self-cleaning by means of blow-off

> See page 665

Touch valves

> Installation directly in vacuum cups
> Sealing of unused suction openings to maintain the system vacuum for vacuum cups still in use
> Spring-loaded push-button plunger opens vacuum channel following mechanical scanning
> Any installation position

> See page 670

Check valves

> Maintenance of the vacuum level in suction systems in cases of vacuum generator failure

32.631 to 32.635
> Inline version for mounting in the tubing line

32.647 to 32.653
> Suitable for installation between vacuum pumps and storage device
> Prevents oil return into the vacuum system in vacuum pumps without built-in check valve

32.638
> Check valves with compressed air inlet for short release times
> Installation directly between vacuum cup and ejector

> See page 672

FIPA Base valves

Butterfly valves

> Reduction of air flow at a constant vacuum level to compensate leakages through unused vacuum openings
> Also suitable for compressed air
> Inline-model available

> See page 675

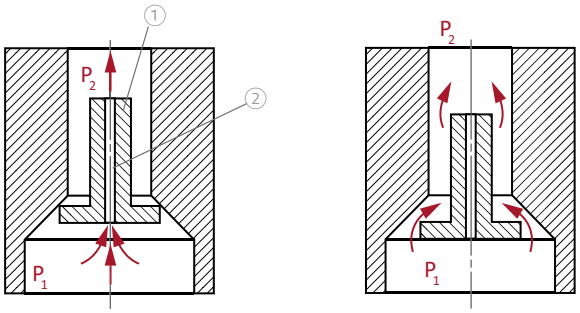
Manual valves

> Valves for manual switching on/off of pressure or vacuum circuits
> 3/2-way versions for the manual aeration of vacuum circuits
> Inline-models available
> Any installation position

> See page 678

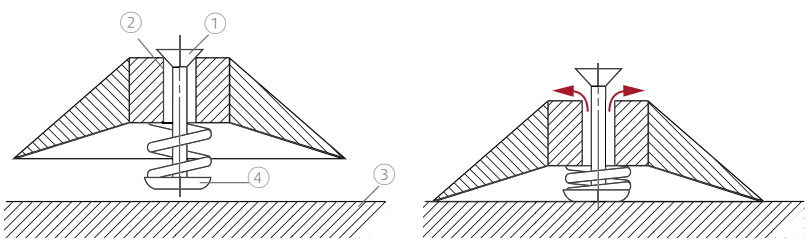
Method of operation: Flow valves

Flow valves are generally installed vertically, close to the vacuum cup. The vacuum cups are applied under vacuum, without these touching the goods being handled, and the flow control pin ① is forced upwards by the pressure difference between P1 and P2. The flow control pin then closes the valve and only a small amount of leakage flows through the central bore ②.
When the vacuum cups are placed on the goods being handled, air flows through the central bore until the pressures P1 and P2 are equalised, at which point the flow control pin falls down.



Method of operation: Touch valves

The touch valve is attached directly to the vacuum cup. A spring presses a sealing element ① (e.g. a pin) against a sealing seat ② and maintains the vacuum in the system. When the vacuum cup is placed on the workpiece ③, the valve plunger ④ is pushed upwards and the touch valve opens.

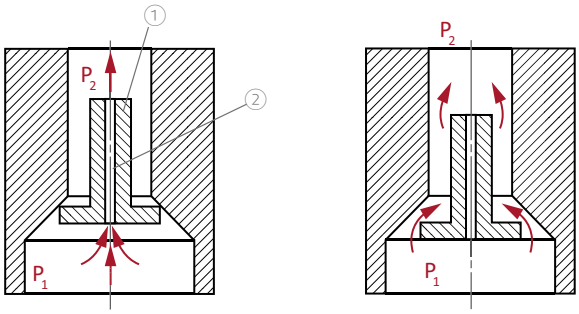


Continued on the next page

FIPA Base valves

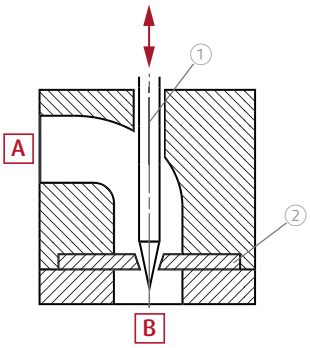
Method of operation: Check valves

A spring presses a sealing element ① (e.g. a pin) against a sealing seat ②. If a pressure difference ΔP is applied to the valve, the medium is only able to flow in one direction. The valve locks in the other direction.
Type A: Flow pattern from vacuum cup to vacuum generator
Type B: Flow pattern from vacuum generator to vacuum cup



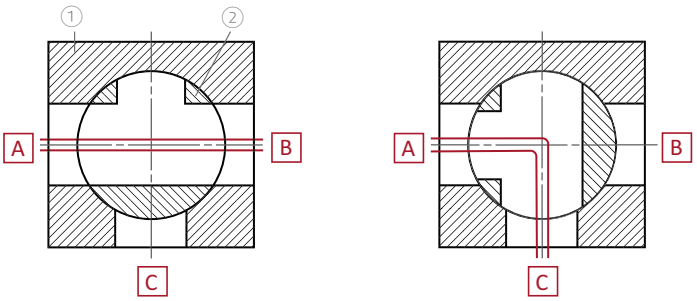
Method of operation: Butterfly valves

The resulting annular gap between the control needle ① and the cavity plate ② acts as a control valve for the air flow. The higher the flow rate, the higher the pressure difference between A and B. The cross-section of the annular gap, and therefore also the action of the control valve, can be adjusted via the axial position of the control needle. Butterfly valves are bidirectional.



Method of operation: Manual valves

A housing ① has three air connections (A, B, C). A rotary vane ② which can pivot up to 90° is mounted inside the housing. In the initial position, there is a free passage from A to B. If the rotary vane is rotated by 90°, B closes and a passage is opened from A to C. Alternatively, C can be fixed closed, making it a 2/2-way valve.



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Flow control valves with flow pin

For handling of porous products

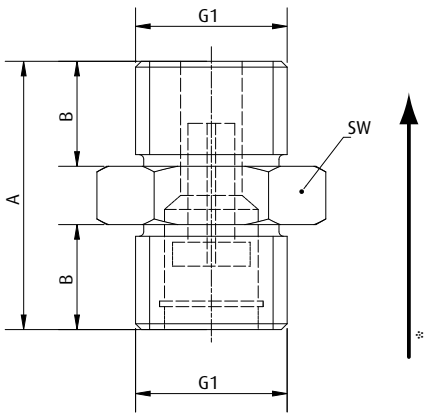
Product Description

> Sealing of unused suction openings to maintain the system vacuum
> Limited leakage prevents premature triggering with porous workpieces
> Very short design
> Optimal installation position is vertical

Technical data

Item no.	Suction power to achieve 30 % vacuum [Nl/min]	Suction power to achieve 60 % vacuum [Nl/min]	Max. flow rate with blow-off at 5 bar [Nl/min]	Flow pin bore hole diameter [mm]	Leakage loss [m³/h]	Weight [g]
63.036	5	5	370	0.8	0.46	8
63.037	11	11	620	1.2	1.04	8
63.038	17	18	480	1.5	1.62	8
63.055	3	3	320	0.6	0.21	8

Dimensions



* = Flow direction

Item no.	G1	A [mm]	B [mm]	SW
63.036	G1/4	23	9	17
63.037	G1/4	23	9	17
63.038	G1/4	23	9	17
63.055	G1/8	16	5	17

Flow control valves with flow pin, self-cleaning

For harsh environmental conditions

Product Description

> Sealing of unused suction openings to maintain the system vacuum
> Limited leakage prevents premature triggering with porous workpieces
> Self-cleaning by blow-off
> Suitable for harsh environmental conditions (Heavy-duty)
> Optimal installation position is vertical

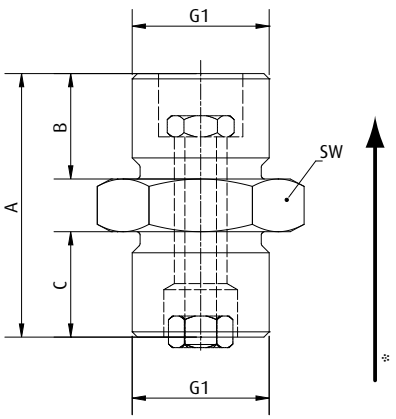
Notes

> 63.015 can be plugged directly into a vacuum cup to conserve space

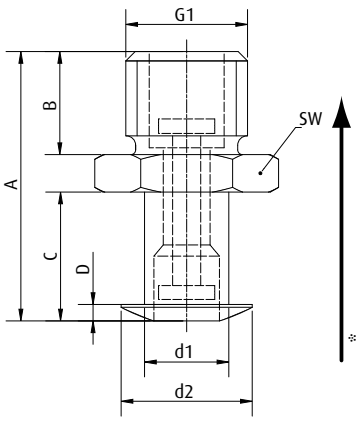
Technical data

Item no.	Suction power to achieve 30 % vacuum [Nl/min]	Suction power to achieve 60 % vacuum [Nl/min]	Max. flow rate with blow-off at 5 bar [Nl/min]	Weight [g]
63.013	38	55	450	10
63.015	38	55	450	8

Dimensions



63.013



63.015

* = Flow direction

Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	SW
63.013	G1/4	25	10	10	--	--	--	17
63.015	G1/4	29	11	14	2	9	14	17

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Flow control valves with flow pin and filter, low leakage loss

Inch thread

Product Description

> Sealing of unused suction openings to maintain the system vacuum
> Ball seat valve with filter (not suitable for high levels of dust or dirt)
> Suitable for short cycle times
> Limited leakage prevents premature triggering with porous workpieces
> Preset at the factory, 63.003 can be adjusted if necessary
> Vertical mounting, exception of 63.001 to 63.003: Any mounting position

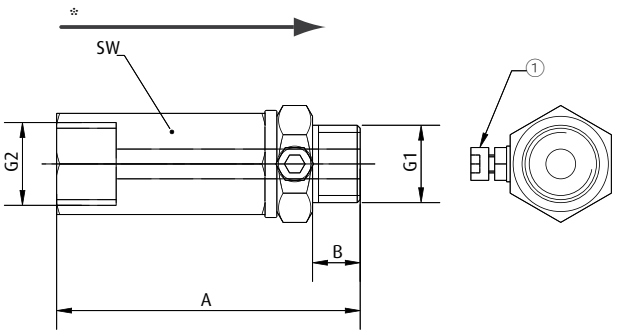
Technical data

Item no.	Suction power to achieve 30 % vacuum [Nl/min]	Suction power to achieve 60 % vacuum [Nl/min]	Max. flow rate with blow-off at 5 bar [Nl/min]	Weight [g]
63.001	4	7	260	15
63.002	4	8	360	24
63.003	0 - 22.6	0 - 28.6	550	25
63.008	3	3	340	17
63.011	7	8	590	31
63.012	8	9	790	49
63.060	7	8	590	10

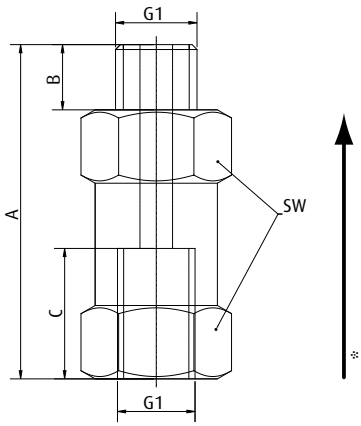
Dimensions

G1	G2	A [mm]	B [mm]	C [mm]	SW
G1/8	G1/8	48.5	6	--	14
G1/4	G1/4	50	10	--	17
G1/4	G1/4	50	8	--	17
G1/4	--	36	10	11	17
G3/8	--	39	10	12	22
G1/2	--	41	12	14	27
R1/8	--	39	10	12	22

Dimensions



63.001 | 63.002 | 63.003



63.008 | 63.011 | 63.012 | 63.060

① = Adjusting screw for 63.003 * = Flow direction

Flow control valves with flow pin and filter, low leakage loss

Metric thread

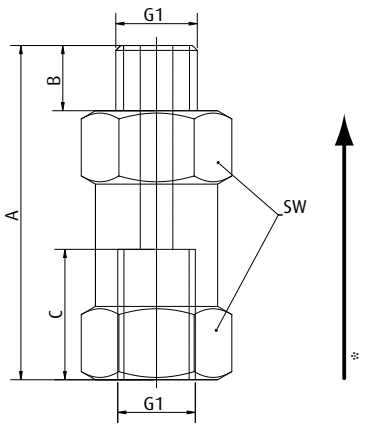
Product Description

> Sealing of unused suction openings to maintain the system vacuum
> Ball seat valve with filter (not suitable for high levels of dust or dirt)
> Suitable for short cycle times
> Low leakage prevents premature triggering with porous workpieces

Technical data

Item no.	Suction power to achieve 30 % vacuum [Nl/min]	Suction power to achieve 60 % vacuum [Nl/min]	Max. flow rate with blow-off at 5 bar [Nl/min]	Leakage loss [m^3/h]	Weight [g]
63.058	1	1	80	0.105	6
63.059	1.5	1.5	100	0.105	12

Dimensions



* = Flow direction

Item no.	G1	A [mm]	B [mm]	C [mm]	SW
63.058	M5	19.9	3	4.5	10
63.059	M6	28.1	4	4.9	12

Flow control valves with flow pin, without leakage loss

Product Description

> Sealing of unused suction openings to maintain the system vacuum
> No leakage loss, which means it is particularly well suited for dense workpieces
> Closed valves are reset by switching off the vacuum
> Can be mounted in any installation position

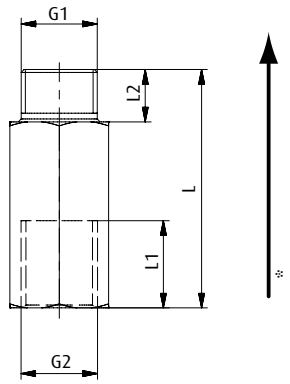
Notes

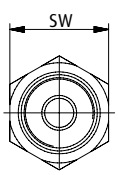
> These valves work only if the vacuum is switched on after the vacuum cup has been set in position

Technical data

Item no.	Suction power [Nl/min]	Min. vacuum level required [mbar]
63.017	28.3	-250
63.018	28.3	-250

Dimensions





* = Flow direction

Item no.	G1	G2	L [mm]	L1 [mm]	L2 [mm]	SW
63.017	G1/8	G1/4	41	15	9	17
63.018	G1/4	G1/4	41	15	9	17

Touch valves

Product Description

> Maintains the vacuum level in vacuum systems
> Mechanical scanning leaves unused suction openings closed
> Spring-loaded spring leveler allows for any mounting position
> Low susceptibility to dirt and very safe operation

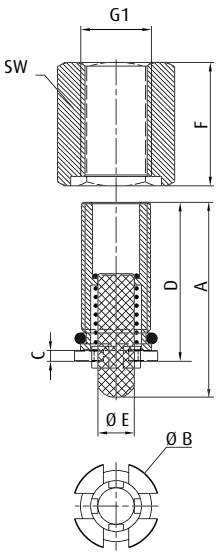
Notes

> Touch valves are directly screwed into vacuum cup, no further fittings needed

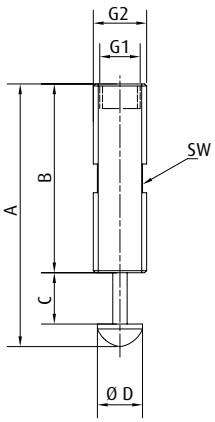
Technical data

Item no.	Weight [g]	Suitable holder
270.129	7	--
270.130	62	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.026	29	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.027	21	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.032	8	270.090 (p.752)

Dimensions



270.129 | 270.130



63.026 | 63.027

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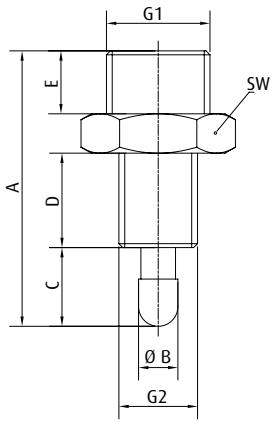
Dimensions



63.032

Item no.	G1	G2	A [mm]	B [mm]	Ø B [mm]	C [mm]	D [mm]	Ø D [mm]	E [mm]	Ø E [mm]	F [mm]	SW
270.129	G1/8	--	27	--	12	1.5	22	--	--	5	17	14
270.130	G1/2	--	43	--	25	1.5	35	--	--	8	32	30
63.026	G1/8	G1/4	65	45	--	13	--	11	--	--	--	11
63.027	G1/8	G1/4	56	46	--	5	--	11	--	--	--	11
63.032	G1/4	G1/4	45	--	7.2	10	6.5	--	10	--	--	17

"Inline" non-return valves

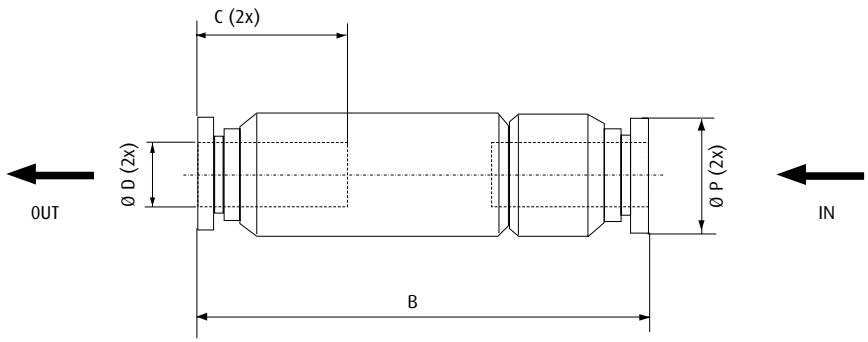
Product Description

> Maintenance of the vacuum level in suction systems in cases of vacuum generator failure
> Can also be used with dense workpieces as an energy-saving system
> Two-sided quick fittings for fast installation in existing vacuum systems
> Robust metal bodies
> Very small design
> Can be mounted in any installation position

Technical data

Item no.	Effective surface area [mm²]	Material	Weight [g]
32.631	2.7	Aluminium	5
32.632	6.8	Aluminium anodised	9.5
32.633	15.5	Aluminium anodised	20
32.634	32	Aluminium anodised	61.5
32.635	46	Aluminium anodised	68

Dimensions



Item no.	Ø **D** [mm]	**B** [mm]	**C** [mm]	Ø **P** [mm]
32.631	4	34	11	9
32.632	6	38.5	12	12
32.633	8	55.5	18.5	15
32.634	10	82.5	21	25
32.635	12	87.5	23.5	25

Non-return valves for very high volume flows

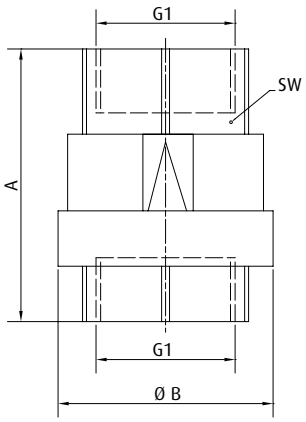
Product Description

> Maintenance of the vacuum level in suction systems in cases of vacuum generator failure
> Suitable for installation between the vacuum pump and vacuum tank
> Prevents return flow of the oil into the vacuum system with vacuum pumps without an integrated non-return valve
> Can be mounted in any installation position

Technical data

Item no.	Nominal flow rate [m³/h]	Material	Weight [g]
32.647	20	Bronze with oil-resistant seals	151
32.648	26	Bronze with oil-resistant seals	196
32.649	45	Bronze with oil-resistant seals	280
32.650	75	Bronze with oil-resistant seals	421
32.651	125	Bronze with oil-resistant seals	658
32.652	200	Bronze with oil-resistant seals	897
32.653	350	Bronze with oil-resistant seals	1,346

Dimensions



Item no.	G1	A [mm]	Ø B [mm]	SW
32.647	G3/8	55	34.5	23
32.648	G1/2	58	35	27
32.649	G3/4	65	41	33
32.650	G1	74.5	48	40
32.651	G1 1/4	83	60.5	50
32.652	G1 1/2	93	71	55
32.653	G2	101	87	70

Non-return valves with blow-off device

Handling of wooden plates with ejector EIL.09 and check valve 32.638 (vacuum cup 102.070.234.4 for wood)

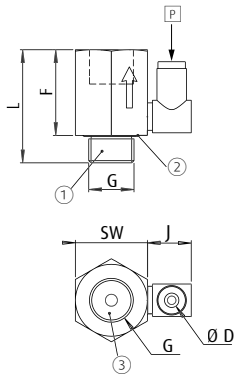
Product Description

> Installation directly between vacuum cup and ejector
> Short release time thanks to blow-off function via compressed air inlet P
> Suitable as a safety valve: In cases of tubing damage, malfunction or emergency shutdown of the vacuum generator, the vacuum is maintained
> Metal screen made from stainless steel (Inox) with mesh width of 200 µ prevents dirt from entering the ejector

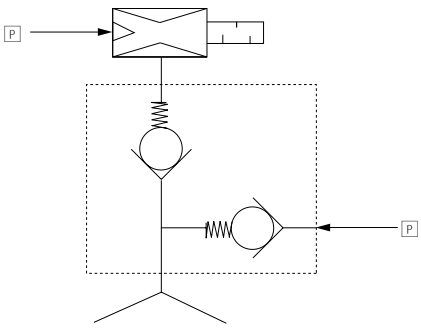
Technical data

Item no.	Minimum blow-off pressure [bar]	Suitable blow-off device
32.638	5	32.660 (p.525)

Dimensions



Wiring diagram



P = Compressed air blow-off at 5 bar 4/6 tubing ① = To the vacuum cup ② = O-ring ③ = To vacuum generator

Item no.	G	Ø D [mm]	F [mm]	L [mm]	J [mm]	SW
32.638	G1/4	4	25	33	12.8	21

Butterfly valves - screw-in type

Product Description

- Limitation of suction flow at a constant vacuum level
- Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
- Manual adjustment using knurled screw
- Flexible installation using horizontal swivel air connector

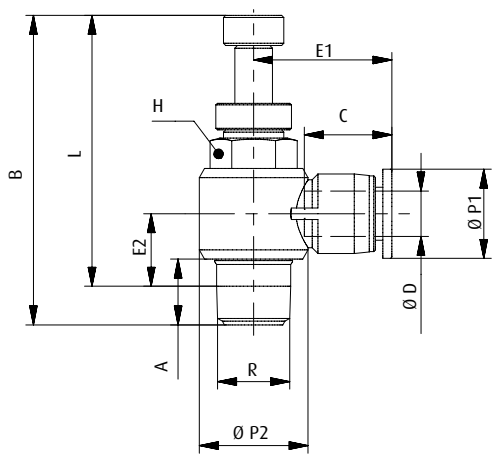
Technical data

Item no.	Operating pressure [bar]	Operating temperature [°C]	Weight [g]
32.500	-1 - 8	0 - 60	9
32.501	-1 - 8	0 - 60	20
32.502	-1 - 8	0 - 60	10
32.503	-1 - 8	0 - 60	20
32.504	-1 - 8	0 - 60	36
32.505	-1 - 8	0 - 60	20
32.506	-1 - 8	0 - 60	36
32.507	-1 - 8	0 - 60	67
32.508	-1 - 8	0 - 60	40
32.509	-1 - 8	0 - 60	69
32.510	-1 - 8	0 - 60	72
32.511	-1 - 8	0 - 60	103

Dimensions

R	Ø D [mm]	A [mm]	B [mm]	C [mm]	E1 [mm]	E2 [mm]	H [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]
M5	4	3.5	27 - 29.5	15	20	6.5	8	23.5 - 26	10	10
G1/8	4	8	34 - 40.5	15	21.5	10.5	10	30 - 36.5	10	14.5
M5	6	3.5	27 - 29.5	17	24	7.5	8	23.5 - 26	12.5	10
G1/8	6	8	34 - 40.5	17	23.5	10.5	10	30 - 36.5	12.5	14.5
G1/4	6	11	41 - 47.5	17	25.5	12	14	35 - 41.5	12.5	18.5
G1/8	8	8	34 - 40.5	18.5	27	11.5	10	30 - 36.5	14.5	14.5
G1/4	8	11	41 - 47.5	18.5	28.5	13	14	35 - 41.5	14.5	18.5
G3/8	8	12	46.5 - 53.5	18.5	29	15	19	40 - 47	14.5	22
G1/4	10	11	41 - 47.5	20.5	31	14.5	14	35 - 41.5	18	18
G3/8	10	12	46.5 - 53.5	20.5	31.5	16.5	19	40 - 47	18	22
G3/8	12	12	46.5 - 53.5	23.5	37	18	19	40 - 47	21.5	22
G1/2	12	15	51.5 - 59	23.5	36.5	19.5	24	45.5 - 51	21.5	28

Dimensions



"Inline" - butterfly valves

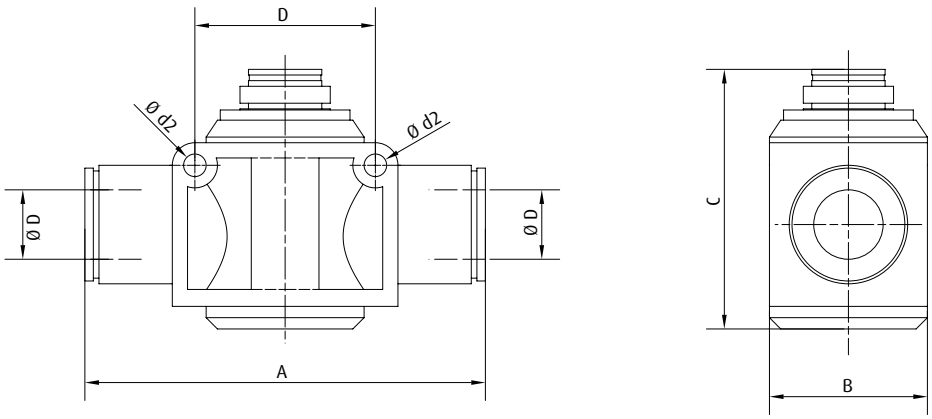
Product Description

> Limitation of suction flow at a constant vacuum level
> Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
> Manual adjustment using knurled screw
> Simple installation in the tubing line

Technical data

Item no.	Operating pressure [bar]	Operating temperature [°C]	Weight [g]
32.540	-1 - 9	0 - 60	12
32.541	-1 - 9	0 - 60	33
32.542	-1 - 9	0 - 60	44
32.543	-1 - 9	0 - 60	77
32.544	-1 - 9	0 - 60	127

Dimensions



Item no.	Ø D [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d2 [mm]
32.540	4	37.5	11	29.5	14	3.2
32.541	6	46	15	44	20	4.3
32.542	8	51.5	18	48	22	4.3
32.543	10	59.5	21	53.5	26	4.3
32.544	12	72	28	58	32	4.3

"Inline" - one-way flow control valves

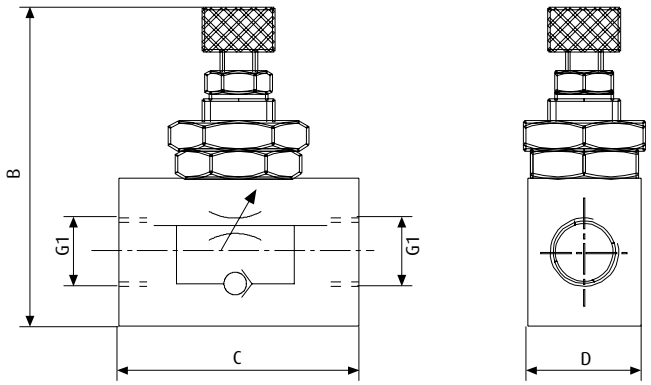
Product Description

> Limitation of suction power at a constant vacuum level
> Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
> Manual adjustment using knurled screw

Technical data

Item no.	Maximum flow rate [m³/h]	Regulating range [mbar]	Operating temperature [°C]	Weight [g]
73.001	2.4	-999 - 0	-20 - 80	95
73.004	5.4	-999 - 0	-20 - 80	95

Dimensions



Item no.	G1	B [mm]	C [mm]	D [mm]
73.001	G1/4	60	39	22
73.004	G1/2	75	56	30

2/2-way manual shut-off valves

Product Description

> Use when electro valves are not possible or uneconomical

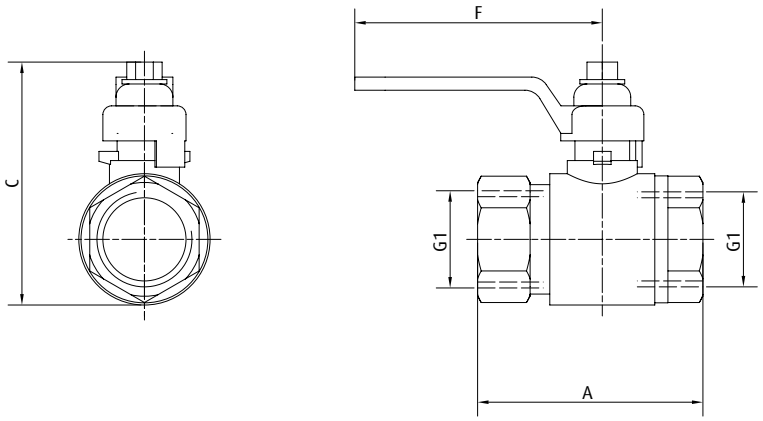
Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.075	10	0 - 30	121
33.076	10	0 - 30	121
33.077	15	0 - 30	177
33.078	20	0 - 30	298
33.079	25	0 - 30	560
33.080	32	0 - 30	830
33.081	40	0 - 30	1,000
33.082	50	0 - 30	1,600
33.083	80	0 - 30	2,200

Dimensions

G1	A [mm]	C [mm]	F [mm]
G1/4	44	49	80
G3/8	44	51	80
G1/2	50	57	80
G3/4	57	74	113
G1	70	83	113
G1 1/4	80	90	138
G1 1/2	94	110	138
G2	112	115	157
G3	157	175	250

Dimensions



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3/2-way manual shut-off valves

Product Description

> Switching on/off individual vacuum cups in vacuum systems
> Blow-off and ventilation of vacuum cups
> Valve type with L-bore

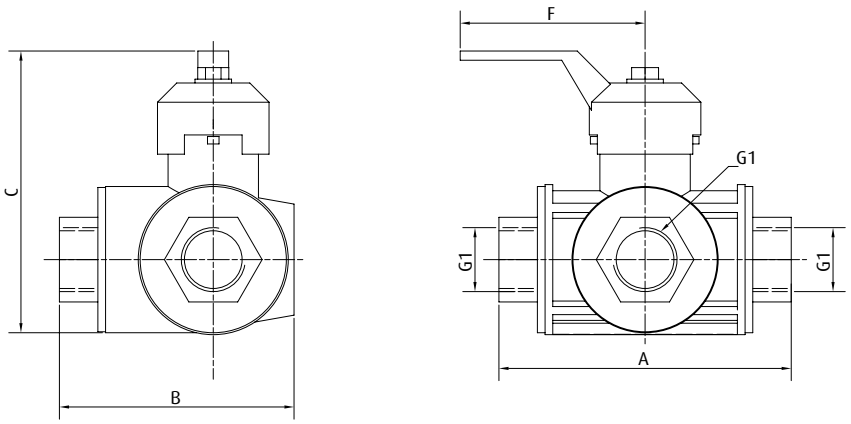
Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.084	10	0 - 30	160
33.085	12	0 - 30	190
33.086	14	0 - 30	300
33.087	18	0 - 30	490
33.088	23	0 - 30	850
33.089	29	0 - 30	1,760
33.090	36	0 - 30	2,490

Dimensions

G1	A [mm]	B [mm]	C [mm]	F [mm]
G1/4	77	58	85	125
G3/8	77	58	85	125
G1/2	77	58	85	125
G3/4	92	70	107	145
G1	104	80	124	170
G1 1/4	118	92	134	170
G1 1/2	138	109	145	170

Dimensions



3/2-way manual shut-off valves with quick fittings on both sides

Product Description

> Switching on/off individual vacuum cups in vacuum systems
> Blow-off and ventilation of vacuum cups
> Easy in line installation in the tubing line

Ordering notes

> Other connections available on request

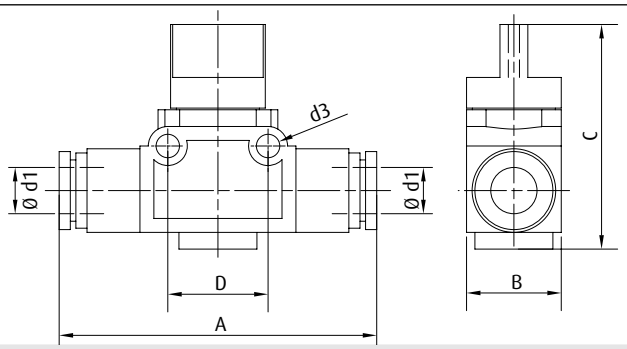
Technical data

Item no.	Pressure range [bar]	Weight [g]
33.000	-1 - 9	24
33.001	-1 - 9	24.5
33.002	-1 - 9	25.5
33.003	-1 - 9	27
33.004	-1 - 9	44
33.005	-1 - 9	47.5
33.006	-1 - 9	50

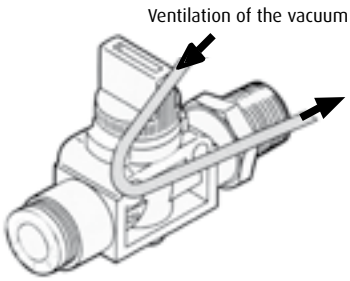
Dimensions

d1 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d3 [mm]
4	52	17	40.5	18	4.2
6	52	17	40.5	18	4.2
8	54	17	40.5	18	4.2
8	56	17	40.5	18	4.2
10	65	21	41	24	4.2
12	68	21	41	24	4.2
12	71	21	41	24	4.2

Dimensions



Operating principle



3/2-way manual shut-off valves with quick fitting / threaded connection

Product Description

> Switching on/off individual vacuum cups in vacuum systems
> Blow-off and ventilation of vacuum cups

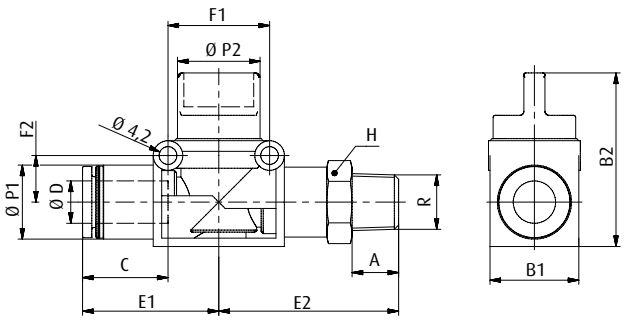
Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.016	5	-1 - 9	33
33.017	5	-1 - 9	39.5
33.018	5	-1 - 9	52
33.019	5	-1 - 9	34.5
33.020	5	-1 - 9	40.5
33.021	5	-1 - 9	53.5
33.022	7	-1 - 9	61.5
33.023	7	-1 - 9	70
33.024	7	-1 - 9	91.5
33.025	7	-1 - 9	65
33.026	7	-1 - 9	73
33.027	7	-1 - 9	95

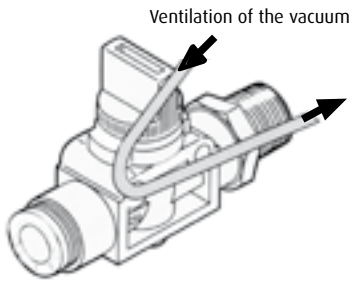
Dimensions

R	Ø D [mm]	A [mm]	B1 [mm]	B2 [mm]	C [mm]	E1 [mm]	E2 [mm]	F1 [mm]	F2 [mm]	H [mm]	Ø P1 [mm]	Ø P2 [mm]
R1/8	6	8	17	40.5	17	26	33.5	18	8	14	12.5	16.5
R1/4	6	11	17	40.5	17	26	36.5	18	8	14	12.5	16.5
R3/8	6	12	17	40.5	17	26	38.5	18	8	17	12.5	16.5
R1/8	8	8	17	40.5	18	28	33.5	18	8	14	15	16.5
R1/4	8	11	17	40.5	18	28	36.5	18	8	14	15	16.5
R3/8	8	12	17	40.5	18	28	38.5	18	8	17	15	16.5
R1/4	10	11	21	41	20	32.5	42.5	24	11	17	17.5	19.5
R3/8	10	12	21	41	20	32.5	43.5	24	11	17	17.5	19.5
R1/2	10	15	21	41	20	32.5	46.5	24	11	21	17.5	19.5
R1/4	12	11	21	41	23.5	35	42.5	24	11	17	21	19.5
R3/8	12	12	21	41	23.5	35	43.5	24	11	17	21	19.5
R1/2	12	15	21	41	23.5	35	46.5	24	11	21	21	19.5

Dimensions



Operating principle



Notes:

System monitoring at a glance 684

Vacuum switches 686

Vacuum / Pressure switches 694

Pressure switches 695

Vacuum and pressure gauges 696

Accessories 698

FIPA System monitoring

Vacuum and pressure switches

> Regulation and monitoring of vacuum circuits
> High degree of user flexibility thanks to models with digital, analogue, pneumatic or mechanical controls
> See next page for overview

> See page 691

Vacuum and pressure gauge

> Visual monitoring of vacuum circuits
> Analogue or digital display

> See page 696

FIPA System monitoring - Overview

	Item no.	Page	Vacuum and pressure switches						
			Product	Special applications	Signal output	Hysteresis	Protection class	Operation	Display
	20.002	687	Vacuum switch - pneumatic	No electrical connection required	1 x pneumatic	120 mbar	--	Adjustment screw	--
	20.011	686	Vacuum switch - electromechanical	NO/NC change-over contact function, for example for controlling solenoid valves	1 x electric, 250 V max.	6 % from switching point	IP65		
	20.007	688	Vacuum switch - electronic with analogue output	Monitoring of the continuous vacuum trend	1 x 1-5 V	0 - 30 % from switching point	IP50		
	20.040	689	Mini vacuum switch with digital output	Vacuum measurement at vacuum cup or ejector, Switch freely rotatable after mounting	1 x PNP	3 % from switching point	IP 40		Red LED
	20.041	689			1 x NPN				
	20.020	690	Vacuum switch - electronic with analogue and digital output	Switch freely rotatable after mounting	1 x PNP 1 x 1-5 V	freely programma-ble	IP65	Keys	Yellow LED
	20.021	691	Vacuum switch with two digital outputs	Monitoring of a pressure range possible, Switch freely rotatable after mounting	2 x PNP			Keys with menu navigation	Red / green LED 7-segment
	20.022	691		Round design, Monitoring of a pressure range possible, Switch freely rotatable after mounting					
	20.023	695	Pressure switch - electronic with two digital outputs						
	20.035	692	Vacuum switch - electronic with two digital outputs and analogue output	Monitoring of two switching points (digital) as well as of the continuous vacuum trend (analogue)	2 x PNP 1 x 1-5 V		IP40		
	20.036	692			2 x NPN 1 x 1-5 V				
	20.026 / 20.027	694	Vacuum pressure switch - electronic with two digital outputs	Small design Monitoring of a pressure window possible, 20.027 with plug-in connection for ejector or tubing line	1 x PNP		IP65	Self-learning via connection cable, PC or preset	Red / green LED

Vacuum switch - electromechanical

With NO/NC function for DC- and AC-connection

Product Description

> An electrical signal is triggered when set vacuum value is reached
> Switching point set via setscrew
> Hysteresis is fixed
> Standard vacuum connnection via galvanised steel G1/8 screw-in port
> Long service life due to high quality, robust design
> Can be mounted in any position

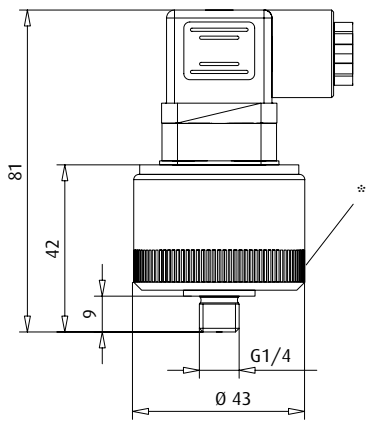
Ordering notes

> If desired the switching point can be preset

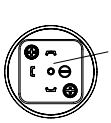
Technical data

Item no.	20.011
Adjustable range [mbar]	20 - 800
Hysteresis	6 % switch point
Switching capacity DC up to 28 V [A]	max. 2
Switching capacity AC up to 250 V [A]	max. 2
Max. switching frequency [Hz]	200
Protection class	IP65
Suitable media	Filtered, oiled or unoiled air or neutral gases
Operating temperature [°C]	-25 - 85
Weight [g]	120

Dimensions



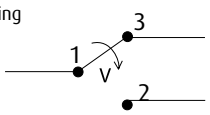
Electrical connection / changeover contact



Setting screw
M3 DIN 914

1. Completely screw in with hex-wrench
2. Apply switching vacuum
3. Ease screw until contact toggles

Wiring



* = Knurled screw

FIPA Material in Motion

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Vacuum switch - pneumatic

NEW

Product Description

> Switch outputs a pneumatic signal when the set vacuum level is reached
> No electrical connection required
> Usable as switch element for pneumatic valves

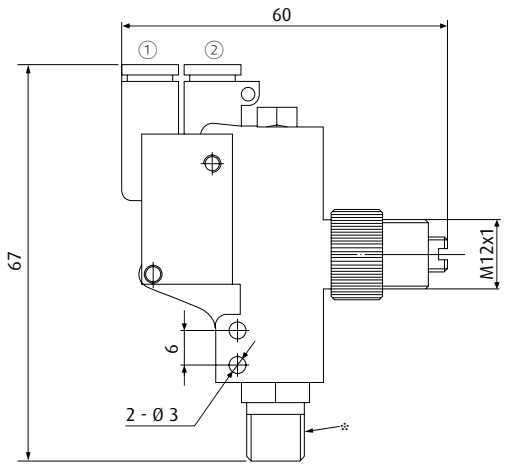
Notes

> Vacuum switch 20.002 is part of the air-saving function for multi-chamber ejectors 65.340-LSE to 65.390-LSE

Technical data

Item no.	20.002
Adjustable range [mbar]	-950 - -150
Hysteresis [mbar]	120
Operating pressure [bar]	1.5 - 8
Operating principle	NC
Repeat accuracy [%]	± 5
Suitable media	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	10 - 60
Weight [g]	44

Dimensions



① = Compressed air inlet, quick fitting Ø 4 mm ② = Compressed air output, quick fitting Ø 4 mm * = G1/8-male

Vacuum switch - electronic with analogue output

Product Description

> Analogue output enables monitoring of the continuous vacuum trend
> Compact and light design for installation directly on the vacuum cup
> LED display in plug connection

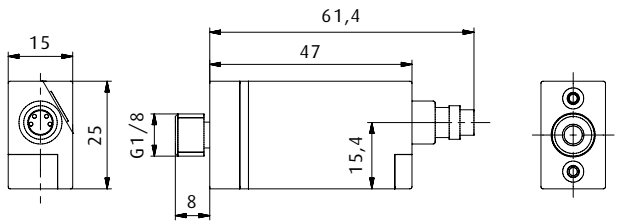
Notes

> As an option: Mounting rail 20.008-H incl. channel nut for mounting the vacuum switch, e.g. on FIPA SLine extrusions

Technical data

Item no.	**20.007**
Adjustable range [mbar]	-999 - 0
Hysteresis	0 - 30 %
Analogue output [VDC]	1 - 5
Switching logic	Contact breaker (NC)
Response time [ms]	< 5
Thermal error	± 3 % from measuring range
Overpressure safety [bar]	3
Supply voltage [VDC]	18 - 30
Current consumption [mA]	< 20
Protection class	IP50
Suitable media	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	0 - 50
Weight [g]	85
Electric connection	Plug M8x1, 4-pin
Suitable accessories	Mounting rail 20.008-H Connector cable 20.501 (p.717) Connector cable 20.502 (p.717)

Dimensions



Mini vacuum switch - electronic with digital output

Example: Mini vacuum switch 20.040 on ejector EBA.08H.2-A and flat vacuum cup Ø 40 mm

Product Description

> Switch outputs a digital signal when a specific vacuum level is reached
> Vacuum level is manually set with a potentiometer screw
> Hysteresis is fixed
> Red LED indicates set level reached
> Space-saving installation on ejectors thanks to very small design

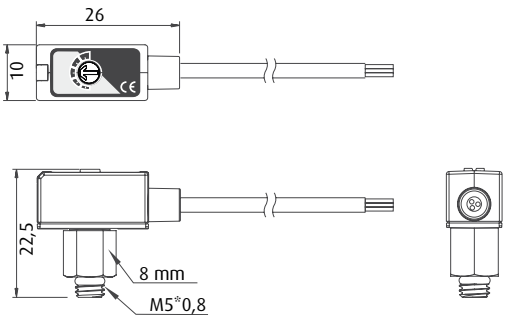
Ordering notes

> Included in scope of delivery: Cable 1.5 meter, 3-pole, open wire

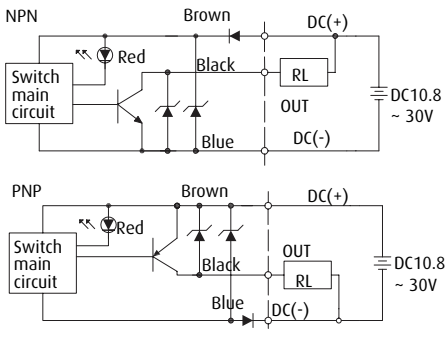
Technical data

Item no.	20.040	20.041
Adjustable range [mbar]	-990 - 0	-990 - 0
Hysteresis	3 % from default setting	3 % from default setting
Digital switching outputs	PNP	NPN
Response time [ms]	~ 1	~ 1
Repeat accuracy [%]	≤ ± 1 % from measuring range	≤ ± 1 % from measuring range
Overpressure safety [bar]	2	2
Supply voltage [VDC]	10.8 - 30	10.8 - 30
Max. Current consumption [mA]	10	10
Vacuum connection	M5	M5
Protection class	IP40	IP40
Suitable media	Filtered, oiled or unoiled air or neutral gases	Filtered, oiled or unoiled air or neutral gases
Operating temperature [°C]	0 - 60	0 - 60
Weight [g]	20	20

Dimensions



Wiring diagrams



Vacuum switch - electronic with analogue and digital output

Product Description

> Monitoring of vacuum levels e.g. in handling systems
> Intelligent sensor with "teaching" feature
> Suitable for all vacuum levels due to flexible setting of switching point and hysteresis
> Small and robust
> Easy operation
> Protection class IP65 (no ventilation tube required)
> Flexible mounting: Control panel can be rotated 360° after installation

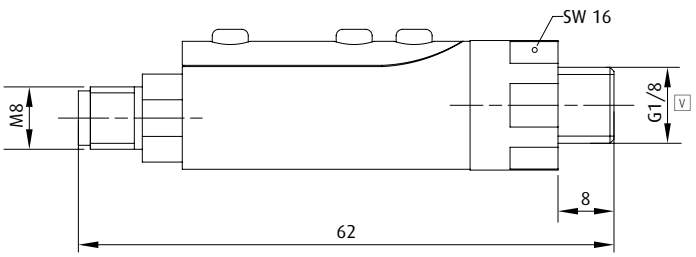
Notes

> Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
> Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006

Technical data

Item no.	**20.020**
Measuring range [bar]	-1 - 0
Digital switching outputs	1x PNP (NO or NC)
Analogue output [V]	1 - 5
Repeat accuracy [%]	± 0.2 % from measuring range
Overpressure safety [bar]	6
Supply voltage [VDC]	11 - 30
Current consumption [mA]	< 25
Maximum switching current [mA]	125
Electric connection	Plug M8x1, 4-pin
Protection class	IP65
Suitable media	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	0 - 50
Weight [g]	20
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Adapter 20.511 (p.698), Adapter 20.523 (p.698), Adapter 20.522 (p.698), Wall clip 20.520 (p.700)

Dimensions



V = Vacuum connection

Vacuum switch - electronic with two digital outputs and display

Product Description

> Monitoring of vacuum levels, e.g. in handling systems
> Optimisation of cycle times to improve the economy of vacuum systems
> Two freely adjustable digital outputs to set lower and upper threshold values
> Additional analogue output
> 7-segmet LED-display
> Protection class IP65 (no ventilation tube required)
> Integrated reverse voltage protection
> Compact, lightweight and robust design
> Flexible mounting: 20.021 can be rotated 360° after installation

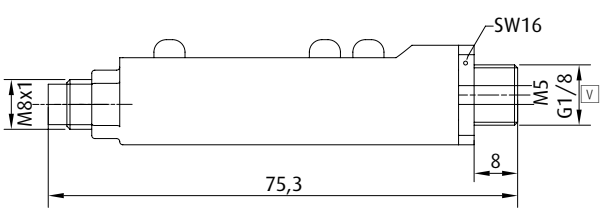
Notes

> Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
> Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006
> Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, inHg, mmHg

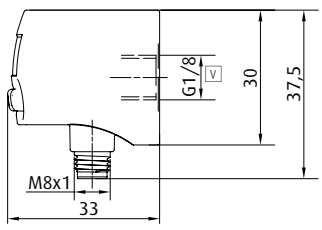
Technical data

Item no.	20.021	20.022
Measuring range [bar]	-1 - 0	-1 - 0
Digital switching outputs	2x PNP (NO or NC)	2x PNP (NO or NC)
Repeat accuracy [%]	± 0.2 % from measuring range	± 0.2 % from measuring range
Overpressure safety [bar]	6	6
Supply voltage [VDC]	11 - 30	11 - 30
Current consumption [mA]	< 55	< 55
Maximum switching current [mA]	125	125
Electric connection	Plug M8x1, 4-pin	Plug M8x1, 4-pin
Protection class	IP65	IP65
Suitable media	Filtered, oiled or unoiled air or neutral gases	Filtered, oiled or unoiled air or neutral gases
Operating temperature [°C]	0 - 50	0 - 50
Weight [g]	25	45
Suitable accessories	Connector cable 20.501, 20.502 (p.717), Adapter 20.522, 20.523, 20.511 (p.698), Wall clip 20.520 (p.700)	Connector cable 20.501, 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

Dimensions



20.021



20.022

V = Vacuum connection

Vacuum switch - electronic with two digital outputs and analogue output

Product Description

> Monitoring of vacuum levels, e.g. in handling systems
> Optimisation of cycle times to improve the economy of vacuum systems
> Two freely adjustable digital outputs to set lower and upper threshold values
> Analogue output for continuous monitoring of vacuum level
> Stable measurement even with short fluctuations of the supply pressure due to anti-chattering function
> 7-segmet 3 digit LED display
> Integrated reverse voltage protection
> Compact and lightweight design

Notes

> Vacuum values can be displayed and adjusted by the customer in following units: kPa, kgf/cm², bar, psi, inHg, mmHg

Ordering notes

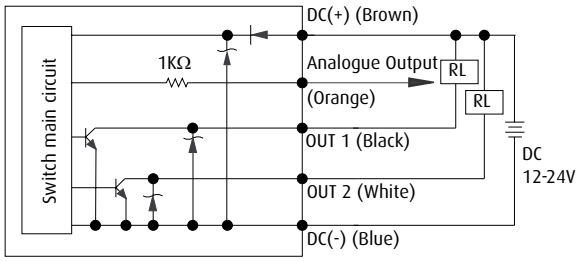
> Connector cable 0.3 meter with plug (M12 5-pin, straight) included in delivery
> Connector cable optional
20.508: M12, 5-pin, straight, open wires, 2 m
20.509: M12, 5-pin, 90°, open wires, 2 m

Technical data

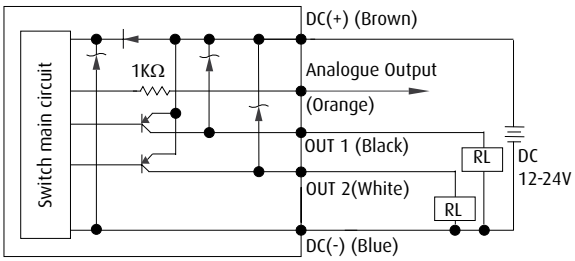
Item no.	20.035	20.036
Measuring range [bar]	-1 - 0	-1 - 0
Digital switching outputs	2 x PNP	2 x NPN
Analogue output [V]	1 - 5	1 - 5
Repeat accuracy [%]	≤ ± 0.2 % from measuring range	≤ ± 0.2 % from measuring range
Overpressure safety [bar]	3	3
Supply voltage [VDC]	10.8 - 30	10.8 - 30
Current consumption [mA]	≤ 55	≤ 55
Maximum switching current [mA]	80	80
Electric connection	Plug M12x1, 5-pin	Plug M12x1, 5-pin
Protection class	IP40	IP40
Suitable media	Dry, unoiled air and non-abrasive gases	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	0 - 50	0 - 50
Weight [g]	35	35
Suitable connector cable	20.508 (p.717) 20.509 (p.717)	20.508 (p.717) 20.509 (p.717)

Wiring diagrams

20.035 (NPN)

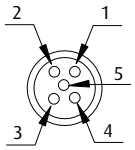


20.036 (PNP)



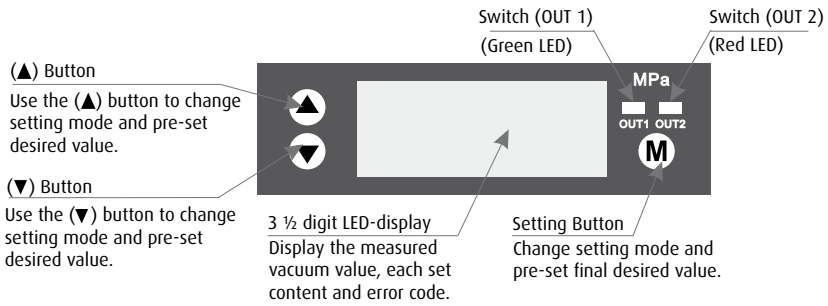
Plug assignment

20.035 and 20.036

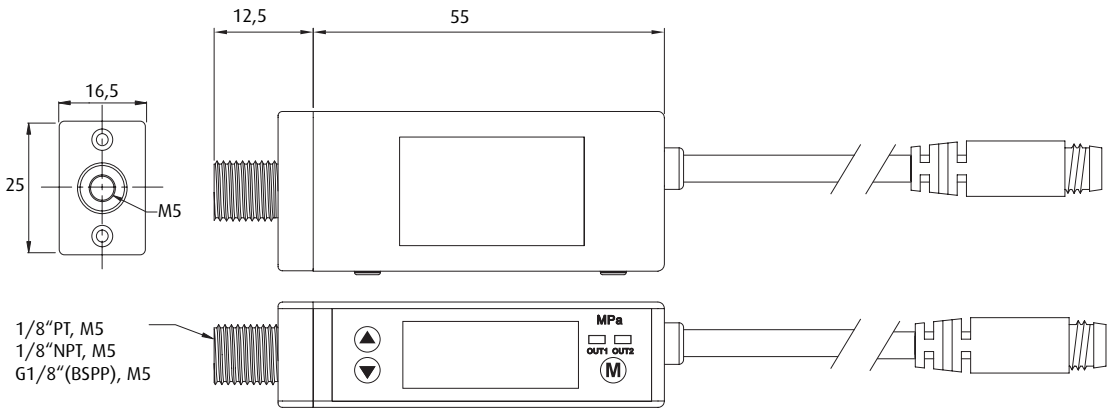


(1) Brown (+)
(2) White (OUT 2)
(3) Blue (-)
(4) Black (OUT 1)
(5) Orange (analogue OUT 1-5)

Panel instructions



Dimensions



Vacuum / Pressure switches - electronic with digital output

Compact design

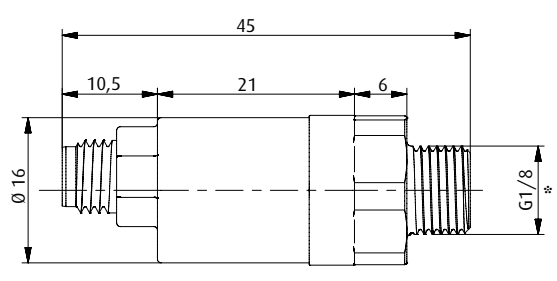
Product Description

> Digital monitoring of vacuum and pressure in handling and automation systems
> Small, lightweight and compact
> Transistor output
> Simple programming of the switching point, hysteresis and switching logic NC/NO
> Monitoring of a pressure window is possible
> Locking feature
> LED operation and status indication
> Item 20.027: With fitting pipe Ø 6 mm to be inserted into tubing or ejectors (e.g. inline or base ejectors)

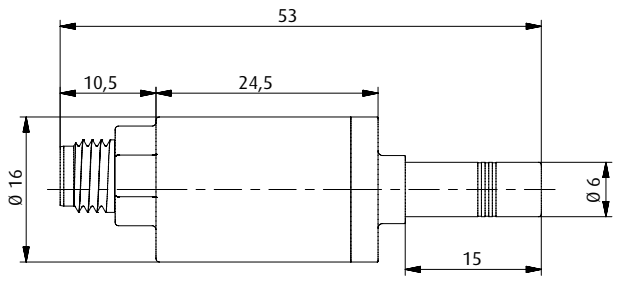
Technical data

Item no.	20.026	20.027
Adjustable range [mbar]	-999 - 999	-999 - 999
Hysteresis	0 - 100 %	0 - 100 %
Digital switching outputs	PNP Transistor	PNP Transistor
Switching logic	NO/NC	NO/NC
Repeat accuracy [%]	± 0.2 % from measuring range	± 0.2 % from measuring range
Supply voltage [VDC]	9 - 30 (reverse polarity, short circuit protected)	9 - 30 (reverse polarity, short circuit protected)
Current consumption [mA]	< 20	< 20
Maximum switching current [mA]	250	250
Voltage at the output	ca. Ub -1,5 V	ca. Ub -1,5 V
EMI / EMC	According to EU-directive 2004 / 108 / EG	According to EU-directive 2004 / 108 / EG
Protection class	IP65	IP65
Suitable media	Dry, unoiled air and non-abrasive gases	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	-10 - 80	-10 - 80
Electric connection	Plug M8x1, 4-pin	Plug M8x1, 4-pin
Suitable accessories	Connector cable 20.501 (p.717) Connector cable 20.502 (p.717) Adapter 20.511 (p.698), Adapter 20.522 (p.698) Adapter 20.523 (p.698)	Connector cable 20.501 (p.717) Connector cable 20.502 (p.717) Adapter 20.511 (p.698), Adapter 20.522 (p.698) Adapter 20.523 (p.698)

Dimensions



20.026



20.027

* = M5-female

Material in Motion
Phone +49 (0)89 / 96 24 89-0

Pressure switches - electronic with two digital switching outputs

Diagram with installation kit 20.515 for control panel installation

Product Description

> Intelligent sensor for pressure monitoring
> Adjustable with "teaching" feature
> Switching point and hysteresis can be programmed as desired
> Simple operation using button functions and LCD display
> Small and robust

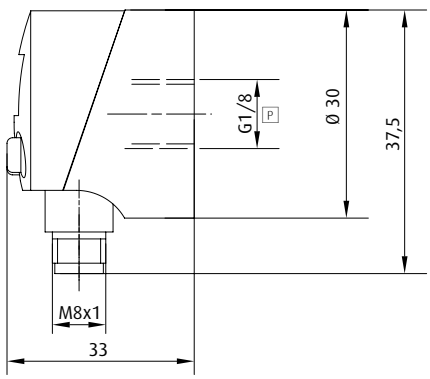
Notes

> Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
> Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006
> Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, psi

Technical data

Item no.	20.023
Measuring range [bar]	0 - 10
Digital switching outputs	2x PNP (NO/NC)
Repeat accuracy [%]	± 0.2 % from measuring range
Overpressure safety [bar]	0.2
Supply voltage [V]	11 - 30
Current consumption [mA]	< 55
Maximum switching current [mA]	125
Electric connection	Plug M8x1, 4-pin
Protection class	IP65
Suitable media	Filtered, oiled or unoiled air or neutral gases
Operating temperature [°C]	0 - 50
Weight [g]	40
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

Dimensions



P = Compressed air connection

Vacuum - and pressure gauge

With red-green indication

Vacuum gauge

Pressure gauge

Product Description

> Visual monitoring of the vacuum and/or pressure level in gripper systems
> Standardised design for flexible use in vacuum and/or pressure systems

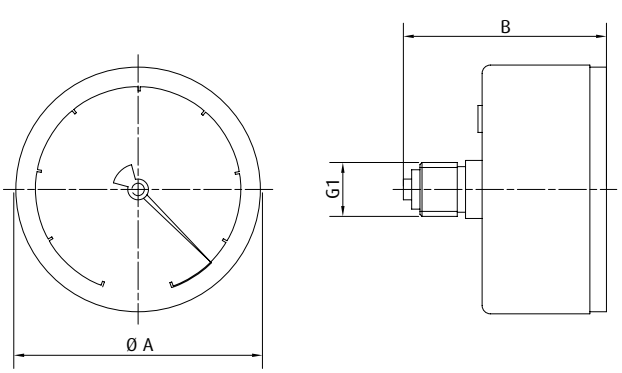
Technical data

Item no.	Measuring range [bar]	Measuring range [mbar]	Connection	Weight [g]
91.001	--	0 - -1,000	At the rear	45
91.001-R	--	0 - -1,000	At the rear	40
91.003	--	0 - -1,000	At the rear	90
91.000	--	0 - -1,000	At the bottom	47
91.002	--	0 - -1,000	At the bottom	92
91.004	--	0 - -1,000	At the bottom	975
91.013	1 - 10	--	At the bottom	90
91.014	1 - 10	--	At the rear	90

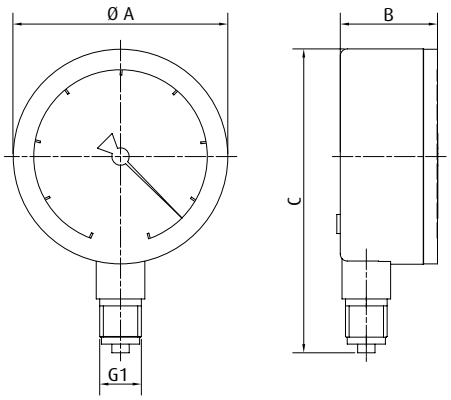
Dimensions

G1	Ø A [mm]	B [mm]	C [mm]
G1/8	40	41	--
R1/8	40	41	--
G1/4	63	49	--
G1/8	40	26.5	55.5
G1/4	63	27.5	86
G1/2	160	50	200
G1/4	63	27.5	86
G1/4	63	27.5	86

Dimensions



91.001 | 91.001-R | 91.003 | 91.014



91.000 | 91.002 | 91.004 | 91.013

Material in Motion
Phone +49 (0)89 / 96 24 89-0

Digital pressure gauge - connection at the bottom

Diagram with installation kit 20.515 for front panel mounting

Product Description

> Visual monitoring of the vacuum and/or pressure level in gripper systems
> Calibration feature
> Very compact
> LCD display with selectable pressure units
> Robust aluminium housing

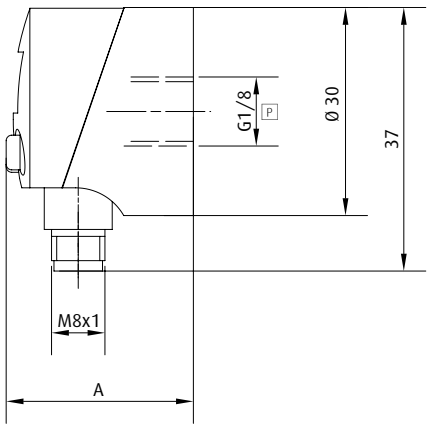
Notes

> Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, psi

Technical data

Item no.	**91.012**
Measuring range [bar]	-1 - 1
Overpressure safety [bar]	5
Supply voltage [VDC]	10.8 - 30 (with reverse current protection)
Current consumption [mA]	< 30
Response time [ms]	2.5
Insulation resistance [mOhm]	> 100 (500 VDC)
Electric connection	Plug M8x1, 4-pin
Mounting position	any
EMI / EMC	According to EN 50081-1 / 50082-2
Operating temperature [°C]	-10 - 0
Weight [g]	45
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

Dimensions



P = Pressure / Vacuum connection

Adapter and mounting brackets for vacuum switches and pressure switches

20.522 | 20.523

20.511

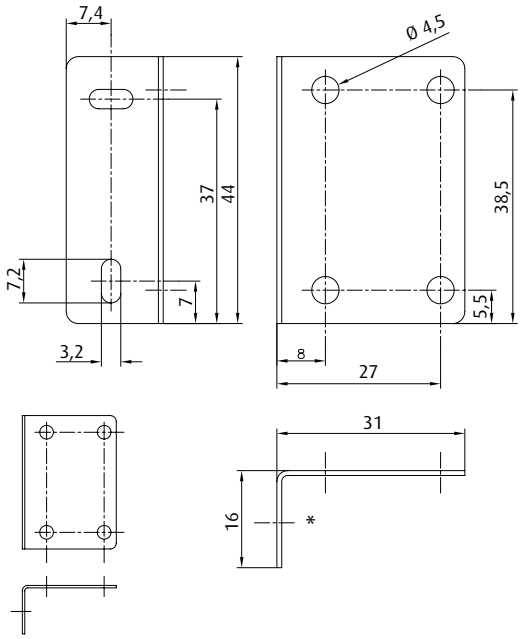
Ordering notes

> Mounting material included in scope of delivery

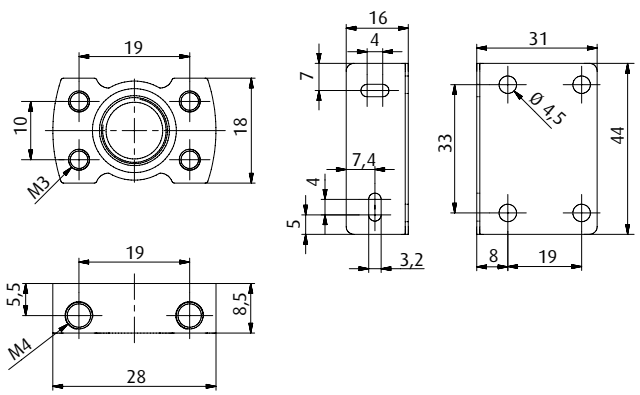
Technical data

Item no.	Description	Suitable for vacuum / pressure switches
20.511	Push-In Fitting G1/8, tubing-Ø 6 mm with mounting angle	20.020, 20.021, 20.026, 20.027
20.522	Adapter with angle bracket for flange assembly	20.020, 20.021, 20.026, 20.027
20.523	Adapter for flange assembly	20.020, 20.021, 20.026, 20.027

Dimensions



20.511



20.522 | 20.523

* = Push-In Fitting G1/8, tubing-Ø 6 mm not displayed

FIPA Material in Motion

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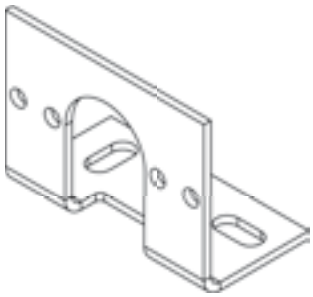
Mounting frame and brackets for front panel mounting

NEW



Example application: Gauge 20.023 with installation kit 20.515

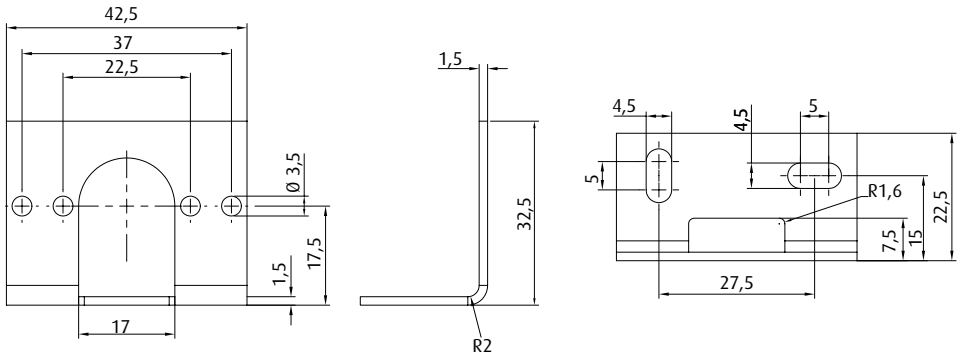
Ordering notes

> Mounting material included in scope of delivery

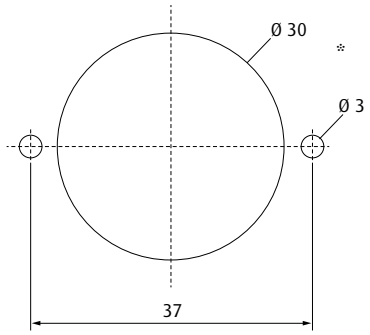
Technical data

Item no.	Description	Suitable for vacuum / pressure switches
20.514	Bracket	20.022, 20.023, 91.012
20.515	Mounting frame with bracket	20.022, 20.023, 91.012

Dimensions



20.514



20.515

* = Installation frame drilling dimensions

Clip 16 mm for wall mounting

Suitable for vacuum switches 20.020 and 20.021

NEW

Notes

> Mounting via through hole Ø 5 mm located centric at bottom side

Technical data

Item no.	Suitable for vacuum / pressure switches
20.520	20.020, 20.021

Tubing and cables at a glance 702

Tubing 704

Cables 717

Push-in fittings at a glance 718

Vacuum manifolds and rotary feedthroughs 720

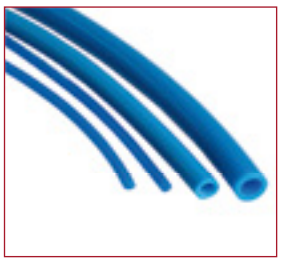
Push-in fittings and plug-in connectors 724

Quick couplings with vacuum / pressure lock 748

Accessories 750

FIPA Tubings and cables

> Piping of vacuum and compressed air systems
> Control cables for ejectors and vacuum switches



Flexible vacuum pressure tubing made from polyurethane (PUR)

> Very small bending radius
> Standard blue transparent or intransparent

61.090 - 61.096
> High chemical stability and mechanical resistance
> Outer diameter toleranced tubing, making them suitable for quick fittings

61.056 - 61.062
> Available in a wide range of colors
> Outer diameter toleranced tubing, making them suitable for quick fittings

61.020 - 61.030
> Suitable for use in trailing chains, corrugated external surface

61.005S - 61.011S
> Self-extinguishing, flame-resistant according to DIN 4102 B1, corrugated external surface

> See page 704

Vacuum-pressure tubing made from transparent fluororesin (PFA)

> Excellent resistance to chemicals, temperature and weather conditions
> Used predominantly in chemical, foodstuff and medical industries

> See page 706

Vacuum-pressure tubing made from highly flexible PVC, reinforced

> Very abrasion-resistant
> Suitable for use as transport tubing thanks to smooth interior walls

61.160 - 61.169
> Smooth external surface

> See page 707

FIPA Tubings and cables

Highly flexible, soft PVC tubing for pressure applications

> Suitable for frequently occurring pivoting motions and oscillations
> Not suitable for vacuum

> See page 710

Spiral tubings made from black polyurethane (PUR) for vacuum and pressure applications

> Space-saving tubings for mobile vacuum or pressure systems without straining the connections
> Suitable for pneumatic tools

> See page 711

Accessories:

Tubing nipples with male M and G threads

> See page 713

Reinforcing sleeves, especially for soft tubings

> See page 715

Tubing cutter with measuring tape

> See page 715

Connection cable made from polyurethane (PUR)

> Connection of vacuum switches, sensors or ejectors
> Weather and oil resistant

> See page 717

Flexible vacuum and pressure tubing made from PUR blue transparent

SUITABLE FOR INSTALLATION IN DRAG CHAINS

Product Description

> High flexibility enables small bending curve to build compact tubing systems
> Suitable for air and tap water
> Cut marks at 500 mm intervals facilitate installation
> High chemical and mechanical resistance
> Very high oil resistance

Notes

> Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.090	3	2	8	-1 - 8	29	-15 - 60	7	20
61.091	4	2.5	10	-1 - 8	29	-15 - 60	9	20
61.092	6	4	15	-1 - 8	29	-15 - 60	19	20
61.093	8	5	15	-1 - 8	29	-15 - 60	36	20
61.094	10	6.5	20	-1 - 8	29	-15 - 60	54	20
61.095	12	8	30	-1 - 8	29	-15 - 60	74	20
61.096	12	9	30	-1 - 8	29	-15 - 60	68	20

Flexible vacuum and pressure tubing made of blue PUR

SUITABLE FOR INSTALLATION IN DRAG CHAINS

Product Description

> High flexibility enables small bending curve to build compact tubing systems
> Suitable for air and tap water
> Cut marks at 500 mm intervals facilitate installation

Notes

> Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

Ordering notes

> Standard length 20 meters, colour blue
> Available in various tubing lengths and a wide selection of colours (black, red, orange, ocher, yellow, green, blue, light blue, transparent, pure white)
> 61.062 The standard colour is black
> Length of 50 meters generally only available in black

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.056	3	2	8	-1 - 8	29	-15 - 60	7	20 / 50 / 100
61.057	4	2.5	10	-1 - 8	29	-15 - 60	9	20 / 50 /100
61.058	6	4	15	-1 - 8	29	-15 - 60	19	20 / 50 / 100
61.059	8	5	15	-1 - 8	29	-15 - 60	36	20 / 50 / 100
61.060	10	6.5	20	-1 - 8	29	-15 - 60	54	20 / 50 / 100
61.061	12	8	30	-1 - 8	29	-15 - 60	74	20 / 50 / 100
61.062	16	11	60	-1 - 8	29	-15 - 60	128	20 / 50 / 100

Vacuum and pressure tubing made of transparent Fluororesin (PFA)

FOR CHEMICAL, FOODSTUFF AND MEDICAL INDUSTRIES

Product Description

> Excellent resistance to chemicals, temperature and weather conditions
> Very smooth, transparent inner surface
> Suitable for air, water and corrosive fluids

Notes

> 61.069 to 61.073: Suitable for cleanroom applications

Ordering notes

> Standard packaging unit: 5 meters

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range for air / gas [bar]	Pressure range for liquids [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.063	4	2.5	20	-0.99 - 9	3	49	-65 - 260	18	5 / 20
61.064	6	4	30	-0.99 - 9	3	49	-65 - 260	36	5 / 20
61.065	8	6	48	-0.99 - 9	3	39	-65 - 260	50	5 / 20
61.066	10	7.5	60	-0.99 - 9	3	39	-65 - 260	78	5 / 20
61.067	12	9	72	-0.99 - 9	3	59	-65 - 260	112	5 / 20
61.068	16	13	78	-0.99 - 9	3	34	-65 - 260	154	5 / 20
61.069	4	2.5	20	-0.99 - 9	3	49	-65 - 260	55	5
61.070	6	4	30	-0.99 - 9	3	49	-65 - 260	95	5
61.071	8	6	30	-0.99 - 9	3	39	-65 - 260	125	5
61.072	10	7.5	60	-0.99 - 9	3	39	-65 - 260	190	5
61.073	12	9	72	-0.99 - 9	3	39	-65 - 260	270	5

Vacuum and pressure tubing made of highly flexible transparent PVC, reinforced with wire spiral

Product Description

> Vacuum applications up to 95 %
> Very smooth inner surface for residue-free transport of materials such as granulate
> Suitable for continuous movement
> Hight abrasion-proof

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.160	13	8	32	-0.9 - 16	-5 - 65	140	1
61.161	16	10	20	-0.95 - 8	-5 - 65	155	1
61.162	18	12	25	-0.95 - 8	-5 - 65	180	1
61.163	20	14	30	-0.95 - 8	-5 - 65	200	1
61.164	22	16	35	-0.95 - 8	-5 - 65	225	1
61.165	24	18	40	-0.95 - 7	-5 - 65	280	1
61.166	27	20	50	-0.95 - 7	-5 - 65	340	1
61.167	33	25	60	-0.95 - 7	-5 - 65	510	1
61.168	42	32	75	-0.95 - 7	-5 - 65	730	1
61.169	53	40	100	-0.95 - 7	-5 - 65	1,220	1

Highly flexible vacuum and pressure tubing made of PUR, reinforced with PVC spiral

SUITABLE FOR INSTALLATION IN DRAG CHAINS

Product Description

> Vacuum applications up to 40 % vacuum
> Very smooth inner surface for residue-free transport of materials such as granulate
> Resistant to weather conditions and many chemicals
> Outer surface slightly corrugated
> Colour transparent

Notes

> Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

Ordering notes

> Other sizes on request

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.020	25	20	20	-0.4 - 1	-10 - 70	100	20
61.021	30	25	25	-0.4 - 1	-10 - 70	150	20
61.022	36	30	30	-0.4 - 1	-10 - 70	190	20
61.023	38	32	32	-0.3 - 0.5	-10 - 70	200	20
61.024	41	35	35	-0.3 - 0.5	-10 - 70	230	20
61.025	44	38	38	-0.3 - 0.5	-10 - 70	230	20
61.026	46	40	40	-0.3 - 0	-10 - 70	250	20
61.027	51	45	45	-0.3 - 0	-10 - 70	280	20
61.028	57	50	50	-0.3 - 0	-10 - 70	310	20
61.029	62	55	55	-0.3 - 0	-10 - 70	350	20
61.030	67	60	60	-0.3 - 0	-10 - 70	390	20
61.031	70	63	63	-0.3 - 0	-10 - 70	410	20
61.033	78	70	70	-0.3 - 0	-10 - 70	500	20
61.034	84	76	76	-0.3 - 0	-10 - 70	555	20
61.035	89	80	80	-0.3 - 0	-10 - 70	610	20
61.036	99	90	90	-0.3 - 0	-10 - 70	715	20
61.037	112	102	102	-0.3 - 0	-10 - 70	835	20
61.038	120	110	110	-0.3 - 10	-10 - 70	890	20
61.039	131	120	120	-0.3 - 0	-10 - 70	950	20
61.040	138	127	127	-0.2 - 0	-10 - 70	1,015	20
61.043	164	152	152	-0.2 - 0	-10 - 70	1,380	20

PUR highly flexible vacuum pressure tubing, reinforced, self-extinguishing

SUITABLE FOR INSTALLATION IN DRAG CHAINS

Product Description

> Highly flexible polyurethane for pressure and vacuum applicationstubing
> Self-extinguishing, flame resistant according to DIN 4102 B 1
> Alternative product in case of flying sparks, weld spatter or special fire safety obstructions
> Reinforced with PVC-coated spring coil
> Highly abrasion-proof
> Smooth inner walls, corrugated external surface
> Colour transparent

Notes

> Tubing built acc. to TRBS 2153 (zone 1 and 21) suitable for non-combustible dusts / bulk goods and gases / liquids of low conductivity Spiral ends shall be earthed at both sides to ensure good dissipation
> Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.005S	18	13	13	-0.5 - 2	-40 - 90	82	10
61.006S	25	20	20	-0.45 - 1.8	-40 - 90	147	10
61.007S	30	25	25	-0.4 - 1.6	-40 - 90	183	10
61.008S	35	30	30	-0.35 - 1.5	-40 - 90	220	10
61.009S	45	40	40	-0.3 - 1.4	-40 - 90	380	10
61.010S	50	45	45	-0.28 - 1.5	-40 - 90	410	10
61.011S	56	50	50	-0.28 - 1.5	-40 - 90	460	10

Highly flexible tubing made of soft PVC for light pressure applications

SUITABLE FOR FOODSTUFFS

Product Description

> Unpressurised and low-pressure applications with concurrent pivoting motions and oscillations
> High flexibility enables small bending curves for compact tubing systems
> FDA approval for aqueous foods
> Extremely resistant to acids and bases
> Colour transparent

Notes

> Not suitable for vacuum

Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.211	4	2	5	0 - 1	-5 - 60	9	20
61.212	6	4	14	0 - 1	-5 - 60	17	20
61.213	8	6	25	0 - 0.5	-5 - 60	23	20
61.214	10	7	25	0 - 0.5	-5 - 60	36	20
61.215	12	9	35	0 - 0.5	-5 - 60	52	10

Spiral tubing made of black PUR for vacuum and pressure applications

Product Description

> Space-saving tubing for mobile vacuum or pressure systems without straining the connections
> Suitable for pneumatic tools

Technical data

Item no.	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]
61.100	-1 - 7	29	-15 - 60
61.101	-1 - 7	29	-15 - 60
61.102	-1 - 7	29	-15 - 60
61.103	-1 - 7	29	-15 - 60
61.104	-1 - 7	29	-15 - 60
61.105	-1 - 7	29	-15 - 60
61.106	-1 - 7	29	-15 - 60
61.107	-1 - 7	29	-15 - 60
61.108	-1 - 7	29	-15 - 60
61.109	-1 - 7	29	-15 - 60
61.110	-1 - 7	29	-15 - 60
61.135	-1 - 7	29	-15 - 60
61.111	-1 - 7	29	-15 - 60
61.112	-1 - 7	29	-15 - 60
61.113	-1 - 7	29	-15 - 60
61.114	-1 - 7	29	-15 - 60
61.115	-1 - 7	29	-15 - 60
61.116	-1 - 7	29	-15 - 60
61.117	-1 - 7	29	-15 - 60
61.118	-1 - 7	29	-15 - 60
61.119	-1 - 7	29	-15 - 60
61.120	-1 - 7	29	-15 - 60
61.121	-1 - 7	29	-15 - 60
61.122	-1 - 7	29	-15 - 60
61.123	-1 - 7	29	-15 - 60

Dimensions

A [mm]	Ø d [mm]	Ø D [mm]	L [mm]
70	3	16	210
150	3	16	450
230	3	16	700
390	3	16	1,200
120	4	24	360
180	4	24	540
350	4	24	1,100
480	4	24	1,500
700	4	24	2,100
1,040	4	24	3,200
1,450	4	24	4,400
90	6	30	270
160	6	30	500
230	6	30	700
430	6	30	1,300
620	6	30	1,900
910	6	30	2,800
1,300	6	30	3,900
1,850	6	30	5,600
250	8	42	750
390	8	42	1,200
540	8	42	1,700
770	8	42	2,400
1,045	8	42	3,200
1,550	8	42	4,700

Continued on the next page

Spiral tubing made of black PUR for vacuum and pressure applications

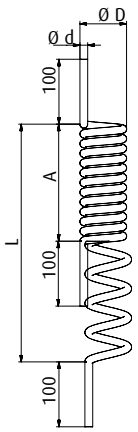
Technical data

Item no.	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]
61.124	-1 - 7	29	-15 - 60
61.125	-1 - 7	29	-15 - 60
61.126	-1 - 7	29	-15 - 60
61.127	-1 - 7	29	-15 - 60
61.128	-1 - 7	29	-15 - 60
61.129	-1 - 7	29	-15 - 60
61.130	-1 - 7	29	-15 - 60
61.131	-1 - 7	29	-15 - 60
61.132	-1 - 7	29	-15 - 60
61.133	-1 - 7	29	-15 - 60

Dimensions

A [mm]	Ø d [mm]	Ø D [mm]	L [mm]
330	10	58	1,000
470	10	58	1,400
680	10	58	2,100
970	10	58	3,000
1,380	10	58	4,200
310	12	72	1,000
450	12	72	1,400
660	12	72	2,000
920	12	72	2,800
1,320	12	72	4,000

Dimensions



Material in Motion

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Tubing nipple with external thread

Ordering notes

> Select the tubing inner diameter about 1 - 2 mm smaller than the tubing nipple

Technical data

Item no.	For hose inner Ø [mm]	Material
62.019	9	Nickel-plated brass
62.020	6	Nickel-plated brass
62.021	8	Nickel-plated brass
62.022	10	Nickel-plated brass
62.023	6	Nickel-plated brass
62.024	8	Nickel-plated brass
62.025	10	Nickel-plated brass
62.026	12	Nickel-plated brass
62.027	16	Nickel-plated brass
62.028	19	Nickel-plated brass
62.029	25	Nickel-plated brass
62.030	10	Nickel-plated brass
62.031	12	Nickel-plated brass
62.033	16	Nickel-plated brass
62.034	18	Nickel-plated brass
62.035	25	Nickel-plated brass
62.036	32	Nickel-plated brass
62.037	38	Nickel-plated brass
62.038	32	Brass
62.040	50	Brass
62.041	50	Brass
62.042	63	Brass
62.045	6	Brass
62.046	9	Brass
62.047	12	Brass
62.048	16	Nickel-plated brass
62.060	14	Nickel-plated brass
62.061	32	Brass
62.062	4	Brass
62.063	6	Brass

Dimensions

G1	Ø D [mm]	SW
G1/8	9	12
G1/8	6	12
G1/8	8	12
G1/8	10	12
G1/4	6	14
G1/4	8	14
G1/4	10	14
G1/4	12	14
G3/4	16	17
G3/4	19	32
G3/4	25	32
G1/2	10	22
G1/2	12	22
G1/2	16	22
G1/2	18	22
G1	25	37
G1 1/4	32	50
G1 1/2	38	55
G1 1/2-male	32	48
G1 1/2-male	50	52
G2-male	50	70
G2 1/2-male	63	80
G3/8-male	6	19
G3/8-male	9	19
G3/8-male	12	19
R3/8-male	16	17
G1/2-male	14	24
G1-male	32	36
M5	4	7
M5	6	7

Tubing clamps

Material: Steel, galvanised

Product Description

> Corrosion-proof thanks to the use of galvanised steel

Technical data

Item no.	Adjustment range of diameter [mm]	Weight [g]
66.010	8 - 12	6
66.011	12 - 22	6
66.015	16 - 27	10
66.017	25 - 40	15
66.019	30 - 43	18
66.020	40 - 60	22

Reinforcing sleeves

Material: Stainless steel

Product Description

> We recommend the use of reinforcing for all soft tubing
> Reinforced sleeves also recommended for water transportation

Technical data

Item no.	Hose outer Ø [mm]	Hose inner Ø [mm]
WR 0425	4	2.5
WR 0640	6	4
WR 0850	8	5
WR 0860	8	6
WR 1065	10	6.5
WR 1075	10	7.5
WR 1280	12	8
WR 1290	12	9
WR 1613	16	13

Tubing cutter with measuring tape

Technical data

Item no.	Compatible hose diameter [mm]
61.083	3 - 16

Notes:

Connector cable M8, M12, 2-5-pin, Material PUR

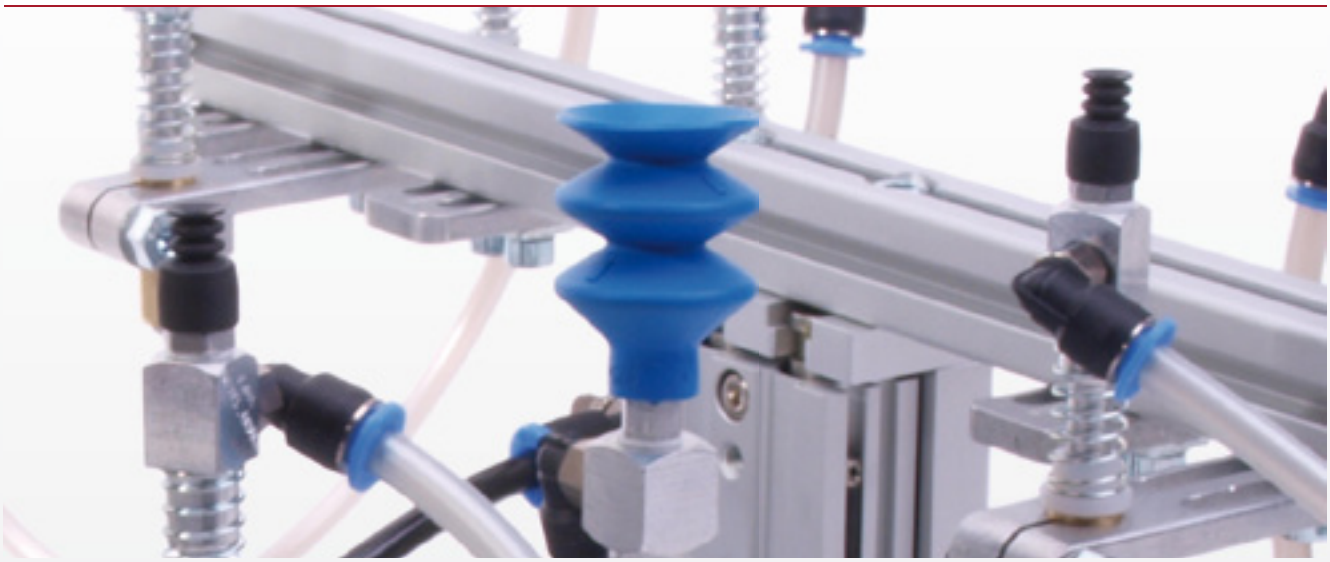
Product Description

> Electric connection e. g. of vacuum switches, sensors or ejectors

Technical data

Item no.	Contact	Plug Design	Cable length [mm]	Suitable for
20.550	Plug with plastic housing, 2-pin, open cable	Straight	1,500	Connection of base ejectors with blow-off boost EBA.08H.2-A
20.503	Plug M8, 3-pin, open cable	Straight	2,500	Connection of sensors and sensor grippers
20.504	Plug M8, 3-pin, jack M8, 3-pin	90° elbow	300	Connection of sensors and sensor grippers
20.507	Plug M8, 3-pin, jack M8, 3-pin	90° elbow	2,000	Connection of sensors and sensor grippers
20.570	Plug M8, 3-pin, jack M8, 3-pin	Straight	1,500	Connection of sensors and sensor grippers
20.501	M8, 4-pin, female, open cable	Straight	5,000	Connection of vacuum switches or compact ejectors
20.502	M8, 4-pin, female, open cable	90° elbow	5,000	Connection of vacuum switches or compact ejectors
20.518	M12, 4-pin, female, open cable	Straight	2,000	Connection of vacuum switches or compact ejectors
20.519	M12, 4-pin, female, open cable	90° elbow	2,000	Connection of vacuum switches or compact ejectors
20.508	Plug M12, 5-pin, open cable	90° elbow	2,000	Connection of compact ejectors
20.509	Plug M12, 5-pin, open cable	90° elbow	2,000	Connection of compact ejectors

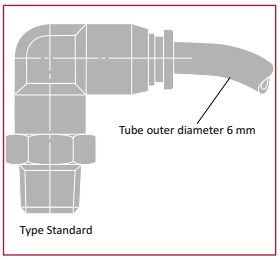
FIPA Push-in fittings



Vacuum manifolds

> Construction of vacuum systems by means of simple installation of Push-in fittings or quick fittings
> Inlets on one or both sides
> Up to six inlets or outlets, male and female threads from M5 to G1 1/4
> Design: Aluminium or brass

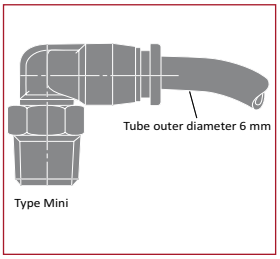
> See page 720



Push-in fittings and plug-in connectors - Standard

> Suitable for vacuum and pressure applications (-1 to 10 bar)
> M, G and R male and female threads, straight or 90° version
> T and Y manifolds, 2-way and 3-way angle swivel screw connections
> Stackable plug-in connector (QC-3-3M - QC 8-8)
> Lock connection push-in connectors 30.761 - 20.765 (straight); 30.774 - 30.778 (90°): locking of compressed air or vacuum during hose disassembly, release after reconnection
> Rotation screw connections for mounting in with fast-running machines

> See page 724



Push-in fittings and plug-in connectors - Mini

> Suitable for vacuum and pressure applications (-1 to 10 bar)
> 40 % smaller than standard version
> M, R and G male and female threads, straight, 45° or 90° version
> T-manifold
> Easy assembly and disassembly thanks to elliptical mini-release-ring

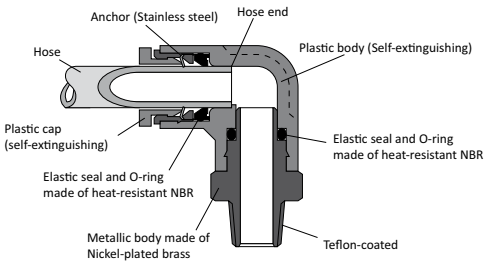
> See page 744

FIPA Push-in fittings

Push-in fittings and plug-in connectors - self-extinguishing

> These quick-action Push-in fittings with spark protection are specifically designed for use with flying sparks and weld spatter
> No chance of release ring malfunctions, for example due to the penetration of dirt or scale
> The Push-in fittings are made from self-extinguishing plastic (UL94 V-0) and brass

> See page 741

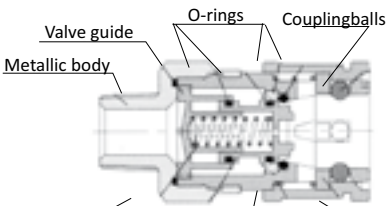


Quick-action couplings with pressure / vacuum lock

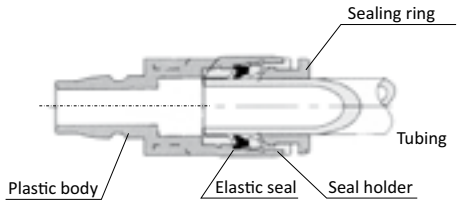
> Locking of compressed air or vacuum during disassembly, release after reconnection
> Coupling can be operated with one hand

> See page 748

Socket (with pressure lock)



Plug (with free passage)



Accessories

> Double nipples
> Thread adapters
> Threaded sockets
> Screw plugs
> Sealing rings

> See page 750

Manifolds for simple assembly of vacuum loads

Outputs on one side, at the front

Product Description

> Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
> Material: Aluminium

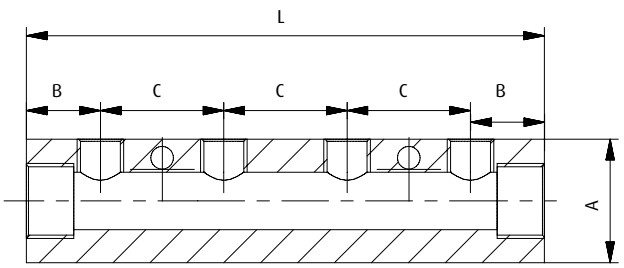
Technical data

Item no.	Input connection	Output connection	Suitable sealing plugs
79.000	2x 1/8	2x M5	77.000 (p.753), 77.009 (p.753)
79.001	2x 1/8	4x M5	77.000 (p.753), 77.009 (p.753)
79.002	2x 1/8	6x M5	77.000 (p.753), 77.009 (p.753)
79.003	2x 1/4	2x 1/8	77.008 (p.753), 77.009 (p.753)
79.004	2x 1/4	4x 1/8	77.008 (p.753), 77.009 (p.753)
79.005	2x 1/4	6x 1/8	77.008 (p.753), 77.009 (p.753)
79.006	2x 3/8	2x 1/4	77.008 (p.753), 77.010 (p.753)
79.007	2x 3/8	4x 1/4	77.008 (p.753), 77.010 (p.753)
79.008	2x 3/8	6x 1/4	77.008 (p.753), 77.010 (p.753)
79.009	2x 3/8	2x 1/8	77.009 (p.753), 77.010 (p.753)
79.010	2x 3/8	4x 1/8	77.009 (p.753), 77.010 (p.753)
79.011	2x 3/8	6x 1/8	77.009 (p.753), 77.010 (p.753)
79.012	2x 1/2	2x 1/4	77.007 (p.753), 77.008 (p.753)
79.013	2x 1/2	4x 1/4	77.007 (p.753), 77.008 (p.753)
79.014	2x 1/2	6x 1/4	77.008 (p.753), 77.007 (p.753)

Dimensions

A [mm]	B [mm]	C [mm]	L [mm]
20	15	15	45
20	15	15	75
20	15	15	105
30	15	30	60
30	15	30	120
30	15	30	180
40	18	36	72
30	18	36	144
30	18	36	216
40	18	30	66
30	18	30	126
30	18	30	186
40	22	36	80
40	22	36	152
40	22	36	224

Dimensions



FIPA Material in Motion

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Manifolds for simple assembly of vacuum loads

Outputs on both sides, at the front and rear

Product Description

> Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
> Material: Aluminium

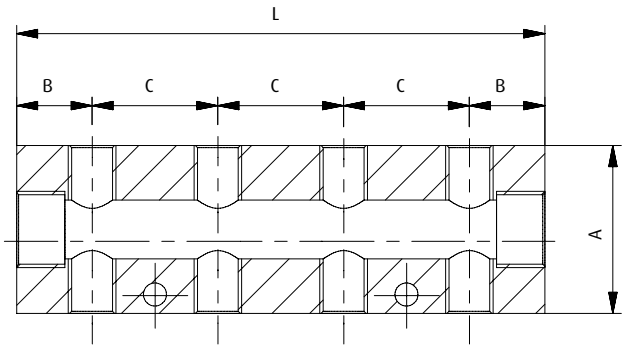
Technical data

Item no.	Input connection	Output connection	Suitable sealing plugs
79.015	2x 1/8	2+2 x M5	77.000 (p.753) 77.009 (p.753)
79.016	2x 1/8	4+4 x M5	77.000 (p.753) 77.009 (p.753)
79.017	2x 1/4	2+2 x 1/8	77.008 (p.753) 77.009 (p.753)
79.018	2x 1/4	4+4 x 1/8	77.008 (p.753) 77.009 (p.753)
79.019	2x 3/8	2+2 x 1/4	77.008 (p.753) 77.010 (p.753)
79.020	2x 3/8	4+4 x 1/4	77.008 (p.753) 77.010 (p.753)
79.023	2x 1/2	2+2 x 1/4	77.007 (p.753) 77.008 (p.753)
79.024	2x 1/2	4+4 x 1/4	77.007 (p.753) 77.008 (p.753)

Dimensions

A [mm]	B [mm]	C [mm]	L [mm]
20	15	15	45
20	15	15	75
30	15	30	60
30	15	30	120
40	18	36	72
40	18	36	144
40	22	36	80
40	22	36	152

Dimensions



Distributors

With two or three outputs

Product Description

> Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
> Suitable for vacuum and compressed air

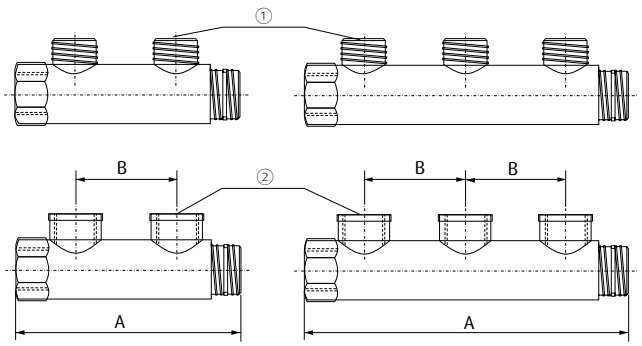
Technical data

Item no.	Input connection	Output connection	Material	Suitable sealing caps
79.025	2x 3/4	2x 1/2 male	Brass blank	79.040, 79.041
79.026	2x 3/4	2x 1/2 female	Brass blank	79.040, 79.041
79.027	2x 1	2x 1/2 male	Brass blank	79.040, 79.042
79.028	2x 1	2x 1/2 female	Brass blank	79.040, 79.042
79.029	2x 1 1/4	2x 1/2 male	Brass blank	79.040, 79.043
79.030	2x 1 1/4	2x 1/2 female	Brass blank	79.040, 79.043
79.031	2x 3/4	3x 1/2 male	Brass blank	79.040, 79.041
79.032	2x 3/4	3x 1/2 female	Brass blank	79.040, 79.041
79.033	2x 1	3x 1/2 male	Brass blank	79.040, 79.042
79.034	2x 1	3x 1/2 female	Brass blank	79.040, 79.042
79.035	2x 1 1/4	3x 1/2 male	Brass blank	79.040, 79.043
79.036	2x 1 1/4	3x 1/2 female	Brass blank	79.040, 79.043

Dimensions

A [mm]	B [mm]
114	50
114	50
114	50
114	50
137	60
137	60
164	50
164	50
164	50
164	50
197	60
197	60

Dimensions



① = Connection output (male thread) ② = Connection output (female thread)

Phone +49 (0)89 / 96 24 89-0

Rotary feedthroughs for vacuum

Rotary feedthroughs for revolving machine parts

Product Description

> Vacuum inlet for revolving machine parts
> Suitable for fast moving machinery or gripping systems

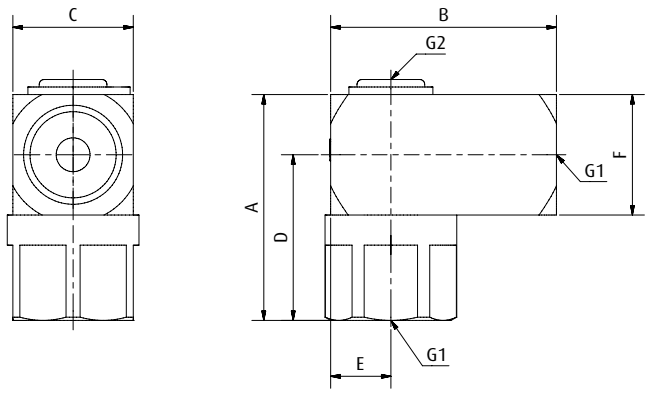
Notes

> Only suitable for vacuum, not for compressed air
> Construction: Housing of brass, nickel-plated, NBR seals, guide pins, flange screws and retaining ring: Steel galvanised

Technical data

Item no.	Nominal width [mm]	Flow rate solenoid valve [Nl/min]	U max. [1/min]	Operating temperature [°C]	Weight [g]
30.816	5	425	500	-10 - 85	69
30.817	5	465	550	-10 - 85	58
30.818	8	1,350	300	-10 - 85	150
30.819	11	3,200	200	-10 - 85	549

Dimensions



Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
30.816	G1/8	--	32	30	16	22	8	16
30.817	G1/4	--	32	30	16	22	8	16
30.818	G3/8	G1/8	39	40	25	26	12.5	20
30.819	G1/2	G3/8	55	65	40	35	20	30

Straight male stud connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.000	-0.95 - 15	0 - 60	4	M5
30.001	-0.95 - 15	0 - 60	4	M6
30.002	-0.95 - 15	0 - 60	4	R1/8
30.003	-0.95 - 15	0 - 60	4	R1/4
30.004	-0.95 - 15	0 - 60	6	M5
30.005	-0.95 - 15	0 - 60	6	M6
30.006	-0.95 - 15	0 - 60	6	R1/8
30.007	-0.95 - 15	0 - 60	6	R1/4
30.008	-0.95 - 15	0 - 60	6	R3/8
30.009	-0.95 - 15	0 - 60	8	R1/8
30.010	-0.95 - 15	0 - 60	8	R1/4
30.011	-0.95 - 15	0 - 60	8	R3/8
30.012	-0.95 - 15	0 - 60	10	R1/8
30.013	-0.95 - 15	0 - 60	10	R1/4
30.014	-0.95 - 15	0 - 60	10	R3/8
30.015	-0.95 - 15	0 - 60	10	R1/2
30.016	-0.95 - 15	0 - 60	12	R1/4
30.017	-0.95 - 15	0 - 60	12	R3/8
30.018	-0.95 - 15	0 - 60	12	R1/2
30.019	-0.95 - 15	0 - 60	16	R3/8
30.020	-0.95 - 15	0 - 60	16	R1/2
30.002-G	-0.95 - 15	-20 - 80	4	G1/8
30.003-G	-0.95 - 15	-20 - 80	4	G1/4
30.006-G	-0.95 - 15	-20 - 80	6	G1/8
30.007-G	-0.95 - 15	-20 - 80	6	G1/4
30.008-G	-0.95 - 15	-20 - 80	6	G3/8
30.011-G	-0.95 - 15	-20 - 80	8	G3/8
30.012-G	-0.95 - 15	-20 - 80	10	G1/8
30.014-G	-0.95 - 15	-20 - 80	10	G3/8
30.015-G	-0.95 - 15	-20 - 80	10	G1/2
30.016-G	-0.95 - 15	-20 - 80	12	G1/4
30.017-G	-0.95 - 15	-20 - 80	12	G3/8
30.018-G	-0.95 - 15	-20 - 80	12	G1/2
30.019-G	-0.95 - 15	-20 - 80	16	G3/8
30.020-G	-0.95 - 15	-20 - 80	16	G1/2
30.021-G	-0.95 - 15	-20 - 80	28	G1

Mini male stud connectors, round, hex key

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.200	-0.95 - 15	0 - 60	4	M5
30.201	-0.95 - 15	0 - 60	4	M6
30.202	-0.95 - 15	0 - 60	4	R1/8
30.203	-0.95 - 15	0 - 60	6	M5
30.204	-0.95 - 15	0 - 60	6	M6
30.205	-0.95 - 15	0 - 60	6	R1/8
30.206	-0.95 - 15	0 - 60	6	R1/4
30.207	-0.95 - 15	0 - 60	8	R1/8
30.208	-0.95 - 15	0 - 60	8	R1/4
30.209	-0.95 - 15	0 - 60	8	R3/8
30.210	-0.95 - 15	0 - 60	10	R1/4
30.211	-0.95 - 15	0 - 60	10	R3/8
30.212	-0.95 - 15	0 - 60	10	R1/2
30.213	-0.95 - 15	0 - 60	12	R3/8
30.214	-0.95 - 15	0 - 60	12	R1/2

Straight push-in fittings with cutoff valve

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data				Dimensions	
Item no.	Effective passage area [mm²]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.761	1.6	-0.95 - 15	0 - 60	4	M5
30.762	2	-0.95 - 15	0 - 60	4	R1/8
30.763	2.3	-0.95 - 15	0 - 60	6	M5
30.764	7.3	-0.95 - 15	0 - 60	6	R1/8
30.765	7.3	-0.95 - 15	0 - 60	6	R1/4

Female stud connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.050	-0.95 - 15	0 - 60	4	R1/8
30.051	-0.95 - 15	0 - 60	4	R1/4
30.052	-0.95 - 15	0 - 60	6	R1/8
30.053	-0.95 - 15	0 - 60	6	R1/4
30.054	-0.95 - 15	0 - 60	8	R1/8
30.055	-0.95 - 15	0 - 60	8	R1/4
30.056	-0.95 - 15	0 - 60	8	R3/8
30.057	-0.95 - 15	0 - 60	10	R1/4
30.058	-0.95 - 15	0 - 60	10	R3/8
30.059	-0.95 - 15	0 - 60	12	R1/4
30.060	-0.95 - 15	0 - 60	12	R3/8
30.062	-0.95 - 15	0 - 60	10	G1/2
30.063	-0.95 - 15	0 - 60	12	G1/2
30.056-G	-0.95 - 15	-20 - 80	8	G3/8
30.057-G	-0.95 - 15	-20 - 80	10	G1/4
30.058-G	-0.95 - 15	-20 - 80	10	G3/8
30.059-G	-0.95 - 15	-20 - 80	12	G1/4
30.060-G	-0.95 - 15	-20 - 80	12	G3/8

Straight tube connector - equal

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
30.223	-0.95 - 15	0 - 60	4
30.224	-0.95 - 15	0 - 60	6
30.225	-0.95 - 15	0 - 60	8
30.226	-0.95 - 15	0 - 60	10
30.227	-0.95 - 15	0 - 60	12
30.228	-0.95 - 15	0 - 60	16

Straight tube reducer

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.075	-0.95 - 15	0 - 60	6	4
30.076	-0.95 - 15	0 - 60	8	6
30.077	-0.95 - 15	0 - 60	10	8
30.078	-0.95 - 15	0 - 60	12	10
30.080	-0.95 - 15	0 - 60	16	12

Male stud connector with ball bearing

Ball bearing enables applications with fast rotation or pivoting

Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.800	500	-0.95 - 15	0 - 60	4	M5
30.801	500	-0.95 - 15	0 - 60	4	M6
30.802	500	-0.95 - 15	0 - 60	4	R1/8
30.803	500	-0.95 - 15	0 - 60	6	M6
30.804	500	-0.95 - 15	0 - 60	6	R1/8
30.805	500	-0.95 - 15	0 - 60	6	R1/4
30.806	400	-0.95 - 15	0 - 60	8	R1/8
30.807	400	-0.95 - 15	0 - 60	8	R1/4
30.808	400	-0.95 - 15	0 - 60	8	R3/8
30.809	300	-0.95 - 15	0 - 60	10	R1/8
30.810	300	-0.95 - 15	0 - 60	10	R1/4
30.811	300	-0.95 - 15	0 - 60	10	R3/8
30.812	300	-0.95 - 15	0 - 60	10	R1/2
30.813	250	-0.95 - 15	0 - 60	12	R1/4
30.814	250	-0.95 - 15	0 - 60	12	R3/8
30.815	250	-0.95 - 15	0 - 60	12	R1/2

Push-in stud connectors for high speed rotation

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.846	1,500	-0.95 - 15	0 - 60	4	M5
30.847	1,500	-0.95 - 15	0 - 60	4	M6
30.848	1,500	-0.95 - 15	0 - 60	4	R1/8
30.849	1,200	-0.95 - 15	0 - 60	6	R1/8
30.850	1,200	-0.95 - 15	0 - 60	6	R1/4
30.851	1,200	-0.95 - 15	0 - 60	8	R1/8
30.852	1,200	-0.95 - 15	0 - 60	8	R1/4
30.853	900	-0.95 - 15	0 - 60	10	R3/8
30.854	900	-0.95 - 15	0 - 60	10	R1/2
30.855	900	-0.95 - 15	0 - 60	12	R3/8
30.856	900	-0.95 - 15	0 - 60	12	R1/2

90° elbow male connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.100	-0.95 - 15	0 - 60	4	M5
30.101	-0.95 - 15	0 - 60	4	M6
30.102	-0.95 - 15	0 - 60	4	R1/8
30.103	-0.95 - 15	0 - 60	4	R1/4
30.104	-0.95 - 15	0 - 60	6	M5
30.105	-0.95 - 15	0 - 60	6	M6
30.106	-0.95 - 15	0 - 60	6	R1/8
30.107	-0.95 - 15	0 - 60	6	R1/4
30.108	-0.95 - 15	0 - 60	6	R3/8
30.109	-0.95 - 15	0 - 60	8	R1/8
30.110	-0.95 - 15	0 - 60	8	R1/4
30.111	-0.95 - 15	0 - 60	8	R3/8
30.112	-0.95 - 15	0 - 60	10	R1/8
30.113	-0.95 - 15	0 - 60	10	R1/4
30.114	-0.95 - 15	0 - 60	10	R3/8
30.115	-0.95 - 15	0 - 60	10	R1/2
30.116	-0.95 - 15	0 - 60	12	R1/4
30.117	-0.95 - 15	0 - 60	12	R3/8
30.118	-0.95 - 15	0 - 60	12	R1/2
30.119	-0.95 - 15	0 - 60	16	R3/8
30.120	-0.95 - 15	0 - 60	16	R1/2
30.102-G	-0.95 - 15	-20 - 80	4	G1/8
30.103-G	-0.95 - 15	-20 - 80	4	G1/4
30.106-G	-0.95 - 15	-20 - 80	6	G1/8
30.107-G	-0.95 - 15	-20 - 80	6	G1/4
30.108-G	-0.95 - 15	-20 - 80	6	G3/8
30.109-G	-0.95 - 15	-20 - 80	8	G1/8
30.110-G	-0.95 - 15	-20 - 80	8	G1/8
30.111-G	-0.95 - 15	-20 - 80	8	G3/8
30.112-G	-0.95 - 15	-20 - 80	10	G1/8
30.113-G	-0.95 - 15	-20 - 80	10	G1/4
30.114-G	-0.95 - 15	-20 - 80	10	G3/8
30.115-G	-0.95 - 15	-20 - 80	10	G1/2
30.116-G	-0.95 - 15	-20 - 80	12	G1/4
30.117-G	-0.95 - 15	-20 - 80	12	G3/8
30.118-G	-0.95 - 15	-20 - 80	12	G1/2
30.119-G	-0.95 - 15	-20 - 80	16	G3/8
30.120-G	-0.95 - 15	-20 - 80	16	G1/2

90° extended elbow male connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.279	-0.95 - 15	0 - 60	4	M5
30.280	-0.95 - 15	0 - 60	4	R1/8
30.281	-0.95 - 15	0 - 60	6	R1/8
30.282	-0.95 - 15	0 - 60	6	R1/4
30.283	-0.95 - 15	0 - 60	6	R3/8
30.284	-0.95 - 15	0 - 60	8	R1/8
30.285	-0.95 - 15	0 - 60	8	R1/4
30.286	-0.95 - 15	0 - 60	8	R3/8
30.287	-0.95 - 15	0 - 60	10	R1/4
30.288	-0.95 - 15	0 - 60	10	R3/8
30.289	-0.95 - 15	0 - 60	10	R1/2
30.290	-0.95 - 15	0 - 60	12	R1/4
30.291	-0.95 - 15	0 - 60	12	R3/8
30.292	-0.95 - 15	0 - 60	12	R1/2

90° elbow female connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.170	-0.95 - 15	0 - 60	4	M5
30.171	-0.95 - 15	0 - 60	4	M6
30.172	-0.95 - 15	0 - 60	4	R1/8
30.173	-0.95 - 15	0 - 60	4	R1/4
30.174	-0.95 - 15	0 - 60	6	M5
30.175	-0.95 - 15	0 - 60	6	M6
30.176	-0.95 - 15	0 - 60	6	R1/8
30.177	-0.95 - 15	0 - 60	6	R1/4
30.178	-0.95 - 15	0 - 60	6	R3/8
30.179	-0.95 - 15	0 - 60	8	R1/8
30.180	-0.95 - 15	0 - 60	8	R1/4
30.181	-0.95 - 15	0 - 60	8	R3/8
30.182	-0.95 - 15	0 - 60	10	R1/4
30.183	-0.95 - 15	0 - 60	10	R3/8
30.184	-0.95 - 15	0 - 60	10	R1/2
30.172-G	-0.95 - 15	-20 - 80	4	G1/8
30.173-G	-0.95 - 15	-20 - 80	4	G1/4
30.176-G	-0.95 - 15	-20 - 80	6	G1/8
30.178-G	-0.95 - 15	-20 - 80	6	G3/8
30.179-G	-0.95 - 15	-20 - 80	8	G1/8
30.180-G	-0.95 - 15	-20 - 80	8	G1/4
30.181-G	-0.95 - 15	-20 - 80	8	G3/8
30.182-G	-0.95 - 15	-20 - 80	10	G1/4
30.183-G	-0.95 - 15	-20 - 80	10	G3/8

90° male elbow with cutoff valve

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.774	-0.95 - 15	0 - 60	4	M5
30.775	-0.95 - 15	0 - 60	4	G1/8
30.776	-0.95 - 15	0 - 60	6	M5
30.777	-0.95 - 15	0 - 60	6	G1/8
30.778	-0.95 - 15	0 - 60	6	G1/4

90° elbow connectors - equal

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
30.270	-0.95 - 15	0 - 60	4
30.271	-0.95 - 15	0 - 60	6
30.272	-0.95 - 15	0 - 60	8
30.273	-0.95 - 15	0 - 60	10
30.274	-0.95 - 15	0 - 60	12
30.275	-0.95 - 15	0 - 60	16

90° male elbow with ball bearing

Ball bearing enables applications with fast rotation or pivoting

Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.823	500	-0.95 - 15	0 - 60	4	M5
30.824	500	-0.95 - 15	0 - 60	4	M6
30.825	500	-0.95 - 15	0 - 60	4	R1/8
30.826	500	-0.95 - 15	0 - 60	6	M6
30.827	500	-0.95 - 15	0 - 60	6	R1/8
30.828	500	-0.95 - 15	0 - 60	6	R1/4
30.829	400	-0.95 - 15	0 - 60	8	R1/8
30.830	400	-0.95 - 15	0 - 60	8	R1/4
30.831	400	-0.95 - 15	0 - 60	8	R3/8
30.832	300	-0.95 - 15	0 - 60	10	R1/8
30.833	300	-0.95 - 15	0 - 60	10	R1/4
30.834	300	-0.95 - 15	0 - 60	10	R3/8
30.835	300	-0.95 - 15	0 - 60	10	R1/2
30.836	250	-0.95 - 15	0 - 60	12	R1/4
30.837	250	-0.95 - 15	0 - 60	12	R3/8
30.838	250	-0.95 - 15	0 - 60	12	R1/2

90° Male elbow for high speed rotation

Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.863	1,500	-0.95 - 15	0 - 60	4	M5
30.864	1,500	-0.95 - 15	0 - 60	4	M6
30.865	1,500	-0.95 - 15	0 - 60	4	R1/8
30.866	1,200	-0.95 - 15	0 - 60	6	R1/8
30.867	1,200	-0.95 - 15	0 - 60	6	R1/4
30.868	1,200	-0.95 - 15	0 - 60	8	R1/8
30.869	1,200	-0.95 - 15	0 - 60	8	R1/4
30.870	900	-0.95 - 15	0 - 60	10	R3/8
30.871	900	-0.95 - 15	0 - 60	10	R1/2
30.872	900	-0.95 - 15	0 - 60	12	R3/8
30.873	900	-0.95 - 15	0 - 60	12	R1/2

Male banjo connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.300	-0.95 - 15	0 - 60	4	M6
30.301	-0.95 - 15	0 - 60	4	R1/8
30.302	-0.95 - 15	0 - 60	6	M5
30.303	-0.95 - 15	0 - 60	6	M6
30.304	-0.95 - 15	0 - 60	6	R1/8
30.305	-0.95 - 15	0 - 60	6	R1/4
30.306	-0.95 - 15	0 - 60	8	R1/8
30.307	-0.95 - 15	0 - 60	8	R1/4
30.308	-0.95 - 15	0 - 60	8	R3/8
30.309	-0.95 - 15	0 - 60	10	R1/4
30.310	-0.95 - 15	0 - 60	10	R3/8
30.311	-0.95 - 15	0 - 60	12	R3/8
30.312	-0.95 - 15	0 - 60	12	R1/2
30.313	-0.95 - 15	0 - 60	16	R3/8

Male branch tee connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.332	-0.95 - 15	0 - 60	4	M5
30.333	-0.95 - 15	0 - 60	4	M6
30.334	-0.95 - 15	0 - 60	4	R1/8
30.335	-0.95 - 15	0 - 60	4	R1/4
30.336	-0.95 - 15	0 - 60	6	M5
30.337	-0.95 - 15	0 - 60	6	M6
30.338	-0.95 - 15	0 - 60	6	R1/8
30.339	-0.95 - 15	0 - 60	6	R1/4
30.340	-0.95 - 15	0 - 60	6	R3/8
30.341	-0.95 - 15	0 - 60	8	R1/8
30.342	-0.95 - 15	0 - 60	8	R1/4
30.343	-0.95 - 15	0 - 60	8	R3/8
30.344	-0.95 - 15	0 - 60	10	R1/4
30.345	-0.95 - 15	0 - 60	10	R3/8
30.346	-0.95 - 15	0 - 60	10	R1/2
30.347	-0.95 - 15	0 - 60	12	R1/4
30.348	-0.95 - 15	0 - 60	12	R3/8
30.349	-0.95 - 15	0 - 60	12	R1/2
30.350	-0.95 - 15	0 - 60	16	R3/8
30.351	-0.95 - 15	0 - 60	16	R1/2

Equal tube tee connectors

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
30.390	-0.95 - 15	0 - 60	4
30.391	-0.95 - 15	0 - 60	6
30.392	-0.95 - 15	0 - 60	8
30.393	-0.95 - 15	0 - 60	10
30.394	-0.95 - 15	0 - 60	12
30.395	-0.95 - 15	0 - 60	16

Unequal tube tee connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.399	-0.95 - 15	0 - 60	6	4
30.400	-0.95 - 15	0 - 60	8	6
30.401	-0.95 - 15	0 - 60	10	8
30.402	-0.95 - 15	0 - 60	12	10

Equal Y connectors

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
30.431	-0.95 - 15	0 - 60	4
30.432	-0.95 - 15	0 - 60	6
30.433	-0.95 - 15	0 - 60	8
30.434	-0.95 - 15	0 - 60	10
30.435	-0.95 - 15	0 - 60	12
30.436	-0.95 - 15	0 - 60	16

Unequal Y connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.440	-0.95 - 15	0 - 60	6	4
30.441	-0.95 - 15	0 - 60	8	6
30.442	-0.95 - 15	0 - 60	10	8
30.443	-0.95 - 15	0 - 60	12	10

Male Y connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.403	-0.95 - 15	0 - 60	4	M5
30.404	-0.95 - 15	0 - 60	4	R1/8
30.405	-0.95 - 15	0 - 60	4	R1/4
30.406	-0.95 - 15	0 - 60	6	M5
30.407	-0.95 - 15	0 - 60	6	M6
30.408	-0.95 - 15	0 - 60	6	R1/8
30.409	-0.95 - 15	0 - 60	6	R1/4
30.410	-0.95 - 15	0 - 60	6	R3/8
30.411	-0.95 - 15	0 - 60	8	R1/8
30.412	-0.95 - 15	0 - 60	8	R1/4
30.413	-0.95 - 15	0 - 60	8	R3/8
30.414	-0.95 - 15	0 - 60	10	R1/4
30.415	-0.95 - 15	0 - 60	10	R3/8
30.416	-0.95 - 15	0 - 60	10	R1/2
30.417	-0.95 - 15	0 - 60	12	R1/4
30.418	-0.95 - 15	0 - 60	12	R3/8
30.419	-0.95 - 15	0 - 60	12	R1/2
30.420	-0.95 - 15	0 - 60	16	R3/8
30.421	-0.95 - 15	0 - 60	16	R1/2

Elbow Y male connectors

Item no.	Technical data: Pressure range [bar]	Technical data: Operating temperature [°C]	Dimensions: Ø D [mm]	Dimensions: G
30.518	-0.95 - 15	0 - 60	4	M5
30.519	-0.95 - 15	0 - 60	4	M6
30.520	-0.95 - 15	0 - 60	4	R1/8
30.521	-0.95 - 15	0 - 60	4	R1/4
30.522	-0.95 - 15	0 - 60	6	M5
30.523	-0.95 - 15	0 - 60	6	M6
30.524	-0.95 - 15	0 - 60	6	R1/8
30.525	-0.95 - 15	0 - 60	6	R1/4
30.526	-0.95 - 15	0 - 60	6	R3/8
30.527	-0.95 - 15	0 - 60	8	R1/8
30.528	-0.95 - 15	0 - 60	8	R1/4
30.529	-0.95 - 15	0 - 60	8	R3/8
30.530	-0.95 - 15	0 - 60	10	R1/4
30.531	-0.95 - 15	0 - 60	10	R3/8
30.532	-0.95 - 15	0 - 60	10	R1/2
30.533	-0.95 - 15	0 - 60	12	R1/4
30.534	-0.95 - 15	0 - 60	12	R3/8
30.535	-0.95 - 15	0 - 60	12	R1/2

Push-in connectors QC

Available as an option: Connecting strap for parallel circuit = QB-H, for series circuit = QB-T

Item no.	Technical data: Pressure range [bar]	Technical data: Operating temperature [°C]	Dimensions: Ø D1 [mm]	Dimensions: Ø D2 [mm]
QC3-3M	-0.95 - 15	0 - 60	3	3
QC3-4M	-0.95 - 15	0 - 60	3	4
QC3-6M	-0.95 - 15	0 - 60	3	6
QC4-3M	-0.95 - 15	0 - 60	4	3
QC4-4M	-0.95 - 15	0 - 60	4	4
QC4-6M	-0.95 - 15	0 - 60	4	6
QC6-3M	-0.95 - 15	0 - 60	6	3
QC6-4M	-0.95 - 15	0 - 60	6	4
QC6-6M	-0.95 - 15	0 - 60	6	6
QC6-6	-0.95 - 15	0 - 60	6	6
QC6-8	-0.95 - 15	0 - 60	6	8
QC8-6	-0.95 - 15	0 - 60	8	6
QC8-8	-0.95 - 15	0 - 60	8	8

Two stack banjo

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.599	-0.95 - 15	0 - 60	4	R1/8
30.600	-0.95 - 15	0 - 60	4	R1/4
30.601	-0.95 - 15	0 - 60	4	R3/8
30.602	-0.95 - 15	0 - 60	6	R1/8
30.603	-0.95 - 15	0 - 60	6	R1/4
30.604	-0.95 - 15	0 - 60	6	R3/8
30.605	-0.95 - 15	0 - 60	8	R1/8
30.606	-0.95 - 15	0 - 60	8	R1/4
30.607	-0.95 - 15	0 - 60	8	R3/8
30.608	-0.95 - 15	0 - 60	8	R1/2
30.609	-0.95 - 15	0 - 60	10	R1/4
30.610	-0.95 - 15	0 - 60	10	R3/8
30.611	-0.95 - 15	0 - 60	10	R1/2
30.612	-0.95 - 15	0 - 60	12	R1/4
30.613	-0.95 - 15	0 - 60	12	R3/8
30.614	-0.95 - 15	0 - 60	12	R1/2

Two stack, twin banjo

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.649	-0.95 - 15	0 - 60	4	R1/8
30.650	-0.95 - 15	0 - 60	4	R1/4
30.651	-0.95 - 15	0 - 60	4	R3/8
30.652	-0.95 - 15	0 - 60	6	R1/8
30.653	-0.95 - 15	0 - 60	6	R1/4
30.654	-0.95 - 15	0 - 60	6	R3/8
30.655	-0.95 - 15	0 - 60	8	R1/8
30.656	-0.95 - 15	0 - 60	8	R1/4
30.657	-0.95 - 15	0 - 60	8	R3/8
30.658	-0.95 - 15	0 - 60	8	R1/2
30.659	-0.95 - 15	0 - 60	10	R1/4
30.660	-0.95 - 15	0 - 60	10	R3/8
30.661	-0.95 - 15	0 - 60	10	R1/2
30.662	-0.95 - 15	0 - 60	12	R1/4
30.663	-0.95 - 15	0 - 60	12	R3/8
30.664	-0.95 - 15	0 - 60	12	R1/2

3-way male elbow connector

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.490	-0.95 - 15	0 - 60	4	M5
30.491	-0.95 - 15	0 - 60	4	M6
30.492	-0.95 - 15	0 - 60	4	R1/8
30.493	-0.95 - 15	0 - 60	4	R1/4
30.494	-0.95 - 15	0 - 60	6	M5
30.495	-0.95 - 15	0 - 60	6	M6
30.496	-0.95 - 15	0 - 60	6	R1/8
30.497	-0.95 - 15	0 - 60	6	R1/4
30.498	-0.95 - 15	0 - 60	6	R3/8
30.499	-0.95 - 15	0 - 60	8	R1/8
30.500	-0.95 - 15	0 - 60	8	R1/4
30.501	-0.95 - 15	0 - 60	8	R3/8
30.502	-0.95 - 15	0 - 60	10	R1/4
30.503	-0.95 - 15	0 - 60	10	R3/8
30.504	-0.95 - 15	0 - 60	10	R1/2
30.505	-0.95 - 15	0 - 60	12	R1/4
30.506	-0.95 - 15	0 - 60	12	R3/8
30.507	-0.95 - 15	0 - 60	12	R1/2

Three stack, twin banjo

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.674	-0.95 - 15	0 - 60	4	R1/8
30.675	-0.95 - 15	0 - 60	4	R1/4
30.676	-0.95 - 15	0 - 60	4	R3/8
30.677	-0.95 - 15	0 - 60	6	R1/8
30.678	-0.95 - 15	0 - 60	6	R1/4
30.679	-0.95 - 15	0 - 60	6	R3/8
30.680	-0.95 - 15	0 - 60	8	R1/8
30.681	-0.95 - 15	0 - 60	8	R1/4
30.682	-0.95 - 15	0 - 60	8	R3/8
30.683	-0.95 - 15	0 - 60	8	R1/2
30.684	-0.95 - 15	0 - 60	10	R1/4
30.685	-0.95 - 15	0 - 60	10	R3/8
30.686	-0.95 - 15	0 - 60	10	R1/2
30.687	-0.95 - 15	0 - 60	12	R1/4
30.688	-0.95 - 15	0 - 60	12	R3/8
30.689	-0.95 - 15	0 - 60	12	R1/2

Self-extinguishing male stud connector

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.000	-0.95 - 15	0 - 60	4	M5
32.001	-0.95 - 15	0 - 60	4	M6
32.002	-0.95 - 15	0 - 60	4	R1/8
32.003	-0.95 - 15	0 - 60	4	R1/4
32.004	-0.95 - 15	0 - 60	6	R1/8
32.005	-0.95 - 15	0 - 60	6	R1/4
32.006	-0.95 - 15	0 - 60	6	R3/8
32.007	-0.95 - 15	0 - 60	8	R1/8
32.008	-0.95 - 15	0 - 60	8	R1/4
32.009	-0.95 - 15	0 - 60	8	R3/8
32.010	-0.95 - 15	0 - 60	10	R1/8
32.011	-0.95 - 15	0 - 60	10	R1/4
32.012	-0.95 - 15	0 - 60	10	R3/8
32.013	-0.95 - 15	0 - 60	10	R1/2
32.014	-0.95 - 15	0 - 60	12	R1/4
32.015	-0.95 - 15	0 - 60	12	R3/8
32.016	-0.95 - 15	0 - 60	12	R1/2

Self-extinguishing equal tube connector

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
32.055	-0.95 - 15	0 - 60	4
32.056	-0.95 - 15	0 - 60	6
32.057	-0.95 - 15	0 - 60	8
32.058	-0.95 - 15	0 - 60	10
32.059	-0.95 - 15	0 - 60	12

90° male elbow connetors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.033	-0.95 - 15	0 - 60	4	M5
32.034	-0.95 - 15	0 - 60	4	M6
32.035	-0.95 - 15	0 - 60	4	R1/8
32.036	-0.95 - 15	0 - 60	4	R1/4
32.037	-0.95 - 15	0 - 60	6	R1/8
32.038	-0.95 - 15	0 - 60	6	R1/4
32.039	-0.95 - 15	0 - 60	6	R3/8
32.040	-0.95 - 15	0 - 60	8	R1/8
32.041	-0.95 - 15	0 - 60	8	R1/4
32.042	-0.95 - 15	0 - 60	8	R3/8
32.043	-0.95 - 15	0 - 60	10	R1/8
32.044	-0.95 - 15	0 - 60	10	R1/4
32.045	-0.95 - 15	0 - 60	10	R3/8
32.046	-0.95 - 15	0 - 60	10	R1/2
32.047	-0.95 - 15	0 - 60	12	R1/4
32.048	-0.95 - 15	0 - 60	12	R3/8
32.049	-0.95 - 15	0 - 60	12	R1/2

90° male elbow connetors - equal

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
32.050	-0.95 - 15	0 - 60	4
32.051	-0.95 - 15	0 - 60	6
32.052	-0.95 - 15	0 - 60	8
32.053	-0.95 - 15	0 - 60	10
32.054	-0.95 - 15	0 - 60	12

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Male branch tee connectors, self-extinguishing

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.017	-0.95 - 15	0 - 60	4	M5
32.018	-0.95 - 15	0 - 60	4	M6
32.019	-0.95 - 15	0 - 60	4	R1/8
32.020	-0.95 - 15	0 - 60	4	R1/4
32.021	-0.95 - 15	0 - 60	6	R1/8
32.022	-0.95 - 15	0 - 60	6	R1/4
32.023	-0.95 - 15	0 - 60	6	R3/8
32.024	-0.95 - 15	0 - 60	8	R1/8
32.025	-0.95 - 15	0 - 60	8	R1/4
32.026	-0.95 - 15	0 - 60	8	R3/8
32.027	-0.95 - 15	0 - 60	10	R1/4
32.028	-0.95 - 15	0 - 60	10	R3/8
32.029	-0.95 - 15	0 - 60	10	R1/2
32.030	-0.95 - 15	0 - 60	12	R1/4
32.031	-0.95 - 15	0 - 60	12	R3/8
32.032	-0.95 - 15	0 - 60	12	R1/2

Equal tube tee connectors, self-extinguishing

Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
32.060	-0.95 - 15	0 - 60	4
32.061	-0.95 - 15	0 - 60	6
32.062	-0.95 - 15	0 - 60	8
32.063	-0.95 - 15	0 - 60	10
32.064	-0.95 - 15	0 - 60	12

Mini male stud connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.900	-0.95 - 15	0 - 60	3	M3
30.901	-0.95 - 15	0 - 60	3	M5
30.902	-0.95 - 15	0 - 60	3	M6
30.903	-0.95 - 15	0 - 60	4	M3
30.904	-0.95 - 15	0 - 60	4	M5
30.905	-0.95 - 15	0 - 60	4	M6
30.906	-0.95 - 15	0 - 60	4	R1/8
30.907	-0.95 - 15	0 - 60	6	M5
30.908	-0.95 - 15	0 - 60	6	M6
30.906-G	-0.95 - 15	-20 - 80	4	G1/8
30.910-G	-0.95 - 15	-20 - 80	6	G1/8

Mini male stud connectors, round, hex key

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.920	-0.95 - 15	0 - 60	3	M3
30.921	-0.95 - 15	0 - 60	3	M5
30.922	-0.95 - 15	0 - 60	4	M3
30.923	-0.95 - 15	0 - 60	4	M5
30.924	-0.95 - 15	0 - 60	4	M6
30.925	-0.95 - 15	0 - 60	4	R1/8
30.926	-0.95 - 15	0 - 60	6	M5
30.927	-0.95 - 15	0 - 60	6	M6
30.928	-0.95 - 15	0 - 60	6	R1/8

Mini tube fitting, cartridge

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.932	-0.95 - 15	0 - 60	3	M6
30.933	-0.95 - 15	0 - 60	4	M6
30.934	-0.95 - 15	0 - 60	4	M8
30.935	-0.95 - 15	0 - 60	6	M8

Mini female stud connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.914	-0.95 - 15	0 - 60	3	M3
30.915	-0.95 - 15	0 - 60	3	M5
30.916	-0.95 - 15	0 - 60	4	M3
30.917	-0.95 - 15	0 - 60	4	M5

Mini 45° male elbow connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.977	-0.95 - 15	0 - 60	4	M5
30.978	-0.95 - 15	0 - 60	4	M6
30.979	-0.95 - 15	0 - 60	4	R1/8
30.980	-0.95 - 15	0 - 60	6	M5
30.981	-0.95 - 15	0 - 60	6	M6
30.982	-0.95 - 15	0 - 60	6	R1/8

Mini unequal tube tee connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
31.025	-0.95 - 15	0 - 60	4	3
31.026	-0.95 - 15	0 - 60	6	4

Mini extended male elbow connector

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.963	-0.95 - 15	0 - 60	3	M3
30.964	-0.95 - 15	0 - 60	4	M3
30.965	-0.95 - 15	0 - 60	4	M5
30.966	-0.95 - 15	0 - 60	4	M6
30.967	-0.95 - 15	0 - 60	4	R1/8
30.968	-0.95 - 15	0 - 60	6	M5
30.969	-0.95 - 15	0 - 60	6	M6
30.970	-0.95 - 15	0 - 60	6	R1/8

Mini male elbow connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.949	-0.95 - 15	0 - 60	3	M3
30.950	-0.95 - 15	0 - 60	3	M5
30.951	-0.95 - 15	0 - 60	3	M6
30.952	-0.95 - 15	0 - 60	4	M3
30.953	-0.95 - 15	0 - 60	4	M5
30.954	-0.95 - 15	0 - 60	4	M6
30.955	-0.95 - 15	0 - 60	4	R1/8
30.956	-0.95 - 15	0 - 60	6	M5
30.957	-0.95 - 15	0 - 60	6	M6
30.958	-0.95 - 15	0 - 60	6	R1/8

Mini male branch equal tee connectors

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.993	-0.95 - 15	0 - 60	3	M3
30.994	-0.95 - 15	0 - 60	3	M5
30.995	-0.95 - 15	0 - 60	3	M6
30.996	-0.95 - 15	0 - 60	4	M3
30.997	-0.95 - 15	0 - 60	4	M5
30.998	-0.95 - 15	0 - 60	4	M6
30.999	-0.95 - 15	0 - 60	4	R1/8
31.000	-0.95 - 15	0 - 60	6	M5
31.001	-0.95 - 15	0 - 60	6	M6
31.002	-0.95 - 15	0 - 60	6	R1/8

Sockets with threaded connection

Locking of compressed air or vacuum during disassembly, release after reconnection
Coupling: Socket (lock) and plug (open)

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	G	Ø P [mm]
CPS20-02W	-0.95 - 13	0 - 60	R1/4	12
CPS20-03W	-0.95 - 13	0 - 60	R3/8	12
CPS20-04W	-0.95 - 13	0 - 60	R1/2	12

Sockets with plug-in connection

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	Ø P [mm]
CPS20-6W	-0.95 - 13	0 - 60	6	12
CPS20-8W	-0.95 - 13	0 - 60	8	12
CPS20-10W	-0.95 - 13	0 - 60	10	12
CPS20-12W	-0.95 - 13	0 - 60	12	12

Connectors

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	Ø P [mm]
CPP20-6W	-0.95 - 13	0 - 60	6	16
CPP20-8W	-0.95 - 13	0 - 60	8	16
CPP20-10W	-0.95 - 13	0 - 60	10	20
CPP20-12W	-0.95 - 13	0 - 60	12	20

Angle plugs

Locking of compressed air or vacuum during disassembly, release after reconnection

Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
CPP20L-6W	-0.95 - 13	0 - 60
CPP20L-8W	-0.95 - 13	0 - 60
CPP20L-10W	-0.95 - 13	0 - 60
CPP20L-12W	-0.95 - 13	0 - 60

Dimensions

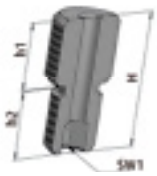
Ø D [mm]	Ø P [mm]
6	14.5
8	14.5
10	21
12	21

Double nipple, equal thread - SZ-GA-MM

Technical data | **Dimensions**

Item no.	Material	G1 (male)	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	Ø d1 [mm]	SW1
270.420	Brass	M5	13	5	5	3	2.5	7
270.059	Brass	G1/8	18	7	7	4	5	14
270.120	Brass	G1/4	25.5	10.5	10.5	--	--	60
270.121	Nickel-plated brass	G3/8	23	9	9	5	11	19
270.122	Brass	G1/2	35	14	14	--	--	60
270.123	Brass	G3/4	33.5	13.5	13.5	--	--	60
270.124	Brass	G1	36	14.5	14.5	--	--	60
270.125	Brass	G1 1/4	37	15	15	--	--	60
270.126	Brass	G1 1/2	40	16.5	16.5	--	--	60
270.127	Brass	G2	40	16.5	16.5	--	--	60

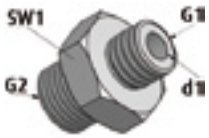
Reducing bushes with hex socket - SZ GA- MMI

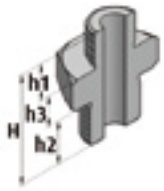


Technical data | **Dimensions**

Item no.	Material	G1 (male)	G2 (male)	H [mm]	h1 [mm]	h2 [mm]	Ø d1 [mm]	SW
270.561	Aluminium	G3/8	G1/4	25	15	10	6	6
270.562	Aluminium	G3/8	M10	27	15	12	4	5
270.563	Aluminium	G3/8	M14x1.5	27	15	12	6	6
270.564	Aluminium	G1/4	G1/4	22	--	--	4	5
270.565	Aluminium	G1/4	M10	24	12	12	4	5
270.566	Aluminium	G1/4	M14x1.5	24	13	11	4	5

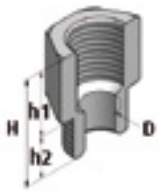
Reducing nipples - SZ-GA-RMM





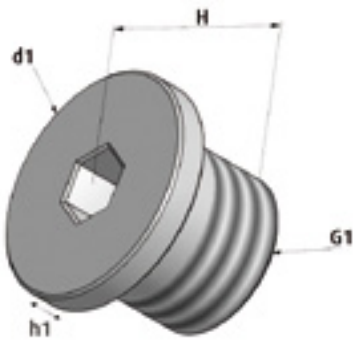
Technical data		Dimensions						
Item no.	Material	G1 (male)	G2 (male)	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	Ø d1 [mm]	SW1
270.280	Nickel-plated brass	G1/8	M5	15.5	4.8	6.5	4.2	2.4	14
270.279	Aluminium	G1/8	M6	21	7	9	5	3	14
270.131	Brass	G1/8	M8	18	6	7	5	4	14
270.107	Aluminium	G1/8	M12	21	7.5	8.5	5	5.5	17
270.227	Brass	G1/4	M5	19	5	9	5	2.5	17
270.320	Aluminium	G1/4	M10x1.25	25	10	10	5	5.5	17
270.108	Aluminium	G1/4	M12	21	8	8	5	5.5	17
270.181	Nickel-plated brass	G1/4	G1/8	22	8	9	5	4	17
270.297	Nickel-plated brass	G1/2	G1/4	25	9	10.5	5.5	8	24
270.323	Nickel-plated brass	G1/2	G3/8	25.5	9	10.5	6	11	24
270.148	Nickel-plated brass	G3/4	M14x1.5	30	12	12	6	20	36
270.138	Nickel-plated brass	G3/4	G1/2	30	12	12	6	15	32

Reducing bushings male/female - SZ-GA-MF



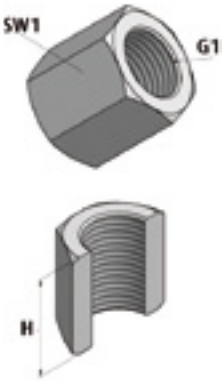
Technical data		Dimensions						
Item no.	Material	G1 (male)	G2 (female)	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]	SW1
270.423	Nickel-plated brass	M5	M5	11	7	4	2	8
270.079	Brass	M5	G1/8	17	12	5	2.4	14
270.576	Steel galvanised	M12	G1/4	22	12	10	6.5	17
270.577	Steel galvanised	M16	G3/8	25	15	10	10	24
270.302	Nickel-plated brass	G1/8	M5	10	4	6	--	14
270.303	Nickel-plated brass	G1/8	M6	13	5	8	--	13
270.334	Nickel-plated brass	G1/8	G1/4	20	13.6	6.5	5.4	17
270.304	Aluminium	G1/4	M6	15	5	10	--	17
270.090	Brass	G1/4	M10x1.25	11.5	5.8	5.7	17	19
270.088	Aluminium	G1/4	M10	28	16	12	4	17
270.245	Brass	G1/4	G1/8	13	4.5	8.5	--	17
270.078	Brass	G1/4	G1/4	28	19	9	7.5	17
270.567	Aluminium	G1/4	G3/8	27	11	10	4	20
270.560	Aluminium	G3/8	G1/4	16	11	16	--	22
270.229	Brass	G1/2	G1/4	18	6	12	--	24
270.230	Brass	G1/2	G3/8	18	6	12	--	24
270.102	Brass	G3/4	G3/8	18	6	12	--	32
270.600	Brass	G1	G1/2	21	6	15	--	36
270.601	Brass	G1	G3/4	21	6	15	--	36
270.604	Brass	G1 1/2	G1	24	8	16	--	50
270.605	Brass	G1 1/4	G1	23	7	16	--	42

Blanking plugs with O-ring seal - SZ-SCV



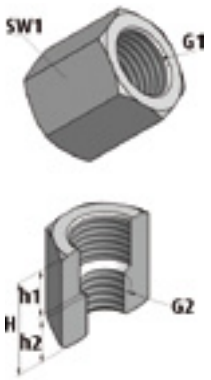
Technical data		Dimensions			
Item no.	Material	G1 (male)	H [mm]	h1 [mm]	Ø d1 [mm]
77.000	Nickel-plated brass	M5	6	2	8
77.009	Nickel-plated brass	G1/8	10	3	14
77.008	Nickel-plated brass	G1/4	11	3	17
77.010	Nickel-plated brass	G3/8	12.5	3.5	20
77.007	Nickel-plated brass	G1/2	14.5	4.5	26

Threaded bush - SZ-GA-FF



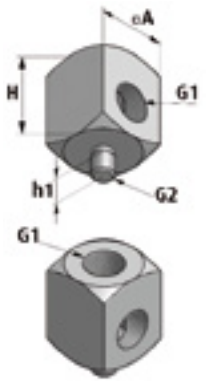
Technical data		Dimensions		
Item no.	Material	G1 (female)	H [mm]	SW1
270.343	Nickel-plated brass	G1/8	17	14
270.182.O	Aluminium	G1/4	20	19
270.130.O	Aluminium	G1/2	32	30
270.579	Aluminium	G3/8	23	22

Reducing bush - SZ-GA-RFF



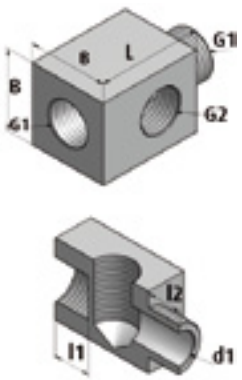
Technical data		Dimensions					
Item no.	Material	G1 (female)	G2 (female)	H [mm]	h1 [mm]	h2 [mm]	SW1
270.306	Aluminium	G1/8	M5	14	9.5	4.5	13
270.307	Aluminium	G1/8	M6	14	9.5	4.5	13
270.308	Aluminium	G1/4	M6	17.5	11	6.5	17
270.089	Aluminium	G1/4	M10	18	9	9	17
270.228	Nickel-plated brass	G3/8	G1/4	21.5	11.5	10	22

Elbow connectors AG - SZ-WAA



Technical data		Dimensions				
Item no.	Material	G1 (female)	G2 (male)	H [mm]	h1 [mm]	□A [mm]
GR07.010	Steel nickel-plated	G1/8	M5	20	6	16
GR07.011	Steel nickel-plated	G1/4	M6	33	10	25
GR07.012	Steel nickel-plated	G1/4	M8	33	10	25

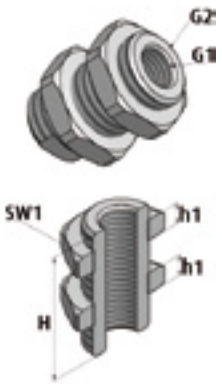
Elbow connectors IG - SZ-WAI



Technical data		Dimensions						
Item no.	Material	G1 (female+male)	G2 (female)	Ø d1 [mm]	L [mm]	B [mm]	l1 [mm]	l2 [mm]
270.395	Aluminium	G1/8	G1/8	6.6	21	16	6	7
270.396	Aluminium	G1/4	G1/8	8	26	18	10	10
270.397	Steel galvanised	G1/2	G3/8	10	35	24	12	10

Bulkhead connectors - SZ-SVS

Allow for height adjustment during vacuum cup installation



Technical data			Dimensions				
Item no.	Material bushing	Material screw nut	G1 (female)	G2 (male)	H [mm]	h1 [mm]	SW1
270.518	Stainless steel	Steel galvanised	G1/8	M16x1	30	5	22
270.519	Stainless steel	Steel galvanised	G1/4	M20x1.5	30	5	24

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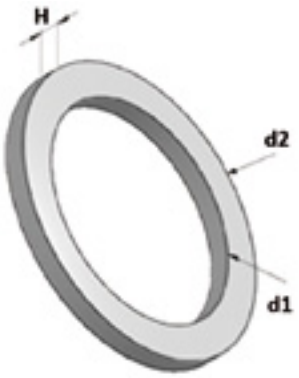
Sealing rings - SZ-DR



Technical data

Dimensions

Item no.	For outside thread	Material	H [mm]	Ø d1 [mm]	Ø d2 [mm]
78.052	M5	Rigid PVC white	1	5.4	7.9
78.053	G1/8	Rigid PVC white	2	10.3	13.5
78.054	G1/4	Rigid PVC white	2	13.3	17.9
78.051	G3/8	Rigid PVC white	2	17.2	21.2
78.055	G1/2	Rigid PVC white	2	21.2	27.9
78.056	G3/4	Rigid PVC white	2	26.7	32.5

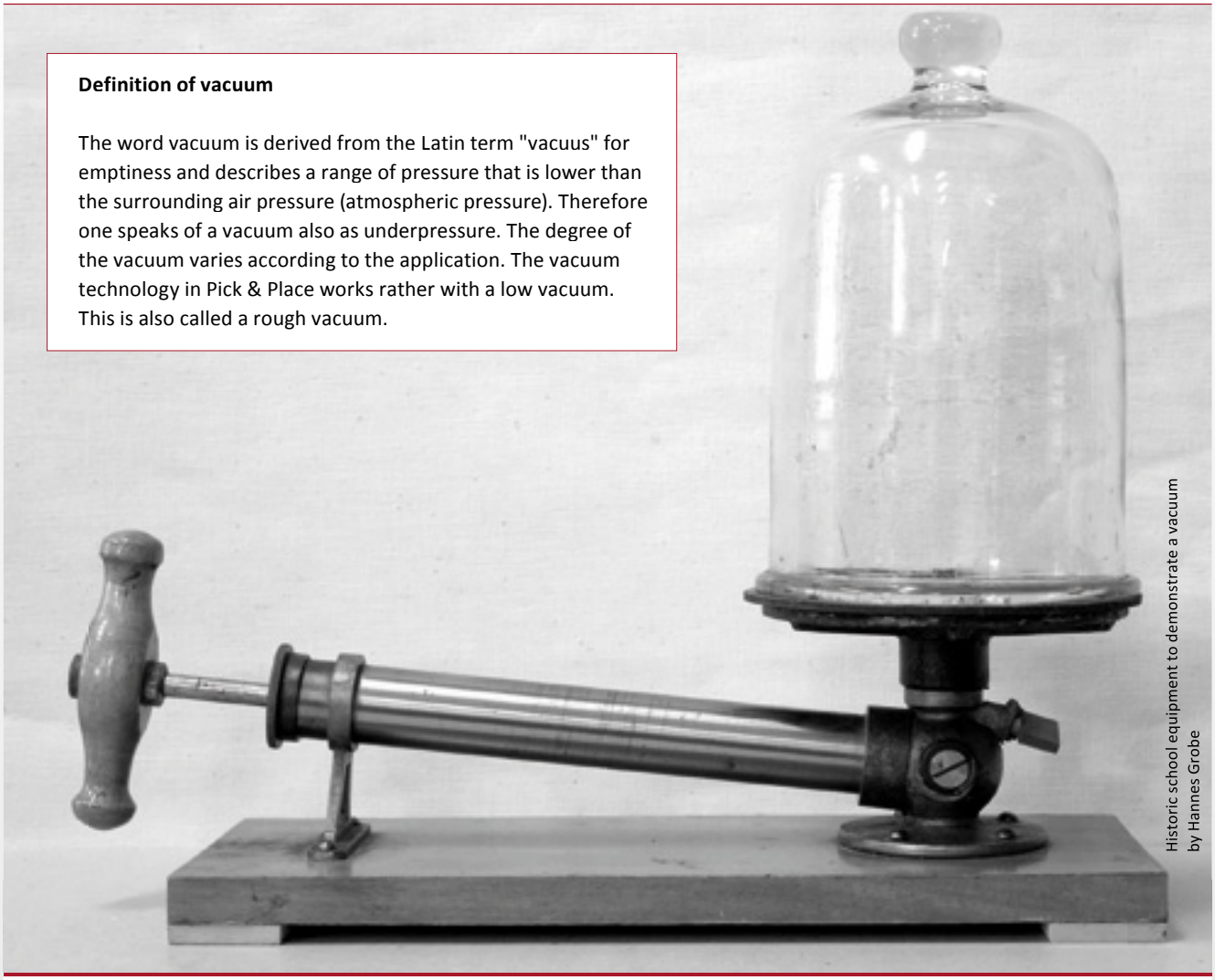
Ordering notes:

1 packing unit = 100 pieces

Vacuum: Basics

Definition of vacuum

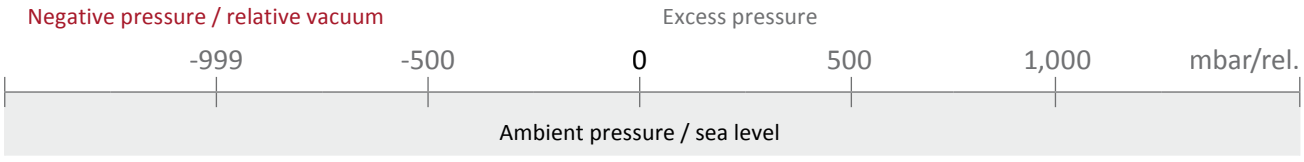
The word vacuum is derived from the Latin term "vacuus" for emptiness and describes a range of pressure that is lower than the surrounding air pressure (atmospheric pressure). Therefore one speaks of a vacuum also as underpressure. The degree of the vacuum varies according to the application. The vacuum technology in Pick & Place works rather with a low vacuum. This is also called a rough vacuum.



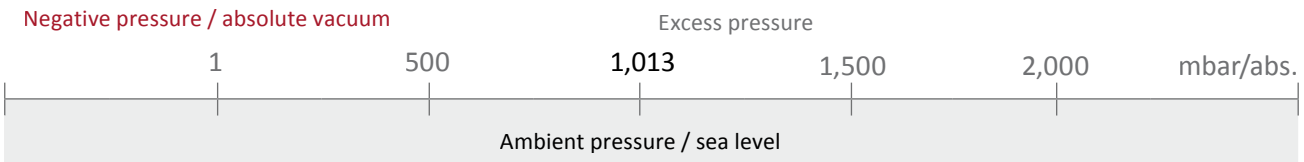
Historic school equipment to demonstrate a vacuum by Hannes Grobe

Vacuum values

The vacuum is specified as a relative or absolute value. In vacuum technology, as a rule, the vacuum is specified as a relative value with a negative prefix. The reference point for measuring the relative pressure is the air pressure at 0 mbar.



The absolute vacuum, in contrast, always has a positive prefix. Background: The conventional value used in science relates the negative pressure (vacuum) to the absolute zero point or vacuum.



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Units of vacuum

Pascal (Pa), kilopascals (kPa), bar (bar) and millibars (mbar) are used as pressure units in vacuum technology.
The conversion of these units is as follows:

0.001 bar = 0.1 kPa = 1 mbar = 100 Pa

or as indicated in the conversion table:

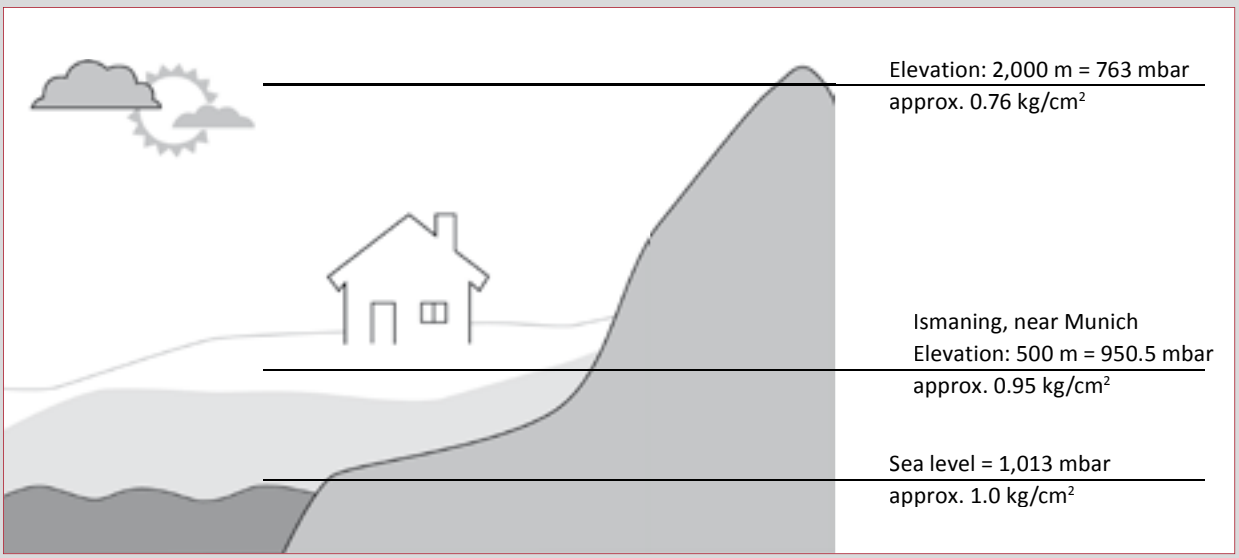
Vacuum / pressure conversion table

Residual pressure absolute [mbar]	Relative vacuum	bar relative	N/cm²	kPa	atm.kp/cm²	mm H_2O	Torr; mmHg	inHg
900	10 %	-0.101	-1.01	-10.1	-0.103	-1,030	-76	-3
800	20 %	-0.203	-2.03	-20.3	-0.207	-2,070	-152	-6
700	30 %	-0.304	-3.04	-30.4	-0.31	-3,100	-228	-9
600	40 %	-0.405	-4.05	-40.5	-0.413	-4,130	-304	-12
500	50 %	-0.507	-5.07	-50.7	-0.517	-5,170	-380	-15
400	60 %	-0.608	-6.08	-60.8	-0.62	-6,200	-456	-18
300	70 %	-0.709	-7.09	-70.9	-0.723	-7,230	-532	-21
200	80 %	-0.811	-8.11	-81.1	-0.827	-8,270	-608	-24
100	90 %	-0.912	-9.12	-91.2	-0.93	-9,300	-684	-27

Relationship between air pressure and vacuum

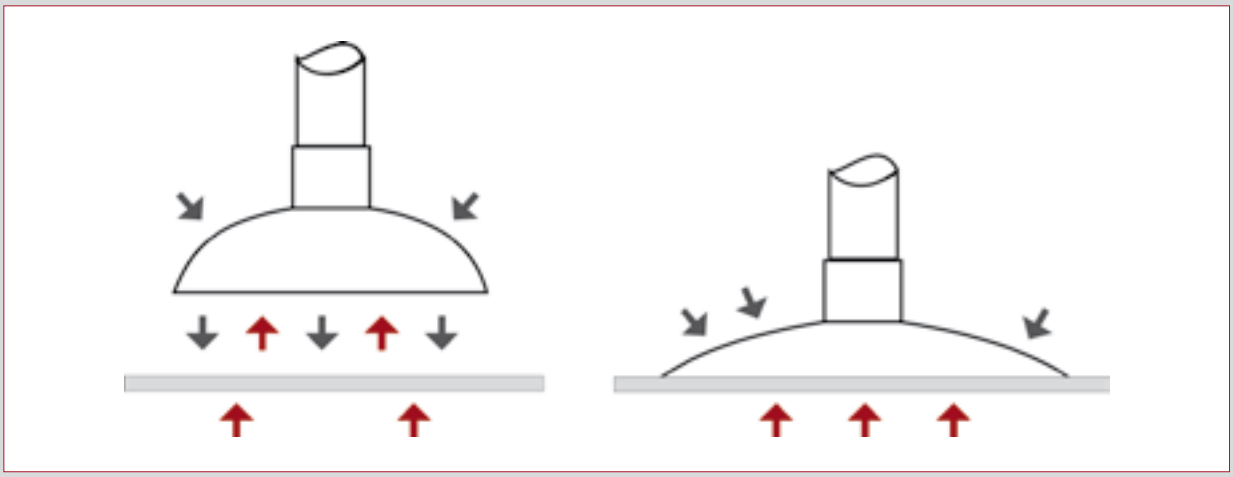
The ambient pressure or atmospheric pressure at 0 mbar is the reference quantity for the manufacture of a vacuum.
The air pressure in turn depends on the height at which it is measured.

In general: Air pressure decreases with increasing altitude. Thus, the ambient pressure on the Zugspitze (2,963 metres height; 695 mbar) is much lower than at sea level (1,013 mbar) which at 0 metres marks the ideal state for vacuum generation.
For vacuum technology that means: As air pressure is reduced, the difference in pressure between ambient pressure and the vacuum cup pressure narrows. The maximum holding force of the vacuum is thus reduced. The benchmark: For every 100 metre increase in altitude, the ambient pressure falls by about 12.5 mbar. That must correspondingly be considered when using components in producing a vacuum.

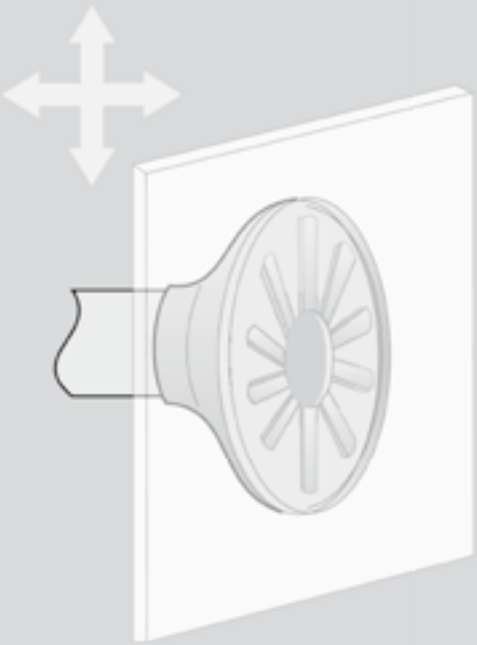


Vacuum cups: Functional principle

It is not the vacuum unit that sucks up the workpiece to be moved, but the good to be handled that is pressed firmly to the vacuum unit. This happens due to the negative pressure that is created by the built-in vacuum cup or the connected vacuum generator.



The functional principle is straightforward: The vacuum generator draws out the air located between the vacuum cup and workpiece. After contact, the vacuum cup seals off the workpiece surface against the surrounding air pressure. The underpressure or vacuum is created.



Depending on the application, different shapes and sizes of vacuum cups and vacuum cup materials are used.
Example: For handling movements parallel to the vacuum surface, flat vacuum cups with cleats or knobs are especially suitable because of their high frictional resistance.

Vacuum cups: Holding forces

Calculation

The force exerted by a vacuum cup holding or lifting a workpiece depends on many factors. These include the acceleration, the safety factor, turning and tilting moments, the elasticity of the material and even the design of the vacuum cup.

Regardless of such factors, the holding power of a vacuum cup can easily be identified by the following formula:

$$\text{Holding power in N} = \frac{\text{active suction surface in cm}^2 \times \text{vacuum available in \%}}{10}$$

In short form:

$$F = \frac{A \times P}{10}$$

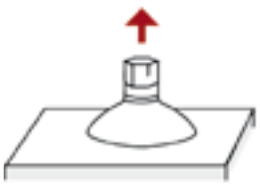
The following applies: The holding power of a vacuum cup is proportional to the active suction surface.

To determine the necessary vacuum cup diameter or the required active suction surface, the following formula helps:

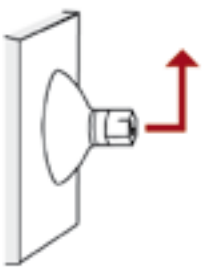
$$\text{Vacuum cup diameter in mm} = 113 \times \sqrt{\frac{\text{Weight in kg} \times \text{Safety factor}}{\text{Underpressure in \%} \times \text{Number of vacuum cups}}}$$

Important: The safety factor (dependent on the lifting direction)

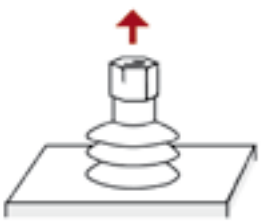
min. 2x safety factor

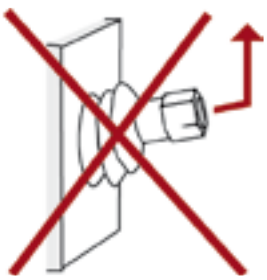


min. 4x safety factor



min. 2x safety factor





Average values for vacuum cups in standard applications

Vacuum cup diameter [mm]	**Effective diameter** approx. [mm]	**Effective suction surface** approx. [cm²]	**Theoretical holding force 20 % vacuum** [N]	**Theoretical holding force 60 % vacuum** [N]	**Theoretical holding force 80 % vacuum** [N]	**Volume flat approx.** [cm³]	**Volume folds approx.** [cm³]	**Recommended internal tubing diameter approx.** [mm]
1	0.80	0.0050	0.01	0.03	0.04	0.001	0.05	2
2	1.60	0.0201	0.04	0.12	0.16	0.001	0.05	2
3	2.40	0.0452	0.09	0.27	0.36	0.002	0.05	2
4	3.20	0.0804	0.16	0.48	0.64	0.003	0.05	2
5	4.00	0.1257	0.25	0.75	1.01	0.005	0.1	2
6	5.17	0.2101	0.42	1.26	1.68	0.008	0.1	2
7	6.03	0.2860	0.57	1.72	2.29	0.015	0.1	2
8	6.90	0.3736	0.75	2.24	2.99	0.03	0.2	2
9	7.76	0.4728	0.95	2.84	3.78	0.05	0.2	2
10	8.62	0.5837	1.17	3.50	4.67	0.07	0.5	4
11	9.48	0.7063	1.41	4.24	5.65	0.1	0.5	4
12	10.34	0.8405	1.68	5.04	6.72	0.1	1	4
13	11.21	0.9864	1.97	5.92	7.89	0.2	1	4
14	12.07	1.1440	2.29	6.86	9.15	0.3	1	4
15	12.93	1.3133	2.63	7.88	10.51	0.4	3	4
16	13.79	1.4942	2.99	8.97	11.95	0.5	3	4
17	14.66	1.6868	3.37	10.12	13.49	0.5	3	4
18	15.52	1.8911	3.78	11.35	15.13	0.6	3	4
19	16.38	2.1071	4.21	12.64	16.86	0.7	5	4
20	17.24	2.3347	4.67	14.01	18.68	0.8	5	4
25	21.55	3.6480	7.30	21.89	29.18	1.3	5	4
30	25.86	5.2531	10.51	31.52	42.02	1.3	5	4
35	30.17	7.1501	14.30	42.90	57.20	2.7	10	4
40	34.48	9.3389	18.68	56.03	74.71	3.8	10	4
45	38.79	11.8195	23.64	70.92	94.56	5	20	4
50	43.10	14.5920	29.18	87.55	116.74	7	20	6
60	51.72	21.0124	42.02	126.07	168.10	10	30	6
70	60.34	28.6003	57.20	171.60	228.80	20	50	6
80	68.97	37.3554	74.71	224.13	298.84	25	60	6
90	77.59	47.2780	94.56	283.67	378.22	30	100	6
100	86.21	58.3679	116.74	350.21	466.94	40	200	9
125	107.76	91.1998	182.40	547.20	729.60	80	300	9
150	129.31	131.3277	262.66	787.97	1,050.62	180	500	9
175	150.86	178.7516	357.50	1,072.51	1,430.01	250	650	12
200	172.41	233.4715	466.94	1,400.83	1,867.77	430	800	12
250	215.52	364.7992	729.60	2,188.80	2,918.39	500	1,600	12
300	258.62	525.3109	1,050.62	3,151.87	4,202.49	600	2,000	12
350	301.72	715.0065	1,430.01	4,290.04	5,720.05	1,500	3,000	12
400	344.83	933.8860	1,867.77	5,603.32	7,471.09	2,000	5,000	12
500	431.03	1,459.1969	2,918.39	8,755.18	11,673.58	4,000	x	16
600	517.24	2,101.2436	4,202.49	12,607.46	16,809.95	6,500	x	16

The information provided above consists of average values for smooth, dry product surfaces without a safety factor.
The application, shape of the vacuum cup and product qualities (e.g. surface texture or air permeability) may result in deviations.

Air volume to be evacuated per meter of tubing, dependent on the internal tubing diameter

Internal tubing diameter [mm]	Cross section [mm^2]	Air volume per meter [cm^3]	Air volume per meter [l]
2	3.14	3.1	0.003
3	7.07	7.1	0.007
4	12.56	12.6	0.013
6	28.26	28.3	0.028
7	38.47	38.5	0.038
8	50.24	50.2	0.050
9	63.59	63.6	0.064
10	78.50	78.5	0.079
11	94.99	95.0	0.095
12	113.04	113.0	0.113
14	153.86	153.9	0.154
16	200.96	201.0	0.201
18	253.34	254.3	0.254
20	314.00	314.0	0.314
25	490.63	490.6	0.491
32	803.84	803.8	0.804
35	961.63	961.6	0.962
38	1,133.54	1,133.5	1.134
40	1,256.00	1,256.0	1.256

Required inner diameter D in the case of the branching of tubing

Number of tubing	Calculation [diameter D x factor]
1	D x 1
2	D x 0.71
4	D x 0.50
8	D x 0.36
16	D x 0.25
32	D x 0.18

Example calculation

If a tubing with an inner diameter of 40 mm branches out to become 4 tubing, each of these tubing requires an internal diameter of 20 mm.
If a tubing with an inner diameter of 40 mm branches out to become 16 tubing, each of these tubing requires an internal diameter of 10 mm.

Required internal diameter for compressed air tubing lines

Air flow rate [liters/min.]	**Tubing length** [m]																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
100	3	4	4	4	4	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6
200	4	5	5	5	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7
300	5	5	6	6	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9
400	5	6	7	7	7	8	8	8	8	8	9	9	9	9	9	9	9	9	10	10
500	6	7	7	8	8	8	9	9	9	9	9	9	10	10	10	10	10	10	10	11
600	6	7	8	8	9	9	9	9	10	10	10	10	10	10	11	11	11	11	11	11
700	7	8	8	9	9	9	10	10	10	10	11	11	11	11	11	11	12	12	12	12
800	7	8	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	12	13
900	7	8	9	9	10	10	11	11	11	11	12	12	12	12	12	12	13	13	13	13
1,000	7	9	9	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	13	14
1,100	8	9	10	10	11	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14
1,200	8	9	10	11	11	11	12	12	12	13	13	13	13	14	14	14	14	14	14	15
1,300	8	9	10	11	11	12	12	12	13	13	13	14	14	14	14	14	14	15	15	15
1,400	8	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	15	15	15	15
1,500	9	10	11	11	12	12	13	13	13	14	14	14	14	15	15	15	15	15	16	16
1,600	9	10	11	12	12	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16
1,700	9	10	11	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17
1,800	9	11	12	12	13	13	14	14	14	15	15	15	15	16	16	16	16	17	17	17
1,900	9	11	12	12	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17
2,000	10	11	12	13	13	14	14	15	15	15	16	16	16	16	17	17	17	17	17	18
2,100	10	11	12	13	14	14	14	15	15	16	16	16	16	17	17	17	17	17	18	18
2,200	10	11	12	13	14	14	15	15	15	16	16	16	17	17	17	17	18	18	18	18
2,300	10	12	13	13	14	15	15	15	16	16	16	17	17	17	17	18	18	18	18	18
2,400	10	12	13	14	14	15	15	16	16	16	17	17	17	17	18	18	18	18	19	19
2,500	10	12	13	14	14	15	15	16	16	17	17	17	17	18	18	18	18	19	19	19
2,600	11	12	13	14	15	15	16	16	16	17	17	17	18	18	18	18	19	19	19	19
2,700	11	12	13	14	15	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20
2,800	11	13	14	14	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20	20
2,900	11	13	14	15	15	16	16	17	17	18	18	18	18	19	19	19	19	20	20	20
3,000	11	13	14	15	15	16	17	17	17	18	18	18	19	19	19	20	20	20	20	20
3,100	11	13	14	15	16	16	17	17	18	18	18	19	19	19	19	20	20	20	20	21
3,200	11	13	14	15	16	16	17	17	18	18	19	19	19	19	20	20	20	20	21	21
3,300	12	13	14	15	16	17	17	18	18	18	19	19	19	20	20	20	20	21	21	21
3,400	12	13	15	15	16	17	17	18	18	19	19	19	20	20	20	20	21	21	21	21
3,500	12	14	15	16	16	17	18	18	18	19	19	19	20	20	20	21	21	21	21	22
3,600	12	14	15	16	17	17	18	18	19	19	19	20	20	20	21	21	21	21	22	22
3,700	12	14	15	16	17	17	18	18	19	19	20	20	20	21	21	21	21	22	22	22
3,800	12	14	15	16	17	17	18	19	19	19	20	20	20	21	21	21	22	22	22	22
3,900	12	14	15	16	17	18	18	19	19	20	20	20	21	21	21	21	22	22	22	22
4,000	12	14	16	16	17	18	18	19	19	20	20	20	21	21	21	22	22	22	22	23
4,100	13	14	16	17	17	18	19	19	20	20	20	21	21	21	22	22	22	22	23	23
4,200	13	15	16	17	18	18	19	19	20	20	20	21	21	22	22	22	22	23	23	23
4,300	13	15	16	17	18	18	19	19	20	20	21	21	21	22	22	22	23	23	23	23
4,400	13	15	16	17	18	18	19	20	20	20	21	21	21	22	22	22	23	23	23	23
4,500	13	15	16	17	18	19	19	20	20	21	21	21	22	22	22	23	23	23	23	24
4,600	13	15	16	17	18	19	19	20	20	21	21	22	22	22	22	23	23	23	24	24
4,700	13	15	16	17	18	19	20	20	21	21	21	22	22	22	23	23	23	24	24	24
4,800	13	15	17	18	18	19	20	20	21	21	22	22	22	23	23	23	23	24	24	24
4,900	13	15	17	18	19	19	20	20	21	21	22	22	22	23	23	23	24	24	24	24
5,000	14	16	17	18	19	19	20	21	21	21	22	22	23	23	23	24	24	24	24	25
5,500	14	16	17	18	19	20	21	21	22	22	23	23	23	24	24	24	25	25	25	26
6,000	14	17	18	19	20	21	21	22	22	23	23	24	24	25	25	25	26	26	26	26
6,500	15	17	19	20	21	21	22	23	23	24	24	25	25	25	26	26	26	27	27	27
7,000	15	18	19	20	21	22	23	23	24	24	25	25	26	26	26	27	27	27	28	28
7,500	16	18	20	21	22	22	23	24	24	25	25	26	26	27	27	27	28	28	28	29
8,000	16	18	20	21	22	23	24	24	25	26	26	26	27	27	28	28	28	29	29	29
8,500	16	19	21	22	23	24	24	25	26	26	27	27	28	28	28	29	29	29	30	30
9,000	17	19	21	22	23	24	25	25	26	27	27	28	28	29	29	29	30	30	30	31
9,500	17	20	21	23	24	25	25	26	27	27	28	28	29	29	29	30	30	31	31	31
10,000	17	20	22	23	24	25	26	27	27	28	28	29	29	30	30	30	31	31	32	32

Values at an operating pressure of 6 bar and a pressure drop of 0.5 bar
Design example: At a required air flow rate of 2,000 liters per minute and a tubing length of 10 meters, the required internal diameter is 15 mm.

Notes:

Questionnaire F 100 | Vacuum Technology

To:

FIPA GmbH
Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Unit

Please answer the following questions carefully, so we can select the vacuum unit best suited for your purpose.

1. Please quote the following application:

2. What kind of parts are you handling?

3. The objects are:

- ☐ round
- ☐ oval
- ☐ square
- ☐ rectangular
- ☐ curved
- ☐ unstable

3a. Material:

4. Dimensions / Weight:

Length _____ mm

Width _____ mm

Height / Thickness _____ mm

Ø _____ mm

Weight _____ g/kg

5. Lifting direction:

6. Surface:

- ☐ smooth
- ☐ rough
- ☐ textured
- ☐ rippled
- ☐ oily
- ☐ scaled
- ☐ wet
- ☐ dry
- ☐ porous

7. Temperature:

briefly _____ °C

continuously

+ _____ °C

- _____ °C

8. Use:

- ☐ indoor
- ☐ outdoor

9. Vacuum generating:

☐ Vacuum pump ☐ Vacuum ejector ☐ existing ☐ not existing

Power capacity _____

10. Duty cycle _____

11. Distance _____

12. Suck in time _____

13. Positioning accuracy _____

14. Accelaration _____

15. Environment _____

Vacuum Cups

16. In use?

☐ no ☐ yes, following type _____

17. Annual requirement? approx. _____ pieces

FIPA will gladly perform individual handling tests free of charge on samples of the objects to be carried. Alternatively please feel free to request sample cups for your own tests.

Online forms and downloads: www.fipa.com

To:

FIPA GmbH
Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Pumps

Please answer the following questions carefully, so we can select the vacuum unit best suited for your purpose.

1. Please specify the branch of industry in which the pump will be used
   - ☐ Packaging ☐ Food & Beverage ☐ Glass
   - ☐ Graphic arts ☐ Wood-working ☐ Plastic
   - ☐ Marble / Stone ☐ Sheet metal
   - ☐ _____

2. What will the pump be used for?
   - ☐ Handling ☐ Degasification of silicon mixture
   - ☐ Vacuum Clamping ☐ Degasification of synthetic resin
   - ☐ Degasification of laminated materials
   - ☐ Evacuating tanks: Liters:_____ / Time: _____

3. Location of pump
   - ☐ Indoor ☐ Outdoor ☐ Mobile
   - ☐ Temperature range: _____ to _____ °F
   - ☐ Relative humidity (e.g. tropical areas) _____ %

4. Medium to be sucked
   - ☐ Dry air ☐ Humid air ☐ Oily air
   - ☐ Water vapor ☐ Water ☐ Grinding sludge
   - ☐ Aggressive gases (which): _____

   Temperature of medium: _____ °C

5. Suction capacity: _____ m³/h or _____ Nl/min

6. Vacuum Level (in continuous operation):
   _____ mbar or _____ % vacuum

7. Duty cycle
   Continuous operation ☐ 8-10 h/day ☐ 16-18 h/day
   Intermittent operation:
   Operating interval of pump? _____

8. Back diffusion
   Does leakage of the medium have to be prevented when the pump is switched off? (Check valve for oil-lubricated vacuum pump)
   ☐ Yes ☐ No

9. Maintenance of vacuum
   Does the vacuum have to be maintained for a certain period (e.g. for putting down loads in case of power failure)?
   ☐ Yes ☐ No

10. Vacuum tank
    - ☐ available (_____ liters) ☐ desired (_____ liters)
    - ☐ Capacity suggested by FIPA

11. Maintenance
    - Is the pump accessible for maintenance? ☐ Yes ☐ No
    - Is sufficient cooling available for the pump? ☐ Yes ☐ No
    - Is remote monitoring of pump condition possible? (e.g. oil level)
      ☐ Yes ☐ No

12. General information if new pump is desired:
    - ☐ Only one pump is required
    - ☐ Number of pumps needed per year: _____
    - ☐ Delivery desired within: _____
    - ☐ Replacement

13. In case of replacement please fill out
    - ☐ Brand until now _____
    - ☐ Vacuum level _____
    - ☐ Suction capacity _____
    - ☐ Electricity supply _____

Online forms and downloads: www.fipa.com

Questionnaire F 300 | Vacuum grippers

To:

FIPA GmbH
Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Vacuum Grippers

Please answer the following questions carefully, so we can select the vacuum gripper best suited for your purpose.

Product Information

1. What kind of parts are you handling (product, material)?

2. The objects are:
- ☐ round
- ☐ oval
- ☐ square
- ☐ rectangular
- ☐ curved
- ☐ inherent stable
- ☐ deformable

3. Surface:
- ☐ smooth
- ☐ rough
- ☐ textured
- ☐ rippled
- ☐ oily
- ☐ wet
- ☐ dry
- ☐ porous
- ☐ airtight

4. Dimensions, weight:

Length _____ mm

Width _____ mm

Height / Thickness _____ mm

Ø _____ mm

Weight _____ g/kg

5. Available surface for gripping:

Length _____ mm

Width _____ mm

Ø _____ mm

6. Is the height of the product greater than the width? ☐ no ☐ yes [mm / cm]: _____

7. Do you have to evacuate a volume of air? ☐ no ☐ yes [m^3]: _____

8. Kind of packaging (strength, elasticity etc.)?

9. Remarks:

Information on product layers

1. Do you transport single products or layers of products? ☐ single ☐ in layers
2. Number of cycles? _____
3. Measurements of layers
   Length _____ mm Height / Thickness _____ mm
   Width _____ mm Ø _____ mm
   Weight _____ g
4. Amount of products / layers
   _____ units

5. Minimum depth of coverage of a single layer? [%]: _____
6. Maximum level difference of a single layer? _____
7. Is there a progressive deformation? ☐ no ☐ yes
8. Remarks:

Application Information

1. Please describe your application:
2. Number of cycles per minute: _____
3. Max. available time to pick and place the product: _____
4. Product acceleration: _____
5. Max. carrying capacity : _____
6. Utilisation [operating hours / day / week]: _____
7. Housing required? ☐ no ☐ yes _____
8. Can parts get inside the gripper (e.g. dust, parts of the product or similar) ☐ no ☐ yes _____
9. Remarks:

Online forms and downloads: www.fipa.com

Questionnaire F 400 | Customised grippers

To:

FIPA GmbH
Freisinger Str. 30
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11
info@fipa.com

Company

Name

Street

City, State, Zip Code

Phone/Fax

Customised grippers

Please complete the following questionnaire carefully, so that we can select the optimal product for you.

Robot-Gripper Interface

1. Robot type: _____

2. Handling type
   - ☐ Linear
   - ☐ Swivel axes _____ No. of axes
   - ☐ Delta robot (3-leg); FlexPicker

   Model name: _____

   _____

   - ☐ Other _____

3. Media supply

   Number of vacuum circuits ____

   Number of compressed air circuits

   ____ ___ bar

   Tubing diameter ____ mm

   Tubing length ____ mm

4. Vacuum generation
   - ☐ by FIPA
   - ☐ by the customer
   - ☐ Number of ejectors ____

   Model name: _____

   - ☐ Pump

   Model name: _____

   - ☐ Side channel blower

   Model name: _____

   - ☐ Other: _____

5. Comments: _____

_____

Application

1. Type of product to be handled: _____

   Product weight: _____ g

   Product dimensions (LxWxH): _____ mm

   CAD available: ☐ yes ☐ no

2. Item picked from:
   - ☐ Conveyor belt
   - ☐ Pallet
   - ☐ Container
   - ☐ Tray
   - ☐ Fixture
   - ☐ Other

3. Item placed on:
   - ☐ Conveyor belt
   - ☐ Pallet
   - ☐ Container
   - ☐ Tray
   - ☐ Fixture
   - ☐ Other:

4. Cycle time

   Pick-up _____ seconds

   Placement _____ seconds

5. Description of application:

Gripper Design

Integrated vacuum generation required ☐ yes ☐ no

Media feed-through required: ☐ yes ☐ no

Interference contours (e.g. gripping space between products):

Labelling:

Colouring:

Special cleaning regulations:

Description of process:

Current solution:

Improvements required:

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Your request | Fax form

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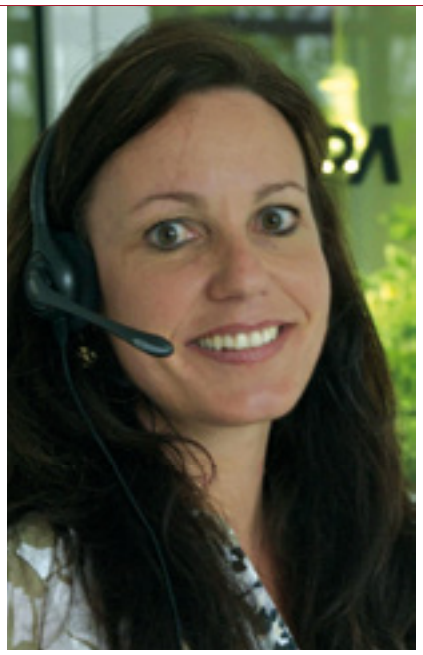

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