

Industry Solutions Automotive
Applications and Products



Schmalz











The World of Vacuum Technology

Schmalz is one of the leading suppliers in the fields of automation, handling and clamping technology and offers innovative and efficient vacuum solutions to customers in numerous different industries.

Facts and Figures

- Founded: 1910 by Johannes Schmalz
- Market position: Leading global supplier of vacuum technology in the fields of Automation, handling and clamping technology
- Business areas: Vacuum Components
Vacuum Gripping Systems
Vacuum Handling Systems
Vacuum Clamping Systems
- Employees: More than 1,400 worldwide
- Innovation figures: Around 450 industrial rights registered and granted
8,5% (of revenue) invested in research and development
- Branches: In 19 countries worldwide
- Sales partners: In over 60 countries worldwide
- Certifications: DIN ISO 9001 (quality management) since 1994
DIN ISO 14001 (environmental management) since 1997
DIN ISO 5001 (energy management) since 2012
AEO C (authorized economic operator, customs simplifications) since 2012

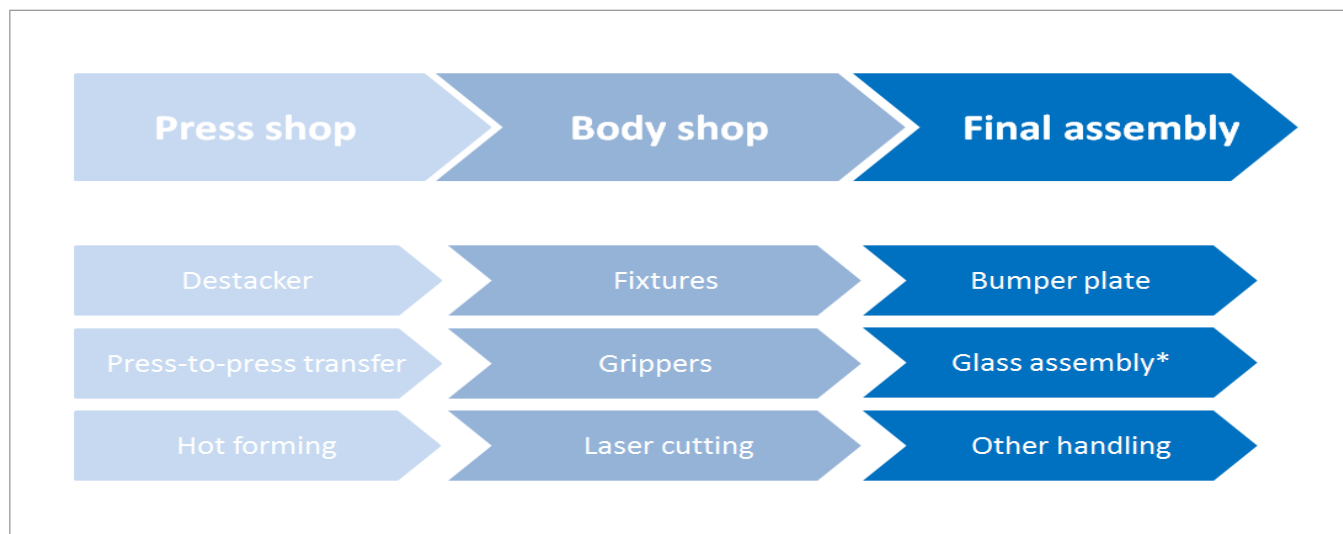
Contents

	Page
	4
Applications	
	5
Vacuum Suction Cup	
	75
Special Grippers	
	85
Tooling and Mounting Elements	
	124
Vacuum Generators	
	173
Switches and System Monitoring	
	182
Filters and Connections	
	193
Vacuum Gripping Systems	
	204
Vacuum Clamping Systems	
	209
Contact	

Industry Solutions Automotive

Applications

Process steps in the automotive industry



* For the special products dedicated to automotive glass assembly applications please see "Industry Solutions Glass".

In addition to innovative products for press shop and body shop applications, Schmalz is also offering innovative handling solutions for the automation of the process chain for the production of composite-parts – from the cutter table to the finished product and also innovative ergonomic handling solutions and lifting assistance systems for many manual workspaces beginning in the pressshop to the final assembly area. More information can be found in "Industry Solutions Composites" and "Industry Solutions Automotive MH".

Challenges in the automotive industry

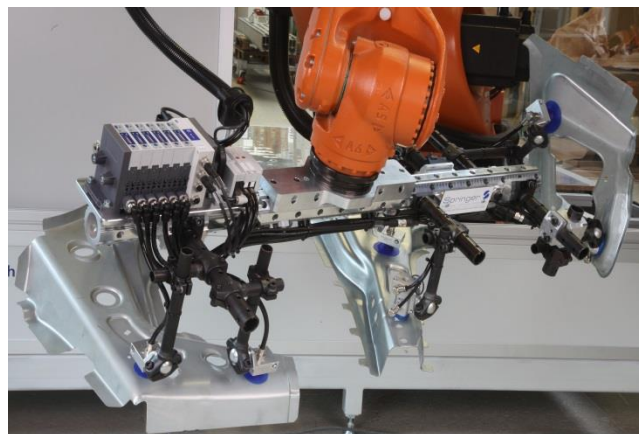
The product requirements for vacuum technology in the press-shop are versatile. The speed of the process and the resulting acceleration is high and increasing. Additionally the workpieces are oily to avoid cracks during the deep drawing process. At the same time the weight of the tooling shall be reduced to avoid vibration. These partly even contrary requirements in combination impose the need that the suction cup offer a high holding force as well as extremely high lateral forces, especially on oily workpieces. Furthermore, cups with high heat resistance to handle parts coming from the hot forming process are required.

The vacuum generators on the other side need to be dirt resistant due to the very dusty and oily environment to guarantee a high level of availability of the line and to reduce time and cost for maintenance. It needs to be able to withstand strong vibration and shocks as well as variations in voltage supply.

In the body in white area, beside the above mentioned requirements also process safety and process transparency from an electronic point of view as well as the reduction of compressed air usage to be able to cut down the energy costs is an increasing focus of attention.



Press-to-press transfer application in a Schuler press line



Schmalz components on a body shop gripper

Overview

Vacuum Suction Cups

Vacuum Suction Cups		
	<p>Bell-Shaped Suction Cups SAX</p> <ul style="list-style-type: none"> • Diameter: 30 to 115 mm • Material: ED • Connection nipple vulcanized to elastomer part 	<p>8</p> <p>High-speed Suction Cup for Handling Sheet Metal with highest absorption of lateral and holding forces thanks to its optional internal structure and high suction cup stroke.</p>
	<p>Bell-Shaped Suction Cups SAXM</p> <ul style="list-style-type: none"> • Diameter: 20 to 115 mm • Material: ED • Connection nipple modular 	<p>14</p> <p>Recyclable high-speed bell-shaped suction cup with highest absorption of lateral and holding forces thanks to its optimal internal structure and high suction cup stroke.</p>
	<p>Flat Suction Cups SAF</p> <ul style="list-style-type: none"> • Diameter: 30 to 125 mm • Material: NBR • Connection nipple vulcanized to elastomer part 	<p>23</p> <p>Round flat suction cup with low internal volume and very high horizontal and vertical holding forces even on oily workpieces.</p>
	<p>Bellows Suction Cups SAB (1.5 folds)</p> <ul style="list-style-type: none"> • Diameter: 22 to 125 mm • Material: NBR • Connection nipple vulcanized to elastomer part 	<p>27</p> <p>Round suction cup with 1.5 folds for extremely curved and thin-walled sheet metal; very high horizontal and vertical holding forces and high suction cup stroke.</p>
	<p>Bell-Shaped Suction Cups SAOXM (oval)</p> <ul style="list-style-type: none"> • Dimensions: 60x20 mm to 100x40 mm • Material: ED • Modular connection nipple 	<p>31</p> <p>Recyclable oval high-speed suction cup with an innovative inner structure and increased suction cup stroke for narrow and long steel pieces such as sections, pipes or fins.</p>
	<p>Flat Suction Cups SAOF (oval)</p> <ul style="list-style-type: none"> • Dimensions: 50 x 16 to 140 x 70 mm • Material: NBR • Connection nipple vulcanized to elastomer part 	<p>40</p> <p>Oval suction cup with low inner volume for elongated sheet metal such as sections, pipes or ribbing; very high horizontal and vertical holding forces.</p>
	<p>Bellows Suction Cups SAOB (oval 1.5 folds)</p> <ul style="list-style-type: none"> • Dimensions: 60 x 30 to 140 x 70 mm • Material: NBR • Connection nipple vulcanized to elastomer part 	<p>44</p> <p>Oval suction cup with 1.5 folds for elongated, curved, thin-walled sheet metal such as pipes or ribbing; very high horizontal and vertical holding forces and high suction cup stroke.</p>

Overview

Vacuum Suction Cups

	<p>Flat Suction Cups PFYN VU1</p> <ul style="list-style-type: none"> • Diameter: 15 to 95 mm • Material: Vulkollan • Connection nipple plugged into elastomer part 	<p>48</p> <p>Extremely wear-resistant Vulkollan suction cup for high loads and a long service life in multi-shift operation.</p>
	<p>Bellows Suction Cups FSGA VU1 (1.5 folds)</p> <ul style="list-style-type: none"> • Diameter: 30 to 110 mm • Material: Vulkollan • Connection nipple plugged into elastomer part 	<p>52</p> <p>Extremely wear-resistant Vulkollan bellows suction cup with 1.5 bellows for high loads and long service life in multishift operation.</p>
	<p>Bellows Suction Cups FSG VU1 (2.5 folds)</p> <ul style="list-style-type: none"> • Diameter: 30 to 85 mm • Material: Vulkollan • Connection nipple plugged into elastomer part 	<p>57</p> <p>Extremely wear-resistant Vulkollan suction cup with 2.5 folds for high loads and long service life in multi-shift operation; optional with oil groove.</p>
	<p>Bellows Suction Cups FSGAO (oval, 1.5 folds)</p> <ul style="list-style-type: none"> • Dimensions: 95 x 40 to 140 x 65 mm • Material: Vulkollan • Connection plate screwed to elastomer part 	<p>60</p> <p>Extremely wear-resistant Vulkollan bellows suction cup with 2.5 folds for high loads and long service life in multi-shift operation.</p>
	<p>Flat Suction Cups SAF HT2</p> <ul style="list-style-type: none"> • Diameter: 30 to 60 mm • Material: HT2 	<p>63</p> <p>The suction cups are made of special, silicone-free material HT2 and are temperature-resistant up to 250° C. Very high horizontal and vertical retention forces.</p>
	<p>Bellows Suction Cups SAB – HT2 (1.5 folds)</p> <ul style="list-style-type: none"> • Diameter: 22 to 80 mm • Material: HT2 	<p>66</p> <p>The suction cups are made of special, silicone-free material HT2 and are temperature-resistant up to 250° C. Very high horizontal and vertical retention forces and maximum compression stroke.</p>

Overview

Vacuum Suction Cup



Flat Suction Cups SAOF-HT2 (oval)

69

- Dimensions: 60 x 23 to 100 x 50 mm
- Material: HT2

The suction cups are made of special, silicone-free material HT2 and are temperature-resistant up to 250° C. Very high horizontal and vertical retention forces.



Bellows Suction Cups SAOB-HT2 (oval, 1.5 folds)

72

- Dimensions: 60 x 30 to to 80 x 40 mm
- Material: HT2

The suction cups are made of special, silicone-free material HT2 and are temperature-resistant up to 250° C. Very high horizontal and vertical retention forces and maximum compression stroke.

Overview

Vacuum Suction Cups



30 Percent
reduced weight
Reduction of weight due to connection nipple out of reinforced plastics enables accelerated processes in high-speed applications.

20 Percent
maximum adaption of shear forces
Process-reliable handling of workpieces with oily surfaces due to transmission of highest shear forces.

30 Percent
lower height
Increased suction stroke despite reduction of height allows adaption to different workpiece outlines.

High-speed Suction Cup for Handling Sheet Metal

Bell-Shaped Suction Cup SAX

The new bell-shaped suction cups SAX of Schmalz offer optimizations in the area of process acceleration due to their reduced weight and lower height.

- The integrated bushing ensures stability and increases the lifetime
- The optimized frictional structure provides maximum adaption of shear forces and holding forces
- A cost-effective construction and the one-piece-design of the suction cup provide reduction of procurement and maintenance costs

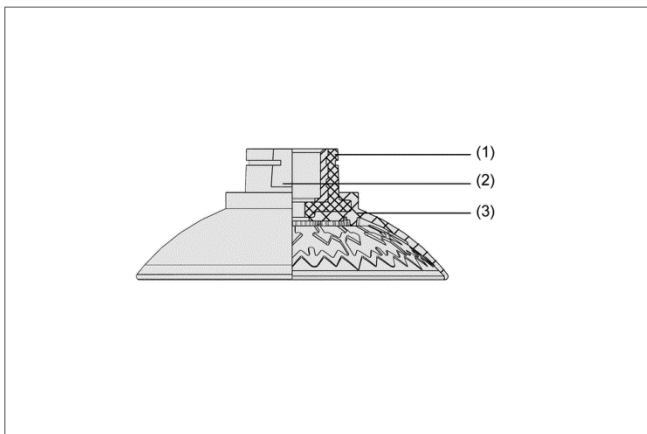
High-speed Suction Cup for Handling Sheet Metal

High Performance Suction Cups SAX

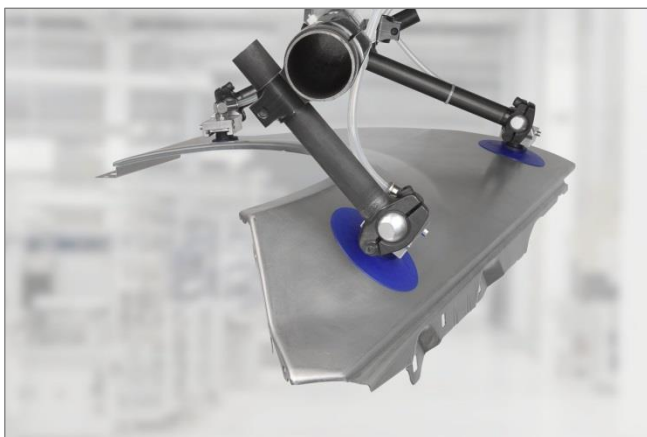
Suction area (Ø) from 30 mm to 115 mm



High performance suction cups SAX



System design high performance suction cups SAX



Bell-shaped suction cups SAX for handling formed sheet metal parts

Applications

- Lightweight and high-speed suction cups with demands for highest holding and shear forces for fast handling of sheet metal and car body parts
- Handling of workpieces with oily surfaces
- Loading and unloading CNC metal and laser cutting machines
- Handling of blanks at destackers
- Handling of workpieces with convex surfaces

Design

- Lightweight round bell-shaped suction cup with flexible sealing lip and optimum internal structure
- Wear-resistant material Elastodur of suction cup (ED-85) and friction disc
- Vulcanized connection nipple out of reinforced plastics (very high strength)
- Available as mounted suction cup with various connection types

Our Highlights...

- Optimum internal structure and minimum total height
- Lightweight design
- Significantly increased stroke of suction cup
- Flexible sealing lip
- Innovative material ED

Your Benefits...

- > Highest transmission of holding forces and adaptation of shear forces, especially on oily sheet metal
- > Reduced weight of the tooling for high speed applications
- > Very good adjustment to different workpiece outlines
- > High sealing properties even on rough workpiece surfaces
- > Highly wear resistant, resistant to the effects of ozone and aggressive draw oils

High-speed Suction Cup for Handling Sheet Metal

High Performance Suction Cups SAX

Suction area (Ø) from 30 mm to 115 mm

Designation Code High Performance Suction Cups SAX

Abbreviated designation	Suction area Ø in mm	Material and shore hardness	Connection thread
Example SAX 80 ED-85 G3/8-IG:	80	ED-85	G3/8-IG
SAX	30	ED-85	G3/8-IG (AG = male (M))
SAX	to		NPT3/8-IG (IG = female (F))
	115		RA rectangular adapter
			G1/4-IG
			G1/8-AG
			G3/8-IG
			M10-AG
			M16-AG

Ordering Data High Performance Suction Cups SAX

Bell-shaped suction cup SAM, available various diameters, is delivered with connection nipple vulcanized to elastomer part.

High Performance Suction Cup SAX (Assembled)

Type*	G3/8"-F	NPT3/8"-F	RA-adapter (rectangular adapter)	G1/4-F
SAX 30	10.01.19.00146	10.01.19.00147	10.01.19.00172	10.01.19.00179
SAX 40	10.01.19.00148	10.01.19.00149	10.01.19.00173	10.01.19.00180
SAX 50	10.01.19.00150	10.01.19.00151	10.01.19.00174	10.01.19.00181
SAX 60	10.01.19.00152	10.01.19.00153	10.01.19.00175	10.01.19.00182
SAX 80	10.01.19.00141	10.01.19.00145	10.01.19.00176	10.01.19.00183
SAX 100	10.01.19.00154	10.01.19.00155	10.01.19.00177	10.01.19.00184
SAX 115	10.01.19.00156	10.01.19.00157	10.01.19.00178	10.01.19.00185

Type*	G1/4"-M	M10-M	M16-M	G3/8-M-adapter
SAX 30	10.01.19.00213	10.01.19.00220	10.01.19.00229	10.01.19.00195
SAX 40	10.01.19.00214	10.01.19.00221	10.01.19.00230	10.01.19.00196
SAX 50	10.01.19.00215	10.01.19.00222	10.01.19.00231	10.01.19.00197
SAX 60	10.01.19.00216	10.01.19.00223	10.01.19.00232	10.01.19.00198
SAX 80	10.01.19.00217	10.01.19.00224	10.01.19.00233	10.01.19.00199
SAX 100	10.01.19.00218	10.01.19.00225	10.01.19.00234	10.01.19.00200
SAX 115	10.01.19.00219	10.01.19.00226	10.01.19.00235	10.01.19.00201

High-speed Suction Cup for Handling Sheet Metal

High Performance Suction Cups SAX

Suction area (\varnothing) from 30 mm to 115 mm

Technical Data High Performance Suction Cups SAX

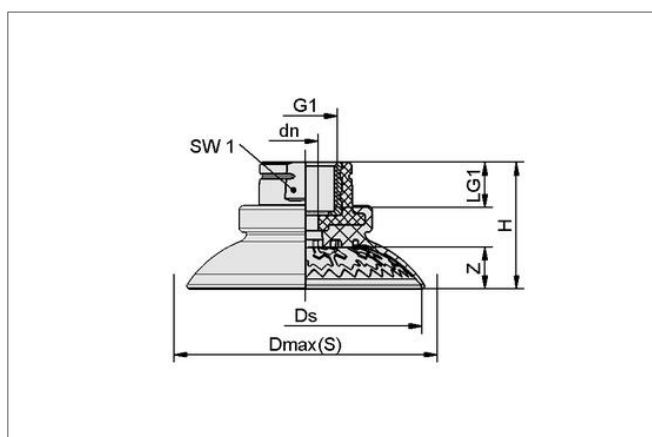
Type	Suction force [N]*	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm ³]	Shore hardness [ShA]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]***
SAXM 30 ED-85	39	38	41	3.2	85	18	5
SAXM 40 ED-85	69	49	71	8.5	85	25	5
SAXM 50 ED-85	109	74	110	15.2	85	25	6
SAXM 60 ED-85	154	107	155	25.2	85	30	6
SAXM 80 ED-85	270	192	269	51.0	85	33	6
SAXM 100 ED-85	412	284	414	96.0	85	40	6
SAXM 115 ED-85	549	390	584	142.0	85	50	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

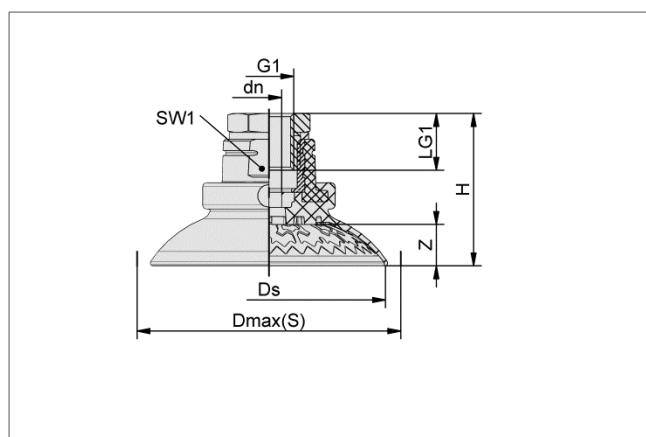
**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx. 2 m

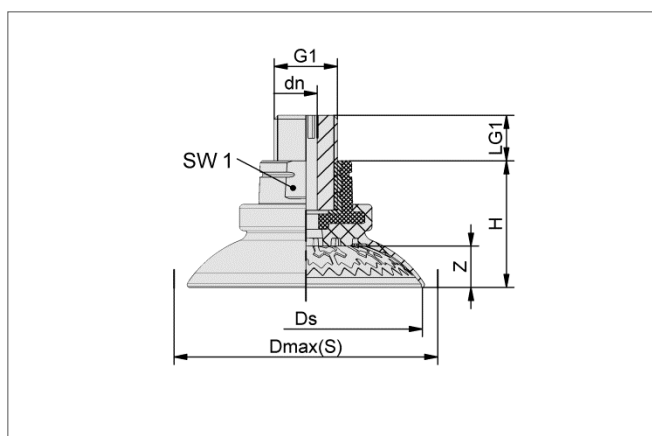
Design Data High Performance Suction Cups SAX (Assembled)



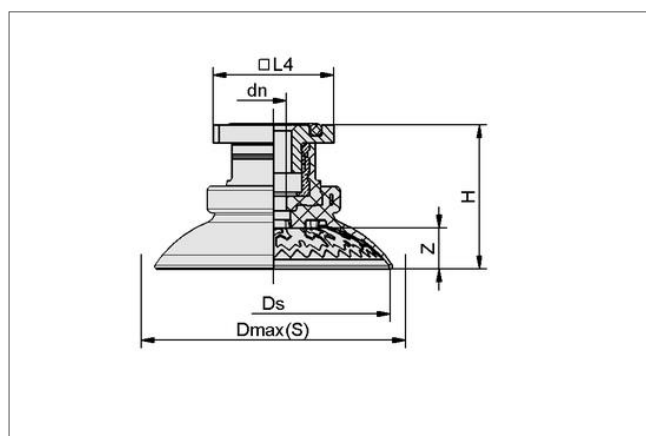
SAX...G3/8-IG and NPT3/8-IG



SAX...G1/4-IG



SAX...AG



SAX...RA

High-speed Suction Cup for Handling Sheet Metal

High Performance Suction Cups SAX

Suction area (Ø) from 30 mm to 115 mm

Design Data High Performance Suction Cups SAX (Assembled)

Type	Dimensions in mm								
	SW 1	dn	Dmax (S)	Ds	G1	LG1	L4	H	Z(Stroke)
SAX 30 ED-85 G3/8-IG	22	6.75	35.2	31.7	G3/8"-F	12.0	-	26.0	4.5
SAX 40 ED-85 G3/8-IG	22	6.75	45.4	41.3	G3/8"-F	12.0	-	29.3	7.1
SAX 50 ED-85 G3/8-IG	22	6.75	58.4	51.5	G3/8"-F	12.0	-	29.6	8.4
SAX 60 ED-85 G3/8-IG	22	6.75	69.7	61.5	G3/8"-F	12.0	-	33.4	10.9
SAX 80 ED-85 G3/8-IG	22	6.75	92.2	81.0	G3/8"-F	12.0	-	34.5	13.9
SAX 100 ED-85 G3/8-IG	22	6.75	111.1	100.1	G3/8"-F	12.0	-	39.7	17.3
SAX 115 ED-85 G3/8-IG	22	6.75	129.4	116.0	G3/8"-F	12.0	-	42.6	20.2
SAX 30 ED-85 NPT3/8-IG	22	6.75	35.2	31.7	NPT3/8"-F	12.0	-	26.0	4.5
SAX 40 ED-85 NPT3/8-IG	22	6.75	45.4	41.3	NPT3/8"-F	12.0	-	29.3	7.1
SAX 50 ED-85 NPT3/8-IG	22	6.75	58.4	51.5	NPT3/8"-F	12.0	-	29.6	8.4
SAX 60 ED-85 NPT3/8-IG	22	6.75	69.7	61.5	NPT3/8"-F	12.0	-	33.4	10.9
SAX 80 ED-85 NPT3/8-IG	22	6.75	92.2	81.0	NPT3/8"-F	12.0	-	34.5	13.9
SAX 100 ED-85 NPT3/8-IG	22	6.75	111.1	100.1	NPT3/8"-F	12.0	-	39.7	17.3
SAX 115 ED-85 NPT3/8-IG	22	6.75	129.4	116.0	NPT3/8"-F	12.0	-	42.6	20.2
SAX 30 ED-85 RA	22	6.75	35.2	31.7	-	-	31.8	30.7	4.5
SAX 40 ED-85 RA	22	6.75	45.4	41.3	-	-	31.8	34.0	7.1
SAX 50 ED-85 RA	22	6.75	58.4	51.5	-	-	31.8	34.3	8.4
SAX 60 ED-85 RA	22	6.75	69.7	61.5	-	-	31.8	38.1	10.9
SAX 80 ED-85 RA	22	6.75	92.2	81.0	-	-	31.8	39.2	13.9
SAX 100 ED-85 RA	22	6.75	111.1	100.1	-	-	31.8	44.4	17.3
SAX 115 ED-85 RA	22	6.75	129.4	116.0	-	-	31.8	47.3	20.2
SAX 30 ED-85 G1/4-IG	22	6.75	35.2	31.7	G1/4"-F	15.0	-	32.8	4.5
SAX 40 ED-85 G1/4-IG	22	6.75	45.4	41.3	G1/4"-F	15.0	-	36.1	7.1
SAX 50 ED-85 G1/4-IG	22	6.75	58.4	51.5	G1/4"-F	15.0	-	36.4	8.4
SAX 60 ED-85 G1/4-IG	22	6.75	69.7	61.5	G1/4"-F	15.0	-	40.2	10.9
SAX 80 ED-85 G1/4-IG	22	6.75	92.2	81.0	G1/4"-F	15.0	-	41.3	13.9
SAX 100 ED-85 G1/4-IG	22	6.75	111.1	100.1	G1/4"-F	15.0	-	46.5	17.3
SAX 115 ED-85 G1/4-IG	22	6.75	129.4	116.0	G1/4"-F	15.0	-	49.4	20.2
SAX 30 ED-85 G3/8-AG	22	6.10	35.2	31.7	G3/8"-M	12.0	-	26.0	4.5
SAX 40 ED-85 G3/8-AG	22	6.10	45.4	41.3	G3/8"-M	12.0	-	29.3	7.1
SAX 50 ED-85 G3/8-AG	22	6.10	58.4	51.5	G3/8"-M	12.0	-	29.6	8.4
SAX 60 ED-85 G3/8-AG	22	6.10	69.7	61.5	G3/8"-M	12.0	-	33.4	10.9
SAX 80 ED-85 G3/8-AG	22	6.10	92.2	81.0	G3/8"-M	12.0	-	34.5	13.9
SAX 100 ED-85 G3/8-AG	22	6.10	111.1	100.1	G3/8"-M	12.0	-	39.7	17.3
SAX 115 ED-85 G3/8-AG	22	6.10	129.4	116.0	G3/8"-M	12.0	-	42.6	20.2

High-speed Suction Cup for Handling Sheet Metal

High Performance Suction Cups SAX

Suction area (\varnothing) from 30 mm to 115 mm



Design Data High Performance Suction Cups SAX (Assembled)

Typ	Dimensions in mm									
	SW 1	dn	Dmax (S)	Ds	G1	LG1	L4	H	Z(Stroke)	
SAX 30 ED-85 G1/4-AG	22	6.10	35.2	31.7	G1/4"-M	14.5	-	26.0	4.5	
SAX 40 ED-85 G1/4-AG	22	6.10	45.4	41.3	G1/4"-M	14.5	-	29.3	7.1	
SAX 50 ED-85 G1/4-AG	22	6.10	58.4	51.5	G1/4"-M	14.5	-	29.6	8.4	
SAX 60 ED-85 G1/4-AG	22	6.10	69.7	61.5	G1/4"-M	14.5	-	33.4	10.9	
SAX 80 ED-85 G1/4-AG	22	6.10	92.2	81.0	G1/4"-M	14.5	-	34.5	13.9	
SAX 100 ED-85 G1/4-AG	22	6.10	111.1	100.1	G1/4"-M	14.5	-	39.7	17.3	
SAX 115 ED-85 G1/4-AG	22	6.10	129.4	116.0	G1/4"-M	14.5	-	42.6	20.2	
SAX 30 ED-85 M10-AG	22	4.10	35.2	31.7	M10-M	14.5	-	26.0	4.5	
SAX 40 ED-85 M10-AG	22	4.10	45.4	41.3	M10-M	14.5	-	29.3	7.1	
SAX 50 ED-85 M10-AG	22	4.10	58.4	51.5	M10-M	14.5	-	29.6	8.4	
SAX 60 ED-85 M10-AG	22	4.10	69.7	61.5	M10-M	14.5	-	33.4	10.9	
SAX 80 ED-85 M10-AG	22	4.10	92.2	81.0	M10-M	14.5	-	34.5	13.9	
SAX 100 ED-85 M10-AG	22	4.10	111.1	100.1	M10-M	14.5	-	39.7	17.3	
SAX 115 ED-85 M10-AG	22	4.10	129.4	116.0	M10-M	14.5	-	42.6	20.2	
SAX 30 ED-85 M16-AG	22	6.10	35.2	31.7	M16-M	12.0	-	26.0	4.5	
SAX 40 ED-85 M16-AG	22	6.10	45.4	41.3	M16-M	12.0	-	29.3	7.1	
SAX 50 ED-85 M16-AG	22	6.10	58.4	51.5	M16-M	12.0	-	29.6	8.4	
SAX 60 ED-85 M16-AG	22	6.10	69.7	61.5	M16-M	12.0	-	33.4	10.9	
SAX 80 ED-85 M16-AG	22	6.10	92.2	81.0	M16-M	12.0	-	34.5	13.9	
SAX 100 ED-85 M16-AG	22	6.10	111.1	100.1	M16-M	12.0	-	39.7	17.3	
SAX 115 ED-85 M16-AG	22	6.10	129.4	116.0	M16-M	12.0	-	42.6	20.2	

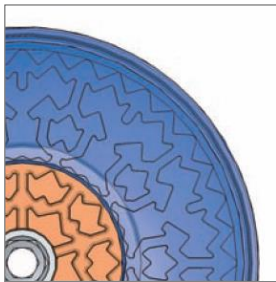
Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

High-speed suction cups for sheet metal handling

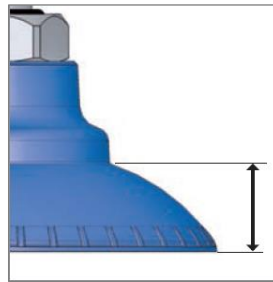
The SAXM series of suction cups from Schmalz optimize performance for handling sheet metal parts. Their bell shape allows flexible adaption to complex contours. They are extremely wear-resistant and can be obtained either assembled or as single parts if needed. They thus help lower the life cycle costs of a production system. The bell-shaped suction cup SAXM is 100% recyclable.

Strongly increased lateral forces on oily sheets



Innovative internal structure

Extreme adaptability to complex contours



Very high stroke of the suction cup

Significantly higher service life than standard materials

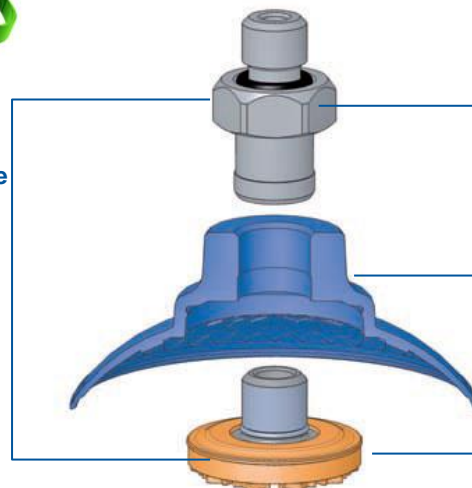


Wear-resistant material Elastodur

Modular design



Two part Schmalz connector with snap rig for loss prevention suitable for reuse



Connector upper part

- Available with various thread connections

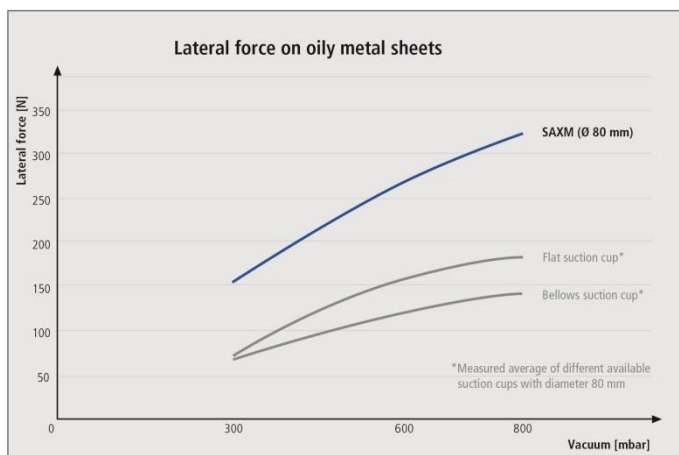
Elastomer part

- Flexible sealing lip, innovative internal structure,
- Wear-resistant material Elastodur ED-85

Connector lower part

- Overmolded friction disc made of the wear-resistant material Elastodur ED-65

Your Benefits



The special inner structure and the additional friction disc make the SAXM able to absorb much more lateral forces than any other round suction cup on the market. That has a positive effect on the relationship between the process speed and the output quantity.

Minimize costs

The number of suction cups can be reduced while maintaining the process speed. This sustainably minimizes the overall tooling costs.

Maximize output quantities

The process speed can be significantly increased while maintaining the same number of suction cups. This also maximizes the output quantities.



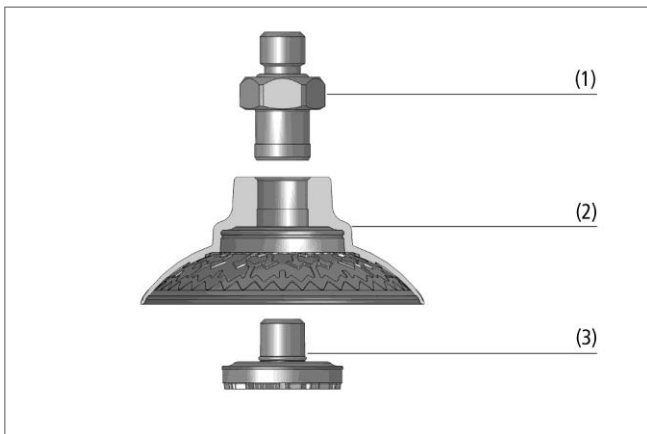
Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (Ø) from 20 mm to 115 mm



Bell-shaped suction cups SAXM



System design bell-shaped suction cups SAXM



Bell-shaped suction cups SAXM for handling formed sheet metal parts

Applications

- High-speed suction cups with demands for highest holding and shear forces for fast handling of sheet metal and car body parts
- Handling of workpieces with oily surfaces
- Loading and unloading CNC metal and laser cutting machines
- Handling of blanks at destackers
- Handling of workpieces with convex surfaces

Design

- Round bell-shaped suction cup (2) with flexible sealing lip, optimum internal structure, special oil groove and inner support
- Wear-resistant material Elastodur of suction cup (ED-85) and friction disc (ED-65)
- Two-part Schmalz connector (SC) consisting of connector upper part (1) and lower part including a friction disc (3)
- Upper connector with loss protection
- Connection elements with male thread have an integrated seal on the thread

Our Highlights...

- Significantly increased stroke of suction cup
- Optimum internal structure
- Large-area, structured inner support
- Innovative material ED
- Environmental friendly, modular design

Your Benefits...

- > Very good adjustment to different workpiece outlines
- > Highest transmission of holding forces and adaptation of shear forces, especially on oily sheet metal
- > Avoidance of deep-drawing, even with thin sheets
- > Highly wear-resistant, resistant to the effects of ozone and aggressive drawing oils
- > Minimum costs, quick replacement of individual components, 100% recyclable

Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (\varnothing) from 20 mm to 115 mm

Designation Code Bell-Shaped Suction Cups SAXM

Abbreviated designation	Suction area \varnothing in mm	Material and shore hardness	Connection thread
Example SAXM 30 ED-85 G1/4-IG:			
SAXM	30	ED-85	G1/4-IG
SAXM	20 to 115	ED-85	G1/4-IG (IG = female (F)) G3/8-IG G1/4-AG G3/8-AG M10x1.5-AG (AG = male (M)) M14x1.5-AG M16x1.5-AG M16x2.0-AG NPT1/4-IG NPT3/8-IG RA rectangular adapter

Ordering Data Bell-Shaped Suction Cups SAXM

Bell-shaped suction cup SAXM (elastomer part + connection element) is delivered assembled. As an alternative the individual parts can also be ordered separately. To do this, the following ordering steps are required:

- Bell-shaped suction cup of type SAXM (step 1) – elastomer part, available in various diameters
- Connector upper part (step 2) – available with various threads
- Connector lower part (step 3) – including molded friction disc

Bell-Shaped Suction Cup SAXM (Assembled)

Type	Connection G1/4"-F	G3/8"-F	M10x1.5-M	M14x1.5-M	M16x1.5-M	M16-M
SAXM 20 ED-85...	10.01.19.00080	10.01.19.00097	10.01.19.00098	10.01.19.00099	10.01.19.00105	-
SAXM 30 ED-85...	10.01.19.00014	10.01.19.00015	10.01.19.00016	10.01.19.00017	10.01.19.00084	10.01.19.00108
SAXM 40 ED-85...	10.01.19.00019	10.01.19.00020	10.01.19.00021	10.01.19.00022	10.01.19.00085	10.01.19.00109
SAXM 50 ED-85...	10.01.19.00024	10.01.19.00025	10.01.19.00026	10.01.19.00027	10.01.19.00086	10.01.19.00110
SAXM 60 ED-85...	10.01.19.00029	10.01.19.00030	10.01.19.00031	10.01.19.00032	10.01.19.00087	10.01.19.00111
SAXM 80 ED-85...	10.01.19.00034	10.01.19.00035	10.01.19.00036	10.01.19.00037	10.01.19.00088	10.01.19.00112
SAXM 100 ED-85...	10.01.19.00039	10.01.19.00040	10.01.19.00041	10.01.19.00042	10.01.19.00089	10.01.19.00113
SAXM 115 ED-85...	10.01.19.00044	10.01.19.00045	10.01.19.00046	10.01.19.00047	10.01.19.00090	10.01.19.00114

Type*	Connection G1/4"-M	G3/8"-M	Rectangular adapter	NPT1/4"-F	NPT3/8"-F
SAXM 20 ED-85...	10.01.19.00101	10.01.19.00102	10.01.19.00100	10.01.19.00104	10.01.19.00103
SAXM 30 ED-85...	10.01.19.00049	10.01.19.00050	10.01.19.00018	10.01.19.00073	10.01.19.00063
SAXM 40 ED-85...	10.01.19.00051	10.01.19.00052	10.01.19.00023	10.01.19.00074	10.01.19.00064
SAXM 50 ED-85...	10.01.19.00053	10.01.19.00054	10.01.19.00028	10.01.19.00075	10.01.19.00065
SAXM 60 ED-85...	10.01.19.00055	10.01.19.00056	10.01.19.00033	10.01.19.00076	10.01.19.00066
SAXM 80 ED-85...	10.01.19.00057	10.01.19.00058	10.01.19.00038	10.01.19.00077	10.01.19.00067
SAXM 100 ED-85...	10.01.19.00059	10.01.19.00060	10.01.19.00043	10.01.19.00078	10.01.19.00068
SAXM 115 ED-85...	10.01.19.00061	10.01.19.00062	10.01.19.00048	10.01.19.00079	10.01.19.00069

*Other connection nipples are available on request.

Step 1: Bell-Shaped Suction Cup SAXM (Single Component)

Type	Part Number
SAXM 20 ED-85 SC045	10.01.19.00003
SAXM 30 ED-85 SC045	10.01.19.00004
SAXM 40 ED-85 SC045	10.01.19.00005
SAXM 50 ED-85 SC055	10.01.19.00006
SAXM 60 ED-85 SC055	10.01.19.00007
SAXM 80 ED-85 SC055	10.01.19.00008
SAXM 100 ED-85 SC55	10.01.19.00009
SAXM 115 ED-85 SC055	10.01.19.00010

Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (\varnothing) from 20 mm to 115 mm

Step 2: Connector Upper Part (Single Component)

Type*	SAXM 20/30/40	SAXM 50/60/80	SAXM 100/115
SC-A 045 G1/4-AG L	10.01.06.02818	-	-
SC-A 055 G1/4-AG L	-	10.01.06.02821	-
SC-A 065 G1/4-AG L	-	-	10.01.06.02824
SC-A 045 G1/4-IG L	10.01.06.02736	-	-
SC-A 055 G1/4-IG L	-	10.01.06.02742	-
SC-A 065 G1/4-IG L	-	-	10.01.06.02774
SC-A 045 G3/8-AG L	10.01.06.02807	-	-
SC-A 055 G3/8-AG L	-	10.01.06.02809	-
SC-A 065 G3/8-AG L	-	-	10.01.06.02810
SC-A 045 G3/8-IG L	10.01.06.02737	-	-
SC-A 055 G3/8-IG L	-	10.01.06.02743	-
SC-A 065 G3/8-IG L	-	-	10.01.06.02648
SC-A 045 M10-AG L	10.01.06.02819	-	-
SC-A 055 M10-AG L	-	10.01.06.02822	-
SC-A 065 M10-AG L	-	-	10.01.06.02825
SC-A 045 M14x1.5-AG L	10.01.06.02820	-	-
SC-A 055 M14x1.5-AG L	-	10.01.06.02823	-
SC-A 065 M14x1.5-AG L	-	-	10.01.06.02826
SC-A 045 M16x1.5-AG L	10.01.06.03186	-	-
SC-A 055 M16x1.5-AG L	-	10.01.06.03187	-
SC-A 065 M16x1.5-AG L	-	-	10.01.06.03219
SC-A 045 M16-AG L	10.01.06.03299	-	-
SC-A 055 M16-AG L	-	10.01.06.03256	-
SC-A 065 M16-AG L	-	-	10.01.06.03308
SC-A 045 NPT1/4-IG L	10.01.06.02971	-	-
SC-A 055 NPT1/4-IG L	-	10.01.06.02972	-
SC-A 065 NPT1/4-IG L	-	-	10.01.06.02973
SC-A 045 NPT3/8-IG L	10.01.06.02939	-	-
SC-A 055 NPT3/8-IG L	-	10.01.06.02941	-
SC-A 065 NPT3/8-IG L	-	-	10.01.06.02943
SC-A 045 RA L	10.01.06.02813	-	-
SC-A 055 RA L	-	10.01.06.02815	-
SC-A 065 RA L	-	-	10.01.06.02817

*Other connection nipples are available on request.

Step 3: Connector Lower Part (Single Component)

Type	SAXM 20/30/40	SAXM 50/60/80	SAXM 100/115
SC-S 045 FDC-L	10.01.06.02803	-	-
SC-S 055 FDC-L	-	10.01.06.02804	-
SC-S 065 FDC-L	-	-	10.01.06.02805

Technical Data Bell-Shaped Suction Cups SAXM

Type	Suction force [N]*	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter [mm]***
SAXM 20 ED-85 SC045	20	15	20	1.6	20	5
SAXM 30 ED-85 SC045	39	32	41	3.4	18	5
SAXM 40 ED-85 SC045	69	38	71	7.1	25	5
SAXM 50 ED-85 SC055	109	58	110	14.4	25	6
SAXM 60 ED-85 SC055	154	85	155	24.2	30	6
SAXM 80 ED-85 SC055	270	150	269	51.9	33	6
SAXM 100 ED-85 SC065	412	230	414	95.5	40	6
SAXM 115 ED-85 SC065	549	320	584	141.5	50	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx. 2 m

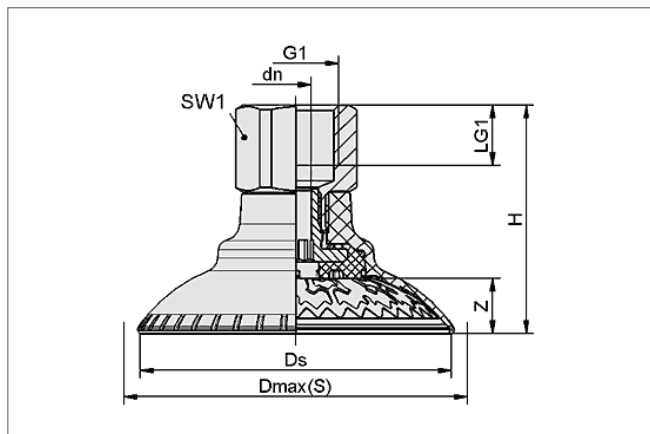


Suction Cups for Sheet Metal Handling

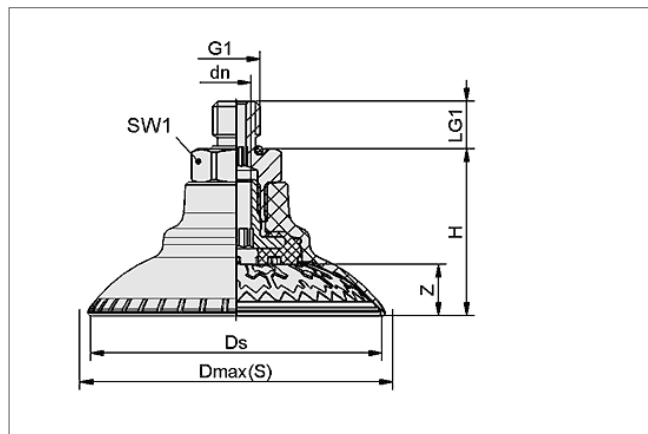
Bell-Shaped Suction Cups SAXM

Suction area (\emptyset) from 20 mm to 115 mm

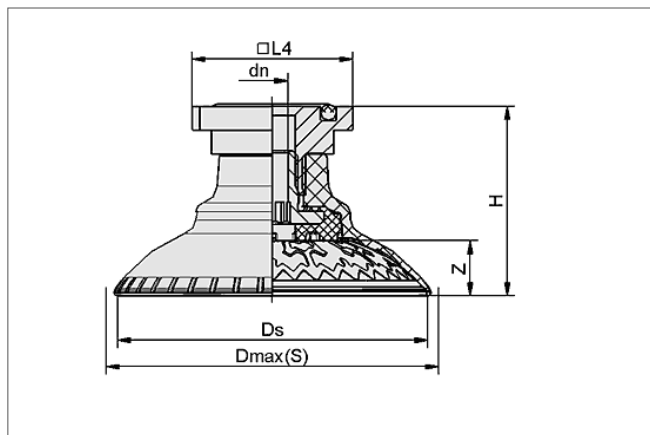
Design Data Bell-Shaped Suction Cups SAXM (Assembled)



SAXM 20 to 115 IG



SAXM 20 to 115 AG



SAXM 20 to 115 RA

Type	Dimensions in mm*			G1	H	LG1	L4	SW1	Z(Stroke)
	dn	Ds	Dmax(S)**						
SAXM 20 ED-85 G1/4-IG	5.10	21.8	26	G1/4"-F	34	12	-	17	3.0
SAXM 20 ED-85 G3/8-IG	5.10	21.8	26	G3/8"-F	34	12	-	22	3.0
SAXM 20 ED-85 NPT1/4-IG	5.10	21.8	26	NPT1/4"-F	34	14	-	17	3.0
SAXM 20 ED-85 NPT3/8-IG	5.10	21.8	26	NPT3/8"-F	34	14	-	22	3.0
SAXM 20 ED-85 G1/4-AG	5.10	21.8	26	G1/4"-M	24	10	-	17	3.0
SAXM 20 ED-85 G3/8-AG	5.10	21.8	26	G3/8"-M	24	10	-	22	3.0
SAXM 20 ED-85 M10x1.5-AG	4.10	21.8	26	M10x1.5-M	24	10	-	17	3.0
SAXM 20 ED-85 M14x1.5-AG	5.10	21.8	26	M14x1.5-M	24	10	-	17	3.0
SAXM 20 ED-85 M16x1.5-AG	5.10	21.8	26	M16x1.5-M	24	10	-	22	3.0
SAXM 20 ED-85 RA	5.10	21.8	26	Rectangular adapter	26	-	32	-	3.0
SAXM 30 ED-85 G1/4-IG	5.10	31.6	35	G1/4"-F	35	12	-	17	4.3
SAXM 30 ED-85 G3/8-IG	5.10	31.6	35	G3/8"-F	35	12	-	22	4.3
SAXM 30 ED-85 NPT1/4-IG	5.10	31.6	35	NPT1/4"-F	35	14	-	17	4.3
SAXM 30 ED-85 NPT3/8-IG	5.10	31.6	35	NPT3/8"-F	35	14	-	22	4.3
SAXM 30 ED-85 G1/4-AG	5.10	31.6	35	G1/4"-M	25	10	-	17	4.3
SAXM 30 ED-85 G3/8-AG	5.10	31.6	35	G3/8"-M	26	10	-	22	4.3
SAXM 30 ED-85 M10x1.5-AG	4.10	31.6	35	M10x1.5-M	25	10	-	17	4.3
SAXM 30 ED-85 M14x1.5-AG	5.10	31.6	35	M14x1.5-M	25	10	-	17	4.3
SAXM 30 ED-85 M16x1.5-AG	5.10	31.6	35	M16x1.5-M	26	10	-	22	4.3
SAXM 30 ED-85 M16-AG	5.10	31.6	35	M16-M	26	11	-	22	4.3
SAXM 30 ED-85 RA	5.10	31.6	35	Rectangular adapter	27	-	32	-	4.3
SAXM 40 ED-85 G1/4-IG	5.10	41.3	45	G1/4"-F	38	12	-	17	6.9
SAXM 40 ED-85 G3/8-IG	5.10	41.3	45	G3/8"-F	38	12	-	22	6.9

Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (Ø) from 20 mm to 115 mm

Design Data Bell-Shaped Suction Cups SAXM (Assembled)

Type	Dimensions in mm*								
	dn	Ds	Dmax(S)**	G1	H	LG1	L4	SW1	Z(Stroke)
SAXM 40 ED-85 NPT1/4-IG	5.10	41.3	45	NPT1/4"-F	38	14	-	17	6.9
SAXM 40 ED-85 NPT3/8-IG	5.10	41.3	45	NPT3/8"-F	38	14	-	22	6.9
SAXM 40 ED-85 G1/4-AG	5.10	41.3	45	G1/4"-M	28	10	-	22	6.9
SAXM 40 ED-85 G3/8-AG	5.10	41.3	45	G3/8"-M	28	10	-	22	6.9
SAXM 40 ED-85 M10x1.5-AG	4.10	41.3	45	M10x1.5-M	28	10	-	17	6.9
SAXM 40 ED-85 M14x1.5-AG	5.10	41.3	45	M14x1.5-M	28	10	-	17	6.9
SAXM 40 ED-85 M16x1.5-AG	5.10	41.3	45	M16x1.5-M	28	10	-	22	6.9
SAXM 40 ED-85 M16x-AG	5.10	41.3	45	M16-M	28	11	-	22	6.9
SAXM 40 ED-85 RA	5.10	41.3	45	Rectangular adapter	28	-	32	-	6.9
SAXM 50 ED-85 G1/4-IG	6.10	51.5	58	G1/4"-F	43	12	-	17	8.4
SAXM 50 ED-85 G3/8-IG	6.10	51.5	58	G3/8"-F	43	12	-	22	8.4
SAXM 50 ED-85 NPT1/4-IG	6.10	51.5	58	NPT1/4-F	43	14	-	17	8.4
SAXM 50 ED-85 NPT3/8-IG	6.10	51.5	58	NPT3/8-F	43	14	-	22	8.4
SAXM 50 ED-85 G1/4-AG	6.10	51.5	58	G1/4"-M	33	10	-	17	8.4
SAXM 50 ED-85 G3/8-AG	6.10	51.5	58	G3/8"-M	33	10	-	22	8.4
SAXM 50 ED-85 M10x1.5-AG	4.10	51.5	58	M10x1.5-M	33	10	-	17	8.4
SAXM 50 ED-85 M14x1.5-AG	6.10	51.5	58	M14x1.5-M	33	10	-	17	8.4
SAXM 50 ED-85 M16x1.5-AG	6.10	51.5	58	M16x1.5-M	33	10	-	22	8.4
SAXM 50 ED-85 M16-AG	6.10	51.5	58	M16-M	33	11	-	22	8.4
SAXM 50 ED-85 RA	6.10	51.5	58	Rectangular adapter	35	-	32	-	8.4
SAXM 60 ED-85 G1/4-IG	6.10	61.5	70	G1/4"-F	45	12	-	17	10.9
SAXM 60 ED-85 G3/8-IG	6.10	61.5	70	G3/8"-F	45	12	-	22	10.9
SAXM 60 ED-85 NPT1/4-IG	6.10	61.5	70	NPT1/4-F	45	14	-	17	10.9
SAXM 60 ED-85 NPT3/8-IG	6.10	61.5	70	NPT3/8-F	45	14	-	22	10.9
SAXM 60 ED-85 G1/4-AG	6.10	61.5	70	G1/4"-M	35.3	10	-	17	10.9
SAXM 60 ED-85 G3/8-AG	6.10	61.5	70	G3/8"-M	35.8	10	-	22	10.9
SAXM 60 ED-85 M10x1.5-AG	4.10	61.5	70	M10x1.5-M	35.3	10	-	17	10.9
SAXM 60 ED-85 M14x1.5-AG	6.10	61.5	70	M14x1.5-M	36	10	-	17	10.9
SAXM 60 ED-85 M16x1.5-AG	6.10	61.5	70	M16x1.5-M	36	10	-	22	10.9
SAXM 60 ED-85 M16-AG	6.10	61.5	70	M16-M	36	11	-	22	10.9
SAXM 60 ED-85 RA	6.10	61.5	70	Rectangular adapter	38	-	32	-	10.9
SAXM 80 ED-85 G1/4-IG	6.10	81.0	92	G1/4"-F	48	12	-	17	13.9
SAXM 80 ED-85 G3/8-IG	6.10	81.0	92	G3/8"-F	48	12	-	22	13.9
SAXM 80 ED-85 NPT1/4-IG	6.10	81.0	92	NPT1/4-F	48	14	-	17	13.9
SAXM 80 ED-85 NPT3/8-IG	6.10	81.0	92	NPT3/8-F	48	14	-	22	13.9
SAXM 80 ED-85 G1/4-AG	6.10	81.0	92	G1/4"-M	38	10	-	17	13.9
SAXM 80 ED-85 G3/8-AG	6.10	81.0	92	G3/8"-M	39	10	-	22	13.9
SAXM 80 ED-85 M10x1.5-AG	4.10	81.0	92	M10x1.5-M	38	10	-	17	13.9
SAXM 80 ED-85 M14x1.5-AG	6.10	81.0	92	M14x1.5-M	38	10	-	17	13.9
SAXM 80 ED-85 M16x1.5-AG	6.10	81.0	92	M16x1.5-M	39	10	-	22	13.9
SAXM 80 ED-85 M16-AG	6.10	81.0	92	M16-M	39	11	-	22	13.9
SAXM 80 ED-85 RA	6.10	81.0	92	Rectangular adapter	41	-	32	-	13.9
SAXM 100 ED-85 G1/4-IG	6.10	99.7	111	G1/4"-F	57	12	-	22	17.1
SAXM 100 ED-85 G3/8-IG	6.10	99.7	111	G3/8"-F	57	12	-	22	17.1
SAXM 100 ED-85 NPT1/4-IG	6.10	99.7	111	NPT1/4-F	57	14	-	22	17.1
SAXM 100 ED-85 NPT3/8-IG	6.10	99.7	111	NPT3/8-F	57	14	-	22	17.1
SAXM 100 ED-85 G1/4-AG	6.10	99.7	111	G1/4"-M	47	10	-	22	17.1
SAXM 100 ED-85 G3/8-AG	6.10	99.7	111	G3/8"-M	47	10	-	22	17.1
SAXM 100 ED-85 M10x1.5-AG	4.10	99.7	111	M10x1.5-M	47	12	-	22	17.1
SAXM 100 ED-85 M14x1.5-AG	6.10	99.7	111	M14x1.5-M	47	12	-	22	17.1
SAXM 100 ED-85 M16x1.5-AG	6.10	99.7	111	M16x1.5-M	47	10	-	22	17.1
SAXM 100 ED-85 M16-AG	6.10	99.7	111	M16-M	47	11	-	22	17.1
SAXM 100 ED-85 RA	6.10	99.7	111	Rectangular adapter	49	-	32	-	17.1
SAXM 115 ED-85 G1/4-IG	6.10	115.2	129	G1/4"-F	60	12	-	22	20.0
SAXM 115 ED-85 G3/8-IG	6.10	115.2	129	G3/8"-F	60	12	-	22	20.0
SAXM 115 ED-85 NPT1/4-IG	6.10	115.2	129	NPT1/4-F	60	14	-	22	20.0
SAXM 115 ED-85 NPT3/8-IG	6.10	115.2	129	NPT3/8-F	60	14	-	22	20.0
SAXM 115 ED-85 G1/4-AG	6.10	115.2	129	G1/4"-M	50	10	-	22	20.0
SAXM 115 ED-85 G3/8-AG	6.10	115.2	129	G3/8"-M	50	10	-	22	20.0
SAXM 115 ED-85 M10x1.5-AG	4.10	115.2	129	M10x1.5-M	50	12	-	22	20.0
SAXM 115 ED-85 M14x1.5-AG	6.10	115.2	129	M14x1.5-M	50	12	-	22	20.0

Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (\varnothing) from 20 mm to 115 mm

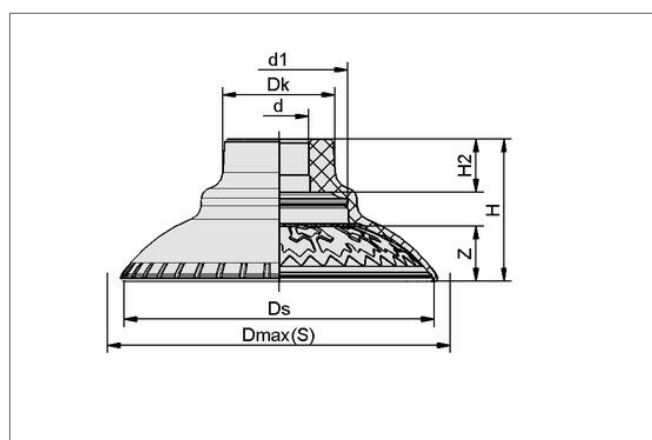
Design Data Bell-Shaped Suction Cups SAXM (Assembled)

Type	Dimensions in mm*								Z(Stroke)
	dn	Ds	Dmax(S)**	G1	H	LG1	L4	SW1	
SAXM 115 ED-85 M16x1.5-AG	6.10	115.2	129	M16x1.5-M	50	10	-	22	20.0
SAXM 115 ED-85 M16-AG	6.10	115.2	129	M16-M	50	11	-	22	20.0
SAXM 115 ED-85 RA	6.10	115.2	129	Rectangular adapter	52	-	32	-	20.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Dmax (S) is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

Design Data Bell-Shaped Suction Cup SAXM (Single Component)



SAXM 20 to 115

Design Data Bell-Shaped Suction Cups SAXM (Single Component)

Type	Dimensions in mm*							
	d	d1	Dk	D1(S)**	Ds	H	H2	Z(Stroke)
SAXM 20 ED-85 SC045	9.7	15.3	19.5	26.0	21.8	17	7.0	3.0
SAXM 30 ED-85 SC045	9.7	15.6	19.2	35.2	31.6	18	7.0	4.3
SAXM 40 ED-85 SC045	9.7	15.6	19.2	45.4	41.3	21	7.0	6.9
SAXM 50 ED-85 SC055	11.8	27.6	22.2	58.4	51.5	26	10.5	8.4
SAXM 60 ED-85 SC055	11.8	27.6	22.2	69.7	61.5	28	10.5	10.9
SAXM 80 ED-85 SC055	11.8	27.6	22.0	92.2	81.0	31	10.5	13.9
SAXM 100 ED-85 SC065	14.0	39.6	25.6	111.1	99.7	39	14.3	17.1
SAXM 115 ED-85 SC065	14.0	39.6	28.9	129.4	115.2	42	14.3	20.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**D1 (S) is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

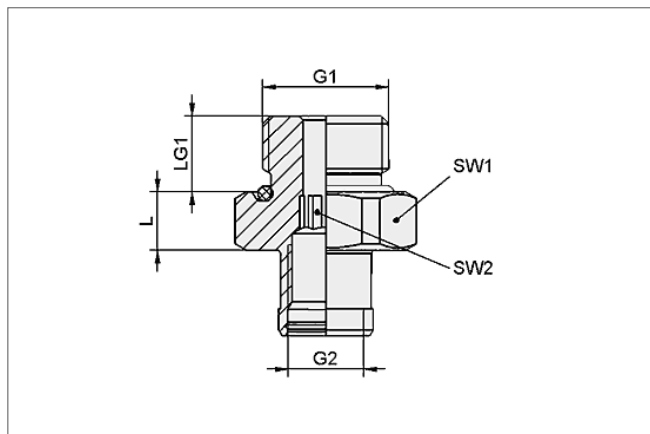
Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

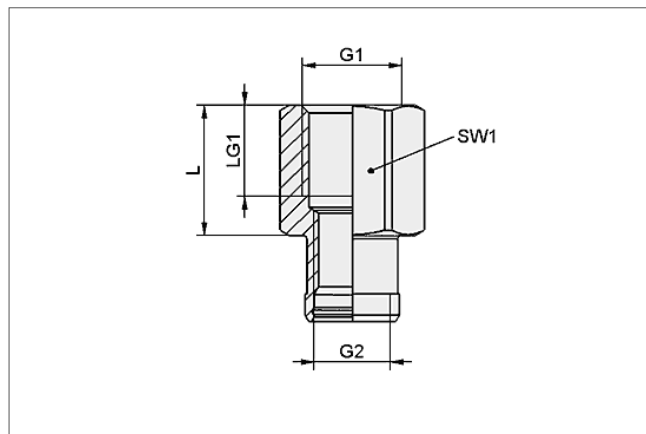
Suction area (\varnothing) from 20 mm to 115 mm



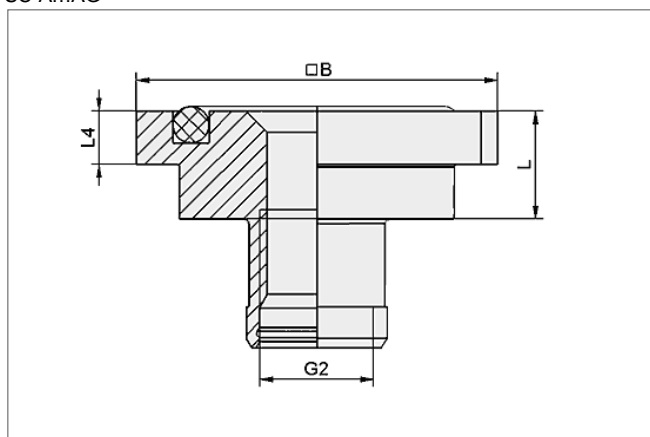
Design Data Bell-Shaped Suction Cup SAXM (Single Component)



SC-A...AG



SC-A...IG



SC-A...RA



Design Data Connector Upper Part (Single Component)

Type	Dimensions in mm								
	B	G1	G2	L	L4	LG1	SW1	SW2	
SC-A 045 G1/4-AG L	-	G1/4"-M	M8x1-F	7.2	-	10	17	5	
SC-A 055 G1/4-AG L	-	G1/4"-M	M10x1-F	7.2	-	10	17	6	
SC-A 065 G1/4-AG L	-	G1/4"-M	M10x1-F	8.0	-	10	22	6	
SC-A 045 G1/4-IG L	-	G1/4"-F	M8x1-F	17.2	-	12	17	-	
SC-A 055 G1/4-IG L	-	G1/4"-F	M10x1-F	17.2	-	12	17	-	
SC-A 065 G1/4-IG L	-	G1/4"-F	M10x1-F	18.0	-	12	22	-	
SC-A 045 G3/8AG L	-	G3/8"-M	M8x1-F	7.7	-	10	22	5	
SC-A 055 G3/8-AG L	-	G3/8"-M	M10x1-F	7.7	-	10	22	6	
SC-A 065 G3/8-AG L	-	G3/8"-M	M10x1-F	8.0	-	10	22	6	
SC-A 045 G3/8-IG L	-	G3/8"-F	M8x1-F	17.2	-	12	22	-	
SC-A 055 G3/8-IG L	-	G3/8"-F	M10x1-F	17.2	-	12	22	-	
SC-A 065 G3/8-IG L	-	G3/8"-F	M10x1-F	18.0	-	12	22	-	
SC-A 045 M10x1.5-AG L	-	M10x1.5-M	M8x1-F	7.2	-	10	17	4	
SC-A 055 M10x1.5-AG L	-	M10x1.5-M	M10x1-F	7.2	-	10	17	4	
SC-0 065 M10x1.5- AG L	-	M10x1.5-M	M10x1-F	8.0	-	10	22	4	
SC-A 045 M14-AG L	-	M14x1.5-M	M8-1-F	7.2	-	10	17	5	
SC-A 055 M14-AG L	-	M14x1.5-M	M10x1-F	7.2	-	10	17	6	
SC-A 065 M14-AG L	-	M14x1.5-M	M10x1-F	8.0	-	10	22	6	
SC-A 045 M16-AG L	-	M16x1.5-M	M8x1-F	7.7	-	10	22	5	
SC-A 055 M16-AG L	-	M16x1.5-M	M10x1-F	7.7	-	10	22	6	
SC-A 065 M16-AG L	-	NPT1/4-M	M10x1-F	8.0	-	11	22	6	
SC-A 045 NPT1/4-IG L	-	NPT1/4-F	M8x1-F	17.2	-	14	17	-	



Suction Cups for Sheet Metal Handling

Bell-Shaped Suction Cups SAXM

Suction area (\varnothing) from 20 mm to 115 mm

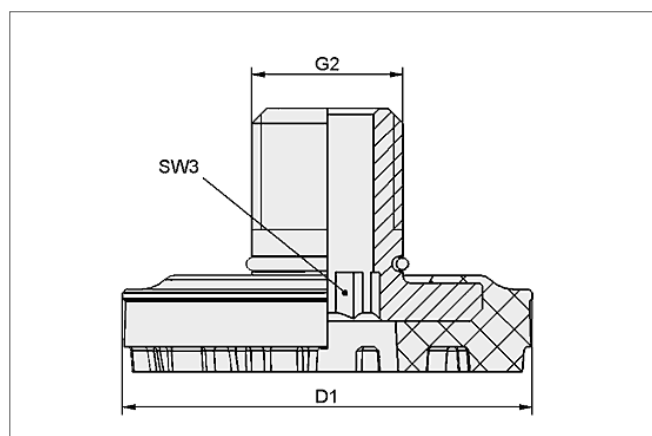


Design Data Connector Upper Part (Single Component)

Type	Dimensions in mm							
	B	G1	G2	L	L4	LG1	SW1	SW2
SC-A 055 NPT1/4-IG L		NPT1/4-F	M10x1-F	17.2		14	17	-
SC-A 065 NPT1/4-IG L		NPT3/8-F	M10x1-F	18.0		14	22	-
SC-A 045 NPT3/8-IG L		NPT3/8-F	M8x1-F	17.2		14	22	-
SC-A 055 NPT3/8-IG L		NPT3/8-F	M10x1-F	17.2		14	22	-
SC-A 065 NPT3/8-IG L			M10x1-F	18.0		14	22	-
SC-A 045 RA L	31.8	-	M8x1-F	9.5	4.7	-	-	-
SC-A 055 RA L	31.8	-	M10x1-F	9.5	4.7	-	-	-
SC-A 065 RA L	31.8	-	M10x1-F	9.5	4.7	-	-	-



Design Data Connector Lower Part (Single Component)



SC-FDC 045...065

Type	Dimensions in mm		
	D1	G2	SW3
SC-S 045 FDC-L	15	M8x1-M	5
SC-S 055 FDC-L	28	M10x1-M	6
SC-S 065 FDC-L	39	M10x1-M	6

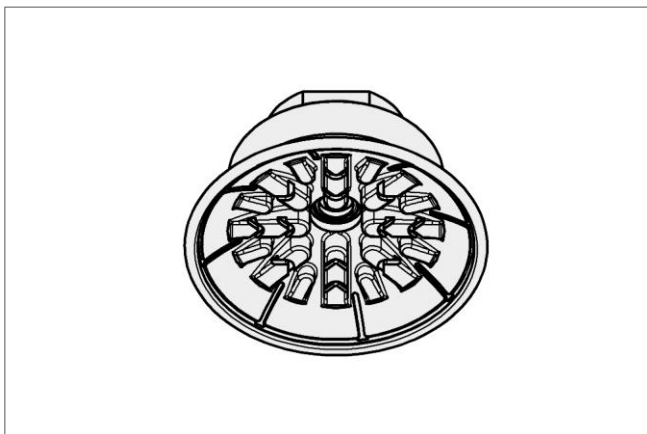
Suction Cups for Handling Sheet Metal

Flat Suction SAF

Suction area (Ø) from 30 mm to 125 mm



Flat suction cups SAF



System design flat suction cups SAF



Flat suction cups SAF being used for handling sheet metal parts

Applications

- Round, flat suction cup for dynamic handling of metal sheets with very short cycle times
- Handling of thin steel sheets and aluminum sheets without deformation
- For use in feeder systems for press lines in the automobile industry
- Special slot on the bottom prevents oily sheets from slipping, permitting precise positioning in stamping presses etc.

Design

- Robust and wear-resistant suction cup SAF made of NBR with single sealing lip, special slot and inner support
- Suction cup SAF vulcanized to the connection nipple (very high strength)
- Suction cup available with various connection types
- Available in two material hardness values (45 Shore, 60 Shore)

Our Highlights...

- Wide range of diameters
- Large-area structured inner-support
- Soft and flexible sealing lip
- Various material hardness values
- Nipple vulcanized to the suction cup

Your Benefits...

- > For a wide range of work-piece sizes and shapes
- > No deep-drawing of the workpiece; capable of handling high lateral forces, even on oily metal sheets
- > Excellent sealing, even on slightly curved surfaces
- > Optimum adaptation to varying workpieces
- > Prevention of machine damages and downtimes as the result of lost suction cups

Suction Cups for Handling Sheet Metal

Flat Suction Cups SAF

Suction area (\varnothing) from 30 mm to 125 mm

Designation Code Flat Suction Cups SAF

Abbreviated designation	Suction area \varnothing in mm	Material and Shore hardness	Connection thread
Example SAF 80 NBR-60 G3/8-IG:	80	NBR-60	G3/8-IG
SAF	30	NBR-45	G1/4-AG (AG = male (M))
SAF	to 125	NBR-60	G1/4-IG (IG = female (F))
			G3/8-IG
			M10-AG
			M14x1.5-AG
			RA rectangular adapter
			NPT 3/8-F

Ordering Data Flat Suction Cups SAF

Suction cup SAF, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Flat Suction cups SAF

Type*	Connection G1/4"-M	G1/4"-F	G3/8"-F	M10x1.5-M	M14x1.5-M	Rectangular adapter	NPT 3/8-F
SAF 30 NBR-60	10.01.01.10646	10.01.01.10506	10.01.01.10705	10.01.01.10713	10.01.01.10730	10.01.01.10790	-
SAF 30 NBR-45	10.01.01.11421	10.01.01.11400	10.01.01.11420	10.01.01.11425	10.01.01.11426	10.01.01.11423	-
SAF 40 NBR-60	10.01.01.10647	10.01.01.10508	10.01.01.10708	10.01.01.10716	10.01.01.10733	10.01.01.10793	-
SAF 40 NBR-45	10.01.01.11430	10.01.01.11401	10.01.01.11431	10.01.01.11435	10.01.01.11436	10.01.01.11433	-
SAF 50 NBR-60	10.01.01.10635	10.01.01.10688	10.01.01.10510	10.01.01.10719	10.01.01.10736	10.01.01.10796	-
SAF 50 NBR-45	10.01.01.11440	10.01.01.11441	10.01.01.11402	10.01.01.11444	10.01.01.11445	10.01.01.11442	10.01.01.12441
SAF 60 NBR-60	10.01.01.10622	10.01.01.10689	10.01.01.10512	10.01.01.10721	10.01.01.10739	10.01.01.10799	-
SAF 60 NBR-45	10.01.01.11450	10.01.01.11451	10.01.01.11403	10.01.01.11454	10.01.01.11455	10.01.01.11452	10.01.01.12447
SAF 80 NBR-60	10.01.01.10623	10.01.01.10690	10.01.01.10514	10.01.01.10724	10.01.01.10742	10.01.01.10802	-
SAF 80 NBR-45	10.01.01.11460	10.01.01.11461	10.01.01.11404	10.01.01.11466	10.01.01.11467	10.01.01.11464	10.01.01.12448
SAF 100 NBR-60	10.01.01.10624	10.01.01.10691	10.01.01.10516	10.01.01.10726	10.01.01.10745	10.01.01.10805	-
SAF 100 NBR-45	10.01.01.11470	10.01.01.11471	10.01.01.11405	10.01.01.11476	10.01.01.11477	10.01.01.11474	10.01.01.12449
SAF 125 NBR-60	10.01.01.10666	10.01.01.10692	10.01.01.10518	10.01.01.10728	10.01.01.10748	10.01.01.10808	-
SAF 125 NBR-45	10.01.01.11480	10.01.01.11481	10.01.01.11406	10.01.01.11485	10.01.01.11468	10.01.01.11483	10.01.01.12450

Other connection nipples are available on request.

Technical Data Flat Suction Cups SAF

Type	Suction force [N]*	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. Internal hose diameter d [mm]***
SAF 30	38	30	28	1.7	40	4
SAF 40	69	52	50	3.8	50	4
SAF 50	100	80	76	7.0	65	4
SAF 60	150	105	85	13.0	75	6
SAF 80	272	205	180	36.0	100	6
SAF 100	430	310	300	58.0	135	6
SAF 125	660	475	400	115.0	165	9

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx. 2 m

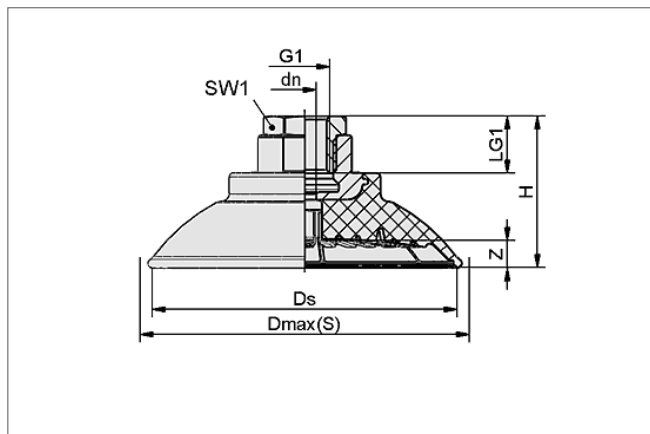
Suction Cups for Handling Sheet Metal

Flat Suction Cups SAF

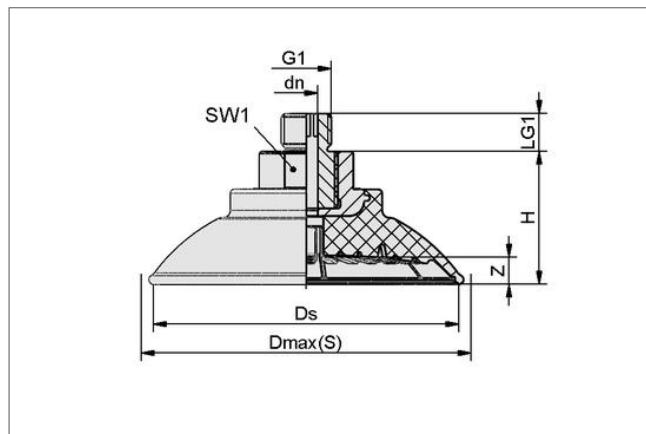
Suction area (\varnothing) from 30 mm to 125 mm



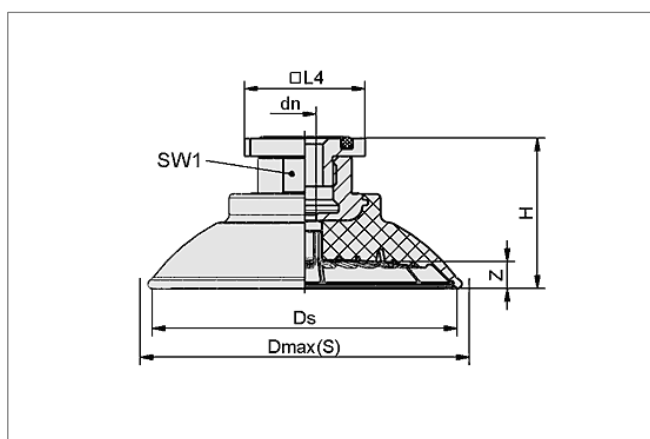
Design Data Flat Suction Cups SAF



SAF 30 to 125 IG



SAF 30 to 125 AG



SAF 30 to 125 RA (rectangular adapter)



Design Data Flat Suction Cups SAF

Type	Dimensions in mm*								
	Dmax(S)**	dn	Ds	G1	H	LG1	L4	SW1	Z(Stroke)
SAF 30 G1/4-AG	34	4	31	G1/4"-M	20.0	10	-	17	3.0
SAF 30 G1/4-IG	34	4	31	G1/4"-F	20.0	12	-	17	3.0
SAF 30 G3/8-IG	34	4	31	G3/8"-F	36.0	9	-	22	3.0
SAF 30 M10x1.5-AG	34	4	31	M10x1.5-M	20.0	12	-	17	3.0
SAF 30 M14x1.5-AG	34	4	31	M14x1.5-M	22.0	12	-	17	3.0
SAF 30 RA	34	4	31	Rectangular adapter	23.2	-	31.8	17	3.0
SAF 40 G1/4-AG	46	4	41	G1/4"-M	22.0	10	-	17	4.0
SAF 40 G1/4-IG	46	4	41	G1/4"-F	22.0	12	-	17	4.0
SAF 40 G3/8-IG	46	4	41	G3/8"-F	38.0	9	-	22	4.0
SAF 40 M10x1.5-AG	46	4	41	M10x1.5-M	22.0	12	-	17	4.0
SAF 40 M14x1.5-AG	46	4	41	M14x1.5-M	22.0	12	-	17	4.0
SAF 40 RA	46	4	41	Rectangular adapter	25.0	-	31.8	17	4.0

Suction Cups for Handling Sheet Metal

Flat Suction Cups SAF

Suction area (\emptyset) from 30 mm to 125 mm

Design Data Flat Suction Cups SAF

Type	Dimensions in mm*			G1	H	LG1	L4	SW1	Z(Stroke)
	Dmax(S)**	dn	Ds						
SAF 50 G1/4-AG	56	6	50.0	G1/4"-M	28.0	10	-	22	5.0
SAF 50 G1/4-IG	56	6	50.0	G1/4"-F	33.0	15	-	22	5.0
SAF 50 G3/8-IG	56	6	50.0	G3/8"-F	28.0	15	-	22	5.0
SAF 50 M10x1.5-AG	56	4	50.0	M10x1.5-M	28.0	12	-	22	5.0
SAF 50 M14x1.5-AG	56	6	50.0	M14x1.5-M	28.0	12	-	22	5.0
SAF 50 RA	56	6	50.0	Rectangular adapter	27.5	-	31.8	22	5.0
SAF 60 G1/4-AG	67	6	60.6	G1/4"-M	31.0	10	-	22	6.0
SAF 60 G1/4-IG	67	6	60.6	G1/4"-F	36.0	15	-	22	6.0
SAF 60 G3/8-IG	67	6	60.6	G3/8"-F	31.0	15	-	22	6.0
SAF 60 M10x1.5-AG	67	4	60.6	M10x1.5-M	31.0	12	-	22	6.0
SAF 60 M14x1.5-AG	67	6	60.6	M14x1.5-M	31.0	12	-	22	6.0
SAF 60 RA	67	6	60.6	Rectangular adapter	30.5	-	31.8	22	6.0
SAF 80 G1/4-AG	89	6	83.0	G1/4"-M	35.0	10	-	22	7.6
SAF 80 G1/4-IG	89	6	83.0	G1/4"-F	40.0	20	-	22	7.6
SAF 80 G3/8-IG	89	6	83.0	G3/8"-F	35.0	15	-	22	7.6
SAF 80 M10x1.5-AG	89	4	83.0	M10x1.5-M	35.0	12	-	22	7.6
SAF 80 M14x1.5-AG	89	6	83.0	M14x1.5-M	35.0	12	-	22	7.6
SAF 80 RA	89	6	83.0	Rectangular adapter	34.5	-	31.8	22	7.6
SAF 100 G1/4-AG	110	6	103.0	G1/4"-M	36.0	10	-	22	9.5
SAF 100 G1/4-IG	110	6	103.0	G1/4"-F	41.0	20	-	22	9.5
SAF 100 G3/8-IG	110	6	103.0	G3/8"-F	36.0	15	-	22	9.5
SAF 100 M10x1.5-AG	110	4	103.0	M10x1.5-M	36.0	12	-	22	9.5
SAF 100 M14x1.5-AG	110	6	103.0	M14x1.5-M	36.0	12	-	22	9.5
SAF 100 RA	110	6	103.0	Rectangular adapter	35.5	-	31.8	22	9.5
SAF 125 G1/4-AG	135	6	128.0	G1/4"-M	43.0	10	-	22	12.5
SAF 125 G1/4-IG	135	6	128.0	G1/4"-F	48.0	20	-	22	12.5
SAF 125 G3/8-IG	135	9	128.0	G3/8"-F	43.0	15	-	22	12.5
SAF 125 M10x1.5-AG	135	4	128.0	M10x1.5-M	43.0	12	-	22	12.5
SAF 125 M14x1.5-AG	135	6	128.0	M14x1.5-M	43.0	12	-	22	12.5
SAF 125 RA	135	9	128.0	Rectangular adapter	42.5	-	31.8	22	12.5

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Dmax (S) is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

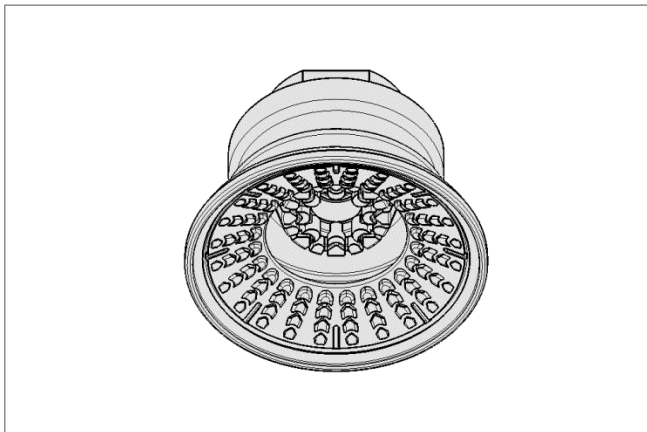
Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAB (1.5 Folds)

Suction area (Ø) from 22 mm to 125 mm



Bellows suction cups SAB (1.5 folds)



System design bellows suction cups SAB (1.5 folds)



Bellows suction cups SAB being used for handling car body parts

Applications

- Round, bellows suction cup with 1.5 folds for dynamic handling of metal sheets (short cycle times)
- Handling of thin steel sheets and aluminum sheets without deformation
- Handling of pre-shaped metal sheet parts, since bellows shape permits optimum adaptation
- For use e.g. in feeder systems for press lines in the automobile industry
- Special slot on the bottom of the cup prevents the oily metal sheets from slipping and permits precise positioning in stamping presses etc.

Design

- Robust and wear-resistant suction cup SAB with 1.5 folds, made of NBR, special slot and inner support
- Suction cup SAB vulcanized to the connection nipple (very high strength)
- Suction cups available with various connection types

Our Highlights...

- Wide range of diameters
- Large-area structured inner-support
- Soft and flexible sealing lip
- Various material hardness values
- Nipple vulcanized to the suction cup

Your Benefits...

- > For a wide range of workpiece sizes and shapes
- > No deep-drawing of the workpiece; capable of handling high lateral forces, even on oily metal sheets
- > Excellent sealing, even on slightly curved surfaces
- > Optimum adaptation to varying workpieces
- > Prevention of machine damages and downtimes as the result of lost suction cups

Suction Cups for Handling Sheet Metal

Bellow Suction Cups SAB (1.5 Folds)

Suction area (Ø) from 22 mm to 125 mm

Designation Code Bellows Suction Cups SAB (1.5 Folds)

Abbreviated designation	Suction area Ø in mm	Material and Shore hardness	Connection thread
Example SAB 30 NBR-60 G1/4-AG:			
SAB	30	NBR-60	G1/4-AG
SAB	22 to 125	NBR-60	G1/4-AG (AG = male (M)) G1/4-IG (IG = female (F)) G3/8-IG NPT3/8-IG M10-AG M14x1.5-AG RA rectangular adapter NPT 3/8-F

Ordering Data Bellows Suction Cups SAB (1.5 Folds)

Suction cup SAB, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Bellows Suction Cups SAB (1.5 Folds)

Type*	Connection G1/4"-M	G1/4"-F	G3/8"-F	M10x1.5-M	M14x1.5-M	Rectangular adapter	NPT3/8"-F
SAB 22 NBR-60	10.01.06.01653	10.01.06.01533	10.01.06.01650	10.01.06.01654	10.01.06.01655	10.01.06.01663	-
SAB 30 NBR-60	10.01.06.01197	10.01.06.01196	10.01.06.01198	10.01.06.01200	10.01.06.01201	10.01.06.01203	-
SAB 40 NBR-60	10.01.06.00803	10.01.06.00670	10.01.06.00924	10.01.06.00994	10.01.06.01006	10.01.06.01054	10.01.06.02559
SAB 50 NBR-60	10.01.06.00804	10.01.06.00851	10.01.06.00672	10.01.06.00996	10.01.06.01008	10.01.06.01055	10.01.06.02899
SAB 60 NBR-60	10.01.06.00805	10.01.06.00852	10.01.06.00674	10.01.06.00998	10.01.06.01010	10.01.06.01056	10.01.06.02905
SAB 80 NBR-60	10.01.06.00806	10.01.06.00850	10.01.06.00676	10.01.06.01000	10.01.06.01012	10.01.06.01057	10.01.06.02913
SAB 100 NBR-60	10.01.06.00807	10.01.06.00853	10.01.06.00678	10.01.06.01002	10.01.06.01014	10.01.06.01058	10.01.06.03117
SAB 125 NBR-60	10.01.06.00825	10.01.06.00854	10.01.06.00680	10.01.06.01004	10.01.06.01016	10.01.06.01059	10.01.06.03086

*Other connection nipples are available on request.

Technical Data Bellows Suction Cups SAB (1.5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm³]	Min. curve radius [mm] (convex)	Recom. Internal hose diameter d [mm]***
SAB 22 NBR-60	16	24	18	6	1.5	20	4
SAB 30 NBR-60	22	33	30	13	5.9	40	4
SAB 40 NBR-60	38	59	36	33	7.0	40	4
SAB 50 NBR-60	53	87	55	52	11.5	50	4
SAB 60 NBR-60	82	130	82	77	24.0	65	6
SAB 80 NBR-60	135	221	145	140	56.5	75	6
SAB 100 NBR-60	190	358	220	214	92.5	90	6
SAB 125 NBR-60	250	558	352	335	191.0	140	9

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx. 2 m

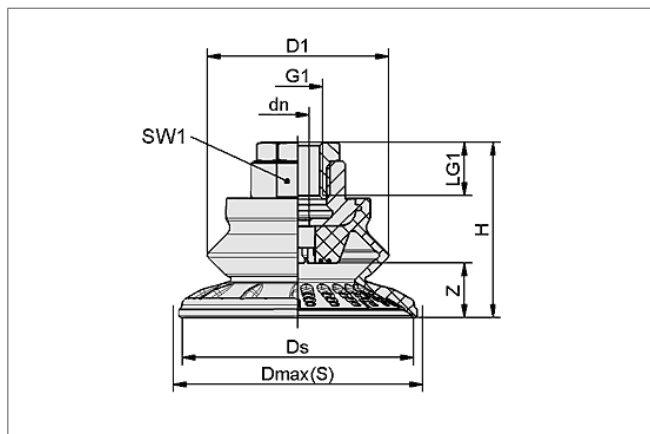
Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAB (1.5 Folds)

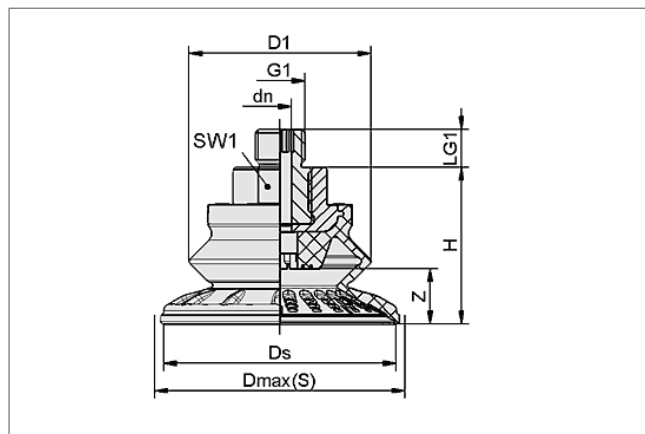
Suction area (\varnothing) from 22 mm to 125 mm



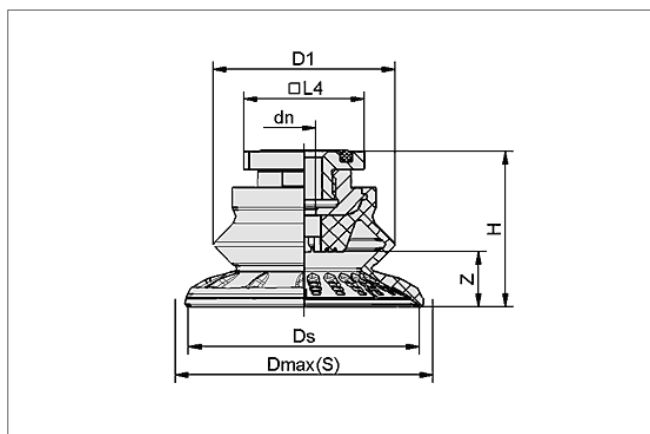
Design Data Bellows Suction Cups SAB (1.5 Folds)



SAB 22 to 125 IG (female)



SAB 22 to 125 AG (male)



SAB 22 to 125 RA (rectangular adapter)

Type	Dimensions in mm*									
	D1**	dn	Ds	Dmax(S)	G1	H	LG1	L4	SW1	Z(Stroke)
SAB 22 NBR-60 G1/4-AG	22	3.5	20.6	24	G1/4"-M	25.0	10.0	-	16	5.8
SAB 22 NBR-60 G1/4-IG	22	3.5	20.6	24	G1/4"-F	25.0	12.0	-	16	5.8
SAB 22 NBR-60 G3/8-IG	22	3.5	20.6	24	G3/8"-F	41.0	9.5	-	22	5.8
SAB 22 NBR-60 M10x1.5-AG	22	3.5	20.6	24	M10x1.5-M	25.0	12.0	-	16	5.8
SAB 22 NBR-60 M14x1.5-AG	22	3.5	20.6	24	M14x1.5-M	25.0	12.0	-	16	5.8
SAB 22 NBR-60 RA	22	3.5	20.6	24	Rectangular adapter	28.2	-	31.8	-	5.8
SAB 30 NBR-60 G1/4-AG	32	4.0	30.6	34	G1/4"-M	28.0	10.0	-	17	9.0
SAB 30 NBR-60 G1/4-IG	32	4.0	30.6	34	G1/4"-F	28.0	12.0	-	17	9.0
SAB 30 NBR-60 G3/8-IG	32	4.0	30.6	34	G3/8"-F	44.0	9.5	-	22	9.0
SAB 30 NBR-60 M10x1.5-AG	32	4.0	30.6	34	M10x1.5-M	28.0	12.0	-	17	9.0
SAB 30 NBR-60 M14x1.5-AG	32	4.0	30.6	34	M14x1.5-M	28.0	12.0	-	17	9.0
SAB 30 NBR-60 RA	32	4.0	30.6	34	Rectangular adapter	31.2	-	31.8	-	9.0
SAB 40 NBR-60 G1/4-AG	32	4.0	40.1	45	G1/4"-M	28.8	10.0	-	17	10.0
SAB 40 NBR-60 G1/4-IG	32	4.0	40.1	45	G1/4"-F	28.8	12.0	-	17	10.0
SAB 40 NBR-60 G3/8-IG	32	4.0	40.1	45	G3/8"-F	44.8	9.5	-	22	10.0
SAB 40 NBR-60 M10x1.5-AG	32	4.0	40.1	45	M10x1.5-M	28.8	12.0	-	17	10.0
SAB 40 NBR-60 M14x1.5-AG	32	4.0	40.1	45	M14x1.5-M	28.8	12.0	-	17	10.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**D1 is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum



Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAB (1.5 Folds)

Suction area (Ø) from 22 mm to 125 mm

Design Data Bellows Suction Cups SAB (1.5 Folds)

Type	Dimensions in mm*									
	D1**	Dn	Ds	Dmax(S)	G1	H	LG1	L4	SW1	Z(Stroke)
SAB 40 NBR-60 RA	32.0	4	40.1	45	Rectangular adapter	31.2	-	31.8	-	10.0
SAB 40 NBR-60 NPT3/8-IG	32.0	4	40.1	45	NPT3/8-F	44.0	9	-	22	10.0
SAB 50 NBR-60 G1/4-AG	39.5	6	50.1	56	G1/4"-M	36.9	10	-	22	11.5
SAB 50 NBR-60 G1/4-IG	39.5	6	50.1	56	G1/4"-F	42.0	20	-	22	11.5
SAB 50 NBR-60 G3/8-IG	39.5	6	50.1	56	G3/8"-F	36.9	15	-	22	11.5
SAB 50 NBR-60 M10x1.5-AG	39.5	4	50.1	56	M10x1.5-M	36.9	12	-	22	11.5
SAB 50 NBR-60 M14x1.5-AG	39.5	6	50.1	56	M14x1.5-M	36.9	12	-	22	11.5
SAB 50 NBR-60 RA	39.5	6	50.1	56	Rectangular adapter	36.5	-	31.8	-	11.5
SAB 50 NBR-60 NPT3/8-IG	39.5	6	50.1	56	NPT3/8-F	36.9	15	-	22	11.5
SAB 60 NBR-60 G1/4-AG	48.0	6	61.1	67	G1/4"-M	41.3	10	-	22	14.5
SAB 60 NBR-60 G1/4-IG	48.0	6	61.1	67	G1/4"-F	46.3	20	-	22	14.5
SAB 60 NBR-60 G3/8-IG	48.0	6	61.1	67	G3/8"-F	41.3	15	-	22	14.5
SAB 60 NBR-60 M10x1.5-AG	48.0	6	61.1	67	M10x1.5-M	41.3	12	-	22	14.5
SAB 60 NBR-60 M14x1.5-AG	48.0	6	61.1	67	M14x1.5-M	41.3	12	-	22	14.5
SAB 60 NBR-60 RA	48.0	6	61.1	67	Rectangular adapter	41.0	-	31.8	-	14.5
SAB 60 NBR-60 NPT3/8-IG	48.0	6	61.1	67	NPT3/8-F	41.3	15	-	22	14.5
SAB 80 NBR-60 G1/4-AG	63.6	6	81.1	89	G1/4"-M	49.9	10	-	22	22.1
SAB 80 NBR-60 G1/4-IG	63.6	6	81.8	89	G1/4"-F	54.9	20	-	22	22.1
SAB 80 NBR-60 G3/8-IG	63.6	6	81.8	89	G3/8"-F	49.9	15	-	22	22.1
SAB 80 NBR-60 M10x1.5-AG	63.6	4	81.8	89	M10x1.5-M	49.9	12	-	22	22.1
SAB 80 NBR-60 M14x1.5-AG	63.6	6	81.8	89	M14x1.5-M	49.9	12	-	22	22.1
SAB 80 NBR-60 RA	63.6	6	81.8	89	Rectangular adapter	49.6	-	31.8	-	22.1
SAB 80 NBR-60 NPT3/8-IG	63.6	6	81.8	89	NPT3/8-F	49.9	15	-	22	22.1
SAB 100 NBR-60 G1/4-AG	77.0	6	100.8	110	G1/4"-M	56.6	10	-	22	25.8
SAB 100 NBR-60 G1/4-IG	77.0	6	100.8	110	G1/4"-F	61.8	20	-	22	25.8
SAB 100 NBR-60 G3/8-IG	77.0	6	100.8	110	G3/8"-F	56.6	15	-	22	25.8
SAB 100 NBR-60 M10x1.5-AG	77.0	4	100.8	110	M10x1.5-M	56.6	12	-	22	25.8
SAB 100 NBR-60 M14x1.5-AG	77.0	6	100.8	110	M14x1.5-M	56.6	12	-	22	25.8
SAB 100 NBR-60 RA	77.0	6	100.8	110	Rectangular adapter	56.3	-	31.8	-	25.8
SAB 100 NBR-60 NPT3/8-IG	77.0	6	100.8	110	NPT3/8-F	56.6	15	-	22	25.8
SAB 125 NBR-60 G1/4-AG	94.0	6	126.0	135	G1/4"-M	67.8	10	-	22	32.0
SAB 125 NBR-60 G1/4-IG	94.0	6	126.0	135	G1/4"-F	72.8	20	-	22	32.0
SAB 125 NBR-60 G3/8-IG	94.0	9	126.0	135	G3/8"-F	67.8	15	-	22	32.0
SAB 125 NBR-60 M10x1.5-AG	94.0	4	126.0	135	M10x1.5-M	67.8	12	-	22	32.0
SAB 125 NBR-60 M14x1.5-AG	94.0	6	126.0	135	M14x1.5-M	67.8	12	-	22	32.0
SAB 125 NBR-60 RA	94.0	6	126.0	135	Rectangular adapter	67.5	-	31.8	-	32.0
SAB 125 NBR-60 NPT3/8-IG	94.0	6	126.0	135	NPT3/8-F	67.8	15	-	22	32.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**D1 is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

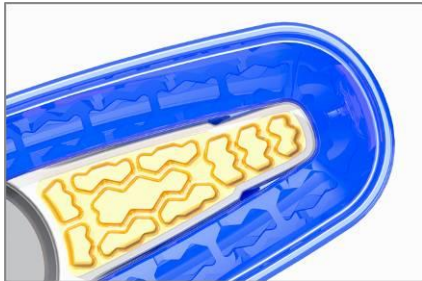
Vacuum Suction Cups

Bell-Shaped Suction Cups SAOXM (Oval)

The High Speed Suction Cup for Handling Sheet Metal

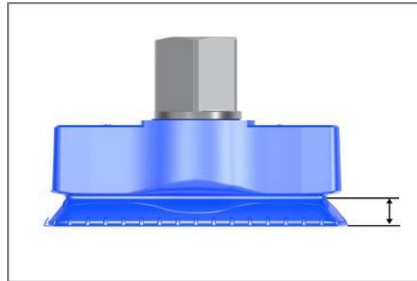
Schmalz has expanded its high speed suction cup series SAXM to include an oval-shaped suction cup for dynamic and efficient handling of long and narrow parts. SAOXM is extremely dynamic, flexible and wear-resistant. The modular suction cup can be ordered either pre-assembled or as single parts and is 100% recyclable.

Dynamic



Innovative structure – for extremely high absorption of lateral forces on oily sheet metal

Flexible



Large stroke – for optimal adaption to complex contours

Durable

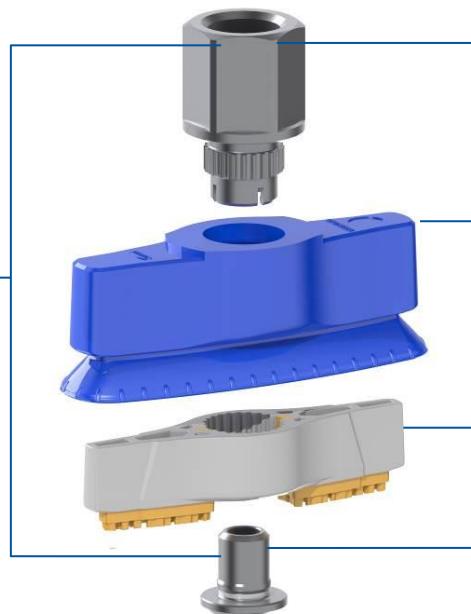


Wear-resistant material – 100% recyclable

Modular design



Two part, reusable Schmalz connector



Connector upper part

- With anti-rotation guard
- Available with different connection threads

Elastomer part

- With a flexible sealing lip and innovative inner structure
- Made from wear-resistant material Elastodur ED-85
- In sizes 60x20 mm, 80x30 mm and 100x40 mm

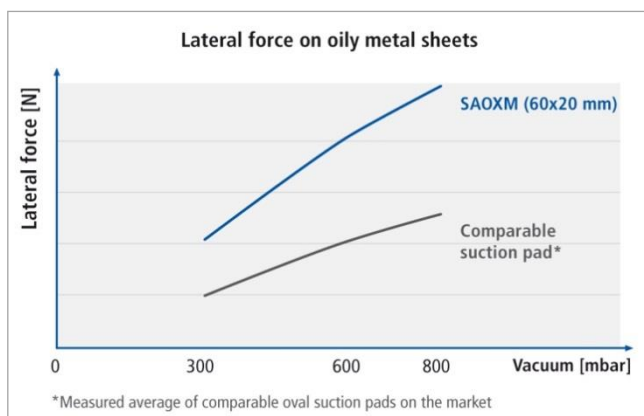
Insert with friction disc

- For additional stability and absorption of lateral force

Connector lower part

- With anti-loosening guard

Your benefits



Comparison of absorption of lateral force for SAOXM

The special inner structure and the additional friction disc make the SAOXM able to absorb much more lateral force than any other oval suction cup on the market. That has a positive effect on the relationship between the process speed and the output quantity.

• Minimize costs

The number of suction cups can be reduced while maintaining the process speed. This sustainably minimizes the overall tooling costs.

• Maximize output quantities

The process speed can be significantly increased while maintaining the same number of suction cups. This also maximizes the output quantities.

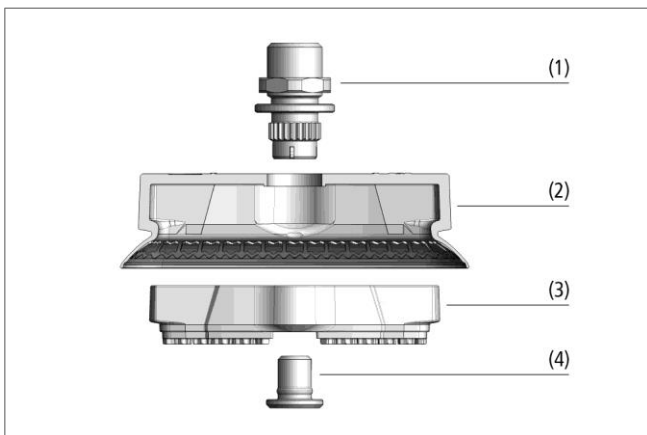
Suction Cups for Handling Sheet Metal

Bell-Shaped Suction Cups SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm



Bell-shaped suction cups SAOXM (oval)



System design bell-shaped suction cups SAOXM (oval)



Bell-shaped suction cups SAOXM for handling formed sheet metal parts

Applications

- Suction cup for high speed applications with highest demands for holding force and the absorption of lateral force especially for narrow metal sheets and car body parts
- Handling of long workpieces, workpieces with internal ribbing and reinforcing plates
- Handling of workpieces with oily surfaces
- Loading and unloading CNC metal and laser cutting machines
- Handling of workpieces with convex surfaces

Design

- Oval bell-shaped suction cup (2) with flexible sealing lip, optimum internal structure, special oil groove and inner support
- Wear-resistant material Elastodur of suction cup (ED-85) and friction disc (ED-65)
- Two-part Schmalz connector (SC) consisting of connector upper part (1) and lower part including a friction disc (3)
- Upper connector with loss protection and anti-rotation

Our Highlights...

- Very high suction cup stroke
- Optimized internal structure
- Insert with large-surface, structured inner support
- Innovative material Elastodur ED
- Environmentally friendly, modular design

Your Benefits...

- > Optimum adjustability for different workpiece contours
- > Extremely high absorption of holding and lateral forces, especially on oily sheet metal
- > Avoidance of deep-drawing, even with thin sheets
- > Extremely wear-resistant, resistant to the effects of ozone and aggressive drawing oils
- > Minimum costs, quick replacement of individual components, 100 % recyclable

Suction Cups for Handling Sheet Metal

Bell-Shaped Suction Cups SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm

Designation Code Bell-Shaped Suction Cups SAOXM (Oval)

Abbreviated designation	Suction area LxW in mm	Material and Shore hardness	Connection thread
Example SAOXM 60x20 ED-85 G1/4-IG: SAOXM	60x20	ED-85	G1/4-IG
SAOXM	60x20 80x30 100x40	ED-85	G1/4-IG (IG = female (F)) G1/4-AG (AG = male (M)) G3/8-IG NPT3/8-IG G3/8-AG M10x1.5-AG M14x1.5-AG RA rectangular adapter

Ordering Data Bell-Shaped Suction Cups SAOXM (Oval)

Bell-shaped suction cup SAOXM (elastomer part with insert including friction disc + connection element) is delivered assembled. As an alternative the individual parts can also be ordered separately. To do this, the following ordering steps are required:

- Bell-shaped suction cup of type SAOXM (step 1) – elastomer part, available in various dimensions
- Insert (step 2) - including moulded on friction disc
- Connector upper part (step 3) – available with various threads
- Connector lower part (step 4)

Bell-Shaped Suction Cups SAOXM (Oval) (Assembled)

Type*	G1/4"-M	G1/4"-F	G3/8"-M	G3/8"-F	M10x1.5-M
SAOXM 60x20 ED-85	10.01.24.00033	10.01.24.00013	10.01.24.00036	10.01.24.00017	10.01.24.00025
SAOXM 80x30 ED-85	10.01.24.00034	10.01.24.00014	10.01.24.00037	10.01.24.00018	10.01.24.00026
SAOXM 100x40 ED-85	10.01.24.00035	10.01.24.00015	10.01.24.00038	10.01.24.00019	10.01.24.00027

Type	M14x1.5-AG	Rectangular adapter	NPT 1/4-IG	NPT 3/8-IG
SAOXM 60x20 ED-85...	10.01.24.00029	10.01.24.00021	10.01.24.00039	10.01.24.00042
SAOXM 80x30 ED-85...	10.01.24.00030	10.01.24.00022	10.01.24.00040	10.01.24.00043
SAOXM 100x40 ED-85...	10.01.24.00031	10.01.24.00023	10.01.24.00041	10.01.24.00044

*Other connection nipples are available on request.

Step 1: Bell-Shaped Suction Cups SAOXM (Oval) (Single Component)

Type	Part Number
SAOXM 60x20 ED-85 SC045-AR	10.01.24.00001
SAOXM 80x30 ED-85 SC045-AR	10.01.24.00002
SAOXM 100x40 ED-85 SC055-AR	10.01.24.00003

Step 2: Insert (Single Component)

Type	SAOXM 60x20	SAOXM 80x30	SAOXM 100x40
SC-I 045 AR-FDC	10.01.24.00009	10.01.24.00010	-
SC-I 055 AR-FDC	-	-	10.01.24.00011

Suction Cups for Handling Sheet Metal

Bell-Shaped Suction SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm

Step 3: Connector Upper Part (Single Component)

Type*	SAOXM 60x20	SAOXM 80x30	SAOXM 100x40
SC-A 045-AR G1/4-AG L	10.01.06.03131	10.01.06.03131	-
SC-A 045-AR G1/4-IG L	10.01.06.03130	10.01.06.03130	-
SC-A 045-AR G3/8-AG L	10.01.06.03133	10.01.06.03133	-
SC-A 045-AR G3/8-IG L	10.01.06.03132	10.01.06.03132	-
SC-A 045-AR M10x1.5-AG L	10.01.06.03136	10.01.06.03136	-
SC-A 045-AR M14x1.5-AG L	10.01.06.03137	10.01.06.03137	-
SC-A 045-AR NPT1/4-IG L	10.01.06.03139	10.01.06.03139	-
SC-A 045-AR NPT3/8-IG L	10.01.06.03140	10.01.06.03140	-
SC-A 045-AR RA L	10.01.06.03135	10.01.06.03135	-
SC-A 055-AR G1/4-AG L	-	-	10.01.06.03165
SC-A 055-AR G1/4-IG L	-	-	10.01.06.03164
SC-A 055-AR G3/8-AG L	-	-	10.01.06.03167
SC-A 055-AR G3/8-IG L	-	-	10.01.06.03166
SC-A 055-AR M10x1.5-AG L	-	-	10.01.06.03170
SC-A 055-AR M14x1.5-AG L	-	-	10.01.06.03171
SC-A 055-AR RA L	-	-	10.01.06.03169
SC-A 055-AR NPT1/4-IG L	-	-	10.01.06.03173
SC-A 055-AR NPT3/8-IG L	-	-	10.01.06.03174

*Other connection nipples are available on request.

Step 4: Connector Lower Part (Single Component)

Type	SAOXM 60x20	SAOXM 80x30	SAOXM 100x40
SC-S 045 L	10.01.06.02740	10.01.06.02740	-
SC-S 055 L	-	-	10.01.06.02746

Technical Data Bell-Shaped Suction Cups SAOXM (Oval)

Type	Suction Force [N]*	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]***
SAOXM 60x20 ED-85...	56	44	62	5	10	4
SAOXM 80x30 ED-85...	105	110	134	13	20	4
SAOXM 100x40 ED-85...	173	135	156	24	32	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values

***The recommended hose diameter refers to a hose length of approx. 2 m

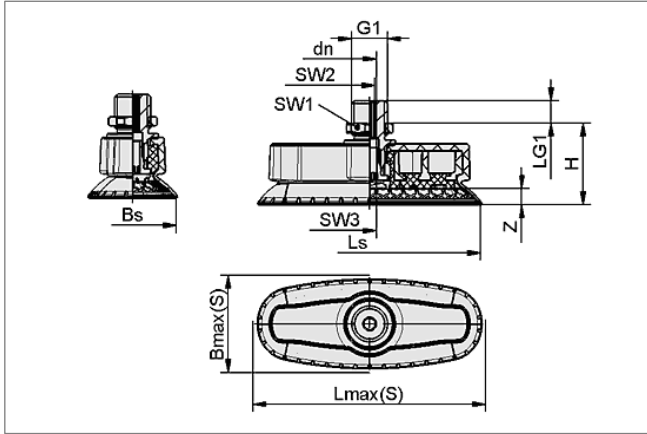
Suction Cups for Handling Sheet Metal

Bell-Shaped Suction SAOXM (Oval)

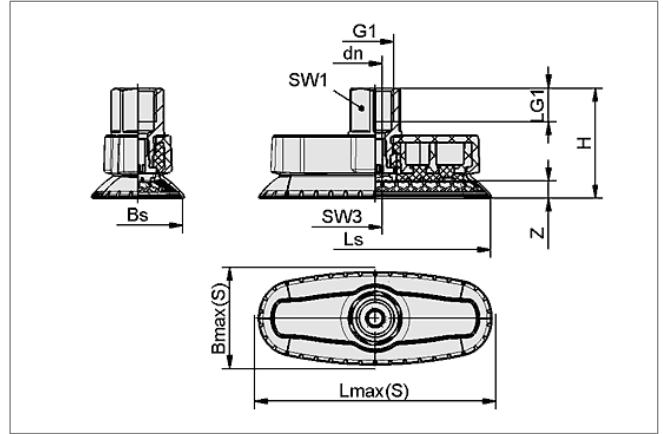
Suction area (LxW) 60x20 mm to 100x40 mm



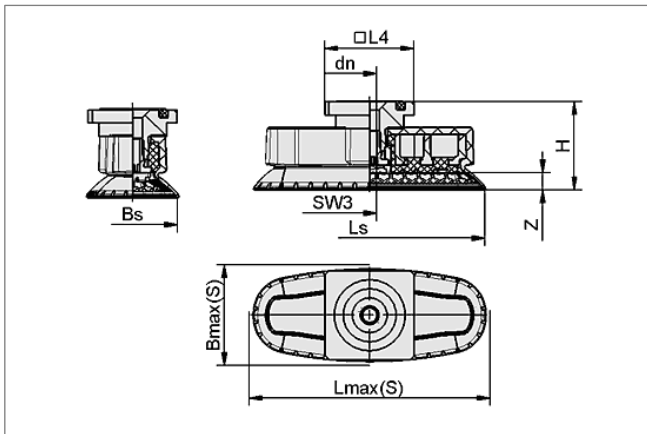
Design Data Bell-Shaped Suction Cups SAOXM (Oval) (Assembled)



SAOXM...AG



SAOXM...IG



SAOXM...RA

Suction Cups for Handling Sheet Metal

Bell-Shaped Suction SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm



Design Data Bell-Shaped Suction Cups SAOXM (Oval) (Assembled)

Type	Dimensions in mm*												
	Bmax (S)**	Bs	dn	G1	H	LG1	Lmax (S)**	Ls	L4	SW1	SW2	SW3	Z (Stroke)
SAOXM 60x20 ED-85 G1/4-IG	24	18.7	5.1	G1/4-F	38.5	12	67	61.8	-	17	-	5	4.5
SAOXM 60x20 ED-85 G3/8-IG	24	18.7	5.1	G3/8-F	38.5	12	67	61.8	-	22	-	5	4.5
SAOXM 60x20 ED-85 RA	24	18.7	5.1	-	30.8	-	67	61.8	-	-	-	5	4.5
SAOXM 60x20 ED-85 M10x1.5-AG	24	18.7	4.1	M10x1.5-M	31.3	8	67	61.8	-	16	4	5	4.5
SAOXM 60x20 ED-85 M14x1.5-AG	24	18.7	4.1	M14x1.5-M	31.3	8	67	61.8	31.8	22	4	5	4.5
SAOXM 60x20 ED-85 G1/4-AG	24	18.7	4.1	G1/4-M	29.8	8	67	61.8	-	17	4	5	4.5
SAOXM 60x20 ED-85 G3/8-AG	24	18.7	4.1	G3/8-M	29.8	8	67	61.8	-	19	4	5	4.5
SAOXM 60x20 ED-85 NPT1/4-IG	24	18.7	5.1	NPT1/4-F	38.5	15	67	61.8	-	17	-	5	4.5
SAOXM 60x20 ED-85 NPT3/8-IG	24	18.7	5.1	NPT3/8-F	38.5	14	67	61.8	-	22	-	5	4.5
SAOXM 80x30 ED-85 G1/4-IG	42	31.9	5.1	G1/4-F	39.1	12	88	82.1	-	17	-	5	6.0
SAOXM 80x30 ED-85 G3/8-IG	42	31.9	5.1	G3/8-F	39.1	12	88	82.1	-	22	-	5	6.0
SAOXM 80x30 ED-85 RA	42	31.9	5.1	-	31.4	-	88	82.1	-	-	-	5	6.0
SAOXM 80x30 ED-85 M10x1.5-AG	42	31.9	4.1	M10x1.5-M	31.8	8	88	82.1	-	16	4	5	6.0
SAOXM 80x30 ED-85 M14x1.5-AG	42	31.9	4.1	M14x1.5-M	31.8	8	88	82.1	31.8	22	4	5	6.0
SAOXM 80x30 ED-85 G1/4-AG	42	31.9	4.1	G1/4-M	30.3	8	88	82.1	-	17	4	5	6.0
SAOXM 80x30 ED-85 G3/8-AG	42	31.9	4.1	G3/8-M	30.3	8	88	82.1	-	19	4	5	6.0
SAOXM 80x30 ED-85 NPT1/4-IG	42	31.9	5.1	NPT1/4-F	39.1	15	88	82.1	-	17	-	5	6.0
SAOXM 80x30 ED-85 NPT3/8-IG	42	31.9	5.1	NPT3/8-F	39.1	14	88	82.1	-	22	-	5	6.0
SAOXM 100x40 ED-85 G1/4-IG	51	41.6	6.1	G1/4-F	45.7	12	109	101.8	-	17	-	6	7.3
SAOXM 100x40 ED-85 G3/8-IG	51	41.6	6.1	G3/8-F	45.7	12	109	101.8	-	22	-	6	7.3
SAOXM 100x40 ED-85 RA	51	41.6	6.1	-	38.2	-	109	101.8	-	-	-	6	7.3
SAOXM 100x40 ED-85 M10x1.5-AG	51	41.6	4.1	M10x1.5-M	37.7	8	109	101.8	-	16	4	6	7.3
SAOXM 100x40 ED-85 M14x1.5-AG	51	41.6	5.1	M14x1.5-M	39.2	8	109	101.8	31.8	22	5	6	7.3
SAOXM 100x40 ED-85 G1/4-AG	51	41.6	5.1	G1/4-M	37.7	8	109	101.8	-	17	5	6	7.3
SAOXM 100x40 ED-85 G3/8-AG	51	41.6	5.1	G3/8-M	37.7	8	109	101.8	-	19	5	6	7.3
SAOXM 100x40 ED-85 NPT1/4-IG	51	41.6	6.1	NPT1/4-F	45.0	15	109	101.8	-	17	-	6	7.3
SAOXM 100x40 ED-85 NPT3/8-IG	51	41.6	6.1	NPT3/8-F	45.7	15	109	101.8	-	22	-	6	7.3

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Bmax (S) and Lmax(S) are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

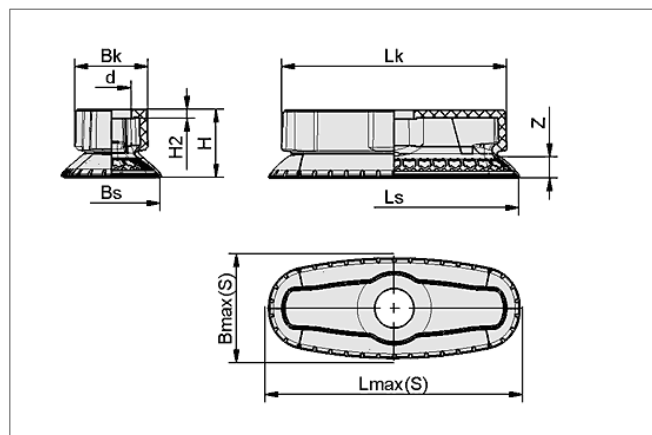
Suction Cups for Handling Sheet Metal

Bell-Shaped Suction Cups SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm



Design Data Bell-Shaped Suction Cups SAOXM (Without Connection Element) (Single Component)



SAOXM 60x20 ... 100x40

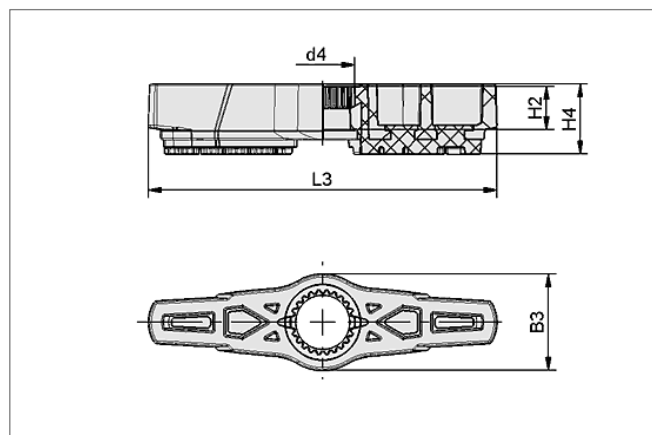
Type	Dimensions in mm*										
	Bk	Bmax(S)**	Bs	d	H	H2	Lk	Lmax(S)**	Ls	Z (Stroke)	
SAOXM 60x20 ED-85 SC045-AR	20.0	24	18.7	12.8	21.9	3	60.0	67	61.8	4	
SAOXM 80x30 ED-85 SC045-AR	24.1	42	31.9	12.8	22.4	3	74.3	88	82.1	6	
SAOXM 100x40 ED-85 SCO55-AR	32.3	51	41.6	15.2	29.3	3	109.0	109	101.8	7.3	

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Bmax (S) and Lmax(S) are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum



Design Data Insert (Single Component)



SC-I...AR-FDC

Type	Dimensions in mm*					
	for suction cup type	B3	d4	H2	H4	L3
SC-I 045 AR-FDC	SAOXM 60x20	16.0	12.7	9	13.9	55.8
SC-I 045 AR-FDC	SAOXM 80x30	19.1	12.7	9	13.9	69.0
SC-I 055 AR-FDC	SAOXM 100x40	27.3	18.6	12	14.5	84.3

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

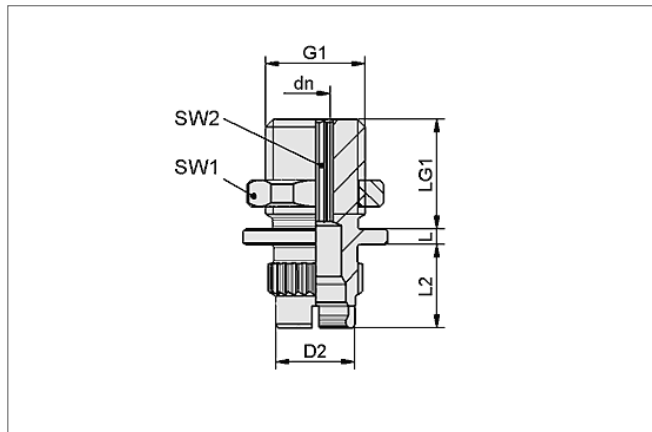
Suction Cups for Handling Sheet Metal

Bell-Shaped Suction Cups SAOXM (Oval)

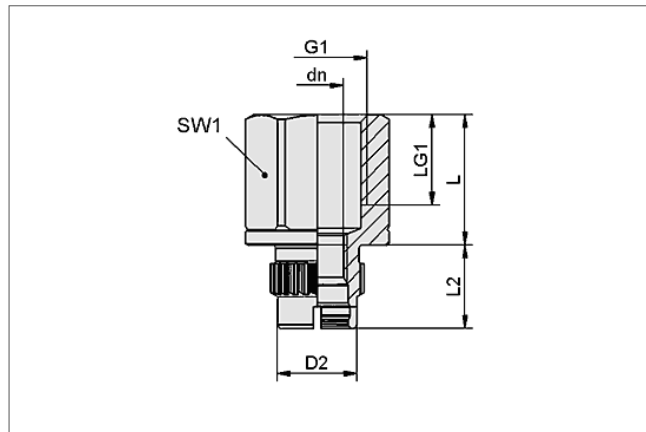
Suction area (LxW) 60x20 mm to 100x40 mm



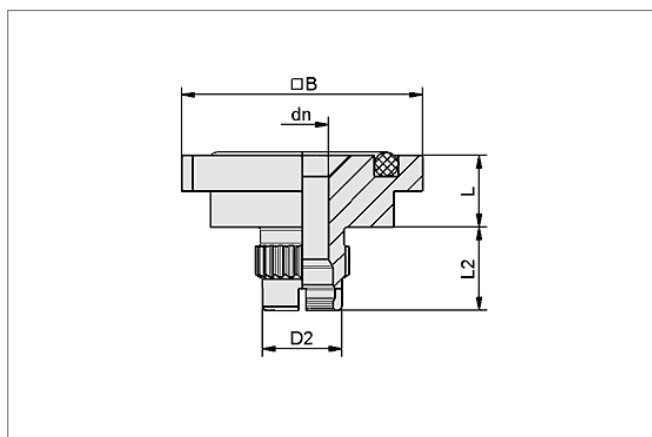
Design Data Connector Upper Part (Single Component)



SC-A...AG



SC-A...IG



SC-A...RA

Type	Dimensions in mm								
	B	dn	D2	G1	L	L2	LG1	SW1	SW2
SC-A 045-AR G1/4-AG L	-	4.1	10.5	G1/4"-M	2.0	11	14.5	17	4
SC-A 045-AR G1/4-IG L	-	-	10.5	G1/4"-F	17.2	11	14.8	17	-
SC-A 045-AR G3/8-AG L	-	4.1	10.5	G3/8"-M	2.0	11	14.5	19	4
SC-A 045-AR G3/8-IG L	-	-	10.5	G3/8"-F	17.2	11	12.0	22	-
SC-A 045-AR M10-AG L	-	4.1	10.5	M10-M	3.5	11	14.5	16	4
SC-A 045-AR M14x1.5-AG L	-	4.1	10.5	M14x1.5-M	2.0	11	16.0	22	4
SC-A 045-AR NPT1/4-IG L	-	-	10.5	NPT1/4-F	17.2	11	15.0	17	-
SC-A 045-AR NPT3/8-IG L	-	-	10.5	NPT3/8-F	17.2	11	14.0	22	-
SC-A 045-AR RA L	31.8	-	10.5	-	9.5	11	-	-	-
SC-A 055-AR G1/4-AG L	-	5.1	13.0	G1/4"-M	2.5	15	14.5	17	5
SC-A 055-AR G1/4-IG L	-	-	13.0	G1/4"-F	17.0	15	14.8	17	-
SC-A 055-AR G3/8-AG L	-	5.1	13.0	G3/8"-M	2.5	15	14.5	19	5
SC-A 055-AR G3/8-IG L	-	-	13.0	G3/8"-F	17.0	15	12.0	22	-
SC-A 055-AR M10-AG L	-	4.1	13.0	M10-M	2.5	15	14.5	16	4
SC-A 055-AR M14x1.5-AG L	-	5.1	13.0	M14x1.5-M	2.5	15	16.0	22	5
SC-A 055-AR NPT1/4-IG L	-	-	13.0	NPT1/4-F	17.0	15	15.0	17	-
SC-A 055-AR NPT3/8-IG L	-	-	13.0	NPT3/8-F	17.0	15	14.0	22	-
SC-A 055-AR RA L	31.8	-	13.0	-	9.5	15	-	-	-

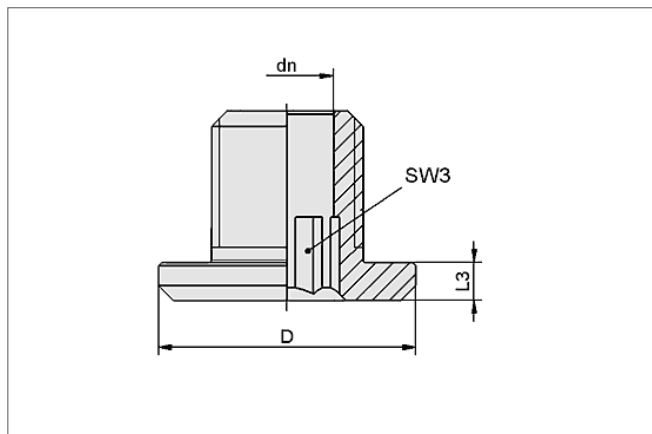
Suction Cups for Handling Sheet Metal

Bell-Shaped Suction Cups SAOXM (Oval)

Suction area (LxW) 60x20 mm to 100x40 mm



Design Data Connector Lower Part (Single Component)



Type	Dimensions in mm			
	dn	D	L3	SW3
SC-S 045 L	5.1	13	2	5
SC-S 055 L	6.1	21	3	6

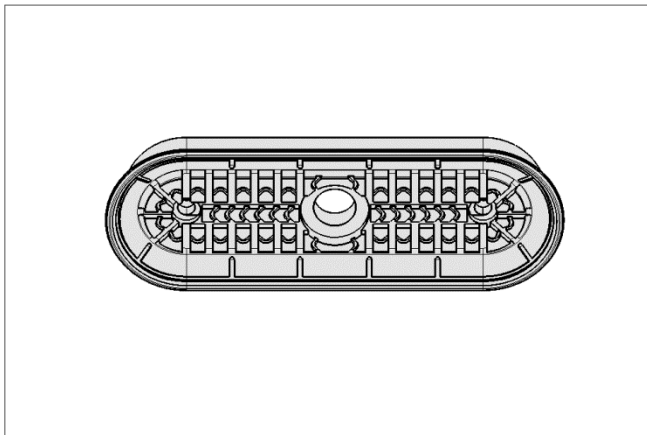
Suction Cups for Handling Sheet Metal

Flat Suction Cups SAOF (Oval)

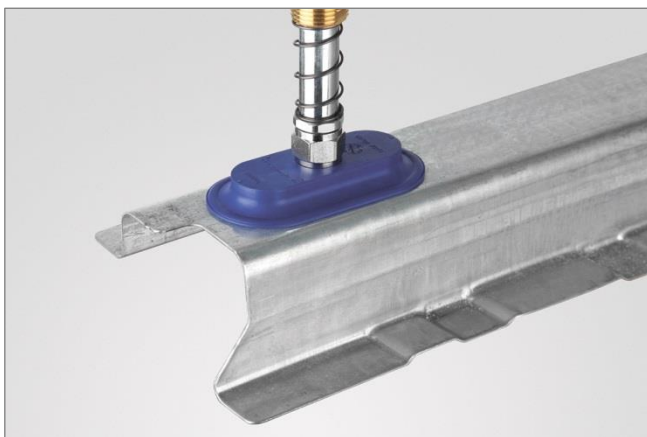
Suction area (LxW) from 50 x 16 mm to 140 x 70 mm



Flat suction cups SAOF (oval)



System design flat suction cups SAOF (oval)



Flat suction cups SAOF being used for handling pressed sheet metal parts

Applications

- Oval, flat suction cup for dynamic handling of metal sheets with short cycle times
- Handling of thin steel sheets and aluminum sheets without deformation or deep-drawing
- For use e.g. in feeder systems for press lines in the automobile industry
- Handling of long, narrow metal sheet parts, e.g. reinforcing ribs and plates
- Slot on the bottom prevents oily sheets from slipping and permits precise positioning in stamping presses etc.

Design

- Robust, wear-resistant oval suction cup SAOF made of NBR with single sealing lip, special slot and inner support
- Connection nipple glued to the suction cup with a reinforcing element (very high strength)
- Suction cup available with various connection types
- Available in two material hardness values (45 Shore, 60 Shore)

Our Highlights...

- Wide range of sizes
- Large, structured inner support
- Flat, oval suction cup
- Soft and flexible sealing lip
- Nipple vulcanized to suction cup

Your Benefits...

- > For a wide range of work-piece sizes and shapes
- > No deep-drawing of the work-piece; capable of handling high lateral forces, even on oily metal sheets
- > Handling of long, narrow workpieces (sections, tubes) or flat workpieces with bars
- > Good sealing, even on slightly curved surfaces
- > Prevention of machine damage and downtimes as the result of lost suction cups

Suction Cups for Handling Sheet Metal

Flat Suction Cups SAOF (Oval)

Suction area (LxW) from 50 x 16 mm to 140 x 70 mm

Designation Code Flat Suction Cups SAOF (Oval)

Abbreviated designation	Suction area LxW in mm	Material and Shore hardness	Connection thread
Example SAOF 80x40 NBR-60 G1/4-IG:			
SAOF	80x40	NBR-60	G1/4-IG
SAOF	50x16 to 140x70	NBR-45 NBR-60	G1/4-AG (AG = male (M)) G1/4-IG (IG = female (F)) G3/8-IG M10-AG M14x1.5-AG RA rectangular adapter NPT 3/8-F

Ordering Data Flat Suction Cups SAOF (Oval)

Suction cup SAOF, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Flat Suction Cups SAOF (Oval)

Type*	Connection G1/4"-M	G1/4"-F	G3/8"-F	M10x1.5-M	M14x1.5-M	Rectangular adapter	NPT 3/8-F
SAOF 50x16 NBR-60	10.01.05.00521	10.01.05.00511	10.01.05.00518	10.01.05.00527	10.01.05.00530	10.01.05.00515	
SAOF 50x16 NBR-45	10.01.05.00550	10.01.05.00551	10.01.05.00553	10.01.05.00555	10.01.05.00556	10.01.05.00554	10.01.05.00813
SAOF 60x23 NBR-60	10.01.05.00376	10.01.05.00367	10.01.05.00370	10.01.05.00382	10.01.05.00385	10.01.05.00373	
SAOF 60x23 NBR-45	10.01.05.00559	10.01.05.00560	10.01.05.00562	10.01.05.00564	10.01.05.00565	10.01.05.00563	10.01.05.00812
SAOF 90x30 NBR-60	10.01.05.00311	10.01.05.00266	10.01.05.00290	10.01.05.00326	10.01.05.00341	10.01.05.00296	
SAOF 90x30 NBR-45	10.01.05.00568	10.01.05.00569	10.01.05.00570	10.01.05.00572	10.01.05.00573	10.01.05.00571	10.01.05.00810
SAOF 80x40 NBR-60	10.01.05.00314	10.01.05.00269	10.01.05.00293	10.01.05.00329	10.01.05.00344	10.01.05.00299	
SAOF 80x40 NBR-45	10.01.05.00577	10.01.05.00578	10.01.05.00579	10.01.05.00581	10.01.05.00582	10.01.05.00580	10.01.05.00759
SAOF 100x50 NBR-60	10.01.05.00317	10.01.05.00281	10.01.05.00272	10.01.05.00332	10.01.05.00347	10.01.05.00302	
SAOF 100x50 NBR-45	10.01.05.00586	10.01.05.00587	10.01.05.00588	10.01.05.00590	10.01.05.00591	10.01.05.00589	10.01.05.00760
SAOF 120x60 NBR-60	10.01.05.00320	10.01.05.00284	10.01.05.00275	10.01.05.00335	10.01.05.00350	10.01.05.00305	
SAOF 120x60 NBR-45	10.01.05.00594	10.01.05.00595	10.01.05.00596	10.01.05.00598	10.01.05.00599	10.01.05.00597	10.01.05.00761
SAOF 140x70 NBR-60	10.01.05.00323	10.01.05.00287	10.01.05.00278	10.01.05.00338	10.01.05.00353	10.01.05.00308	
SAOF 140x70 NBR-45	10.01.05.00603	10.01.05.00604	10.01.05.00605	10.01.05.00607	10.01.05.00608	10.01.05.00606	10.01.05.00811

*Other connection nipples are available on request.

Technical Data Flat Suction Cups SAOF (Oval)

Type	Suction force [N]*	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]***
SAOF 50x16	31	24	12	2.0	8	4
SAOF 60x23	57	37	33	3.0	20	4
SAOF 90x30	122	96	64	7.0	40	4
SAOF 80x40	140	110	100	10.7	50	4
SAOF 100x50	217	181	121	20.0	75	6
SAOF 120x60	312	254	170	35.0	75	6
SAOF 140x70	425	344	230	52.0	90	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

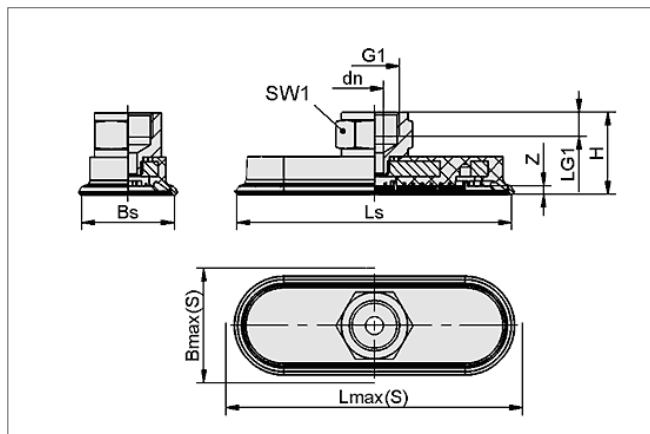
***The recommended hose diameter refers to a hose length of approx. 2 m

Suction Cups for Handling Sheet Metal

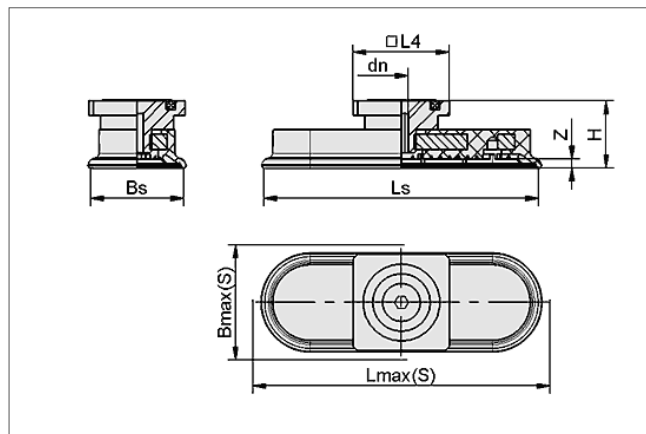
Flat Suction Cups SAOF (Oval)

Suction area (LxW) from 50 x 16 mm to 140 x 70 mm

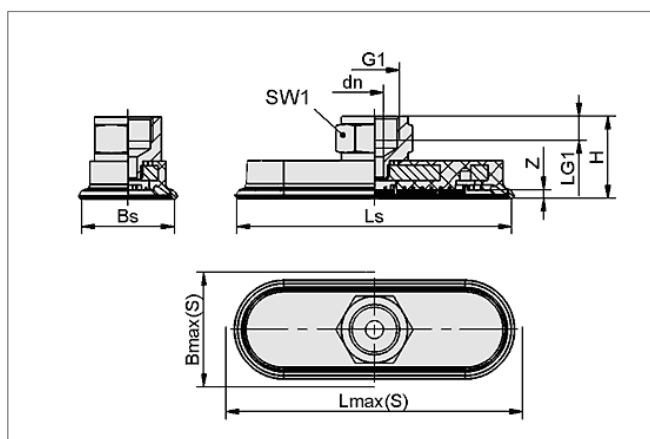
Design Data Flat Suction Cups SAOF (Oval)



SAOF 50x16 to 140x70 IG



SAOF 50x16 to 140x70 AG



SAOF 50x16 to 140x70 RA (rectangular adapter)

Type	Dimensions in mm*										
	Bs	Bmax (S)**	dn	G1	H	L4	Ls	Lmax (S)**	LG1	SW1	Z (Stroke)
SAOF 50x16 G1/4-AG	14.6	18	5	G1/4"-M	26	-	48.6	52	8	17	3
SAOF 50x16 G1/4-IG	14.6	18	6	G1/4"-F	33	-	48.6	52	8	17	3
SAOF 50x16 G3/8-IG	14.6	18	6	G3/8"-F	34	-	48.6	52	9	22	3
SAOF 50x16 M10x1.5-AG	14.6	18	4	M10x1.5-M	26	-	48.6	52	10	16	3
SAOF 50x16 M14x1.5-AG	14.6	18	5	M14x1.5-M	28	-	48.6	52	10	22	3
SAOF 50x16 RA	14.6	18	4	-	29	32	48.6	52	-	-	3
SAOF 60x23 G1/4-AG	21.6	25	5	G1/4"-M	18	-	60.6	64	8	17	3
SAOF 60x23 G1/4-IG	21.6	25	6	G1/4"-F	26	-	60.6	64	8	17	3
SAOF 60x23 G3/8-IG	21.6	25	6	G3/8"-F	26	-	60.6	64	9	22	3
SAOF 60x23 M10x1.5-AG	21.6	25	4	M10x1.5-M	18	-	60.6	64	10	16	3
SAOF 60x23 M14x1.5-AG	21.6	25	5	M14x1.5-M	20	-	60.6	64	10	22	3
SAOF 60x23 RA	21.6	25	4	-	21	32	60.6	64	-	-	3
SAOF 90x30 G1/4-AG	30.6	34	5	G1/4"-M	19	-	90.6	94	8	17	3
SAOF 90x30 G1/4-IG	30.6	34	6	G1/4"-F	26	-	90.6	94	8	17	3
SAOF 90x30 G3/8-IG	30.6	34	6	G3/8"-F	27	-	90.6	94	9	22	3

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Bmax (S) and Lmax(S) are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

Suction Cups for Handling Sheet Metal

Flat Suction Cups SAOF (Oval)

Suction area (LxB) from 50 x 16 mm to 140 x 70 mm

Type	Dimensions in mm*										
	Bs	Bmax(S)**	dn	G1	H	L4	Ls	Lmax(S)**	LG1	SW1	Z (Stroke)
SAOF 90x30 M10x1.5-AG	30.6	34	4	M10x1.5-M	19.0	-	90.6	94	10	17	3
SAOF 90x30 M14-1,5-AG	30.6	34	5	M14x1.5-M	21.0	-	90.6	94	10	22	3
SAOF 90x30 RA	30.6	34	4	-	22.0	-	90.6	94	-	-	3
SAOF 80x40 G1/4-AG	38.6	43	5	G1/4"-M	20.0	-	80.6	85	8	17	4
SAOF 80x40 G1/4-IG	38.6	43	6	G1/4"-F	28.0	-	80.6	85	8	17	4
SAOF 80x40 G3/8-IG	38.6	43	6	G3/8"-F	28.0	-	80.6	85	9	22	4
SAOF 80x40 M10x1.5-AG	38.6	43	4	M10x1.5-M	20.0	-	80.6	85	10	17	4
SAOF 80x40 M14x1.5-AG	38.6	43	5	M14x1.5-M	22.0	-	80.6	85	10	22	4
SAOF 80x40 RA	38.6	43	4	-	23.0	-	80.6	85	-	-	4
SAOF 100x50 G1/4-AG	48.1	54	6	G1/4"-M	22.0	-	101.1	106	8	17	5
SAOF 100x50 G1/4-IG	48.1	54	8	G1/4"-F	30.0	-	101.1	106	8	17	5
SAOF 100x50 G3/8-IG	48.1	54	8	G3/8"-F	30.0	-	101.1	106	9	22	5
SAOF 100x50 M10x1.5-AG	48.1	54	4	M10x1.5-M	22.0	-	101.1	106	10	17	5
SAOF 100x50 M14x1.5-AG	48.1	54	4	M14x1.5-M	22.0	-	101.1	106	10	22	5
SAOF 100x50 RA	48.1	54	6	-	25.0	32	101.1	106	-	-	5
SAOF 120x60 G1/4-AG	57.6	65	6	G1/4"-M	24.0	-	126.6	128	8	17	6
SAOF 120x60 G1/4-IG	57.6	65	8	G1/4"-F	32.0	-	126.6	128	8	17	6
SAOF 120x60 G3/8-IG	57.6	65	8	G3/8"-F	32.0	-	126.6	128	9	22	6
SAOF 120x60 M10x1.5-AG	57.6	65	4	M10x1.5-M	24.0	-	126.6	128	10	17	6
SAOF 120x60 M14x1.5-AG	57.6	65	6	M14x1.5-M	26.0	-	126.6	128	10	22	6
SAOF 120x60 RA	57.6	65	6	-	27.0	-	126.6	128	-	-	6
SAOF 140x70 G1/4-AG	67.6	76	6	G1/4"-M	25.0	-	140.6	149	8	17	7
SAOF 140x70 G1/4-IG	67.6	76	8	G1/4"-F	33.0	-	140.6	149	8	17	7
SAOF 140x70 G3/8-IG	67.6	76	8	G3/8"-F	33.5	-	140.6	149	9	22	7
SAOF 140x70 M10x1.5-AG	67.6	76	4	M10x1.5-M	25.0	-	140.6	149	10	17	7
SAOF 140x70 M14x1.5-AG	67.6	76	6	M14x1.5-M	27.0	-	140.6	149	10	22	7
SAOF 140x70 RA	67.6	76	6	-	28.0	-	140.6	149	-	-	7

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**Bmax (S) and Lmax(S) are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

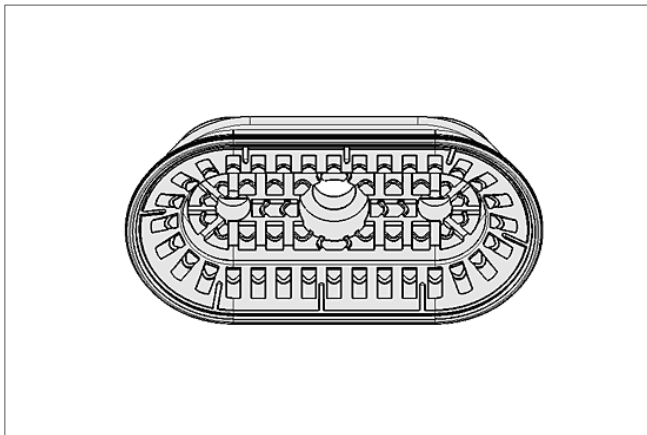
Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 140 x 70 mm



Bellows suction cups SAOB (oval, 1.5 folds)



System design bellows suction cups SAOB (oval, 1.5 folds)



Bellows suction cups SAOB being used for handling car body components

Applications

- Oval bellows suction cup with 1.5 folds for dynamic handling of long, narrow workpieces e.g. reinforcing ribs and plates
- Handling of thin steel sheets and aluminum sheets without deformation or deep-drawing
- For use e.g. in feeder systems for press lines in the automobile industry
- Slot on the bottom prevents the oily sheets from slipping and permits precise positioning in stamping presses etc.

Design

- Robust, wear-resistant oval suction cup SAOB with 1.5 folds made of NBR, single sealing lip, special slot and inner support
- Connection nipple glued to the suction cup with a reinforcing element (very high strength)
- Suction cups available with various connection types

Our Highlights...

- 1.5 folds, oval suction cup
- Large, structured inner support
- Wide range of sizes
- Stiff top fold
- Soft and flexible sealing lip

Your Benefits...

- > For long, narrow workpieces and for stamped body components
- > No deep-drawing of the workpiece and handling of very high lateral forces, even with oily metal sheets
- > For a wide range of workpiece sizes and shapes
- > Resistance to lateral forces and high horizontal accelerations
- > Good sealing, even on slightly curved surfaces

Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 140 x 70 mm

Designation Code Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Abbreviated designation	Suction area LxW in mm	Material and Shore hardness	Connection thread
Example SAOB 60x30 NBR-60 RA:			
SAOB	60x30	NBR-60	RA
SAOB	60x30 80x40 110x55 140x70	NBR-60	G1/4-AG (AG = male (M)) G1/4-IG (IG = female (F)) G3/8-IG NPT3/8-IG M10-AG M14x1.5-AG RA rectangular adapter NPT 3/8-F

Ordering Data Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Suction cup SAOB, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Type*	Connection G1/4"-M	G1/4"-F	G3/8"-F	M10x1.5-M	M14x1.5-M	Rectangular adapter	NPT3/8"-F
SAOB 60x30 NBR-60	10.01.06.00916	10.01.06.00891	10.01.06.00904	10.01.06.01024	10.01.06.01032	10.01.06.00908	10.01.06.03261
SAOB 80x40 NBR-60	10.01.06.00918	10.01.06.00893	10.01.06.00906	10.01.06.01026	10.01.06.01034	10.01.06.00910	10.01.06.03076
SAOB 110x55 NBR-60	10.01.06.00920	10.01.06.00900	10.01.06.00895	10.01.06.01028	10.01.06.01036	10.01.06.00912	10.01.06.03077
SAOB 140x70 NBR-60	10.01.06.00922	10.01.06.00902	10.01.06.00897	10.01.06.01030	10.01.06.01038	10.01.06.00914	10.01.06.03078

*Other connection nipples are available on request.

Technical Data Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Lateral force [N]**	Lateral force oily surface [N]**	Volume [cm³]	Min. curve radius [mm] (convex)	Recom. Internal Hose diameter d [mm]***
SAOB 60x30 NBR-60	38	55	57	52	9.6	30	4
SAOB 80x40 NBR-60	65	100	100	95	20.6	40	6
SAOF 110x55 NBR-60	110	185	180	161	50.8	50	6
SAOF 140x70 NBR-60	165	258	287	255	100.4	70	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified lateral forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx. 2 m

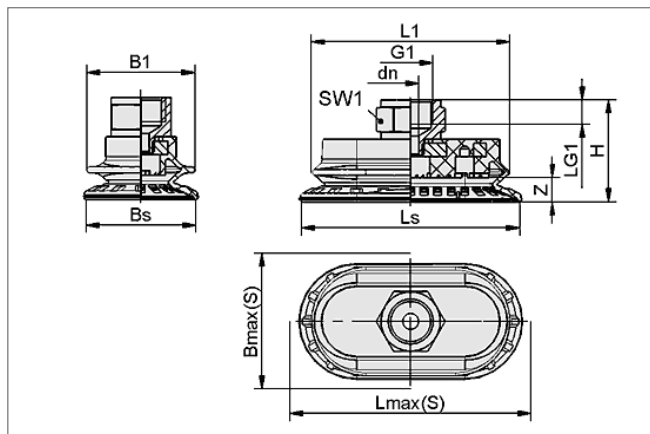


Suction Cups for Handling Sheet Metal

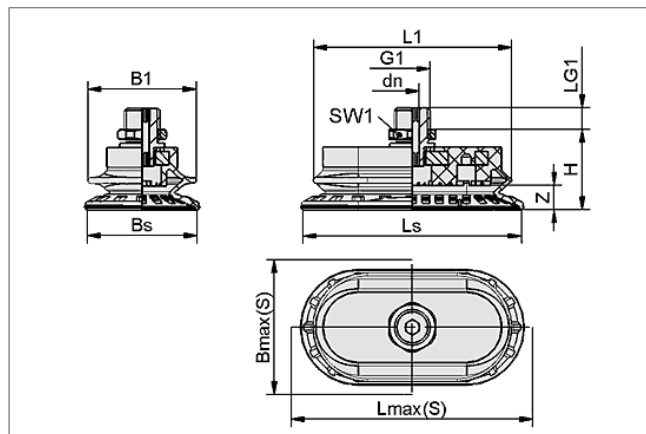
Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 140 x 70 mm

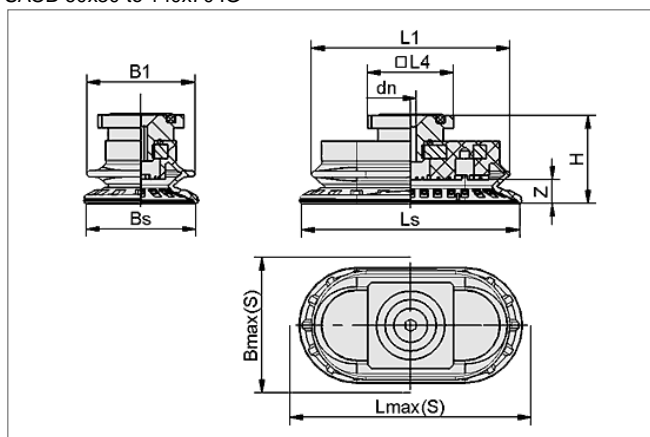
Design Data Bellows Suction Cups SAOB (Oval, 1.5 Folds)



SAOB 60x30 to 140x70 IG



SAOB 60x30 to 140x70 AG



SAOB 60x30 to 140x70 (rectangular adapter)

Type	Dimensions in mm*													
	B	B1**	Bs	dn	G1	H	Lmax(S)	L1**	Ls	LG1	L4	SW1	Z (Stroke)	
SAOB 60x30 NBR-60 G1/4-AG	33	31	30.6	5	G1/4"-M	27.0	63	55.7	60.6	8	-	17	7.0	
SAOB 60x30 NBR-60 G1/4-IG	33	31	30.6	6	G1/4"-F	34.5	63	55.7	60.6	8	-	17	7.0	
SAOB 60x30 NBR-60 G3/8-IG	33	31	30.6	6	G3/8"-F	35.0	63	55.7	60.6	9	-	22	7.0	
SAOB 60x30 NBR-60 M10x1.5-AG	33	31	30.6	4	M10x1.5-M	27.0	63	55.7	60.6	10	-	17	7.0	
SAOB 60x30 NBR-60 M14x1.5-AG	33	31	30.6	5	M14x1.5-M	29.0	63	55.7	60.6	10	-	22	7.0	
SAOB 60x30 NBR-60 RA	33	31	30.6	4	-	30.0	63	55.7	60.6	-	31.8	-	7.0	
SAOB 60x30 NBR-60 NPT3/8-IG	33	31	30.6	6	NPT3/8"-F	35.0	63	55.7	60.6	7	-	22	7.0	
SAOB 80x40 NBR-60 G1/4-AG	43	40	40.6	5	G1/4"-M	29.7	83	73.3	80.6	8	-	17	9.0	
SAOB 80x40 NBR-60 G1/4-IG	43	40	40.6	6	G1/4"-F	37.2	83	73.3	80.6	8	-	17	9.0	
SAOB 80x40 NBR-60 G3/8-IG	43	40	40.6	6	G3/8"-F	37.7	83	73.3	80.6	9	-	22	9.0	
SAOB 80x40 NBR-60 M10x1.5-AG	43	40	40.6	4	M10x1.5-M	29.7	83	73.3	80.6	10	-	17	9.0	
SAOB 80x40 NBR-60 M14x1.5-AG	43	40	40.6	5	M14x1.5-M	31.7	83	73.3	80.6	10	-	22	9.0	
SAOB 80x40 NBR-60 RA	43	40	40.6	4	-	32.7	83	73.3	80.6	-	31.8	-	9.0	
SAOB 80x40 NBR-60 NPT3/8-IG	43	40	40.6	6	NPT3/8"-F	37.7	83	73.3	80.6	7	-	22	9.0	

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**B1 and L1 are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

Suction Cups for Handling Sheet Metal

Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 140 x 70 mm

Design Data Bellows Suction Cups SAOB (Oval, 1.5 Folds)

Type	Dimensions in mm*												
	B	B1**	Bs	dn	G1	H	Lmax (S)	L1**	Ls	LG1	L4	SW1	Z (Stroke)
SAOB 110x55 NBR-60 G1/4-AG	59	53	55.1	6	G1/4"-M	35.5	114	98.8	110.1	8	-	17	12.0
SAOB 110x55 NBR-60 G1/4-IG	59	53	55.1	8	G1/4"-F	43.0	114	98.8	110.1	8	-	17	12.0
SAOB 110x55 NBR-60 G3/8-IG	59	53	55.1	8	G3/8"-F	43.5	114	98.8	110.1	9	-	22	12.0
SAOB 110x55 NBR-60 M10x1.5-AG	59	53	55.1	4	M10x1.5-M	35.5	114	98.8	110.1	10	-	17	12.0
SAOB 110x55 NBR-60 M14x1.5-AG	59	53	55.1	6	M14x1.5-M	37.5	114	98.8	110.1	10	-	22	12.0
SAOB 110x55 NBR-60 RA	59	53	55.1	6	-	38.5	114	98.8	110.1	-	31.8	-	12.0
SAOB 110x55 NBR-60 NPT3/8-IG	59	53	55.1	8	NPT3/8"-F	43.5	114	98.8	110.1	7	-	22	12.0
SAOB 140x70 NBR-60 G1/4-AG	75	67	70.1	6	G1/4"-M	39.5	146	126.0	141.1	8	-	17	16.5
SAOB 140x70 NBR-60 G1/4-IG	75	67	70.1	8	G1/4"-F	47.0	146	126.0	141.1	8	-	17	16.5
SAOB 140x70 NBR-60 G3/8-IG	75	67	70.1	8	G3/8"-F	47.5	146	126.0	141.1	9	-	22	16.5
SAOB 140x70 NBR-60 M10x1.5-AG	75	67	70.1	4	M10x1.5-M	39.5	146	126.0	141.1	10	-	17	16.5
SAOB 140x70 NBR-60 M14x1.5-AG	75	67	70.1	6	M14x1.5-M	41.5	146	126.0	141.1	10	-	22	16.5
SAOB 140x70 NBR-60 RA	75	67	70.1	6	-	42.5	146	126.0	141.1	-	31.8	-	16.5
SAOB 140x70 NBR-60 NPT3/8-IG	75	67	70.1	8	NPT3/8"-F	47.5	146	126.0	141.1	7	-	22	16.5

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

**B1 and L1 are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

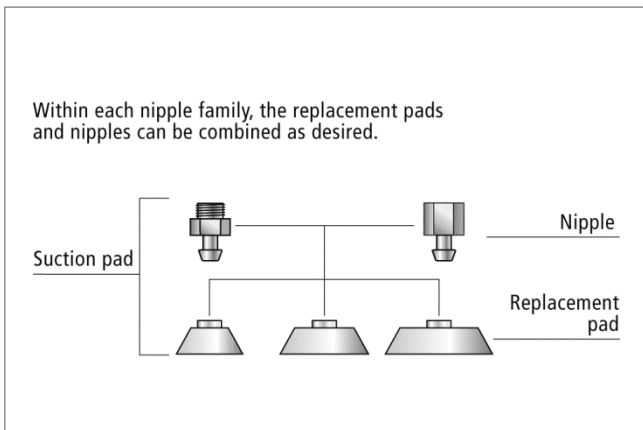
Flat Suction Cups (Round)

Flat Suction Cups PFYN VU1

Suction area (\varnothing) from 15 mm to 95 mm



Flat suction cups PFYN VU1



System design flat suction cups PFYN VU1



Flat suction cups PFYN VU1 being used for handling large sheet metal parts

Applications

- Round, flat suction cup for applications in multi-shift operations with very short cycle times
- Handling of oily metal sheets (automobile production), particularly suitable for destackers
- Handling of extremely abrasive workpieces

Design

- Robust, wear-resistant suction cup PFYN with single sealing lip, consisting of suction cup PFG, made of Vulkollan VU1, and connection nipple
- Suction cup and nipple fitted through a form-fit connection, even handling heavy loads the connection is ensured.

Our Highlights...

- Material Vulkollan VU1, resistant to tearing
- Good resistance to chemicals
- Very low wear, about 10-12mm³ to DIN 53516
- Supports on the bottom
- Temperature resistance: -40 °C to +80 °C, short-term resistance up to +100 °C
- Very good resistance to extreme dynamic loading

Your Benefits...

- > Extremely wear-resistant suction cup for very high loads and a long lifetime
- > Unaffected by oil (handling of sheet metal)
- > Lifetime up to 20 times higher, compared to standard NBR
- > No permanent deformation of thin-walled workpieces
- > Suitable for use at very low and high temperatures
- > Suitable for destackers

Flat Suction Cups (Round)

Flat Suction Cups PFYN VU1

Suction area (\varnothing) from 15 mm to 95 mm

Designation Code Flat Suction Cups PFYN VU1

Abbreviated designation	Suction area \varnothing in mm	Material and Shore hardness	Connection thread
Example PFYN 80 VU1-72 G1/4-IG: PFYN PFYN	80 15 to 95	VU1-72 VU1-72	G1/4-IG G1/8-AG (AG = male (M)) G1/8-IG (IG = female (F)) G1/4-AG G1/4-IG

Ordering Data Flat Suction Cups PFYN VU1

Suction cup PFYN VU1 (elastomer part + connection nipple) is delivered assembled. The assembly consists of:

- Suction cup of type PFG VU 1 – elastomer part, available in various diameters
- Connection nipple of type SA-NIP – available with various threads

Available spare parts: suction cup PFG VU1, connection nipple SA-NIP

Flat Suction Cups PFYN VU1

Type	Connection G1/4" –M	G1/4" –F	G1/8" –M	G1/8" –F
PFYN 15 VU1-72	-	-	10.01.01.00556	10.01.01.00557
PFYN 30 VU1-72	-	-	10.01.01.00550	10.01.01.00558
PFYN 50 VU1-72	10.01.01.00521	10.01.01.00547	-	-
PFYN 60 VU1-72	10.01.01.00608	10.01.01.00609	-	-
PFYN 80 VU1-72	10.01.01.00522	10.01.01.00524	-	-
PFYN 95 VU1-72	10.01.01.00523	10.01.01.00525	-	-

Ordering Data Spare Parts Flat Suction Cups

Type*	Flat suction cup (round)	Part Number
PFYN 15 VU1-72	PFG 15 VU1-72 N005	10.01.01.00555
PFYN 30 VU1-72	PFG 30 VU1-72 N007	10.01.01.00549
PFYN 50 VU1-72	PFG 50 VU1-72 N011	10.01.01.00424
PFYN 60 VU1-72	PFG 60 VU1-72 N011	10.01.01.00606
PFYN 80 VU1-72	PFG 80 VU1-72 N012	10.01.01.00426
PFYN 95 VU1-72	PFG 95 VU1-72 N012	10.01.01.00430

Ordering Data Spare Parts Connection Nipples

Type	Suction cup connection nipple	Part Number
PFYN 15 VU1-72 G1/8-AG	SA-NIP N005 G1/8-AG DN200	10.01.01.03529
PFYN 15 VU1-72 G1/8-IG	SA-NIP N005 G1/8-IG DN200	10.01.01.03521
PFYN 30 VU1-72 G1/8-AG	SA-NIP N007 G1/8-AG DN240	10.01.01.03531
PFYN 30 VU1-72 G1/8IG	SA-NIP N007 G1/8-IG DN350	10.01.01.03523
PFYN 50 VU1-72 G1/4-AG	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
PFYN 50 VU1-72 G1/4-IG	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
PFYN 60 VU1-72 G1/4-AG	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
PFYN 60 VU1-72 G1/4-IG	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
PFYN 80 VU1-72 G1/4-AG	SA-NIP N012 G1/4-AG DN500	10.01.01.10664
PFYN 80 VU1-72 G1/4-IG	SA-NIP N012 G1/4-IG DN600	10.01.01.00528
PFYN 95 VU1-72 G1/4-AG	SA-NIP N012 G1/4-AG DN500	10.01.01.10664
PFYN 95 VU1-72 G1/4-IG	SA-NIP N012 G1/4-IG DN600	10.01.01.00528

Flat Suction Cups (Round)

Flat Suction Cups PFYN VU1

Suction area (\emptyset) from 15 mm to 95 mm

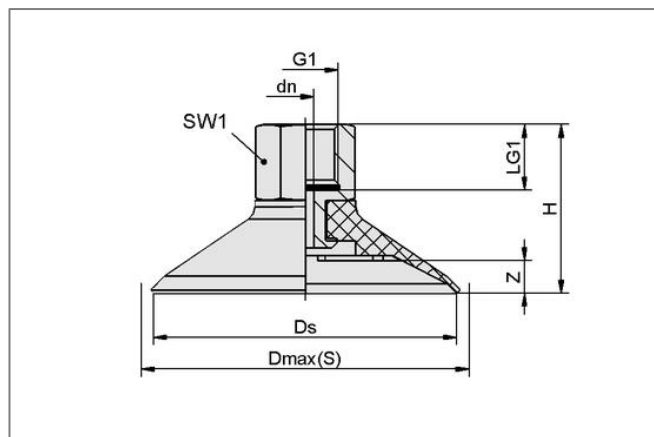
Technical Data Flat Suction Cups PFYN VU1

Type	Suction force [N]*	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]**	Nipple family
PFYN 15 VU1-72	8.5	0.5	13	4	N 005
PFYN 30 VU1-72	32.0	1.7	30	4	N 007
PFYN 50 VU1-72	95.0	6.0	75	6	N 011
PFYN 60 VU1-72	130.0	15.0	75	6	N 011
PFYN 80 VU1-72	260.0	30.0	100	6	N 012
PFYN 95 VU1-72	350.0	42.0	140	6	N 012

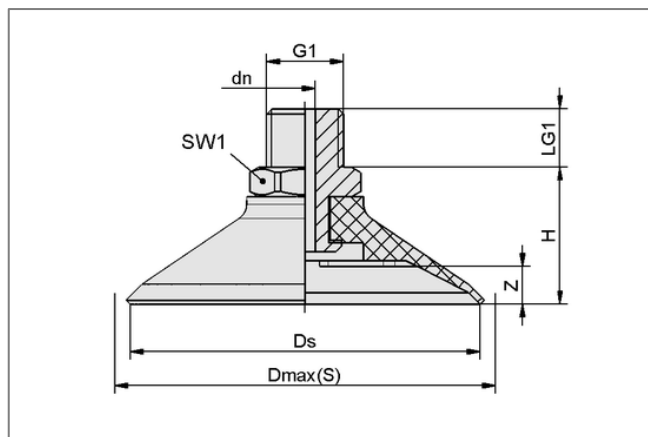
*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The recommended hose diameter refers to a hose length of approx. 2 m

Design Data Flat Suction Cups PFYN VU1



PFYN 15 to 95 VU1 IG



PFYN 15 to 95 VU1 AG

Design Data Flat Suction Cups PFYN VU1

Type	Dimensions in mm*							
	dn	Dmax(S)	Ds	G1	H	LG1	SW1	Z(Stroke)
PFYN 15 VU1-72 G1/8-AG	2.0	17.5	14.5	G1/8"-M	14.5	8	14	1.5
PFYN 15 VU1-72 G1/8-IG	2.0	17.5	14.5	G1/8"-F	25.5	9	14	1.5
PFYN 30 VU1-72 G1/8-AG	2.0	31.5	30.0	G1/8"-M	18.0	8	14	3.0
PFYN 30 VU1-72 G1/8-IG	2.0	31.5	30.0	G1/8"-F	29.0	9	14	3.0
PFYN 50 VU1-72 G1/4-AG	3.5	53.0	50.0	G1/4"-M	22.0	10	17	4.5
PFYN 50 VU1-72 G1/4-IG	3.5	53.0	50.0	G1/4"-F	32.0	12	17	4.5
PFYN 60 VU1-72 G1/4-AG	3.5	67.0	60.0	G1/4"-M	23.5	10	17	6.0
PFYN 60 VU1-72 G1/4-IG	3.5	67.0	60.0	G1/4"-F	33.5	12	17	6.0
PFYN 80 VU1-72 G1/4-AG	6.0	86.0	80.0	G1/4"-M	30.0	10	22	6.0
PFYN 80 VU1-72 G1/4-IG	6.0	86.0	80.0	G1/4"-F	40.0	12	22	6.0
PFYN 95 VU1-72 G1/4-AG	6.0	101.0	95.0	G1/4"-M	30.0	10	22	6.0
PFYN 95 VU1-72 G1/4-IG	6.0	101.0	95.0	G1/4"-F	40.0	12	22	6.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

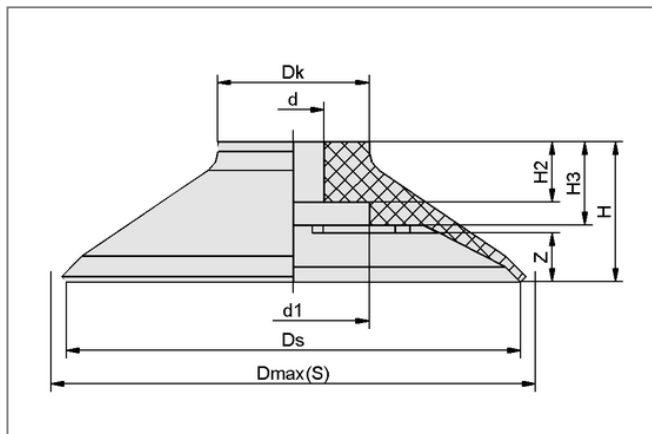
Flat Suction Cups (Round)

Flat Suction Cups PFYN VU1

Suction area (\varnothing) from 15 mm to 95 mm



Design Data Flat Suction Cups PFG VU1 - Spare Parts for PFYN VU1



PFG VU1

Type	Dimensions in mm*								
	d	d1	Dk	Dmax(S)	Ds	H	H2	H3	Z (Stroke)
PFG 15 VU1-72	4.5	8.5	11.5	17.0	14.5	9.5	2.5	4.5	1.5
PFG 30 VU1-72	6.0	11.0	16.0	31.5	29.0	13.0	7.0	7.0	3.0
PFG 50 VU1-72	8.0	13.0	18.0	53.0	49.0	17.0	8.0	11.0	4.5
PFG 60 VU1-72	8.0	20.0	20.0	67.0	60.0	18.5	8.0	11.0	6.5
PFG 80 VU1-72	12.0	25.0	52.3	86.0	80.0	25.0	12.0	17.5	6.0
PFG 95 VU1-72	12.0	25.0	31.0	101.0	95.0	25.0	12.0	16.5	6.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

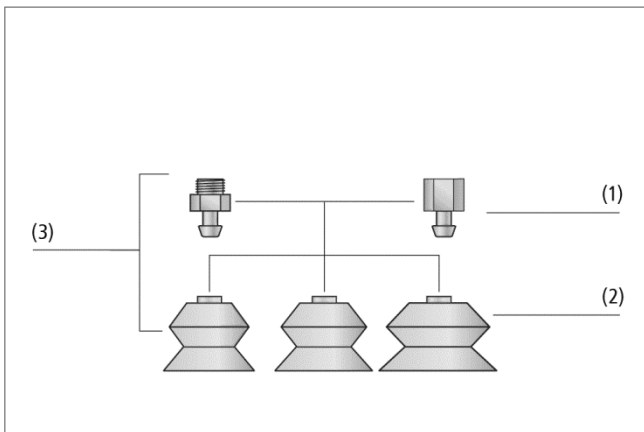
Bellows Suction Cups (Round)

Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (\varnothing) from 30 mm to 110 mm



Bellows suction cups FSGA VU1 (1.5 folds)



System design bellows suction cups FSGA VU1 (1.5 folds)



Bellows suction cups FSGA VU1 being used for handling sheet metal parts

Applications

- Round bellows suction cup with 1.5 folds for hard use in multi-shift operations with very short cycle times
- Handling of workpieces with very abrasive surfaces
- Suction cup with special groove for handling oily metal sheets and better resistance to lateral forces
- Particularly suitable for destacking

Design

- Robust, wear-resistant suction cup FSGA (3) with single sealing lip, consisting of suction cup FGA (2) (Vulkollan VU1) with 1.5 folds and connection nipple (1)
- Suction cup and nipple fixed through a form-fit connection, even handling heavy loads the connection is ensured
- Suction cups with supports on the bottom

Our Highlights...

- Material Vulkollan VU1 with high resistance to tearing
- Good resistance to chemicals
- Minimum abrasion: approx. 10 - 12 mm³ to DIN 53516
- Supports on the bottom
- Very stiff top fold
- Very good resistance to extreme dynamic loading

Your Benefits...

- > Extremely wear-resistant suction cup for very high loads and a long lifetime
- > Unaffected by oil (handling of sheet metal)
- > Lifetime up to 20 times higher compared to standard NBR
- > No permanent deformation of thin-walled workpieces
- > Good resistance to horizontal forces at high acceleration forces
- > Suitable for destackers

Bellows Suction Cups (Round)

Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (\varnothing) from 30 mm to 110 mm

Designation Code Bellows Suction Cups FSGA VU1 (1.5 Folds)

Abbreviated designation	Suction area \varnothing in mm	Material and Shore hardness	Connection thread	Product addition
Example FSGA 60 VU1-72 G1/4-IG: FSGA	60	VU1-72	G1/4-IG	
FSGA	30 to 110	VU1-72	G1/4-AG (AG = male (M)) G1/4-IG (IG = female (F)) G1/2-IG	ON oil slot

Ordering Data Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction cup FSGA VU1 (elastomer part + connection nipple) is delivered assembled. The assembly consists of:

- Suction cup of type FGA VU1 – elastomer part, available in various diameters, optional with oil groove
- Connection nipple of type SA-NIP – available with various threads

Available spare parts: suction cup FGA VU1, connection nipple SA-NIP

Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type	Connection G1/2" -F	G1/4"-M	G1/4"-F
FSGA 30 VU1-72	-	10.01.06.00197	10.01.06.00169
FSGA 40 VU1-72 ON	-	10.01.06.00306	10.01.06.00299
FSGA 50 VU1-72 ON	-	10.01.06.00307	10.01.06.00300
FSGA 60 VU1-72	-	10.01.06.00242	10.01.06.00240
FSGA 60 VU1-72 ON	-	10.01.06.00198	10.01.06.00172
FSGA 85 VU1-72	-	10.01.06.00243	10.01.06.00241
FSGA 85 VU1-72 ON	-	10.01.06.00199	10.01.06.00170
FSGA 110 VU1-72 ON	10.01.06.00497	-	-

Ordering Data Spare Parts Bellows Suction Cups and Connection Nipples

Type	Bellows suction cup (round)
FGA 30 VU1-72	10.01.06.00177
FGA 40 VU1-72 ON	10.01.06.00301
FGA 50 VU1-72 ON	10.01.06.00302
FGA 60 VU1-72	10.01.06.00178
FGA 60 VU1-72 ON	10.01.06.00207
FGA 85 VU1-72	10.01.06.00179
FGA 85 VU1-72 ON	10.01.06.00190
FGA 110 VU1-72 ON	10.01.06.00492

Bellows Suction Cups (Round)

Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (\varnothing) from 30 mm to 110 mm

Ordering Data Spare Parts Bellows Suction Cups and Connection Nipples

Type	Connection nipple	Part Number
FSGA 30 VU1-72 G1/4-AG	SA-NIP N013 G1/4-AG DN350	10.01.06.00183
FSGA 30 VU1-72 G1/4-IG	SA-NIP N013 G1/4-IG DN350	10.01.06.00180
FSGA 40 VU1-72 G1/4-AG	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
FSGA 40 VU1-72 G1/4-IG	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
FSGA 50 VU1-72 G1/4-AG	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
FSGA 50 VU1-72 G1/4-IG	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
FSGA 60 VU1-72 G1/4-AG	SA-NIP N014 G1/4-AG DN600	10.01.06.00184
FSGA 60 VU1-72 G1/4-IG	SA-NIP N014 G1/4-IG DN600	10.01.06.00181
FSGA 85 VU1-72 G1/4-AG	SA-NIP N015 G1/4-AG DN600	10.01.06.00185
FSGA 85 VU1-72 G1/4-IG	SA-NIP N015 G1/4-IG DN600	10.01.06.00182
FSGA 110 VU1-72 G1/2-IG	SA-SCHE 77 G1/2-IG FSGA	10.01.06.00593

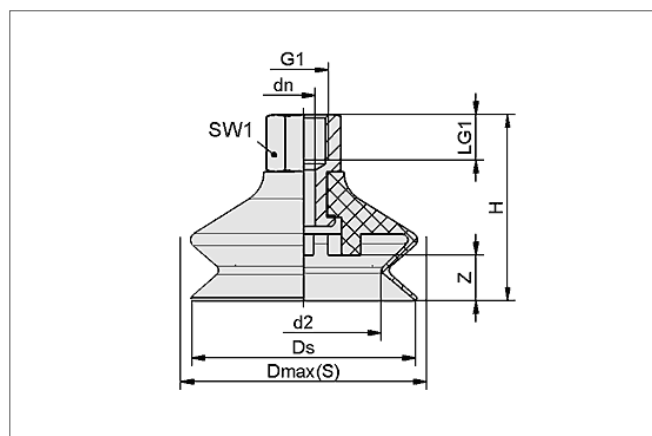
Technical Data Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. Internal hose diameter d [mm]**	Nipple family
FSGA 30 VU1-72	13.5	32	4.2	25	6	N 013
FSGA 40 VU1-72	33.0	56	11.3	30	6	N 011
FSGA 50 VU1-72	52.0	88	22.6	40	6	N 011
FSGA 60 VU1-72	75.0	120	31.0	50	6	N 014
FSGA 85 VU1-72	140.0	250	78.0	80	6	N 015
FSGA 110 VU1-72	295.0	420	350.0	100	9	N 037

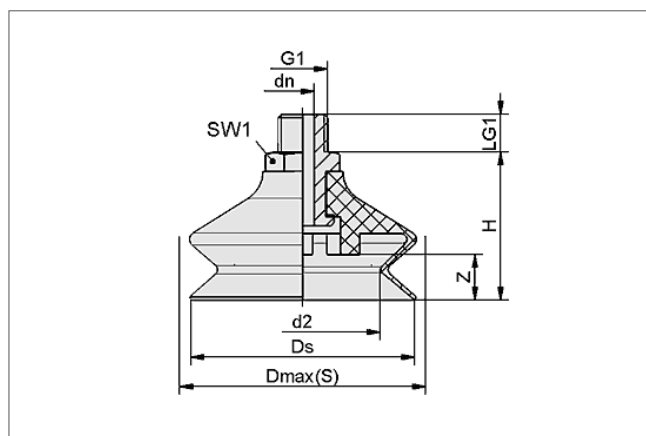
*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The recommended hose diameter refers to a hose length of approx. 2 m

Design Data Bellows Suction Cups FSGA VU1 (1.5 Folds)



FSGA 30 to 85 VU1 IG



FSGA 30 to 85 VU1 AG

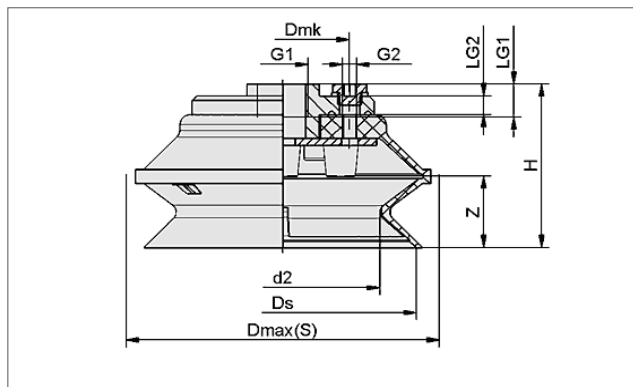
Bellows Suction Cups (Round)

Bellow Suction Cups FSGA VU1 (1.5 Folds)

Suction area (\varnothing) from 30 mm to 110 mm



Design Data Bellows Suction Cups FSGA VU1 (1.5 Folds)



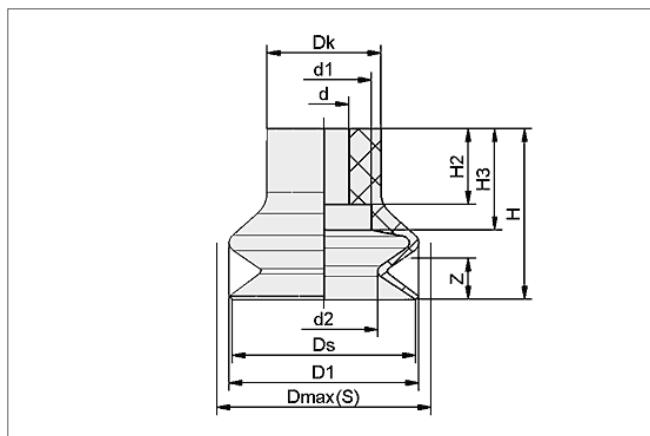
FSGA 110 VU1 IG

Type	Dimensions in mm*												
	d2	Dmax(S)	dn	Ds	D mk	G1	G2	H	LG1	LG2	SW1	Z(Stroke)	
FSGA 30 VU1-72 G1/4-AG	17.0	31.5	3.5	29.0	-	G1/4"-M	-	32.0	10	-	17	8.5	
FSGA 30 VU1-72 G1/4-IG	17.0	31.5	3.5	29.0	-	G1/4"-F	-	42.0	12	-	17	8.5	
FSGA 40 VU1-72 G1/4-AG	26.8	42.5	3.5	38.0	-	G1/4"-M	-	31.0	10	-	17	12.8	
FSGA 40 VU1-72 G1/4-IG	26.8	42.5	3.5	38.0	-	G1/4"-F	-	41.0	12	-	17	12.8	
FSGA 50 VU1-72 G1/4-AG	33.5	53.0	3.5	47.0	-	G1/4"-M	-	37.5	10	-	17	14.5	
FSGA 50 VU1-72 G1/4-IG	33.5	53.0	3.5	47.0	-	G1/4"-F	-	47.5	12	-	17	14.5	
FSGA 60 VU1-72 G1/4-AG	40.0	61.5	6.0	57.0	-	G1/4"-M	-	39.0	10	-	17	12.5	
FSGA 60 VU1-72 G1/4-IG	40.0	61.5	6.0	57.0	-	G1/4"-F	-	49.0	12	-	17	12.5	
FSGA 85 VU1-72 G1/4-AG	50.2	86.5	6.0	82.5	-	G1/4"-M	-	52.0	10	-	22	15.0	
FSGA 85 VU1-72 G1/4-IG	50.2	86.5	6.0	82.5	-	G1/4"-F	-	62.0	12	-	22	15.0	
FSGA 110 VU1-72 G1/2-IG	80.0	127.0	-	110.0	55.0	G1/2"-F	G1/8"-IG	69.0	14	8.0	-	30.0	

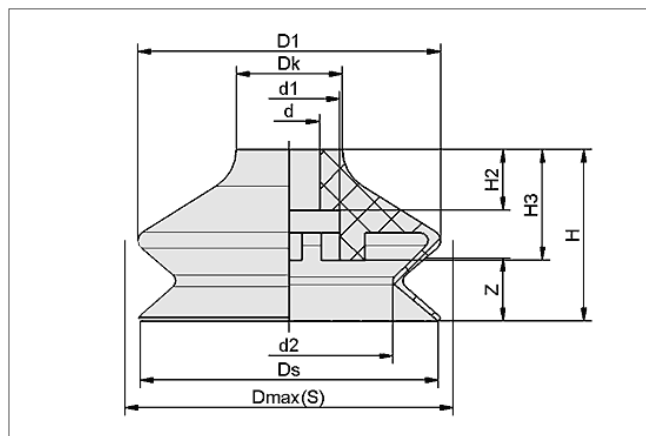
*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3



Design Data Bellows Suction Cups FGA VU1



FGA 30 VU1



FGA 40 to 85 VU1

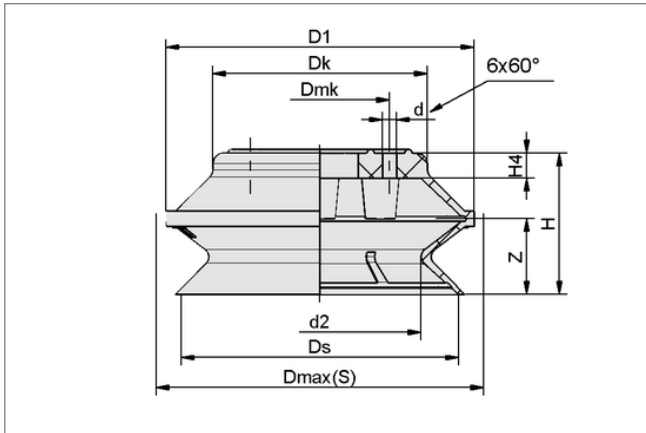
Bellows Suction Cups (Round)

Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (\varnothing) from 30 mm to 110 mm



Design Data Bellows Suction Cups FGA VU1



FGA 110 VU1

Type	Dimensions in mm*												
	d	d1	d2	D1	Dk	Dmax(S)	Ds	D mk	H	H2	H4	H3	Z(Stroke)
FSGA 30 VU1	8.0	15.0	17.0	30.0	18.0	31.5	29.0	-	27.0	12	-	16	8.5
FSGA 40 VU1	8.0	13.6	26.8	40.0	14.0	42.5	38.0	-	27.0	8	-	15	12.8
FSGA 50 VU1	8.0	13.6	33.5	50.0	17.5	53.0	47.0	-	32.5	8	-	18	14.5
FSGA 60 VU1	12.0	20.0	41.0	60.0	21.0	61.5	59.0	-	34.0	12	-	22	12.5
FSGA 85 VU1	12.0	25.0	50.2	85.5	25.0	86.5	82.5	-	47.0	20	-	25	15.0
FSGA 110 VU1	5.5	-	80.0	120.0	85.0	127.0	110.0	55	56.0	-	10	-	30.0

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

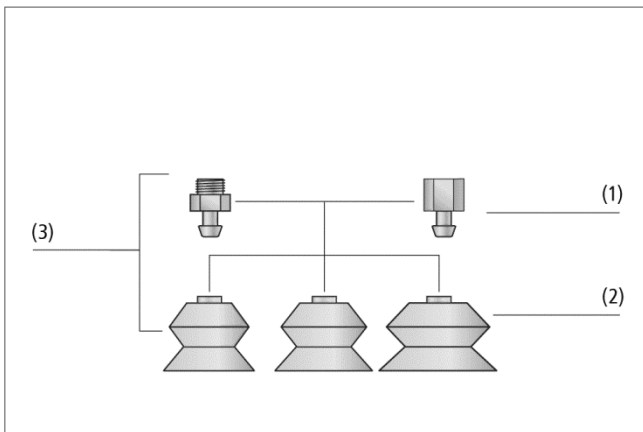
Bellows Suction Cups (Round)

Bellows Suction Cups FSG VU1 (2.5 Folds)

Suction area (\varnothing) from 30 mm to 85 mm



Bellows suction cups FSG VU1 (2.5 folds)



System design bellows suction cups FSG VU1 (2.5 folds)



Bellows suction cups FSG VU1 being used for handling corrugated cardboard

Applications

- Round bellows suction cup with 2.5 folds for hard use in multi-shift operations with very short cycle times
- Handling of workpieces with very abrasive surfaces
- Suction cup with special groove for handling oily metal sheets and better resistance to lateral forces
- Particularly suitable for destacking

Design

- Robust and wear-resistant suction cup FSG (3) with single sealing lip, consisting of suction cup FG (2) (Vulkollan VU1) with 2.5 folds and connection nipple (1)
- Suction cup and nipple fixed through a formit connection, even handling heavy loads the connection is ensured

Our Highlights...

- Material Vulkollan VU1 with high resistance to tearing
- Good resistance to chemicals
- Minimum abrasion, approx. 10 - 12 mm³ to DIN 53516
- Supports on the bottom
- Very stiff top fold
- Very good resistance to extreme dynamic loading

Your Benefits...

- > Extremely wear-resistant suction cup for very high loading and a long lifetime
- > Unaffected by oil (handling of sheet metal)
- > Lifetime up to 20 times longer compared to standard NBR
- > No permanent deformation of thin-walled workpieces
- > Good resistance to horizontal forces at high acceleration values
- > Suitable for destackers

Bellows Suction Cups (Round)

Bellows Suction Cups FSG VU1 (2.5 Folds)

Suction area (Ø) from 30 mm to 85 mm

Designation Code Bellows Suction Cups FSG VU1 (2.5 Folds)

Abbreviated designation	Suction area Ø in mm	Material and Shore hardness	Connection thread	Product addition
Example FSG 60 VU1-72 G1/4-AG:				
FSG	60	VU1-72	G1/4-AG	
FSG	30	VU1-72	G1/4-AG (AG = male (M))	ON oil slot
	60		G1/4-IG (IG = female (F))	
	85			

Ordering Data Bellows Suction Cups FSG VU1 (2.5 Folds)

Suction cup FSG VU1 (elastomer part + connection nipple) is delivered assembled. The assembly consists of:

- Suction cup of type FG VU1 – elastomer part, available in various diameters
- Connection nipple of type SA-NIP – available with various threads

Available spare parts: suction cup FG VU1, connection nipple SA-NIP

Bellows Suction Cups FSG VU1 (2.5 Folds)

Type	Connection G1/4"-M	G1/4"-F
FSG 30 VU1-72	10.01.06.00200	10.01.06.00166
FSG 60 VU1-72	10.01.06.00238	10.01.06.00236
FSG 60 VU1-72 ON	10.01.06.00201	10.01.06.00171
FSG 85 VU1-72	10.01.06.00239	10.01.06.00237
FSG 85 VU1-72 ON	10.01.06.00202	10.01.06.00167

Ordering Data Spare Parts Bellows Suction Cups and Connection Nipples

Type	Bellows suction cup (round)	Type	Connection nipple	Part Number
FG 30 VU1-72	10.01.06.00173	FSG 30 VU1-72 G1/4-AG	SA-NIP N013 G1/4-AG DN350	10.01.06.00183
FG 60 VU1-72	10.01.06.00174	FSG 30 VU1-72 G1/4-IG	SA-NIP N013 G1/4-IG DN350	10.01.06.00180
FG 60 VU1-72 ON	10.01.06.00208	FSG 60 VU1-72 G1/4-AG	SA-NIP N014 G1/4-AG DN600	10.01.06.00184
FG 85 VU1-72	10.01.06.00175	FSG 60 VU1-72 G1/4-IG	SA-NIP N014 G1/4-IG DN600	10.01.06.00181
FG 85 VU1-72 ON	10.01.06.00209	FSG 85 VU1-72 G1/4AG	SA-NIP N015 G1/4-AG DN600	10.01.06.00185
		FSG 85 VU1-72 G1/4-IG	SA-NIP N015 G1/4-IG DN600	10.01.06.00182

Technical Data Bellows Suction Cups FSG VU1 (2.5 Folds)

Type	Suction force [N]*	Pull-off force [N]*	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. Internal hose diameter d [mm]**	Nipple family
FSG 30 VU1-72	13.5	32	9	25	6	N 013
FSG 60 VU1-72	61.0	100	61	50	6	N 014
FSG 85 VU1-72	120.0	250	195	60	6	N 015

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The recommended hose diameter refers to a hose length of approx. 2 m

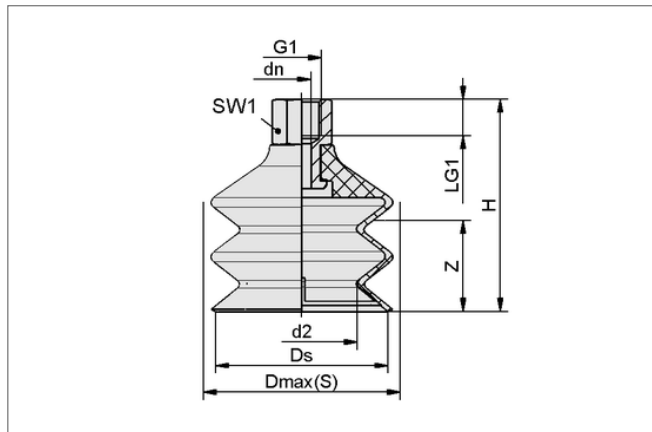
Bellows Suction Cups (Round)

Bellows Suction Cups FSG VU1 (2.5 Folds)

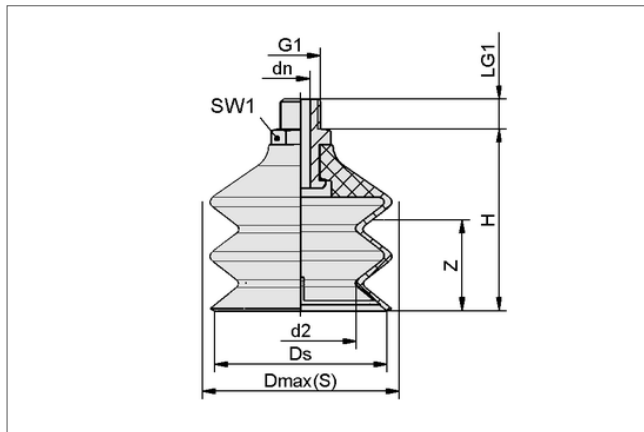
Suction area (\varnothing) from 30 mm to 85 mm



Design Data Bellows Suction Cups FSG VU1 (2.5 Folds)



FSG 30 VU1



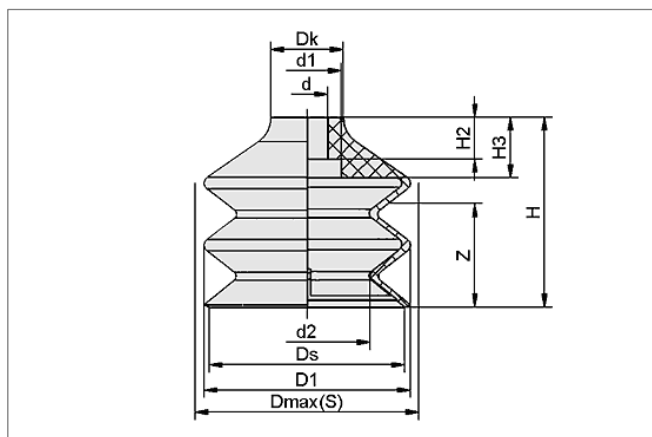
FSG 30 to 85 VU1 AG

Type	Dimensions in mm*									
	d2	dn	Dmax (S)	Ds	G1	H	LG1	SW1	Z(Stroke)	
FSG 30 VU1-72 G1/4-AG	15	3.5	31.5	29.0	G1/4"-M	45	10	17	15	
FSG 30 VU1-72 G1/4-IG	15	3.5	31.5	29.0	G1/4"-F	55	12	17	15	
FSG 60 VU1-72 G1/4-AG	36	6.0	62.5	59.0	G1/4"-M	60	10	17	30	
FSG 60 VU1-72 G1/4-IG	36	6.0	62.5	59.0	G1/4"-F	70	12	17	30	
FSG 85 VU1-72 G1/4-AG	51	6.0	90.0	80.2	G1/4"-M	90	10	22	38	
FSG 85 VU1-72 G1/4-IG	51	6.0	90.0	80.2	G1/4"-F	100	12	22	38	

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3



Design Data Bellows Suction Cups FG VU1 - Spare Parts for FSG VU1



FG 30 to 85 VU1

Type	Dimensions in mm*										
	d	d1	d2	D1	Dk	Dmax(S)	Ds	H	H2	H3	Z(Stroke)
FG 30 VU1-72	8	15	15	30	18	31.5	29.0	40	12	16	15
FG 60 VU1-72	12	20	36	60	21	62.5	59.0	55	12	18	30
FG 85 VU1-72	12	25	51	85	25	90.0	80.2	85	20	27	38

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

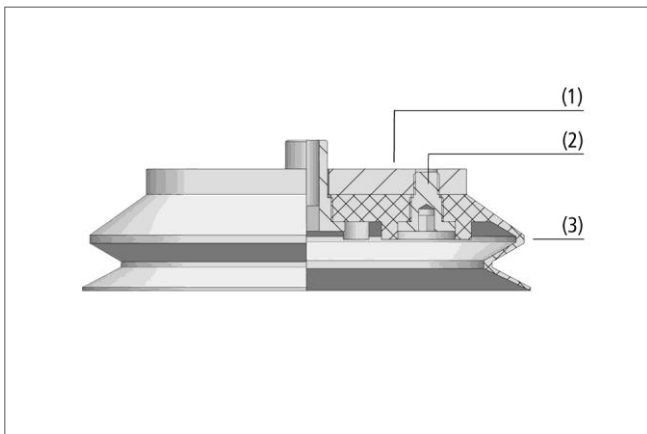
Bellows Suction Cups (Oval)

Bellows Suction Cups FSGAO (1.5 Folds)

Suction area (LxW) from 95 x 40 mm to 140 x 65 mm



Bellows suction cups FSGAO (1.5 folds)



System design bellows suction cups FSGAO (1.5 folds)



Bellows suction cups FSGAO being used for handling metal beams

Applications

- Oval bellows suction cup with 1.5 folds for use in multi-shift operations with very short cycle times
- Handling of oily and narrow, curved metal sheet
- Handling of workpieces with extremely abrasive surfaces

Design

- Suction cup FSGAO, consisting of suction cup FGAO (Vulkollan VU1) with 1.5 folds (3) and connection plate (1)
- Connection plate screwed (2) to suction cup and capable of handling very heavy loads
- The suction cup can be replaced separately when worn

Our Highlights...

- Material Vulkollan VU1 with high resistance to tearing
- Good resistance to chemicals
- Minimum abrasion: approx. 10 - 12 mm³ to DIN 53516
- 1.5 folds

Your Benefits...

- > Very wear-resistant suction cup for heavy loads and a long lifetime
- > Unaffected by oil (handling of sheet-metal parts)
- > Lifetime up to 20 times longer compared with standard NBR
- > High suction force and optimum damping effect during placement on the workpiece

Bellows Suction Cups (Oval)

Bellows Suction Cups FSGAO (1.5 Folds)

Suction area (LxW) from 95 x 40 mm to 140 x 65 mm

Designation Code Bellows Suction Cups FSGAO (1.5 Folds)

Abbreviated designation	Suction area LxW in mm	Material and Shore hardness	Connection thread
Example FSGAO 95x40 VU1-72 G1/8-AG:			
FSGAO	95x40	VU1-72	G1/8-AG
FSGAO	95x40	VU1-72	G1/8-AG (AG = male (M))
	140x65		G1/4-AG

Ordering Data Bellows Suction Cups FSGAO (1.5 Folds)

Suction cup FSGAO (elastomer part + support plate) is delivered assembled. The assembly consists of:

- Suction cup of type FGAO – elastomer part, available in various dimensions (LxW)
- Aluminium support plate

Available spare parts: suction cup FGAO

Bellows Suction Cups FSGAO (1.5 Folds)

Type	Part Number
FSGAO 95x40 VU1-72 G1/8-AG	10.01.06.00503
FSGAO 140x65 VU1-72 G1/4-AG	10.01.06.00498

Ordering Data Spare Parts Bellows Suction Cups

Type	Article No.
FGAO 95x40 VU1-72 N038	10.01.06.00499
FGAO 140x65 VU1-72 N039	10.01.06.00468

Technical Data Bellows Suction Cups FSGAO (1.5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]**	Nipple family
FSGAO 95x40 VU1-72 G1/8-AG	95	110	31	20	9	N 038
FSGAO 140x65 VU1-72 G1/4-AG	225	255	89	30	9	N 039

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor.

**The recommended hose diameter refers to a hose length of approx. 2 m

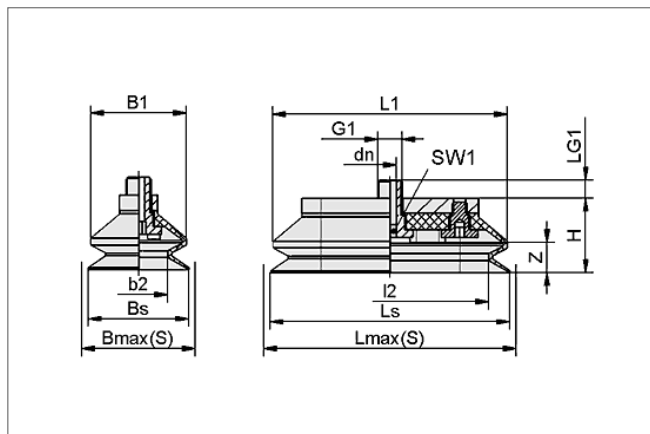
Bellows Suction Cups (Oval)

Bellows Suction Cups FSGAO (1.5 Folds)

Suction area (LxW) from 95 x 40 mm to 140 x 65 mm



Design Data Bellows Suction Cups FSGAO (1.5 Folds)



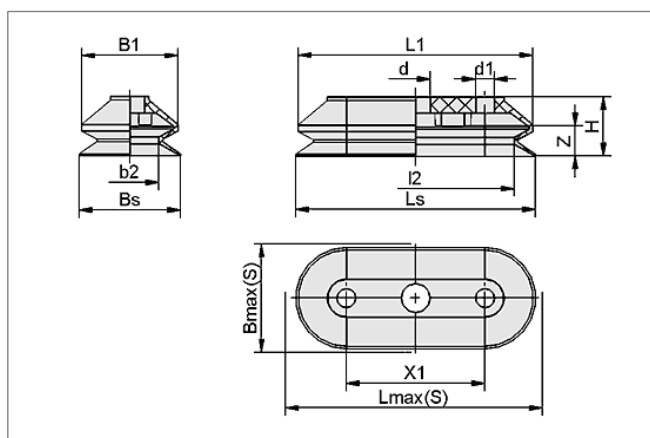
FSGAO 95x40 to 140x65 VU1

Type	Dimensions in mm*													
	Bs	b2	Bmax(S)	dn	G1	B1	H	l2	Ls	LG1	Lmax(S)	L1	SW1	Z(Stroke)
FSGAO 95x40 VU1-72 G1/8-AG	40	23	42.5	5	G1/8"-M	38	29.5	78	95	8	97	93	4	12
FSGAO 140x65 VU1-72 G1/4-AG	65	36	68.5	8	G1/4"-F	65	38.0	111	140	10	142	140	8	16

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3



Design Data Bellows Suction Cups FGAO - Spare Parts for FSGAO



FGAO 95x40 to 140x65 VU1

Type	Dimensions in mm*													
	Bs	b2	Bmax(S)	B1	d	d1	H	Lmax(S)	l2	Ls	L1	X1	Z(Stroke)	
FGAO 95x40 VU1-72 N038	40	23	42.5	38	11.5	7.5	23.5	97	70	78	93	55	12	
FGAO 140x65 VU1-72 N039	65	36	68.5	65	15.5	9.5	30.0	142	111	140	140	75	16	

*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 M3

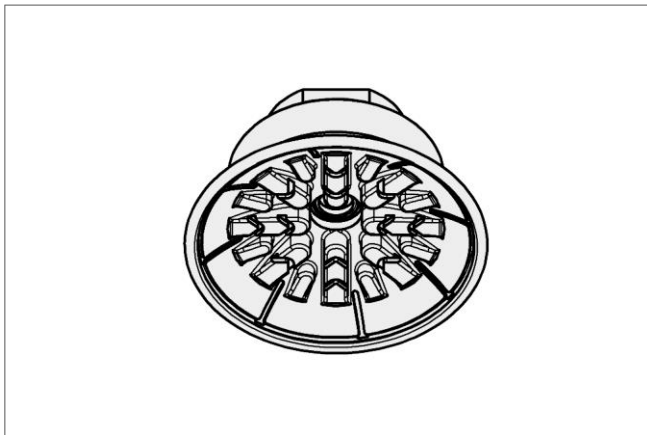
Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAF-HT2

Suction area (Ø) from 30 to 60 mm



Flat suction cups SAF HT2



System design flat suction cup SAF HT2



Flat suction cup SAF HT2 for handling formed sheet metal parts

Applications

- Round, flat suction cups for dynamic handling of hot metal sheets up to 250° C (short cycle times)
- Unloading of parts after forming
- Handling of thin sheets without deformation or deep drawing
- For use e. g. in feeder systems for hot forming presses in the automotive industry

Design

- Robust and wear-resistant suction cup SAF made of HT2 material with special inner support
- Suction cup SAF vulcanized to the connection nipple (very high strength)

Our Highlights...

- Silicone-free special material HT2
- Large structured inner support
- Soft and flexible sealing lip

Your Benefits...

- > Temperature resistance up to 250°C
- > No deep drawing on the workpiece; capable of handling high lateral forces
- > Good sealing, even on slightly curved surfaces

Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAF-HT2

Suction area (\varnothing) from 30 to 60 mm

Designation Code Flat Suction Cups for Hot Forming SAF HT2

Abbreviated designation	Diameter in mm	Material and shore hardness	Connection thread
Example: SAF	50	HT2 65	G1/4-AG (AG = male)
SAF	30 to 60	HT2 65	G1/4-AG G1/4-IG (IG = female) G3/8-IG

Ordering Data Flat Suction Cups for Hot Forming SAF HT2

Suction cup SAF HT2, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Flat Suction Cups for Hot Forming SAF HT2

Type	Connection		
	1/4" (male)	1/4" (female)	3/8" (female)
SAF 30 HT2 65	10.01.01.12349	10.01.01.12348	10.01.01.12350
SAF 40 HT2 65	10.01.01.12353	10.01.01.12352	10.01.01.12354
SAF 50 HT2 65	10.01.01.12357	10.01.01.12356	10.01.01.12358
SAF 60 HT2 65	10.01.01.12361	10.01.01.12360	10.01.01.12362

Other connection nipples are available on request.

Technical Data Flat Suction Cups for Hot Forming SAF HT2

Type	Suction force [N]*	Lateral force [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose diameter d [mm]***
SAF 30 HT2 65	38	29	1.7	40	4
SAF 40 HT2 65	69	51	3.8	50	4
SAF50 HT2 65	100	78	7.0	65	4
SAF 60 HT2 65	150	102	13.0	75	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified transverse forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values

***The recommended hose diameter refers to a hose length of approx.. 2m

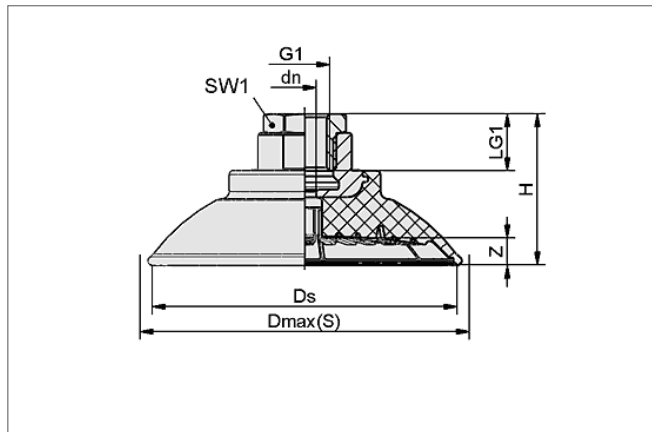
Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAF-HT2

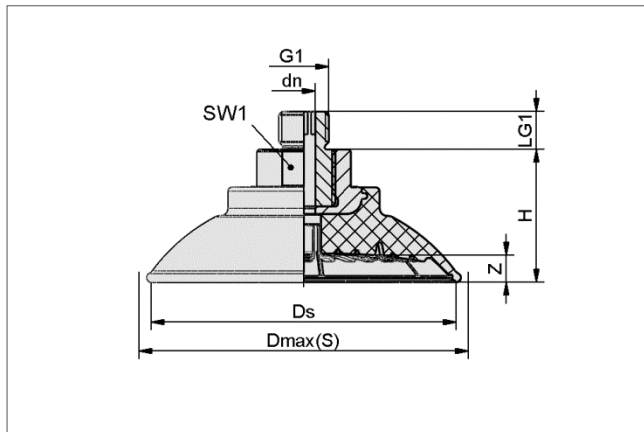
Suction area (\varnothing) from 30 to 60 mm



Design Data Flat Suction Cups for Hot Forming SAF HT2



SAF HT2 30 to 60 IG (female)



SAF HT2 30 to 60 AG (male)

Type	Dimensions in mm*								
	Dmax(S)**	dn	Ds	G1	H	LG1	SW1	Z	
SAF 30 HT2 G1/4-AG	34	4	31	G1/4"-M	20	10	17	3	
SAF 30 HT2 G1/4-IG	34	4	31	G1/4"-F	20	12	17	3	
SAF 30 HT2 G3/8-IG	34	4	31	G3/8"-F	36	9	22	3	
SAf 40 HT2 G1/4-AG	46	4	41	G1/4"-M	22	10	17	4	
SAF 40 HT2 G1/4-IG	46	4	41	G1/4"-F	22	12	17	4	
SAF 40 HT2 G3/8-IG	46	4	41	G3/8"-F	38	9	22	4	
SAF 50 HT2 G1/4-AG	56	6	50	G1/4"-M	28	10	22	5	
SAF 50 HT2 G1/4-IG	56	6	50	G1/4"-F	33	15	22	5	
SAF 50 HT2 G3/8-IG	56	6	50	G3/8"-F	28	15	22	5	
SAF 60 HT2 G1/4-AG	67	6	61	G1/4"-M	31	10	22	6	
SAF 60 HT2 G1/4-IG	67	6	61	G1/4"-F	36	15	22	6	
SAF 60 HT2 G3/8-IG	67	6	61	G3/8"-F	31	15	22	6	

*Acceptable dimensional tolerances for rubber parts concerning to M3

**Dmax (S) is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

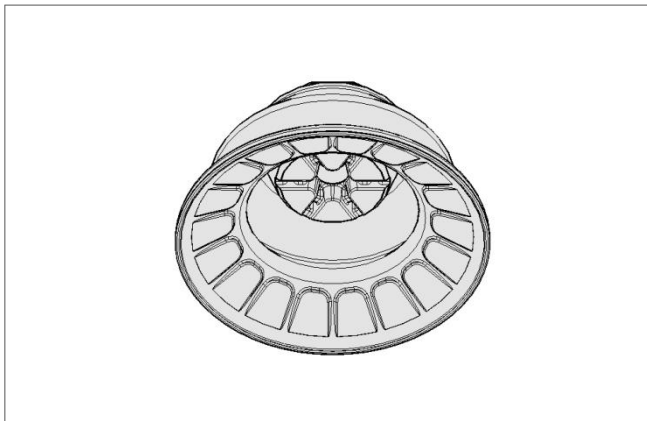
Suction Cups for Handling Sheet Metal

Bellows Suction Cups for Hot Forming SAB HT2 (1.5 Folds)

Suction area (Ø) from 22 to 80 mm



Bellow suction cup SAB HT2 (1.5 folds)



System design bellows suction cup SAB HT2 (1.5 folds)



Bellows suction cups SAB HT2 for handling formed sheet metal parts

Applications

- Round bellows suction cups with 1.5 folds dynamic handling of hot metal sheets up to 250° C
- Handling of pre-shaped metal sheet parts, bellows shape permits optimum adaptation
- Unloading of parts after forming
- Handling of thin sheets without deformation or deep drawing
- For use e. g. in feeder systems for hot forming presses in the automotive industry

Design

- Robust and wear resistant bellows suction cup SAB made of HT2 material and special inner support
- Suction cup SAB vulcanized to the connection nipple (very high strength)

Our Highlights...

- Silicone-free special material HT2
- Large structured inner support
- Soft and flexible sealing lip
- 1.5 folds
- Stiff top fold

Your Benefits...

- > Temperature resistance up to 250° C
- > No deep-drawing on the workpiece; capable of handling high lateral forces
- > Good sealing, even on slightly curved surfaces
- > Optimum adaptation and sealing to curved workpieces, very good damping
- > Good resistance to horizontal forces and lateral acceleration

Suction Cups for Handling Sheet Metal

Bellows Suction Cups for Hot Forming SAB HT2 (1.5 Folds)

Suction area (Ø) from 22 to 80 mm

Designation Code Bellows Suction Cups For Hot Forming SAB HT2 (1.5 Folds)

Abbreviated designation	Diameter in mm	Material and shore hardness	Connection thread
Example: SAB	50	HT2 65	G1/4-AG (AG = male)
SAB	22 to 80	HT2 65	G1/4-AG G1/4-IG (IG = female) G3/8-IG

Ordering Data Bellows Suction Cups For Hot Forming SAB HT2 (1.5 Folds)

Suction cup SAB HT2, available in various diameters, is delivered with connection nipple vulcanized to elastomer part.

Bellows Suction Cups For Hot Forming SAB HT2 (1.5 Folds)

Type*	Connection 1/4" (male)	1/4" (female)	3/8" (female)
SAB 22 HT2-65	10.01.06.02420	10.01.06.02419	10.01.06.02421
SAB 30 HT2-65	10.01.06.02424	10.01.06.02423	10.01.06.02425
SAB 40 HT2-65	10.01.06.02428	10.01.06.02427	10.01.06.02429
SAB 50 HT2-65	10.01.06.03452	10.01.06.03451	10.01.06.03401
SAB 60 HT2-65	10.01.06.03450	10.01.06.03449	10.01.06.03354
SAB 80 HT2-65	10.01.06.03357	10.01.06.03356	10.01.06.03318

Other connection nipples are available on request.

Technical Data Bellows Suction Cups For Hot Forming SAB HT2 (1,5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Lateral force [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose-Ø d [mm]***
SAB 22 HT2-65	16	24	17	1.5	20	4
SAB 30 HT2-65	22	33	29	5.6	40	4
SAB 40 HT2-65	38	59	34	7.0	40	4
SAB 50 HT2-65	53	87	102	18.9	25	4
SAB 60 HT2-65	82	136	126	32.0	30	6
SAB 80 HT2-65	135	238	217	75.4	40	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified transverse forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx.. 2m

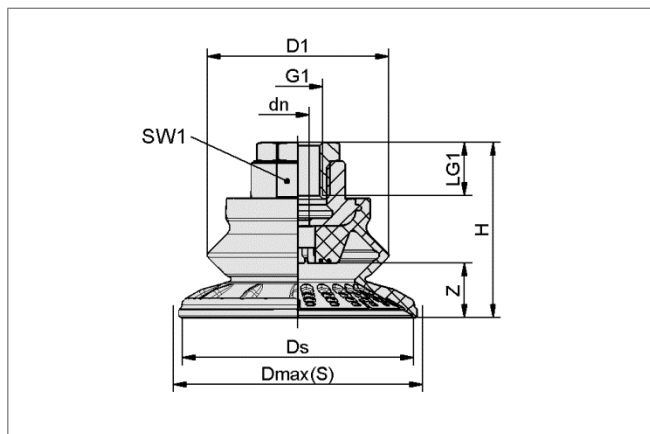
Suction Cups for Handling Sheet Metal

Bellows Suction Cups for Hot Forming SAB HT2 (1.5 Folds)

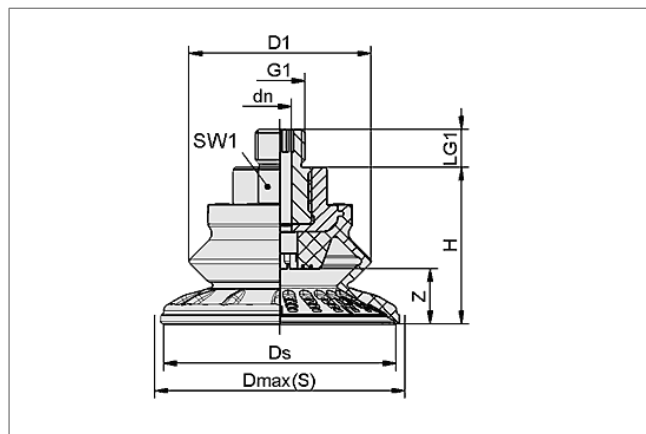
Suction area (\varnothing) from 22 to 80 mm



Design Data Bellows Suction cups For Hot Forming SAB HT2 (1.5 Folds)



SAB HT2 22 to 60 IG (female)



SAB HT2 22 to 60 AG (male)

Type	Dimensions in mm*									
	dn	D1	Dmax(S)**	Ds	G1	H	LG1	SW1	Z(Stroke)	
SAB 22 G1/4-AG	3.5	22	24	21	G1/4"-M	25.0	10.0	16	5.8	
SAB 22 G1/4-IG	3.5	22	24	21	G1/4"-F	25.0	12.0	16	5.8	
SAB 22 G3/8-IG	3.5	22	24	21	G3/8"-F	41.0	9.5	22	5.8	
SAB 30 G1/4-AG	4.0	32	34	31	G1/4"-M	28.0	10.0	17	9.0	
SAB 30 G1/4-IG	4.0	32	34	31	G1/4"-F	28.0	12.0	17	9.0	
SAB 30 G3/8-IG	4.0	32	34	31	G3/8"-F	44.0	9.5	22	9.0	
SAB 40 G1/4-AG	4.0	32	45	40	G1/4"-M	29.0	10.0	17	10.0	
SAB 40 G1/4-IG	4.0	32	45	40	G1/4"-F	29.0	12.0	17	10.0	
SAB 40 G3/8-IG	4.0	32	45	40	G3/8"-F	44.0	9.5	22	10.0	
SAB 50 G1/4-AG	6.0	42	56	50	G1/4"-M	36.9	10.0	22	11.5	
SAB 50 G1/4-IG	6.0	42	56	50	G1/4"-F	41.3	20.0	22	11.5	
SAB 50 G3/8-IG	6.0	42	56	50	G3/8"-F	36.9	15.0	22	11.5	
SAB 60 G1/4-AG	6.0	50	67	61	G1/4"-M	41.3	10.0	22	14.5	
SAB 60 G1/4-IG	6.0	50	67	61	G1/4"-F	46.3	20.0	22	14.5	
SAB 60 G3/8-IG	6.0	50	67	61	G3/8"-F	41.3	15.0	22	14.5	
SAB 80 G1/4-AG	6.0	65	88	81	G1/4"-M	49.8	15.0	22	22.0	
SAB 80 G1/4-IG	6.0	65	88	81	G1/4"-F	54.8	15.0	22	22.0	
SAB 80 G3/8-IG	6.0	65	88	81	G3/8"-F	49.8	15.0	22	22.0	

*Acceptable dimensional tolerances for rubber parts concerning to M3 - DIN 7715

**Dmax (S) is the external dimension of the suction cup when it is pressed against the workpiece by the vacuum

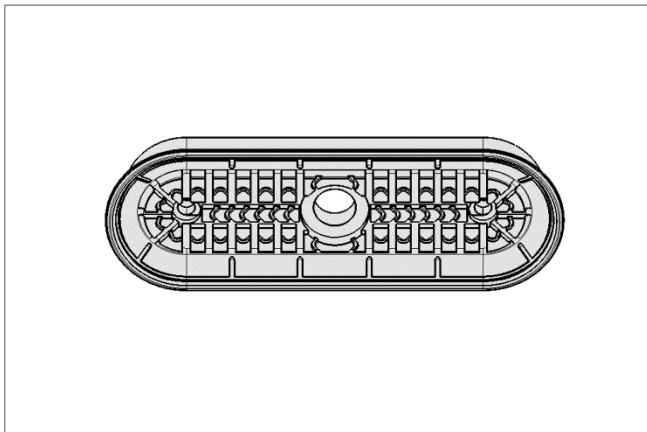
Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAOF-HT2 (Oval)

Suction area (LxW) from 60 x 23 mm to 100 x 50 mm



Flat suction cup SAOF HT2 (oval)



System design flat suction cup SAOF HT2 (oval)



Flat suction cups SAOF HT2 for handling formed sheet metal parts

Applications

- Oval flat suction cup for dynamic handling of hot metal sheets up to 250° C
- Unloading e. g. of elongated workpieces after forming
- Handling of thin sheets without deformation or deep drawing
- For use e. g. in feeder systems for hot forming presses in the automotive industry

Design

- Robust, wear-resistant oval flat suction cup SAOF made of HT2 with single sealing lip and inner support
- Connection nipple glued to the reinforcing element of the suction cup (very high strength and temperature resistance)

Our Highlights...

- Silicone-free special material
- Large structured inner support
- Soft and flexible sealing lip

Your Benefits...

- > Temperature resistance up to 250° C longterm
- > No deep-drawing of the workpiece; capable of handling high lateral forces
- > Good sealing, even on slightly curved surfaces

Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAOF-HT2 (Oval)

Suction area (LxW) from 60 x 23 mm to 100 x 50 mm

Designation Code Flat Suction Cups for Hot Forming SAOF HT2 (Oval)

Abbreviated designation	Dimensions LxB in mm	Material and shore hardness	Connection thread
Example: SAOF	90x30	HT2 65	G1/4-AG (AG = male)
SAOF	60 x 23 to 100x50	HT2 65	G1/4-AG G1/4-IG (IG = female) G3/8-IG

Ordering Data Flat Suction Cups for Hot Forming SAOF HT2 (Oval)

Suction cup SAOF HT2, available in various dimensions, is delivered with connection nipple glued to elastomer part.

Flat Suction Cups for Hot Forming SAOF HT2 (Oval)

Type*	Connection		
	1/4" (male)	1/4" (female)	3/8" (female)
SAOF 60x23 HT2-65	10.01.05.00743	10.01.05.00742	10.01.05.00741
SAOF 80x40 HT2-65	10.01.05.00751	10.01.05.00750	10.01.05.00749
SAOF 90x30 HT2-65	10.01.05.00747	10.01.05.00746	10.01.05.00745
SAOF 100x50 HT2-65	10.01.05.00755	10.01.05.00754	10.01.05.00753

Other connection nipples are available on request.

Technical Data Flat Suction Cups for Hot Forming SAOF HT2 (Oval)

Type	Suction force [N]*	Lateral force [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose-Ø d [mm]***
SAOF 60 x 23 HT2-65	57	36	3.0	20	4
SAOF 80 x 40 HT2-65	140	108	10.7	50	4
SAOF 90 x 30 HT2-65	122	94	7.0	40	4
SAOF 100 x 50 HT2-65	217	177	20.0	75	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified transverse forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

***The recommended hose diameter refers to a hose length of approx.. 2m

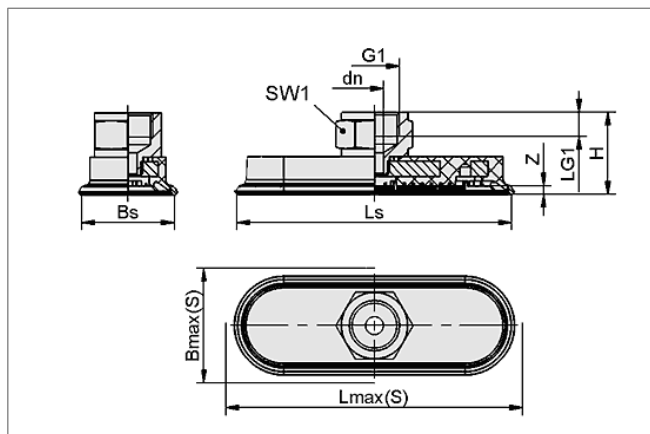
Suction Cups for Handling Sheet Metal

Flat Suction Cups for Hot Forming SAOF-HT2 (Oval)

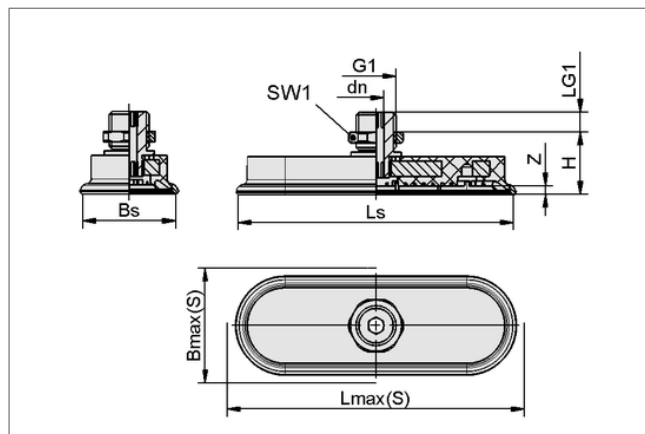
Suction area (LxB) from 60 x 23 mm to 100 x 50 mm



Design Data Flat Suction Cups for Hot Forming SAOF HT2 (Oval)



SAOF HT2 60x23 to 100x50 IG (female)



SAOF HT2 60x23 to 100x50 AG (male)

Type	Dimensions in mm*									
	Bmax(S) **	Bs	dn	G1	H	LG1	Lmax(S)**	LS	SW1	Z(Stroke)
SAOF 60x23 G1/4-AG	25	21.6	5	G1/4"-M	18	8	64	60.6	17	3
SAOF 60x23 G1/4-IG	25	21.6	6	G1/4"-F	26	8	64	60.6	17	3
SAOF 60x23 G3/8-IG	25	21.6	6	G3/8"-F	26	8	64	60.6	22	3
SAOF 90x30 G1/4-AG	34	30.6	5	G1/4"-M	19	8	94	90.6	17	3
SAOF 90x30 G1/4-IG	34	30.6	6	G1/4"-F	26	8	94	90.6	17	3
SAOF 90x30 G3/8-IG	34	30.6	6	G3/8"-F	27	9	94	90.6	22	3
SAOF 80x40 G1/4-AG	43	38.6	5	G1/4"-M	20	8	85	80.6	17	4
SAOF 80x40 G1/4-IG	43	38.6	6	G1/4"-F	28	8	85	80.6	17	4
SAOF 80x40 G3/8-IG	43	38.6	6	G3/8"-F	28	9	85	80.6	22	4
SAOF 100x50 G1/4-AG	54	48.1	6	G1/4"-M	22	8	106	101.1	17	5
SAOF 100x50 G1/4-IG	54	48.1	8	G1/4"-F	30	8	106	101.1	17	5
SAOF 100x50 G3/8-IG	54	48.1	8	G3/8"-F	31	9	106	101.1	22	5

*Acceptable dimensional tolerances for rubber parts concerning to M3

**Bmax (S) and Lmax (S) are the external dimension of the suction cup when it is pressed against the workpiece by the vacuum



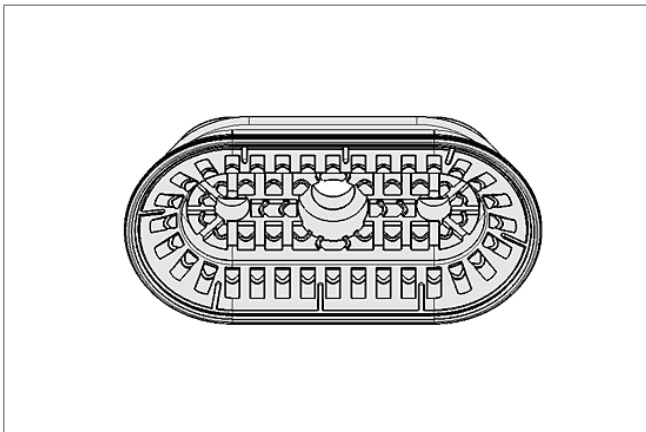
Suction Cups for Handling Sheet Metal

Bellows Suction Cups for Hot Forming SAOB-HT2 (Oval, 1.5 Folds)

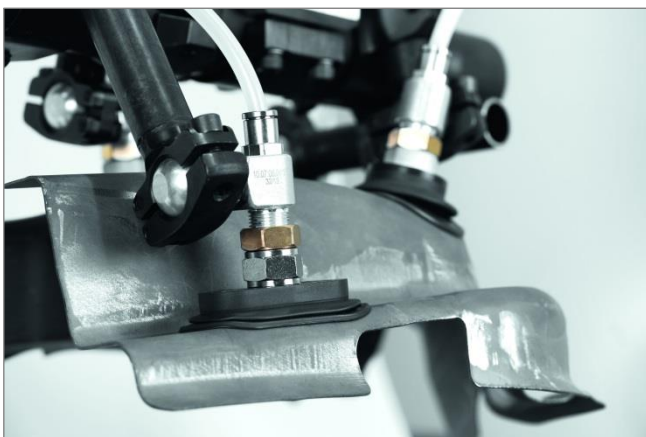
Suction area (LxW) from 60 x 30 mm to 80 x 40 mm



Bellows suction cup SAOB HT2 (oval, 1.5 folds)



System design bellows suction cup SAOB HT2 (oval, 1.5 folds)



Bellows suction cups SAOB HT2 for handling formed sheet metal parts

Applications

- Oval bellows suction cup with 1,5 folds for dynamic handling of hot metal sheets up to 250° C
- Unloading e. g. of elongated workpieces after forming, e. g. reinforced ribs and plates
- Handling of formed sheet metal parts; fold structure allows optimal adjustment
- For use e. g. in feeder systems for hot forming presses in the auto-motive industry

Design

- Robust, wear-resistant oval bellows suction cup SAOB with 1,5 folds made of HT2, single sealing lip and inner support
- Connection nipple glued to the reinforcing element of the suction cup (very high strength and temperature resistance)

Our Highlights...

- Silicone-free special material HT2
- Large structured inner support
- Soft and flexible sealing lip
- 1.5 folds
- Stiff top fold

Your Benefits...

- > Up to 250 °C temperature resistance
- > No deep-drawing of the workpiece; capable of handling high lateral forces
- > Good sealing of even slightly curved surfaces
- > Optimum adaptation to curved workpieces, very good damping
- > Resistance to lateral forces and high horizontal accelerations

Suction Cups for Handling Sheet Metal

Bellows Suction Cups for Hot Forming SAOB-HT2 (Oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 80 x 40 mm

Designation Code Bellows Suction Cups for Hot Forming SAOB HT2 (oval, 1.5 Folds)

Abbreviated designation	Dimensions LxB in mm	Material and shore hardness	Connection thread
Example: SAOB	60x30	HT2 65	G3/8-IG (AG = male)
SAOF	60 x 30 to 80 x 40	HT2 65	G1/4-AG G1/4-IG (IG = female) G3/8-IG

Ordering Data Bellows Suction Cups for Hot Forming SAOB HT2 (Oval, 1.5 Folds)

Suction cup SAOB HT2, available in various dimensions, is delivered with connection nipple glued to elastomer part.

Bellows Suction Cups for Hot Forming SAOB HT2 (oval, 1.5 Folds)

Type*	Connection 1/4" (male)	1/4" (female)	3/8" (female)
SAOB 60x30 HT2-65	10.01.06.02443	10.01.06.02442	10.01.06.02441
SAOB 80x40 HT2-65	10.01.06.02447	10.01.06.02446	10.01.05.02445

*Other connection nipples are available on request.

Technical Data Bellows Suction Cups for Hot Forming SAOB HT2 (oval, 1.5 Folds)

Type	Suction force [N]*	Pull-off force [N]	Lateral force [N]**	Volume [cm ³]	Min. curve radius [mm] (convex)	Recom. internal hose -Ø d [mm]***
SAOB 60 x 30 HT2-65	38	55	56	9.6	30	4
SAOB 80 x 40 HT2-65	65	100	98	20.6	40	6

*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

**The specified transverse forces are values measured at a vacuum of -0.6 bar with a dry or oily, smooth, flat workpiece surface. Depending on the workpiece surface and its quality, the actual values may deviate from these values.

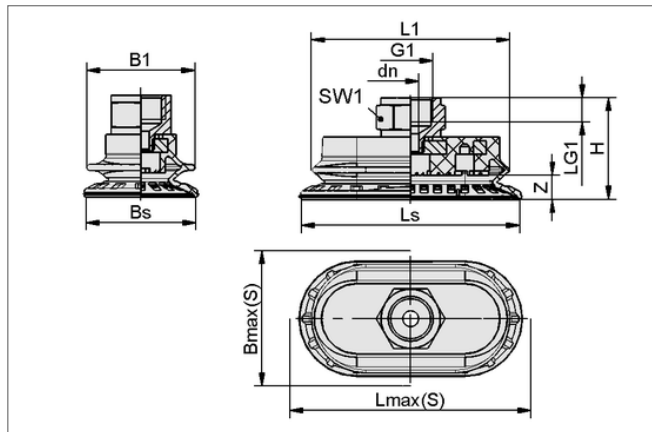
***The recommended hose diameter refers to a hose length of approx.. 2 m

Suction Cups for Handling Sheet Metal

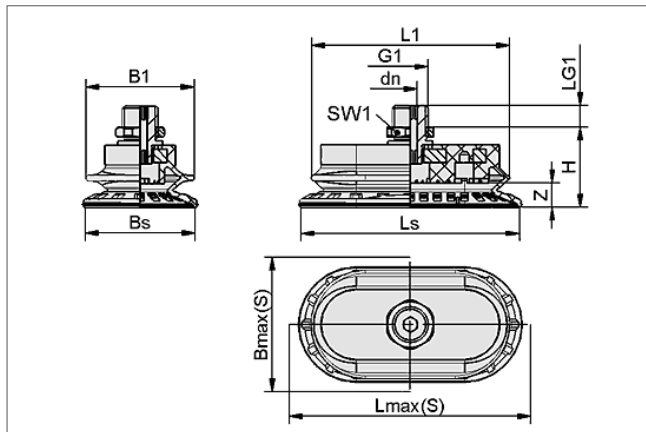
Bellows Suction Cups for Hot Forming SAOB-HT2 (oval, 1.5 Folds)

Suction area (LxW) from 60 x 30 mm to 80 x 40 mm

Design Data Bellows Suction Cups for Hot Forming SAOB HT2 (oval, 1.5 Folds)



SAOB HT2 60x30 and 80x40 IG female



SAOB HT2 60x30 and 80x40 AG (male)

Type	Dimensions in mm*										
	B1	Bmax(S)**	BS	dn	G1	H	LG1	Lmax(S)**	LS	SW1	Z(Stroke)
SAOB 60x30 G1/4-AG	31	33	30.6	5	G1/4"-M	27.0	56	63	60.6	17	7
SAOB 60x33 G1/4-IG	31	33	30.6	6	G1/4"-F	34.4	56	63	60.6	17	7
SAOB 60x33 G3/8-IG	31	33	30.6	6	G3/8"-F	35.0	56	63	60.6	22	7
SAOB 80x40 G1/4-AG	40	43	40.6	5	G1/4"-M	29.7	73	83	80.6	17	9
SAOB 80x40 G1/4-IG	40	43	40.6	6	G1/4"-F	37.2	73	83	80.6	17	9
SAOB 80x40 G3/8-IG	40	43	40.6	6	G3/8"-F	37.7	73	83	80.6	22	9

*Acceptable dimensional tolerances for rubber parts according to DIN ISO 3302-1 M3

**Bmax (S) and Lmax (S) are the external dimensions of the suction cup when it is pressed against the workpiece by the vacuum

Overview

Special Grippers

Magnetic Grippers



Magnetic Grippers SGM – HP / -HT*

76

- Diameter: 20 to 50 mm
- Holding force: 28 N to 560 N

Special gripper with permanent magnet for safely handling of ferromagnetic workpieces, e.g. perforated plates.

*The magnetic gripper SGM-HT/-HP are not available in the Netherlands.



Magnetic Grippers SGM/SGM-HD

81

- Diameter: 30 to 70 mm
- Holding force: 35 to 290 N

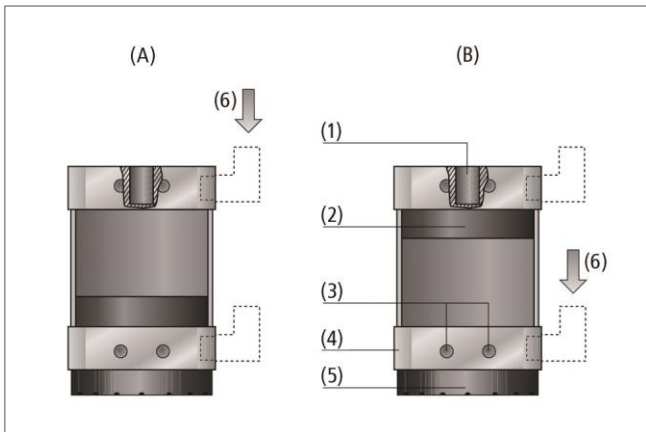
Double acting magnetic gripper for the safe handling of ferromagnetic workpieces.

Magnetic Grippers SGM-HT/-HP*

Suction area (\varnothing) von 20 mm bis 50 mm



Magnetic grippers SGM-HP/-HT



System design magnetic grippers SGM-HP/-HT



Magnetic gripper SGM-HP handling sheet metal

Applications

- Magnetic gripper with powerful holding forces for handling, e.g., perforated plates, workpieces with complex laser-cut patterns, sheet material containing drill holes and apertures
- Handling ferromagnetic workpieces
- HT version for high-temperature application and HP version for higher holding forces

Design

- Durable aluminium housing (4) with permanent magnet (2)
- Friction ring (5) for high lateral forces in dynamic processes
- Bistable version: Magnet position (6) „Grip“ (A) or „Release“ (B) retained in the event of power failure
- Mounting thread for holder (3) on head end (1) and on two gripper sides
- Optional mounting with holder system HTS
- Optional retaining elements facilitate handling of round or uneven workpieces

Our Highlights...

- Secure handling with permanent magnet
- Compact and lightweight shape
- Easily replaceable friction ring
- Low compressed air level needed for control
- Piston monitoring via proximity switch

Your Benefits...

- > No power supply unit required
- > Minimal space required, lightweight
- > Absorbs high lateral forces
- > Reliable operation even with fluctuating compressed air supply
- > Hall effect sensor to detect piston position

*The magnetic gripper SGM-HT/-HP is not available in the Netherlands.

Special Grippers

Magnetic Grippers SGM-HT/-HP

Suction area (Ø) von 20 mm bis 50 mm

Designation Code Magnetic Grippers SGM-HT/-HP

Abbreviated designation	Product range supplement	Suction area Ø in mm	Mechanical connection
Example SGM-HP 40 G1/4-IG:	HP	40	G1/4-IG (IG = female (F))
SGM	HP	20	G1/8-IG
	HT	30	G1/4-IG
		40	
		50	

Note on ordering: The magnetic gripper SGM-HT/-HP comes assembled. The product consists of:

- Gripper SGM-HP with friction ring PU
- Gripper SGM-HT with steel gripping surface for robust applications or with optional friction ring HT2 for high-temperature applications

Available spare parts: friction ring PU for SGM-HP, friction ring HT2 for SGM-HT

Available accessories: proximity switch, holder system, retaining element

Ordering Data Magnetic Grippers SGM-HT/-HP

Type	Part No.
SGM-HP 20 G1/8-IG	10.01.17.00424
SGM-HP 30 G1/8-IG	10.01.17.00316
SGM-HP 40 G1/8-IG	10.01.17.00304
SGM HP 50 G1/4-IG	10.01.17.00282
SGM-HT-HP 30 G1/8-IG	10.01.17.00397
SGM-HT-HP 40 G1/4 IG	10.01.17.00403
SGM-HT-HP 50 G1/4 IG	10.01.17.00402

Ordering Data Spare Parts Magnetic Grippers SGM-HT/-HP

Type	Friction ring
SGM-HP 20 G1/8-IG	10.01.17.00418
SGM-HP 30 G1/8-IG	10.01.17.00385
SGM-HP 40 G1/8-IG	10.01.17.00373
SGM HP 50 G1/4-IG	10.01.17.00381
SGM-HT-HP 30 G1/8-IG	-
SGM-HT-HP 40 G1/4 IG	-
SGM-HT-HP 50 G1/4 IG	-

Special Grippers

Magnetic Grippers SGM-HT/-HP

Suction area (Ø) von 20 mm bis 50 mm

Ordering Data Accessories Magnetic Grippers SGM-HT/-HP

Type	HTS-A2 holder system*	HTS-A3 holder system*
SGM-HP 20 G1/8-IG	10.01.17.00414	10.01.17.00413
SGM-HP 30 G1/8-IG	10.01.17.00416	10.01.17.00378
SGM-HP 40 G1/4-IG	10.01.17.00416	10.01.17.00378
SGM-HP 50 G1/4-IG	10.01.17.00417	10.01.17.00383
SGM-HT-HP 30 G1/8-IG	10.01.07.00416	10.01.17.00378
SGM-HT-HP 40 G1/4-IG	10.01.07.00416	10.01.17.00378
SGM-HT-HP 50 G1/4-IG	10.01.07.00417	10.01.17.00383

*Mounting screws included in delivery

Ordering Data Accessories Magnetic Grippers SGM-HT/-HP

Type	Friction ring HT2*	Proximity switch PNP***	Proximity switch NPN***	Retaining element ADP-E...TRI**	Retaining element ADP-E...RE**
SGM-HP-20 G1/8-IG		10.01.17.00199	10.01.17.00215	10.01.17.00419	10.01.17.00420
SGM-HP-30 G1/8-IG		10.01.17.00199	10.01.17.00215	10.01.17.00421	10.01.17.00423
SGM-HP-40 G1/4-IG		10.01.17.00199	10.01.17.00215	10.01.17.00421	10.01.17.00423
SGM-HP-50 G1/4-IG		10.01.17.00199	10.01.17.00215	10.01.17.00422	10.01.17.00415
SGM-HT-HP 30 G1/8-IG	10.01.17.00410	-	-	10.01.17.00421	10.01.17.00423
SGM-HT-HP 40 G1/4-IG	10.01.17.00411	-	-	10.01.17.00421	10.01.17.00423
SGM-HT-HP 50 G1/4-IG	10.01.17.00412	-	-	10.01.17.00422	10.01.17.00415

*The maximum workpiece temperature can be 250 °C

**Mounting screws included in delivery

***Proximity switch not suitable for high-temperature applications

Technical Data Magnetic Grippers SGM-HT/-HP

Type*	Max. holding force without friction ring [N]	Max. holding force with friction ring [N]	Ideal sheet thickness for max. holding force [mm]	Holding force without friction ring and 2 mm sheet thickness [N]	Holding force with friction ring and 2 mm sheet thickness [N]	Residual holding force [N]
SGM-HP 20 G1/8-IG	28	19	1	25	16	0.3
SGM-HP 30 G1/8-IG	130	90	2	130	90	0.3
SGM-HP 40 G1/4-IG	320	235	4	290	210	0.3
SGM-HP 50 G1/4-IG	560	385	6	415	290	0.3
SGM-HT-HP 30 G1/8-IG**	120	80	2	120	80	0.3
SGM-HT-HP 40 G1/4-IG**	290	230	4	260	200	0.3
SGM-HT-HP 50 G1/4-IG**	520	330	6	370	270	0.3

*Note: The specified holding forces are static specifications under ideal conditions (primarily) depending on material and surface finish). For system design, a safety factor (5) of 3 should be applied.

**Holding forces at 20 °C; can be used for workpieces temperatures up to 350 °C (depending on process conditions), temperature can reduce holding forces by up to 30%

Type	Pressure range (operating pressure) [bar]	Installation position	Mode of operation	Operating temperature [°C]	Weight [g]
SGM-HP-20 G1/8-IG	2.5...6.0	Any	Bistabile	5...70	81
SGM-HP-30 G1/8-IG	2.5...6.0	Any	Bistabile	5...70	215
SGM-HP-40 G1/4-IG	2.5...6.0	Any	Bistabile	5...70	415
SGM-HP-50 G1/4-IG	2.5...6.0	Any	Bistabile	5...70	770
SGM-HT-HP 30 G1/8-IG**	2.5...6.0	Any	Bistabile	5...150	215
SGM-HT-HP 40 G1/4-IG**	2.5...6.0	Any	Bistabile	5...150	415
SGM-HT-HP 50 G1/4-IG**	2.5...6.0	Any	Bistabile	5...150	770

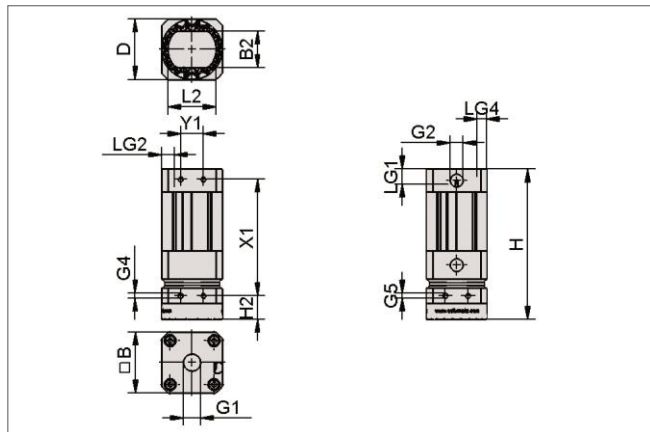
Special Grippers

Magnetic Grippers SGM-HT/-HP

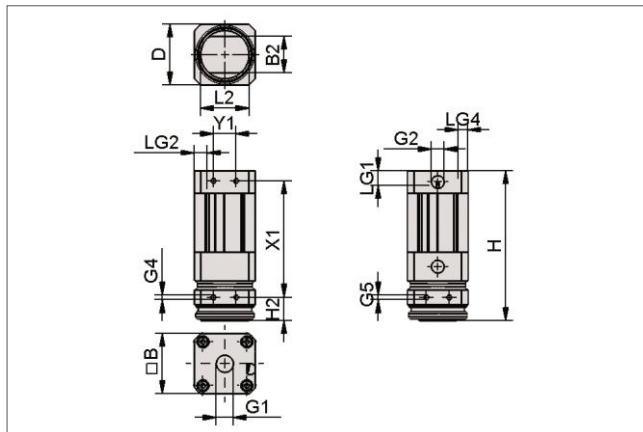
Suction area (\emptyset) von 20 mm bis 50 mm



Design Data Magnetic Grippers SGM-HT/-HP



SGM-HP 20 to 50



SGM-HT-HP 30 to 50

Type	Dimensions in mm*													
	B	B2	D	G1	G2	G4	H	H2	L2	LG1	LG2	LG4	X1	Y1
SGM-HP 20 G1/8-IG*	20.0	9.1	20.0	G1/8"-IG	M5-IG	M3-IG	78.2	12.7	12.0	6.0	5.5	4.0	6.5	55.0
SGM-HP 30 G1/8-IG*	30.0	15.0	30.0	G1/8"-IG	G1/8"-IG	M4-IG	99.4	15.7	20.5	6.0	7.0	5.0	12.0	74.0
SGM-HP 40 G1/4-IG**	40.0	24.2	40.0	G1/4"-IG	G1/8"-IG	M4-IG	99.4	15.7	32.0	9.0	6.0	5.0	12.0	74.0
SGM-HP 50 G1/4-IG*	50.0	31.2	50.0	G1/4"-IG	G1/8"-IG	M5-IG	123.4	15.7	41.5	10.0	6.0	6.5	15.0	100.0
SGM-HT-HP 30 G1/8-IG**	30.0	15.0	26.9	G1/8"-IG	G1/8"-IG	M4-IG	99.2	15.5	20.5	6.0	7.0	5.0	12.0	74.0
SGM-HT-HP 40 G1/8-IG**	40.0	24.2	38.4	G1/4"-IG	G1/8"-IG	M4-IG	99.2	15.5	32.0	9.0	6.0	5.0	12.0	74.0
SGM-HT-HP 50 G1/4-IG**	50.0	31.2	48.4	G1/4"-IG	G1/8"-IG	M5-IG	123.2	15.5	41.5	10.0	6.0	6.5	15.0	100.0

*Gripper contact surface (round) is dimension D

**Gripper contact surface without friction ring (stadium-shaped) is approx. dimension D x B2; with friction ring (round), dimension D



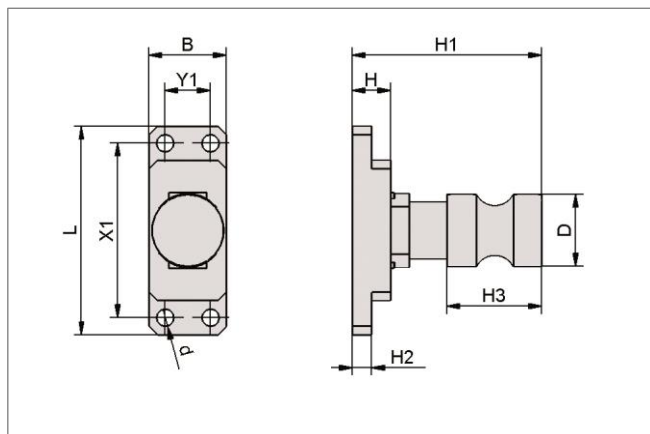
Special Grippers

Magnetic Grippers SGM-HT/-HP

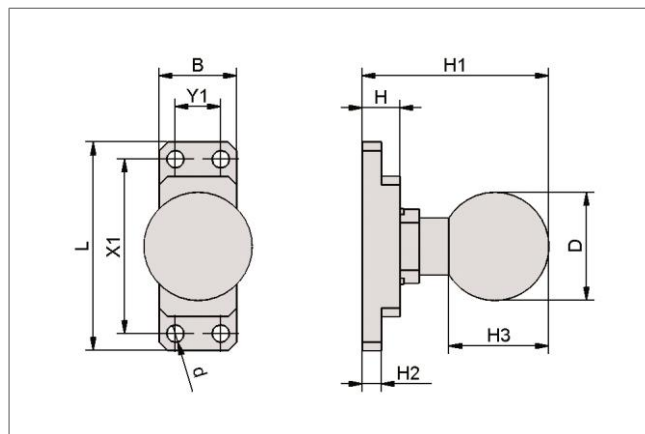
Suction area (\varnothing) von 20 mm bis 50 mm



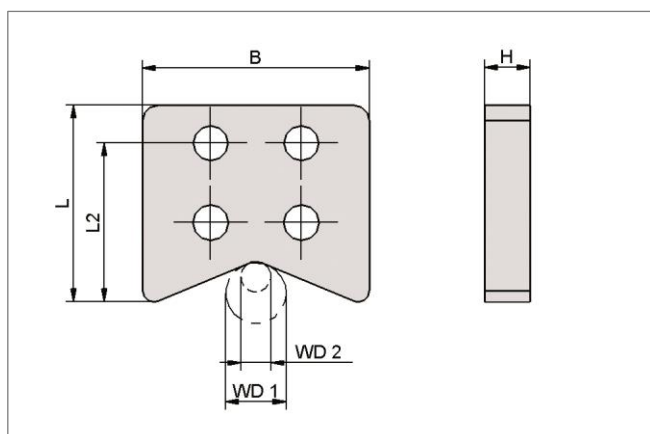
Design Data Accessories Magnetic Grippers SGM-HT/-HP



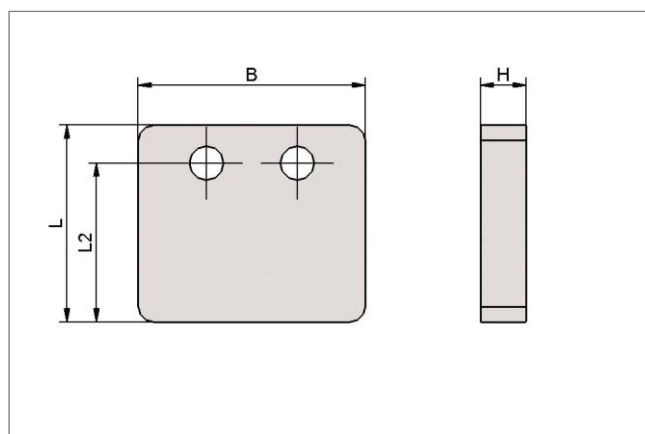
HTS-A2



HTS-A3



ADP-E...TRI



ADP-E...RE

Type	Dimension in mm*												
	B	d	D	H	H1	H2	H3	L	L1	WD1	WD2	X1	Y1
HTS-A2 AP SGM 20*	15.0	3.4	19.0	9.9	50.0	5.2	25.0	63.0	-	-	55.0	55.0	6.5
HTS-A2 AP SGM 40**	26.0	4.6	19.0	9.9	50.0	5.2	25.0	86.0	-	-	74.0	74.0	12.0
HTS-A2 AP SGM 50***	30.0	5.5	19.0	9.9	50.0	5.2	25.0	110.0	-	-	100.0	100.0	15.0
HTS-A3 AP SGM 20*	15.0	3.4	28.5	9.9	49.3	5.2	26.4	63.0	-	-	55.0	55.0	6.5
HTS-A3 AP SGM 40**	26.0	4.6	28.5	9.9	49.3	5.2	26.4	86.0	-	-	74.0	74.0	12.0
HTS-A3 AP SGM 50***	30.0	5.5	28.5	9.9	49.3	5.2	26.4	110.0	-	-	100.0	100.0	15.0
ADP-E 20 TRI*	15.0	-	-	4.0	-	-	-	-	15.5	10.0	-	-	-
ADP-E30/40 TRI**	30.0	-	-	6.0	-	-	-	-	21.0	20.0	-	-	-
ADP-E 50 TRI**	40.0	-	-	6.0	-	-	-	-	21.0	30.0	-	-	-
ADP-E UNI 20 RE*	15.0	-	-	4.0	-	-	-	-	15.5	-	-	-	-
ADP-E UNI 30/40 RE**	30.0	-	-	6.0	-	-	-	-	21.0	-	-	-	-
ADP-E UNI 50 RE***	40.0	-	-	6.0	-	-	-	-	21.0	-	-	-	-

*Suitable for SGM-HP 20

**Suitable for SGM...30 and SGM...40

***Suitable for SGM...50

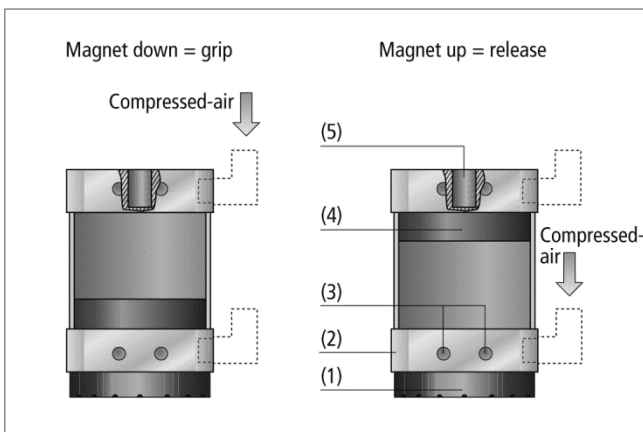
Magnetic Grippers

Magnetic Gripper SGM/SGM-HD

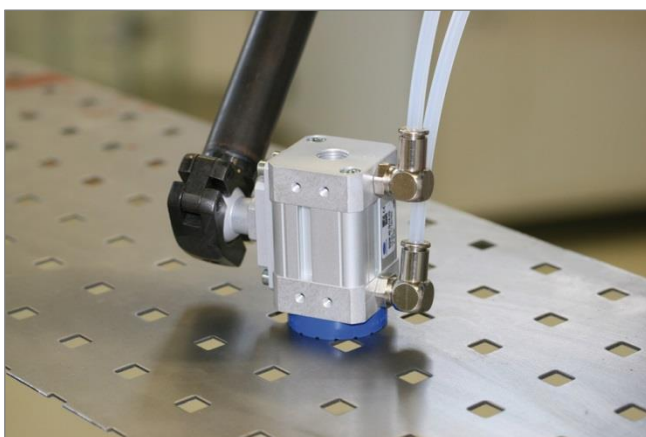
Suction area (Ø) from 30 mm to 70 mm



Magnetic gripper SGM/SGM-HD



System design magnetic grippers SGM/SGM-HD



Magnetic grippers SGM/SGM-HD being used for handling perforated metal sheets

Applications

- Magnetic gripper for handling of perforated metal sheets, complex laser-cut workpieces and metal sheets with holes and apertures
- Handling of ferromagnetic workpieces
- Version with aluminum base (SGM) and robust version (SGM-HD) with stainless steel base e.g. for applications where contact with the metallic gripper base cannot be excluded
- Also available with piston position control sensor on request (for Magnetic Gripper SGM)

Design

- Robust aluminum housing with aluminum base (SGM) and with stainless steel base (SGM-HD) (2) with permanent magnet (4)
- Clip-on, easy to replace friction ring (1)
- Bistable design: the magnet settings "grip" and "release" are maintained in event of power loss
- Standard connection threads (5) in top cover
- Mounting threads (3) for holder systems HTS on 3 sides
- The holder system HTS offers several options for mounting a gripper; HTS...D version for interlocking and mounting two grippers

Our Highlights...

- Safe gripping by a permanent magnet
- Compact and lightweight design
- Easily replaceable friction ring
- Optional side connection for tooling by using HTS holder system
- Option to interlock two magnetic grippers (HTS...D)
- Easy operation with compressed air signal
- Stainless steel gripper base (SGM-HD gripper)
- Pneumatic bistable design

Your Benefits...

- > No electric power required
- > Minimal space requirements, low total weight
- > High shear forces can be achieved
- > Flexible mounting options
- > Optimal for oblong workpieces
- > Reduction of energy costs
- > For robust applications
- > Safe gripping in case of power loss

Magnetic Grippers

Magnetic Grippers SGM/SGM-HD

Suction area (\varnothing) from 30 mm to 70 mm

Designation Code Magnetic Grippers SGM/SGM-HD

Abbreviated designation	Diameter in mm	Connection mechanical
Example SGM 30 G1/8-IG: SGM/SGM-HD	30	G1/8-IG
SGM/SGM-HD	30	G1/8-IG (IG = female (F))
	40	G1/4-IG
	50	
	70	

Ordering Data Magnetic Grippers SGM/SGM-HD

Magnet gripper SGM/SGM-HD is delivered assembled. The assembly consists of:

- Gripper of type SGM/SGM-HD – available in various diameters
- Friction ring made of the material PU

Available spare parts: friction ring

Available accessories: holder system

Magnetic Grippers SGM/SGM-HD

Type	Part Number
SGM/SGM-HD 30 G1/8-IG	10.01.17.00162
SGM/SGM-HD 40 G1/4-IG	10.01.17.00163
SGM/SGM-HD 50 G1/4 IG	10.01.17.00164
SGM/SGM-HD 70 G1/4-IG	10.01.17.00165

Ordering Data Spare Parts Magnetic Grippers SGM/SGM-HD

Type	Friction ring
SGM/SGM-HD 30	10.01.17.00136
SGM/SGM-HD 40	10.01.17.00137
SGM/SGM-HD 50	10.01.17.00138
SGM/SGM-HD 70	10.01.17.00139

Ordering Data Accessories Holder System (Single) Magnetic Grippers SGM/SGM-HD

Type	Holder System HTS-A2*	Holder System HTS-A3*
SGM/SGM-HD 30	10.01.17.00169	10.01.17.00170
SGM/SGM-HD 40	10.01.17.00169	10.01.17.00170
SGM/SGM-HD 50	10.01.17.00172	10.01.17.00173
SGM/SGM-HD 70	10.01.17.00172	10.01.17.00173

*Mounting screws included

Magnetic Grippers

Magnetic Grippers SGM/SGM-HD

Suction area (\varnothing) from 30 mm to 70 mm

Ordering Data Accessories Holder System (Double) Magnetic Grippers SGM/SGM-HD

Type	Holder System HTS-A2 D*	Holder System HTS-A3 D*
SGM/SGM-HD 30	10.01.17.00175	10.01.17.00176
SGM/SGM-HD 40	10.01.17.00175	10.01.17.00176
SGM/SGM-HD 50	10.01.17.00178	10.01.17.00179
SGM/SGM-HD 70	10.01.17.00178	10.01.17.00179

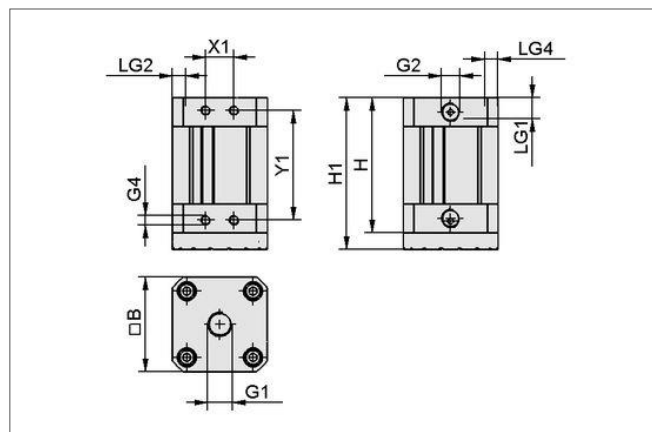
*Mounting screws included

Technical Data Magnetic Grippers SGM/SGM-HD

Type	Holding Force [N]*	Remaining force [N]	Operating Pressure [bar]	Installation position	Principle of operation	Operating Temperature [°C]	Weight SGM [g]	Weight SGM-HD [g]
SGM/SGM-HD 30	35	0.3	3.5...6	Any	Bistable	5...70	130	191
SGM/SGM-HD 40	100	0.3	3.5...6	Any	Bistable	5...70	240	342
SGM/SGM-HD 50	180	0.3	3.5...6	Any	Bistable	5...70	440	594
SGM/SGM-HD 70	290	0.3	3.5...6	Any	Bistable	5...70	715	975

*Note: The value given is a static value with no safety factor; based on a plate with a thickness of 2 mm. For system configurations with magnetic grippers SGM/SGM-HD, a safety factor of S = 3 must be applied.

Design Data Magnetic Grippers SGM/SGM-HD



SGM/SGM-HD 30 to 70

Type	Dimensions in mm*										
	B	G1	G2	G4	H	H1	LG1	LG2	LG4	X1	Y1
SGM/SGM-HD 30 G1/8-IG	30.0	G1/8"-F	G1/8"-F	M4-F	61.4	70.2	7	6	5	12	46
SGM/SGM-HD 40 G1/4-IG	40.6	G1/4"-F	G1/8"-F	M4-F	61.4	70.2	11	6	7	12	46
SGM/SGM-HD 50 G1/4-IG	50.6	G1/4"-F	G1/8"-F	M5-F	71.4	80.2	11	6	7	15	58
SGM/SGM-HD 70 G1/4-IG	68.7	G1/4"-F	G1/8"-F	M5-F	71.4	80.2	11	6	8	15	58

*Contact surface of the grippers (round) corresponds to dimension B

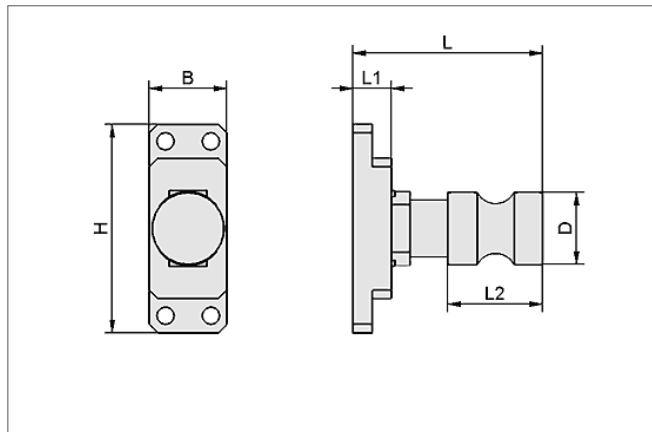
Magnetic Grippers

Magnetic Grippers SGM/SGM-HD

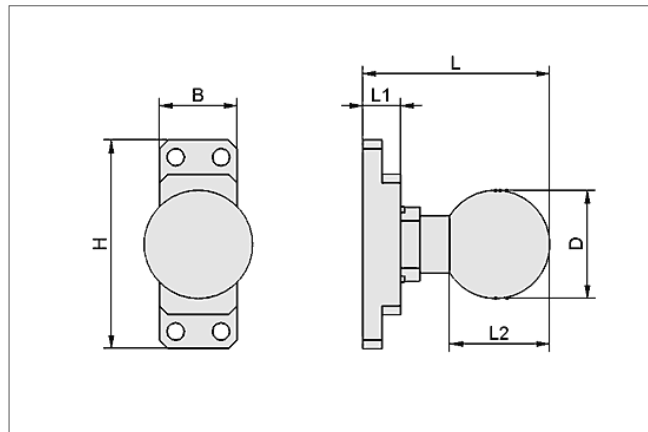
Suction area (\varnothing) from 30 mm to 70 mm



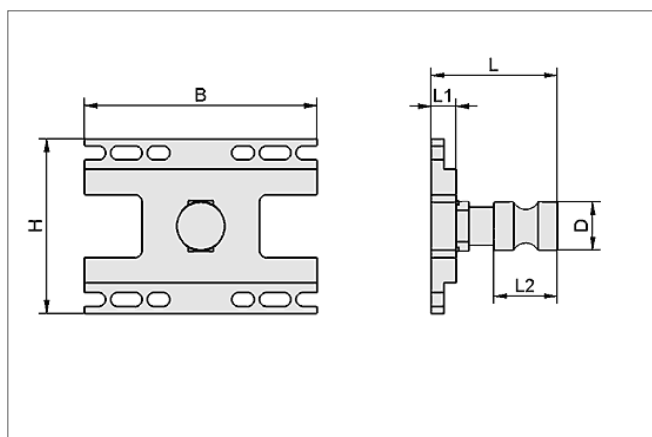
Design Data Accessories Magnetic Grippers SGM/SGM-HD



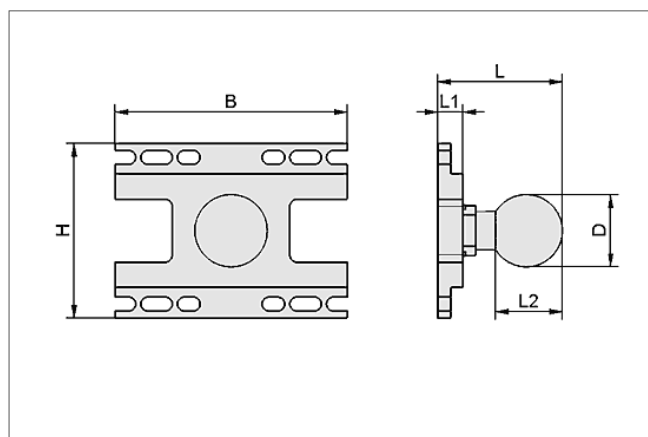
HTS-A2



HTS-A3



HTS-A2 D



HTS-A3 D



Design Data Accessories Holder System Magnetic Grippers SGM/SGM-HD

Type	Dimensions in mm*						
	B	D	H	L	L1	L2	
HTS-A2 SGM/SGM-HD 30/40*	20.5	19.0	55	50.2	9.9	25.0	
HTS-A3 SGM/SGM-HD 30/40*	20.5	28.5	55	49.4	9.9	26.4	
HTS-A2 SGM/SGM-HD 50/70**	26.0	19.0	69	49.9	9.9	25.0	
HTS-A3 SGM/SGM-HD 50/70**	26.0	28.5	69	49.2	9.9	26.4	
HTS-A2 D SGM/SGM-HD 30/40***	59.0	19.0	59	50.0	9.9	25.0	
HTS-A3 D SGM/SGM-HD 30/40***	59.0	28.5	59	49.3	9.9	26.4	
HTS-A2 D SGM/SGM-HD 50/70****	92.0	19.0	69	50.0	9.9	25.0	
HTS-A3 D SGM/SGM-HD 50/70****	92.0	28.5	69	49.3	9.9	26.4	

*suitable for 1 SGM/SGM-HD 30 or 1 SGM/SGM-HD 40

**suitable for 1 SGM/SGM-HD 50 or 1 SGM/SGM-HD 70

***suitable for 2 SGM/SGM-HD 30 or 2 SGM/SGM-HD 40

****suitable for 2 SGM/SGM-HD 50 or 2 SGM/SGM-HD 70



Overview

Mounting Elements

Mounting Elements



Flexolink FLK

87

- Connection: M10x1,5 to G1/2"
- Deflection: max. 12°
- Rubber buffer (vulcanised into position) as a joint

Polydirectional joint mounting made from high-quality steel with vulcanize-bonded rubber buffer for adjusting the suction cup to uneven surfaces; automatic resetting



Ball Joints KGL

90

- Connection: G1/8" to G1/2"
- Deflection: max. 15°
- Sealed ball-and-socket joint with vacuum-tight seal

Polydirectional ball joint made from galvanized steel or stainless steel, sealed using O-ring, for adjustment of the suction cup to uneven surfaces.



Spring Plungers FSTE-HD

93

- Connection: G1/8" to G1/2"
- Stroke: 15 to 90 mm
- Version Heavy Duty
- Integrated vacuum feed

Spring plunger with special slide bearings and damping spring for height compensation for highly dynamic applications with short cycles.



Spring Plungers FSTE-HDB-VG

97

- Connection: G1/8" to G1/2"
- Stroke: 15 to 80 mm
- Integrated vacuum feed
- Version heavy duty

Spring plunger with anti-rotation guide, anti-block protection and special slide bearings for height compensation for highly dynamic applications with short cycles.



Spring Plungers FSTA-HD

100

- Connection: G1/4" to G1/2"
- Stroke: 25 to 90 mm
- Version Heavy Duty
- Integrated vacuum feed

Spring plunger with special slide bearings and two damping springs for height compensation for highly dynamic applications with fragile workpieces and short cycles, as well as for even load distribution.



Spring Plungers FSTI

103

- Connection: G1/4" and G3/8"
- Stroke: 10 to 50 mm
- Internal damping spring
- Integrated vacuum feed

Spring plunger with internal damping spring and high quality sliding bearings for handling fragile workpieces, particularly in the automotive industry.

Overview

Mounting Elements

	Holder System for Tooling HT	107
<ul style="list-style-type: none"> • Tooling connection with pin or ball 	Flexible holder system for ejectors, suction cups and spring plunger for all current tooling systems in press shops; easy assembly.	
	Holder for Spring Plunger HTR-FST	111
<ul style="list-style-type: none"> • Mounting for FSTI plungers 	The versatile holder for mounting on a wide range of spring plungers.	
	Universal Holders HTR-UNI	113
<ul style="list-style-type: none"> • Connection: G1/4" • Vacuum line: G1/8" • Mounting for pipes with diameter 25 to 32 mm or 30x30 mm 	Holder for adjustable installation of suction cups; height and incline of the suction cup can be adjusted.	
	Holder for Double-Blank Sensors DBD	118
<ul style="list-style-type: none"> • Female thread for sensor M36, M42, M54 • Stroke: 36 mm und 80 mm 	Double blank detector sensor holder with spring plungers for sensors with M36, M42 and M54 female thread	
	Vacuum cylinder VSZ	122
<ul style="list-style-type: none"> • Diameter: 30 mm • Stroke: 20 mm 	Single acting vacuum cylinder for positioning work-pieces	

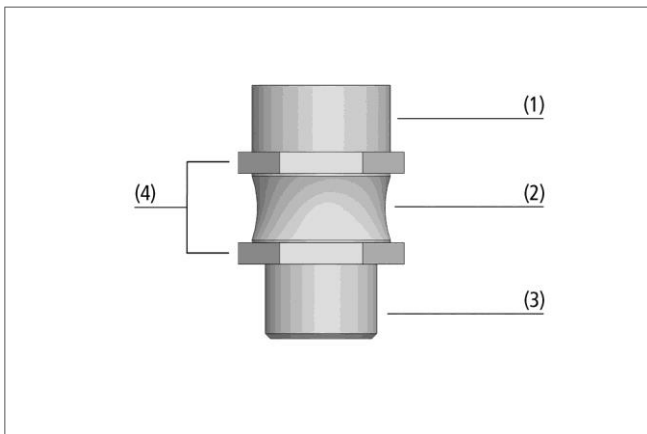
Jointed Mountings

Flexolink FLK

Connection thread from M10x1.25 to G1/2"



Flexolink FLK



System design Flexolink FLK



Flexolink FLK for adaptation to sloping metal sheets

Applications

- Flexolink for handling of workpieces with sloping surfaces with the aid of large-size suction cups or suction plates
- Handling of large sheets of materials (such as wood or sheet metal) which may sag when lifted (Flexolink prevents the sheet from being pulled off due to one-sided forces)
- Can be used together with spring plungers to compensate for differing workpiece heights and uneven surfaces
- Automatic resetting

Design

- Flexible mounting made of high-quality steel with a rubber buffer (vulcanized into position) as a joint (2)
- Maximum deflection angle limited by a screw-in stop
- Force is transferred via a shaped metal connection within the joint
- Flats on upper and lower halves for damage-free installation (4)
- Connection thread for top connection (1) and (3) in various sizes
- Deflection (max.) 12°

Our Highlights...

- Fully flexible mounting of suction cups and suction plates
- Joint made of rubber and metal
- Low center of flexure
- High-strength connection between rubber and metal parts

Your Benefits...

- > Very good adaptation to sloping workpiece surfaces
- > Automatic reset function to neutral position
- > Reduced wear on suction cups when they are placed on sloping surfaces
- > Vacuum-tight design with integrated protection against damage

Jointed Mountings

Flexolink FLK

Connection thread from M10x1.25 to G1/2"

Designation Code Flexolink FLK

Abbreviated designation	Connection thread 1	Connection thread 2	Product addition
Example FLK G1/4-IG M10x1.25-AG:			
FLK	G1/4-IG	M10x1.25-AG	
FLK	G1/4-AG (AG = male (M))	M10x1.25-AG (AG = male (M))	V special reinforced Flexolink
	G1/4-IG (IG = female (F))	G1/4-AG	
	G1/2-AG	G1/2-AG	
	G1/2-IG		

Ordering Data Flexolink FLK

Jointed mounting Flexolink FLK is delivered as a ready to connect product.

Flexolink FLK

Type*	Part Number
FLK G1/4-IG M10x1.25-AG	10.01.03.00206
FLK G1/4-IG G1/4-AG	10.01.03.00178
FLK G1/4-AG G1/4-AG	10.01.03.00152
FLK G1/2-IG G1/2-AG	10.01.03.00175
FLK G1/2-AG G1/2-AG	10.01.03.00153
FLK G1/2-AG G1/2-AG V	10.01.03.00207

*V = Special reinforced Flexolink for use with suction plates SPU 300 and SPU 400

Technical Data Flexolink FLK

Type	Vertical load [N]	Bending moment [Nm]	Weight [g]
FLK G1/4-IG M10x1.25-AG	500	8	26
FLK G1/4-IG G1/4-AG	750	10	30
FLK G1/4-AG G1/4-AG	750	10	30
FLK G1/2 IG G1/2-AG	3000	50	100
FLK G1/2-AG G1/2-AG	3000	65	100
FLK G1/2-IG G1/2-AG V	4500	65	190

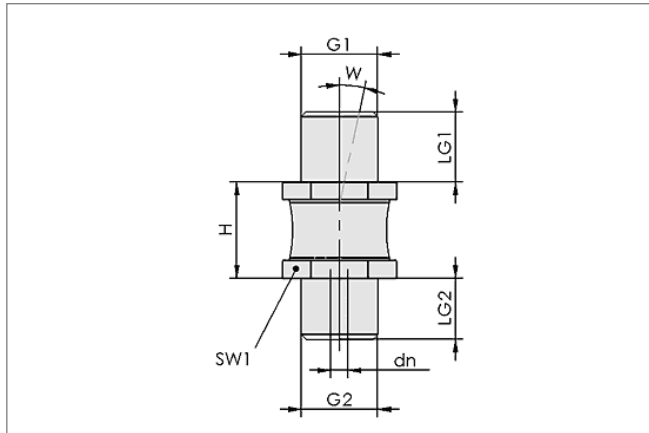
Jointed Mountings

Flexolink FLK

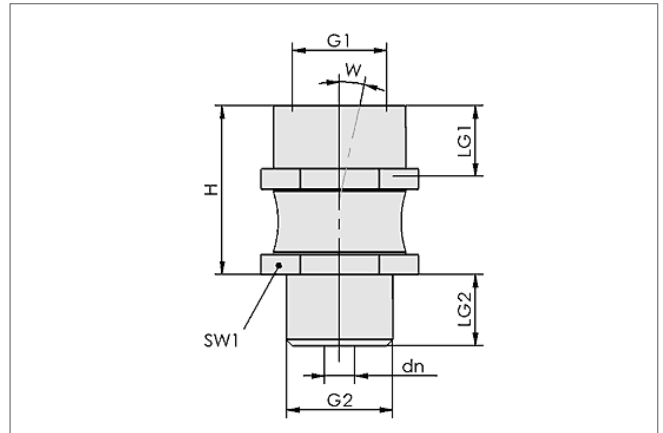
Connection thread from M10x1.25 to G1/2"



Design Data Flexolink FLK



FLK AG-AG



FLK IG-AG



Design Data Flexolink FLK

Type	Dimensions in mm								
	dn	G1	G2	H	LG1	LG2	SW1	W [°]	
FLK G1/4-IG M10x1.25-AG	2.8	G1/4"-F	M10x1.25-M	27.0	10.5	8	17	12	
FLK G1/4-IG G1/4-AG	3.0	G1/4"-F	G1/4"-M	27.0	12.0	12	17	12	
FLK G1/4-AG G1/4-AG	3.0	G1/4-M	G1/4-M	16.5	10.5	12	17	12	
FLK G1/2-IG G1/2-AG	6.0	G1/2"-F	G1/2"-M	33.5	14.0	14	27	12	
FLK G1/2-G G1/2-AG	5.5	G1/2"-M	G1/2"-M	21.0	14.0	14	27	12	
FLK G1/2-IG G1/2-AG V	6.0	G1/2"-F	G1/2"-M	53.0	14.0	14	36	8	

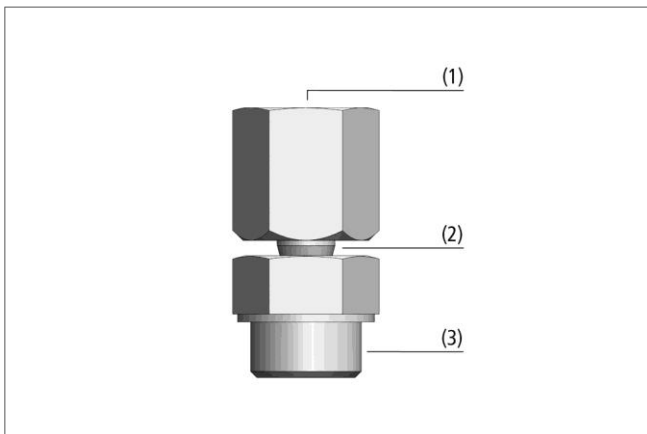
Jointed Mountings

Ball Joints KGL

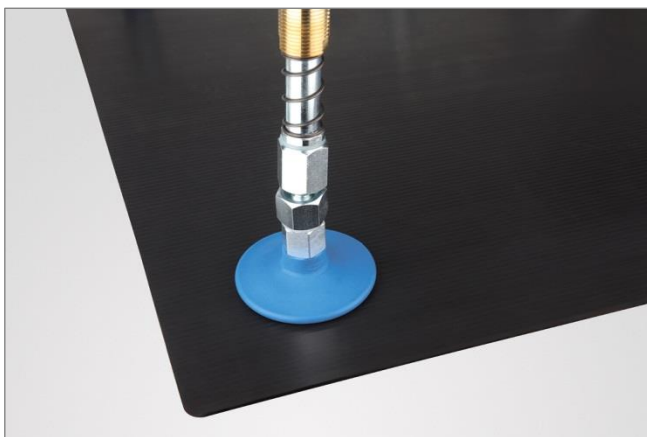
Connection thread from G1/8 "to G1/2"



Ball joints KGL



System design ball joints KGL



Mounting example ball joints KGL

Applications

- Ball joint for handling of workpieces with sloping surfaces with the aid of large-size suction cups or suction plates
- Handling of large sheets of materials (such as wood or sheet metal) which may sag when lifted (flexible mounting with KGL prevents premature pulling-off of the sheet due to one-sided forces)
- Can be used together with spring plungers to compensate for differing workpiece heights and uneven surfaces

Design

- Ball and socket made of galvanized steel (KGL...) or stainless steel (KGL...A2)
- Ball and socket (2) with O-ring seal to prevent vacuum leaks
- Connection thread above (1) and below (3) in various sizes
- Deflection (max.) 15°

Our Highlights...

- Fully flexible mounting of suction cups and suction plates
- Sealed ball-and-socket joint with vacuum-tight seal
- Low center of flexure

Your Benefits...

- > Very good adaptation to workpieces with sloping surfaces
- > Safe handling
- > Minimum wear on the suction cup when it is placed on a sloping surface

Jointed Mountings

Ball Joints KGL

Connection thread from G1/8" to G1/2"

Designation Code Ball Joints KGL

Abbreviated designation	Connection thread 1	Connection thread 2	Material
Example KGL G1/2-IG G1/2 AG:	G1/2-IG	G1/2-AG	
KGL	G1/8-IG (IG = female (F))	G1/8-AG (AG = male (M))	- galvanised steel
KGL	G1/4-IG	G1/4-AG	A2 stainless steel
	G1/2-IG	G1/2-AG	
		M10x1.25-AG	

Ordering Data Ball Joints KGL

Ball joint KGL is delivered as a ready to connect product.

Ball Joints KGL

Type	Part Number
KGL G1/8-IG G1/8-AG A2	10.01.03.00109
KGL G1/4-IG G1/4-AG	10.01.03.00110
KGL G1/4-IG M10x1.25-AG	10.01.03.00137
KGL G1/2-IG G1/2-AG	10.01.03.00111

Technical Data Ball Joints KGL

Type	Vertical load [N]	Weight [g]
KGL G1/8-IG G1/8-AG A2	300	26
KGL G1/4-IG G1/4-AG	1500	67
KGL G1/4-IG M10x1.25-AG	1500	67
KGL G1/2-IG G1/2-AG	2500	116

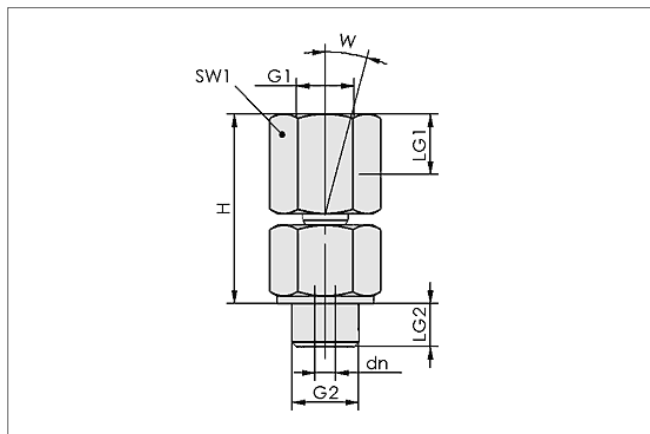
Jointed Mountings

Ball Joints KGL

Connection thread from G1/8" to G1/2"



Design Data Ball Joints KGL



KGL G1/8 to G1/2



Design Data Ball Joints KGL

Type	Dimensions in mm							
	dn	G1	G2	H	LG1	LG2	SW1	W [°]
KGL G1/8-IG G1/8-AG A2	2.0	G1/8"-F	G1/8"-M	26.5	8.5	7	14	15
KGL G1/4-IG G1/4-AG	3.5	G1/4"-F	G1/4"-M	37.5	12.0	10	19	15
KGL G1/4-IG M10x1.25-AG	3.5	G1/4"-F	M10x1.25-M	37.5	12.0	10	19	15
KGL G1/2-IG G1/2-AG	4.0	G1/2"-F	G1/2"-M	40.0	14.0	12	24	15

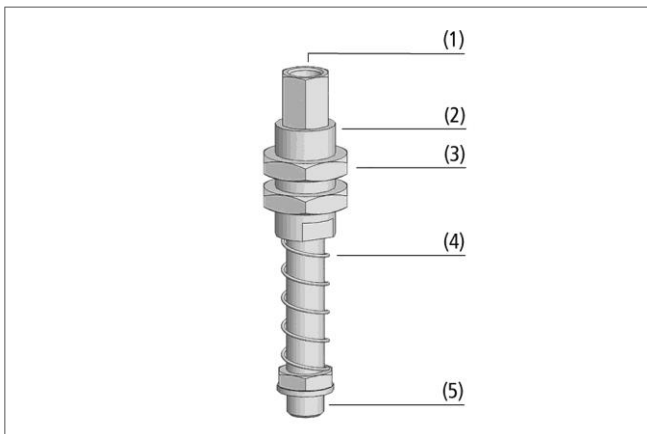
Spring Plungers

Spring Plungers FSTE-HD

Stroke from 15 mm to 90 mm



Spring plungers FSTE-HD



System design spring plungers FSTE-HD



Mounting example spring plungers FSTE-HD

Applications

- Spring plunger with special plain bearings and one damping spring for handling of workpieces with height differences (e. g. curved sheet metal parts)
- Handling very delicate workpieces (e.g. glass plates, etc.) with no additional control technology required; ensures hat workpieces are set down gently
- Highly dynamic handling tasks with short cycle times
- Extraresponsive, rotation-proof design for reliable functions

Design

- Spring plunger with high-strength stainless-steel plunger rod, guide sleeve (2) with integrated bearing bushing and lower damping spring (4)
- Plunger rod with integrated vacuum feed, connection thread (1) always female
- Ball bearing-mounted anti-rotation guard between plunger rod and sliding sleeve
- Suction cup (5) connection thread always male
- Male thread with two lock nuts (3) for mounting

Our Highlights...

- Spring plunger with high-quality sliding bearings
- Extraresponsive, rotation-proof design
- Block protector for damping spring
- Wide hex bolt for suction cup mounting

Your Benefits...

- > Maintenance free with extra-long service life; suitable for short cycle times
- > Can support oval suction cups; also for demanding applications
- > Gentle on the spring for long service life
- > Easy press-on suction cup replacement, gentle on anti-rotation guard

Spring Plungers

Spring Plungers FSTE-HD

Stroke from 15 mm to 90 mm

Designation Code Spring Plungers FSTE-HD

Abbreviated designation	Version	Suction cup connection	Plunger stroke in mm	Product addition
Example FSTE-HD G1/8-AG 15 VG:				
FSTE	HD	G 1/8-AG	15	VG
FSTE	HD Heavy Duty (hard use)	G1/8-AG (AG = male (M))	15	VG with anti-rotation
		G1/4-AG	25	AB guard anti-block
		G3/8-AG	50	
		G1/2-AG	75	
			90	

Ordering Data Spring Plungers FSTE-HD

Spring plunger FSTE-HD is delivered as a ready to connect product.

Spring Plungers FSTE-HD

Type*	Plunger stroke in mm**					
	15	20	25	45	50	70
FSTE-HD G1/8	10.01.02.00756	-	10.01.02.00757	-	10.01.02.00758	-
FSTE-HD G1/8 VG*	10.01.02.00872	-	10.01.02.00873	-	10.01.02.00874	-
FSTE-HD G1/4	-	-	10.01.02.00763	-	10.01.02.00764	-
FSTE-HD G1/4 VG*	-	-	10.01.02.00875	-	10.01.02.00876	-
FSTE-HD G1/4 AB	-	10.01.02.00986	-	10.01.02.01008	-	10.01.02.00988
FSTE-HD G1/4 VG AB*	-	10.01.02.00975	-	-	-	10.01.02.00977
FSTE-HD G3/8	-	-	10.01.02.00811	-	-	-
FSTE-HD G3/8 VG*	-	-	10.01.02.00878	-	-	-
FSTE-HD G1/2	-	-	10.01.02.00770	-	-	-
FSTE-HD G1/2 VG*	-	-	10.01.02.00881	-	-	-

*VG = Version with anti-rotation guard for repeatably accurate positioning of suction cups

**Recommendation: To raise the lifetime in continuous duty, prevent the maximal slide stroke

Type*	Plunger stroke in mm**		
	75	80	90
FSTE-HD G1/8	-	-	-
FSTE-HD G1/8 VG*	-	-	-
FSTE-HD G1/4	10.01.02.00765	-	-
FSTE-HD G1/4 VG*	10.01.02.00877	-	10.01.02.01056
FSTE-HD G1/4 AB	-	-	-
FSTE-HD G1/4 VG AB*	-	10.01.02.01234	-
FSTE-HD G3/8	10.01.02.00812	-	10.01.02.00813
FSTE-HD G3/8 VG*	10.01.02.00879	-	10.01.02.00880
FSTE-HD G1/2	10.01.02.00771	-	10.01.02.00772
FSTE-HD G1/2 VG*	10.01.02.00882	-	10.01.02.00883

*VG = Version with anti-rotation guard for repeatably accurate positioning of suction cups

**Recommendation: To raise the lifetime in continuous duty, prevent the maximal slide stroke

Technical Data Spring Plungers FSTE-HD

Type	Springrate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal load [N]***	Weight [g]	Operating temperature [°C]
FSTE-HD G1/8-AG 15	0.221	3.53	5.19	3700	385	80	0...80
FSTE-HD G1/8-AG 15 VG	0.221	3.53	5.19	3700	385	80	0...80
FSTE-HD G1/8-AG 25	0.143	3.57	5.36	3700	283	90	0...80
FSTE-HD G1/8-AG 25 VG	0.143	3.57	5.36	3700	283	90	0...80
FSTE-HD G1/8-AG 50	0.097	2.92	5.34	3700	173	110	0...80
FSTE-HD G1/8-AG 50 VG	0.097	2.92	5.34	3700	173	110	0...80

Spring Plungers

Spring Plungers FSTE-HD

Stroke from 15 mm to 90 mm

Technical Data Spring Plungers FSTE-HD

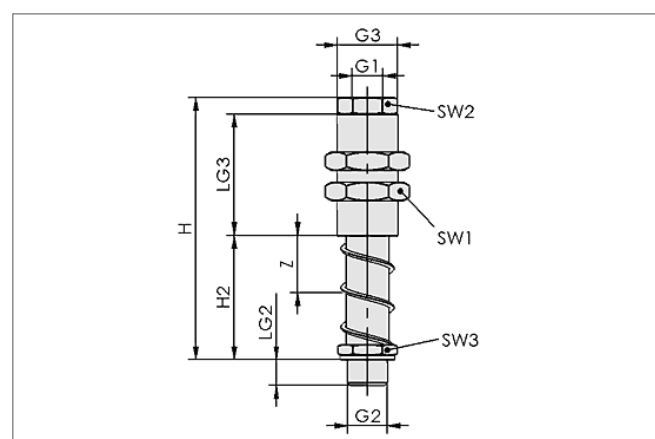
Type	Spring rate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal load [N]***	Weight [g]	Operating temperature [°C]
FSTE-HD G1/4-AG 20 AB	0.711	10.90	18.00	2400	747	152	0...80
FSTE-HD G1/4-AG 20 VG AB	0.974	18.21	27.95	2400	747	145	0...80
FSTE-HD G1/4-AG 25	0.711	6.47	15.36	2400	747	145	0...80
FSTE-HD G1/4-AG 25 VG	0.711	6.47	15.36	2400	747	145	0...80
FSTE-HD G1/4-AG 45 AB	0.453	4.20	14.40	2400	466	191	0...80
FSTE-HD G1/4-AG 50	0.452	1.40	12.70	2400	466	175	0...80
FSTE-HD G1/4-AG 50 VG	0.452	1.40	12.70	2400	466	175	0...80
FSTE-HD G1/4-AG 70 AB	0.262	7.00	16.20	2400	340	215	0...80
FSTE-HD G1/4-AG 70 VG AB	0.262	7.00	16.20	2400	340	212	0...80
FSTE-HD G1/4-AG 75	0.262	5.38	15.20	2400	340	190	0...80
FSTE-HD G1/4-AG 75 VG	0.262	5.38	15.20	2400	340	190	0...80
FSTE-HD G1/4-AG 80 VG AB SO	0.328	9.85	22.98	2400	300	235	0...80
FSTE-HD G1/4-AG 90 VG	0.262	1.49	13.28	1500	300	210	0...80
FSTE-HD G3/8-AG 25	3.829	25.64	73.50	4800	1870	400	0...80
FSTE-HD G3/8-AG 25 VG	3.829	25.64	73.50	4800	1870	400	0...80
FSTE-HD G/8-AG 75	1.072	37.20	77.40	4800	800	530	0...80
FSTE-HD G3/8-AG 75 VG	1.072	37.20	77.40	4800	800	530	0...80
FSTE-HD G3/8-AG 90	1.072	24.38	75.30	4800	730	545	0...80
FSTE-HD G3/8-AG 90 VG	1.072	24.38	75.30	4800	730	545	0...80
FSTE-HD G1/2-AG 25	3.829	25.64	73.50	4900	1870	400	0...80
FSTE-HD G1/2-AG 25 VG	3.829	25.64	73.50	4900	1870	400	0...80
FSTE-HD G1/2-AG 75	1.072	37.20	77.40	4900	800	530	0...80
FSTE-HD G1/2-AG 75 VG	1.072	37.20	77.40	4900	800	530	0...80
FSTE-HD G1/2-AG 90	1.072	24.38	75.30	4900	730	545	0...80
FSTE-HD G1/2-AG 90 VG	1.072	24.38	75.30	4900	730	545	0...80

*Referred to 50% of operating stroke

**Maximum static loading

***The specification of the horizontal stress refers to the lower edge of the plunger with extended spring. It is a maximum static stress and it impairs the spring compression and extension in horizontal position.

Design Data Spring Plungers FSTE-HD



FSTE-HD 1/8 to 1/2 (VG)

Type	Dimensions in mm											
	G1	G2	G3	H	H2	LG1	LG2	LG3	SW1	SW2	SW3	Z(Stroke)
FSTE-HD G1/8-AG 15	G1/8"-F	G1/8"-M	M16x1-M	72.5	28.5	8	6.5	30	22	12	14	15
FSTE-HD G1/8-AG 15 VG	G1/8"-F	G1/8"-M	M16x1-M	72.5	28.5	8	6.5	30	22	12	14	15
FSTE-HD G1/8-AG 25	G1/8"-F	G1/8"-M	M16x1-M	85.5	41.5	8	6.5	30	22	12	14	25
FSTE-HD G1/8-AG 25 VG	G1/8"-F	G1/8"-M	M16x1-M	85.5	41.5	8	6.5	30	22	12	14	25
FSTE-HD G1/8-AG 50	G1/8"-F	G1/8"-M	M16x1-M	116.5	72.5	8	6.5	30	22	12	14	50

Spring Plungers

Spring Plungers FSTE-HD

Stroke from 15 mm to 90 mm

Design Data Spring Plungers FSTE-HD

Type	Dimensions in mm											Z (Stroke)
	G1	G2	G3	H	H2	LG1	LG2	LG3	SW1	SW2	SW3	
FSTE-HD G1/8-AG 50 VG	G1/8"-F	G1/8"-M	M16x1-M	116.5	72.5	8.0	7.5	30	22	12	14	50
FSTE-HD G1/4-AG 20 AB	G1/8"-F	G1/4"-M	M20x1.5-M	86.0	29.3	12.8	8.5	40	24	17	17	20
FSTE-HD G1/4-AG 20 VG AB	G1/8"-F	G1/4"-M	M20x1.5-M	86.0	29.3	12.8	8.5	40	24	17	17	20
FSTE-HD G1/4-AG 25	G1/8"-F	G1/4"-M	M20x1.5-M	86.0	40.5	12.8	8.5	40	24	17	17	25
FSTE-HD G1/4-AG 25 VG	G1/8"-F	G1/4"-M	M20x1.5-M	86.0	40.5	12.8	8.5	40	24	17	17	25
FSTE-HD G1/4-AG 45 AB	G1/8"-F	G1/4"-M	M20x1.5-M	115.3	54.0	12.8	8.5	40	24	17	17	45
FSTE-HD G1/4-AG 50	G1/8"-F	G1/4"-M	M20x1.5-M	115.5	70.0	12.8	8.5	40	24	17	17	50
FSTE-HD G1/4-AG 50 VG	G1/8"-F	G1/4"-M	M20x1.5-M	115.5	70.0	12.8	8.5	40	24	17	17	50
FSTE-HD G1/4-AG 70 AB	G1/8"-F	G1/4"-M	M20x1.5-M	145.0	80.0	12.8	8.5	40	24	17	17	70
FSTE-HD G1/4-AG 70 VG AB	G1/8"-F	G1/4"-M	M20x1.5-M	145.0	80.0	12.8	8.5	40	24	17	17	70
FSTE-HD G1/4-AG 75	G1/8"-F	G1/4"-M	M20x1.5-M	145.5	99.5	12.8	8.5	40	24	17	17	75
FSTE-HD G1/4-AG 75 VG	G1/8"-F	G1/4"-M	M20x1.5-M	145.0	99.5	12.8	8.5	40	24	17	17	75
FSTE-HD G1/4-AG 80 VG AB SO	G1/8"-F	G1/4"-M	M20x1.5-M	160.0	88.0	12.0	8.5	40	24	17	17	72
FSTE-HD G3/8-AG 25	G3/8"-F	G3/8"-M	M30x1.5-M	106.0	41.0	12.0	10.0	53	36	24	24	25
FSTE-HD G3/8-AG 25 VG	G3/8"-F	G3/8"-M	M30x1.5-M	106.0	41.0	12.8	10.0	53	36	24	24	25
FSTE-HD G3/8-AG 75	G3/8"-F	G3/8"-M	M30x1.5-M	177.0	112.0	12.0	10.0	53	36	24	24	75
FSTE-HD G3/8-AG 75 VG	G3/8"-F	G3/8"-M	M30x1.5-M	177.0	112.0	12.8	10.0	53	36	24	24	75
FSTE-HD G3/8-AG 90	G3/8"-F	G3/8"-M	M30x1.5-M	189.0	124.0	12.0	10.0	53	36	24	24	90
FSTE-HD G3/8-AG 90 VG	G3/8"-F	G3/8"-M	M30x1.5-M	189.0	124.0	12.8	10.0	53	36	24	24	90
FSTE-HD G1/2-AG 25	G3/8"-F	G1/2"-M	M30x1.5-M	105.5	40.5	12.0	10.5	53	36	24	24	25
FSTE-HD G1/2-AG 25 VG	G3/8"-F	G1/2"-M	M30x1.5-M	105.5	40.5	12.8	10.5	53	36	24	24	25
FSTE-HD G1/2-AG 75	G3/8"-F	G1/2"-M	M30x1.5-M	176.5	111.5	12.0	10.5	53	36	24	24	75
FSTE-HD G1/2-AG 75 VG	G3/8"-F	G1/2"-M	M30x1.5-M	176.5	111.5	12.8	10.5	53	36	24	24	75
FSTE-HD G1/4-AG 90 VG	G1/8"-F	G1/4"-M	M20x1.5-M	160.0	114.3	12.8	8.5	40	24	17	17	90
FSTE-HD G1/2-AG 90	G3/8"-F	G1/2"-M	M30x1.5-M	188.5	123.5	12.0	10.5	53	36	24	24	90
FSTE-HD G1/2-AG 90 VG	G3/8"-F	G1/2"-M	M30x1.5-M	188.5	123.5	12.8	10.5	53	36	24	24	90

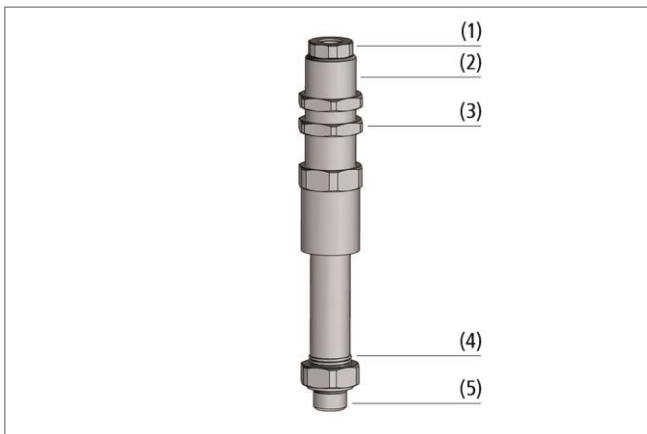
Spring Plungers

Spring Plungers FSTE-HDB-VG – with anti-rotation guard

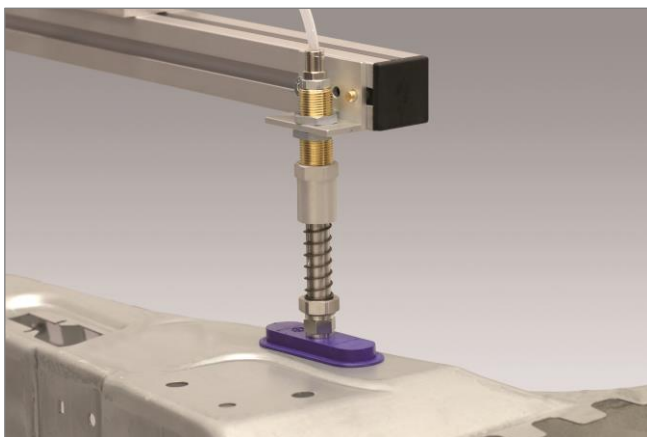
Stroke from 15 mm to 120 mm



Spring plungers FSTE-HDB...VG



System design spring plungers FSTE-HDB...VG



Spring plungers FSTE-HDB handling sheet metals

Applications

- Spring plunger with special plain bearings and clamping spring for handling workpieces with height differences (e.g. curved sheet metal parts)
- Handling very delicate workpieces (e.g. glass plates, ect.) with no additional control technology required; ensures that workpieces are set down gently.
- Highly dynamic handling tasks with short cycle times
- Extra responsive, rotation-proof design for reliable functions even under harsh and difficult conditions

Design

- Spring plunger consisting of high-strength stainless steel rod, brass sleeve with integrated bearing (2) and damping spring (4)
- Plunger rod with integrated vacuum feed, always female connection thread (1)
- Ball bearing anti-rotation guard
- Always male connection thread for suction cup (5)
- Long external mounting thread with lock nuts (3)
- Block guard for damping spring
- Wide hexagon for mounting of suction cup

Our Highlights...

- Spring plunger with high-quality plain bearings
- Extraresponsive rotation-proof design
- Block protector for damping spring
- Wide hex bolt for suction cup mounting

Your Benefits...

- > Maintenancefree with extra-long service life; suitable for short cycle times
- > Can support oval suction cups; also for demanding applications
- > Gentle on the spring for long service life
- > Easy press-on suction cup replacement, gentle on anti-rotation guard

Spring Plungers

Spring Plungers FSTE-HDB-VG – with anti-rotation guard

Stroke from 15 mm to 120 mm

Ordering Code Spring Plungers FSTE-HDB...VG

Abbreviated designation	Version	Suction cup connecton	Plunger stroke in mm	Product addition
Example: FSTE-HDB G1/4-M 45 VG-AB:	HDB	G 1/4-M (AG = male (M))	45	VG-AB
FSTE-HDB	HDB Heavy Duty (hard use) Ball (ball bearing-mounted anti-rotating guard)	G1/8-M G1/4-M G3/8-M G1/2-M	15 25 45 80 120	VG with anti-rotation guard anti-block AB

Note on ordering: Spring plunger FSTE-HDB is delivered ready to connect.

Ordering Data Spring Plungers FSTE-HDB...VG-AB

Type*	Plunger stroke in mm**				
	15	25	45	80	120
FSTE-HDB-G1/8-AG... VG-AB	10.01.02.01437	10.01.02.01438	10.01.02.01439	-	-
FSTE-HDB-G1/4-AG...VG-AB	-	10.01.02.01427	10.01.02.01382	10.01.02.01377	10.01.02.01527
FSTE-HDB-G3/8-AG...VG-AB	-	10.01.02.01436	10.01.02.01422	10.01.02.01423	10.01.02.01530
FSTE-HDB-G1/2-AG...VG-AB	-	10.01.02.01440	-	10.01.02.01441	-

*Recommendation: Avoid max. plunger stroke during continuous operation to extend service life

Technical Data Spring Plungers FSTE-HDB...VG

Typ	Spring rate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal [N]***	Weight [g]	Operating temperature [°C]
FSTE-HDB G1/8-AG 15 VG-AB	0.211	3.76	5.42	3700	385	130	0...80
FSTE-HDB G1/8-AG 25 VG-AB	0.143	3.72	5.51	3700	283	137	0...80
FSTE-HDB G1/8-AG 45 VG-AB	0.097	3.59	5.77	3700	173	149	0...80
FSTE-HDB G1/4-AG 25 VG-AB	0.711	3.06	11.95	2400	747	235	0...80
FSTE-HDB G1/4-AG 45 VG-AB	0.453	3.52	13.71	2400	466	253	0...80
FSTE-HDB G1/4-AG 80 VG-AB	0.417	12.38	29.06	2400	340	298	0...80
FSTE-HDB G1/4-AG 120 VG-AB	0.232	10.37	24.29	2400	290	345	0...80
FSTE-HDB G3/8-AG 25 VG-AB	0.711	3.06	11.95	2400	747	240	0...80
FSTE-HDB G3/8-AG 45 VG-AB	0.453	3.52	13.71	2400	466	256	0...80
FSTE-HDB G3/8-AG 80 VG-AB	0.417	12.38	29.06	2400	340	304	0...80
FSTE-HDB G3/8-AG 120 VG-AB	0.232	10.37	24.29	2400	290	350	0...80
FSTE-HDB G1/2-AG 25 VG-AB	3.828	4.6	52.5	4900	1870	590	0...80
FSTE-HDB G1/2-AG 80 VG-AB	1.072	21.5	64.5	4900	800	725	0...80

*Based on 50 % stroke

**Max. static load

***The horizontal load specification refers to the bottom edge of the plunger with spring extended. This is the max. static load and impacts spring extension and retraction when horizontal.

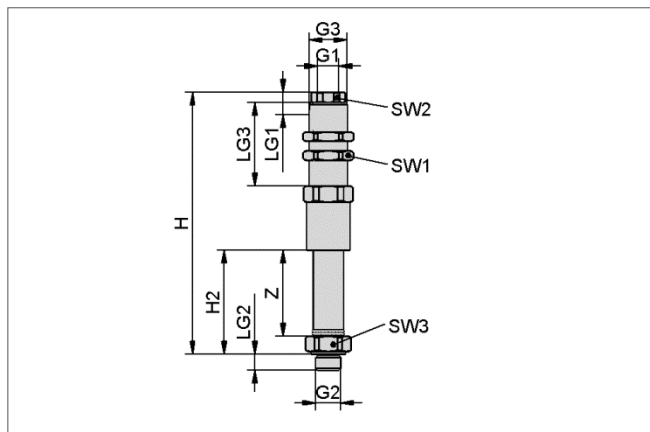
Spring Plungers

Spring Plungers FSTE-HDB-VG – with anti-rotation guard

Stroke from 15 mm to 120 mm



Design Data Spring Plungers FSTE-HDB-VG – anti rotation guard



FSTE-HDB...VG

Type	Dimensions in mm											
	G1	G2	G3	H	H2	LG1	LG2	LG3	SW1	SW2	SW3	Z (Hub)
FSTE-HDB G1/8-AG 15 VG-AB	G1/8"-F	G1/8"-M	M16x1-M	92.5	22.5	7	7.0	34	22	12	19	15
FSTE-HDB G1/8-AG 25 VG-AB	G1/8"-F	G1/8"-M	M16x1-M	105.5	32.5	7	7.0	34	22	12	19	25
FSTE-HDB G1/8-AG 45 VG-AB	G1/8"-F	G1/8"-M	M16x1-M	130.5	52.5	7	7.0	34	22	12	19	45
FSTE-HDB G1/4-AG 25 VG-AB	G1/8"-F	G1/4"-M	M20x1.5-M	118.3	34.8	12	12.0	44	24	17	22	25
FSTE-HDB G1/4-AG 45 VG-AB	G1/8"-F	G1/4"-M	M20x1.5-M	138.3	54.8	12	12.0	44	24	17	22	45
FSTE-HDB G1/4-AG 80 VG-AB	G1/8"-F	G1/4"-M	M20x1.5-M	188.3	89.8	12	12.0	44	24	17	22	80
FSTE-HDB G1/4-AG 120 VG AB	G1/8"-F	G1/4"-M	M20x1.5-M	238.8	129.8	12	8.5	44	24	17	22	120
FSTE-HDB G3/8-AG 25 VG-AB	G1/8"-F	G3/8"-M	M20x1.5-M	118.8	35.3	12	12.0	44	24	17	22	25
FSTE-HDB G3/8-AG 45 VG-AB	G1/8"-F	G3/8"-M	M20x1.5-M	138.8	55.3	12	12.0	44	24	17	22	45
FSTE-HDB G3/8-AG 80 VG-AB	G1/8"-F	G3/8"-M	M20x1.5-M	188.8	90.3	12	12.0	44	24	17	22	80
FSTE-HDB G3/8-AG 120 VG AB	G1/8"-F	G3/8"-M	M20x1.5-M	238.8	130.3	12	8.0	44	24	17	22	120
FSTE-HDB G1/2-AG 25 VG-AB	G3/8"-F	G1/2"-M	M30x1.5-M	136.3	36.8	16	16.0	50	36	24	32	25
FSTE-HDB G1/2-AG 80 VG-AB	G3/8"-F	G1/2"-M	M30x1.5-M	216.3	91.8	16	16.0	50	36	24	32	80

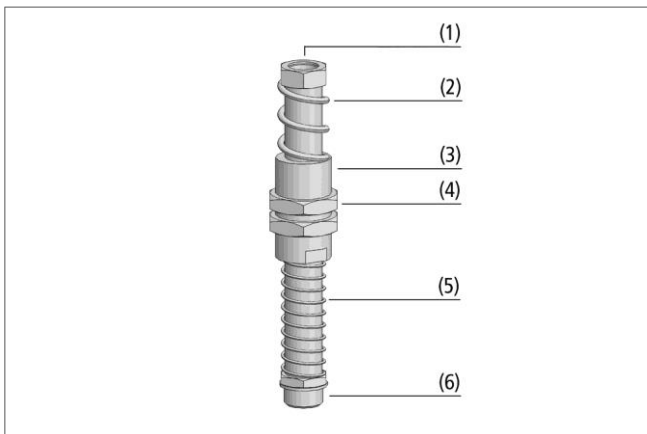
Spring Plungers

Spring Plungers FSTA-HD

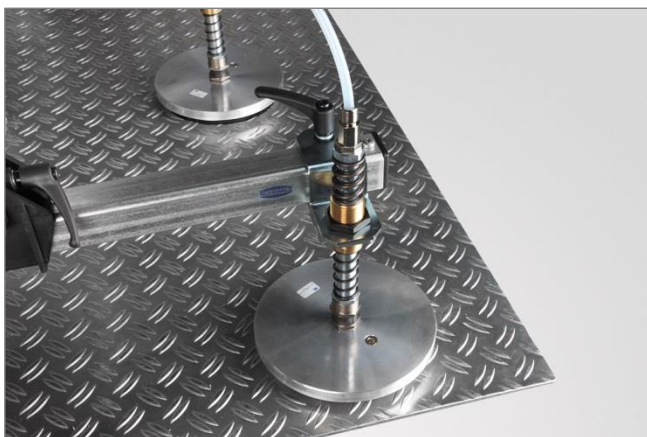
Stroke from 25 mm to 90 mm



Spring plungers FSTA-HD



System design spring plungers FSTA-HD



Mounting example spring plungers FSTA-HD

Applications

- Spring plunger with two damping springs and special sliding bearings for handling of workpieces with different heights (such as curved metal sheets, etc.)
- Handling of easily damaged workpieces (such as sheets of glass) without additional control function to prevent damage, since the plunger ensures soft placement
- For use under rough operating conditions
- For handling tasks with very dynamic motion and short cycle times

Design

- Spring plunger consisting of high-strength steel rod, guide sleeve (3) with integrated bearing and lower (5) and upper (2) damping springs
- Plunger rod with integrated vacuum feed, always female connection thread (1)
- Anti-rotation guard due to flat side on the rod and a correspondingly shaped guide sleeve
- Thread for suction cup is always a male thread (6)
- Two lock nuts (4) for attachment

Our Highlights...

- Spring plunger with high quality sliding bearings and specially machined plunger rod
- Spring plunger with two damping springs
- Wide range of different connection threads and stroke lengths
- Optionally available with antirotation guard

Your Benefits...

- > Maintenance-free, with extremely long operating life-time; suitable for short cycle times
- > Guarantees soft placement on easily damaged workpieces. Absorbs shocks and vibration. Prevents excessively long strokes
- > Available for a wide range of applications and for all suction cups of the standard range
- > Suitable for use with oval suction cups

Spring Plungers

Spring Plungers FSTA-HD

Stroke from 25 mm to 90 mm

Designation Code Spring Plungers FSTA-HD

Abbreviated designation	Version	Suction cup connection	Plunger stroke in mm	Product addition
Example FSTA-HD G1/4-AG 50 VG: FSTA	HD	G 1/4-AG	50	VG
FSTA	HD Heavy Duty (hard use)	G1/4-AG(AG = male (M)) G3/8-AG G1/2-AG	25 50 90	VG with anti-rotation guard

Ordering Data Spring Plungers FSTA-HD

Spring plunger FSTA-HD is delivered as a ready to connect product.

Spring Plungers FSTA-HD

Type	Plunger stroke in mm*		
	25	50	90
FSTA-HD G1/4	10.01.02.00777	10.01.02.00778	-
FSTA-HD G1/4 VG	10.01.02.00884	10.01.02.00885	-
FSTA-HD G3/8	10.01.02.00814	10.01.02.00815	10.01.02.00816
FSTA-HD G3/8-VG	10.01.02.00886	10.01.02.00887	10.01.02.00888
FSTA-HD G1/2	10.01.02.00779	10.01.02.00780	10.01.02.00781
FSTA-HD G1/2 VG	10.01.02.00889	10.01.02.00890	10.01.02.00891

*Commendation: To raise the lifetime in continuous duty, prevent the maximal slide stroke

Technical Data Spring Plungers FSTA-HD

Type	Spring rate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal load [N]***	Weight [g]	Operating temperature [°C]
FSTA-HD G 1/4-AG 25	0.711	8.95	17.8	2400	800	185	0...80
FSTA-HD G 1/4-AG 25 VG	0.711	8.95	17.8	2400	800	185	0...80
FSTA-HD G1/4-AG 50	0.262	14.10	20.6	2400	490	210	0...80
FSTA-HD G1/4-AG 50 VG	0.262	14.10	20.6	2400	490	210	0...80
FSTA-HD G3/8-AG 25	3.828	25.65	73.5	4800	1870	495	0...80
FSTA-HD G3/8-AG 25 VG	3.828	25.65	73.5	4800	1870	495	0...80
FSTA-HD G3/8-AG 50	1.810	3.95	49.2	4800	1200	540	0...80
FSTA-HD G3/8-AG 50 VG	1.810	3.95	49.2	4800	1200	540	0...80
FSTA-HD G3/8-AG 90	1.072	24.38	75.3	4800	730	645	0...80
FSTA-HD G3/8-AG 90 VG	1.072	24.38	75.3	4800	730	645	0...80
FSTA-HD G1/2-AG 25	3.828	25.65	73.5	4900	1870	493	0...80
FSTA-HD G1/2-AG 25 VG	3.828	25.65	73.5	4900	1870	495	0...80
FSTA-HD G1/2-AG 50	1.810	3.95	49.2	4900	1200	539	0...80
FSTA-HD G1/2-AG 50 VG	1.810	3.95	49.2	4900	1200	540	0...80
FSTA-HD G1/2-AG 90	1.072	24.38	75.3	4900	730	645	0...80
FSTA-HD G1/2-AG 90 VG	1.072	24.38	75.3	4900	730	645	0...80

*Referred to 50% of operating stroke

**Maximum static loading

***The specification of the horizontal stress refers to the lower edge of the plunger with extended spring. It is a maximum static stress and it impairs the spring compression and extension in horizontal position.

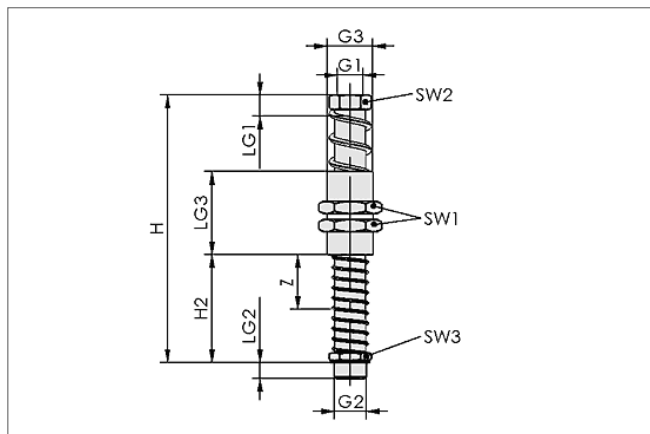
Spring Plungers

Spring Plungers FSTA-HD

Stroke from 25 mm to 90 mm



Design Data Spring Plungers FSTA-HD



FSTA-HD G1/4 to G1/2

Type	Dimensions in mm											
	G1	G2	G3	H	H2	LG1	LG2	LG3	SW1	SW2	SW3	Z(Stroke)
FSTA-HD G1/4-AG 25	G1/8"-F	G1/4"-M	M20x1.5-M	114.5	37.5	12	8.5	40	24	17	17	25
FSTA-HD G1/4-AG 25 VG	G1/8"-F	G1/4"-M	M20x1.5-M	114.5	37.0	12	8.5	40	24	17	17	25
FSTA-HD G1/4-AG 50	G1/8"-F	G1/4"-M	M20x1.5-M	144.0	67.0	12	8.5	40	24	17	17	50
FSTA-HD G1/4-AG 50 VG	G1/8"-F	G1/4"-M	M20x1.5-M	144.0	66.5	12	8.5	40	24	17	17	50
FSTA-HD G3/8-AG 25	G3/8"-F	G3/8"-M	M30x1.5-M	146.5	40.8	12	10.5	53	36	24	24	25
FSTA-HD G3/8-AG 25 VG	G3/8"-F	G3/8"-M	M30x1.5-M	147.0	40.8	12	10.5	53	36	24	24	25
FSTA-HD G3/8-AG 50	G3/8"-F	G3/8"-M	M30x1.5-M	176.5	70.8	12	10.5	53	36	24	24	50
FSTA-HD G3/8-AG 50 VG	G3/8"-F	G3/8"-M	M30x1.5-M	177.0	70.8	12	10.5	53	36	24	24	50
FSTA-HD G3/8-AG 90	G3/8"-F	G3/8"-M	M30x1.5-M	229.5	123.8	12	10.5	53	36	24	24	90
FSTA-HD G3/8-AG 90 VG	G3/8"-F	G3/8"-M	M30x1.5-M	230.0	123.8	12	10.5	53	36	24	24	90
FSTA-HD G1/2-AG 25	G3/8"-F	G1/2"-M	M30x1.5-M	146.5	40.3	12	10.5	53	36	24	24	25
FSTA-HD G1/2-AG 25 VG	G3/8"-F	G1/2"-M	M30x1.5-M	146.5	40.3	12	10.5	53	36	24	24	25
FSTA-HD G1/2-AG 50	G3/8"-F	G1/2"-M	M30x1.5-M	176.5	70.3	12	10.5	53	36	24	24	50
FSTA-HD G1/2-AG 50 VG	G3/8"-F	G1/2"-M	M30x1.5-M	176.5	70.3	12	10.5	53	36	24	24	50
FSTA-HD G1/2-AG 90	G3/8"-F	G1/2"-M	M30x1.5-M	229.5	123.3	12	10.5	53	36	24	24	90
FSTA-HD G1/2-AG 90 VG	G3/8"-F	G1/2"-M	M30x1.5-M	229.5	123.3	12	10.5	53	36	24	24	90

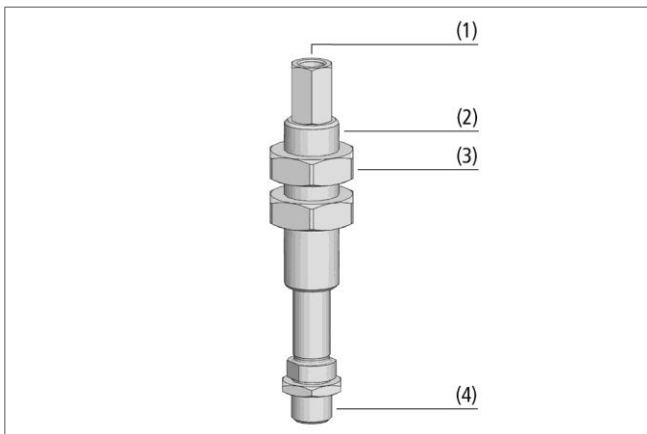
Spring Plungers

Spring Plungers FSTI

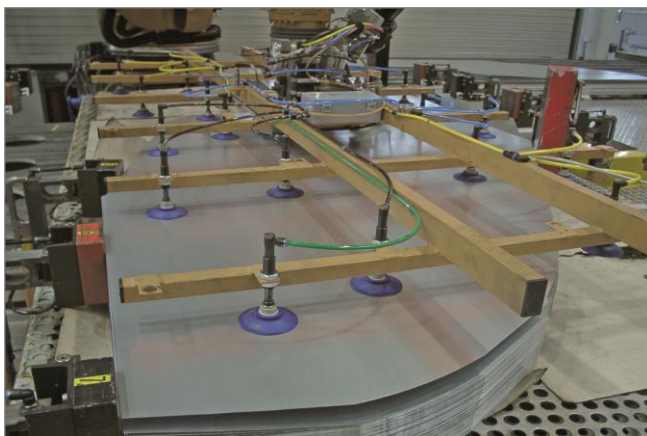
Stroke from 10 mm to 50 mm



Spring plungers FSTI



System design spring plungers FSTI



Mounting example spring plungers FSTI

Applications

- Spring plunger with internal damping spring for handling of workpieces with differing heights (such as curved metal sheets, etc.)
- Handling of easily damaged workpieces (such as sheets of glass) without additional control functions to prevent damage, since the plunger ensures soft placement

Design

- Spring plunger consisting of high-strength steel rod, guide sleeve with integrated sliding bearing (2) and internal damping spring
- Connection thread for suction cup is male (4); connection thread for vacuum supply (1) either a female or male thread
- Two lock nuts (3) for attachment
- Burnished surface finish; on the version with anti-rotation function, the plunger rod is specially coated for optimum sliding behaviour
- Plunger rod with integrated vacuum feed
- Anti-rotation guard due to flat side on the rod and a correspondingly shaped guide sleeve

Our Highlights...

- Spring plunger with high quality sliding bearings and excellent guidance
- Internal damping spring
- Minimum overall height; weight optimized
- Available with anti-rotation guard

Your Benefits...

- > Very economical operation, since no maintenance needed
- > Soft placement on easily damaged workpieces; spring protected against dirt and external mechanical forces
- > Suitable for use in very small spaces and with highly dynamic motion
- > Suitable for use with oval suction cups

Spring Plungers

Spring Plungers FSTI

Stroke from 10 mm to 50 mm

Designation Code Spring Plungers FSTI

Abbreviated designation	Suction cup connection	Vacuum connection	Plunger stroke in mm	Product addition
Example FSTI G1/4-AG G1/8-AG 10 VG: FSTI	G1/4-AG	G 1/8-AG	10	VG
FSTI	G1/4-AG (AG = male (M)) G3/8-AG	G1/8-AG (AG = male (M)) G1/8-IG (IG = female (F))	10 25 50	VG with anti-rotation guard

Ordering Data Spring Plungers FSTI

The spring plunger FSTI is delivered as a ready to connect product.

Spring Plungers FSTI

Type*	Plunger stroke in mm**		
	10	25	50
FSTI G1/4-AG G1/8-AG	10.01.02.00864	10.01.02.00868	10.01.02.00992
FSTI G1/4-AG G1/8-AG VG	10.01.02.00865	10.01.02.00869	10.01.02.00993
FSTI G1/4-AG G1/8-IG	10.01.02.00866	10.01.02.00870	10.01.02.00994
FSTI G1/4-AG G1/8-IG VG	10.01.02.00867	10.01.02.00871	10.01.02.00995
FSTI G3/8-AG G1/8-AG	10.01.02.00755	10.01.02.00843	10.01.02.00996
FSTI G3/8-AG G1/8-AG VG	10.01.02.00860	10.01.02.00862	10.01.02.00997
FSTI G3/8-AG G1/8-IG	10.01.02.00851	10.01.02.00850	10.01.02.00998
FSTI G3/8-AG G1/8-IG VG	10.01.02.00861	10.01.02.00863	10.01.02.00999

*VG = Version with anti-rotation guard for repeatably accurate positioning of suction cups

**Recommendation: To rise the lifetime in continuous duty, prevent the maximal slide stroke

Technical Data Spring Plungers FSTI

Type	Spring rate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal load [N]***	Weight [g]	Operating temperature [°C]
FSTI G1/4-AG G1/8-AG 10	0.097	7.08	7.57	1000	700	150	0...80
FSTI G1/4-AG G1/8-AG 10 VG	0.097	7.08	7.57	1000	500	150	0...80
FSTI G1/4-AG G1/8-IG 10	0.097	7.08	7.57	1000	700	150	0...80
FSTI G1/4-AG G1/8-IG 10 VG	0.097	7.08	7.57	1000	500	150	0...80
FSTI G1/4-AG G1/8-AG 25	0.097	5.63	6.84	1000	700	180	0...80
FSTI G1/4-AG G1/8-AG 25 VG	0.097	5.63	6.84	1000	500	180	0...80
FSTI G1/4-AG G1/8-IG 25	0.097	5.63	6.84	1000	700	180	0...80
FSTI G1/4-AG G1/8-IG 25 VG	0.097	5.63	6.84	1000	500	180	0...80
FSTI G1/4-AG G1/8-AG 50	0.097	2.30	4.70	1000	700	230	0...80
FSTI G1/4-AG G1/8-AG 50 VG	0.097	2.30	4.70	1000	500	230	0...80
FSTI G1/4-AG G1/8-IG 50	0.097	2.30	4.70	1000	700	230	0...80
FSTI G1/4-AG G1/8-IG 50 VG	0.097	2.30	4.70	1000	500	230	0...80
FSTI G3/8-AG G1/8-AG 10	0.097	7.08	7.57	1000	700	150	0...80
FSTI G3/8-AG G1/8-AG 10 VG	0.097	7.08	7.57	1000	500	150	0...80
FSTI G3/8-AG G1/8-IG 10	0.097	7.08	7.57	1000	700	150	0...80
FSTI G3/8-AG G1/8-IG 10 VG	0.097	7.08	7.57	1000	500	150	0...80
FSTI G3/8-AG G1/8-AG 25	0.097	5.63	6.84	1000	700	180	0...80
FSTI G3/8-AG G1/8-AG 25 VG	0.097	5.63	6.84	1000	500	180	0...80
FSTI G3/8-AG G1/8-IG 25	0.097	5.63	6.84	1000	700	180	0...80
FSTI G3/8-AG G1/8-IG 25 VG	0.097	5.63	6.84	1000	500	180	0...80

Spring Plungers

Spring Plungers FSTI

Stroke from 10 mm to 50 mm

Technical Data Spring Plungers FSTI

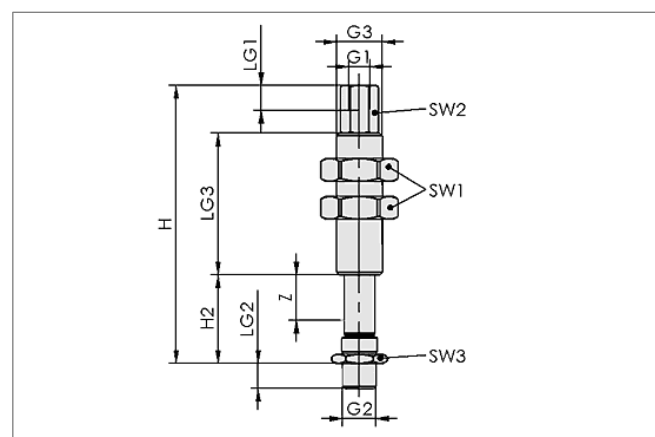
Type	Spring rate [N/mm]	Spring pretension [N]	Spring force [N]*	Vertical load [N]**	Horizontal load [N]***	Weight [g]	Operating temperature [°C]
FSTI G3/8-AG G1/8-AG 50	0.097	2.30	4.70	1000	700	230	0...80
FSTI G3/8-AG G1/8-AG 50 VG	0.097	2.30	4.70	1000	500	230	0...80
FSTI G3/8-AG G1/8-IG 50	0.097	2.30	4.70	1000	700	230	0...80
FSTI G3/8-AG G1/8-IG 50 VG	0.097	2.30	4.70	1000	500	230	0...80

*Referred to 50% of operating stroke

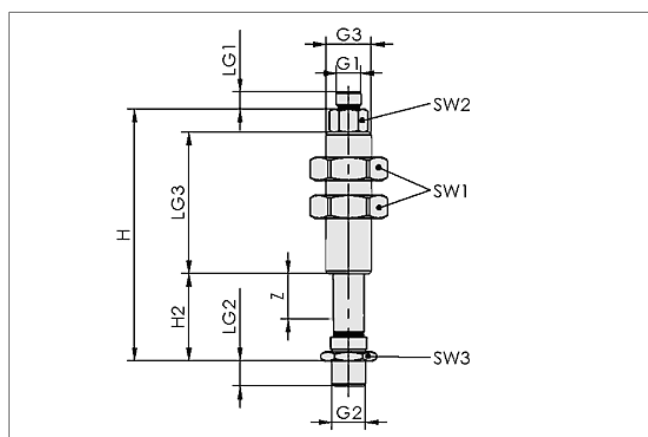
**Maximum static loading

***The specification of the horizontal stress refers to the lower edge of the plunger with extended spring. It is a maximum static stress and it impairs the spring compression and extension in horizontal position.

Design Data Spring Plungers FSTI



FSTI...AG...IG(VG)



FSTI...AG...AG(VG)

Type	Dimensions in mm			H	H2	LG1	LG2	LG3	SW1	SW2	SW3	Z(Stroke)
	G1	G2	G3									
FSTI G1/4-AG G1/8-AG 10	G1/8"-M	G1/4"-M	M18x1.5-M	71.0	21.0	6.5	10	41	27	13	17	10
FSTI G1/4-AG G1/8-AG 10 VG	G1/8"-M	G1/4"-M	M18x1.5-M	71.0	21.0	6.5	10	41	27	13	17	10
FSTI G1/4-AG G1/8-IG 10	G1/8"-F	G1/4"-M	M18x1.5-M	79.5	19.5	12.0	10	41	27	13	17	10
FSTI G1/4-AG G1/8-IG 10 VG	G1/8"-F	G1/4"-M	M18x1.5-M	79.5	19.5	12.0	10	41	27	13	17	10
FSTI G1/4-AG G1/8-AG 25	G1/8"-M	G1/4"-M	M18x1.5-M	101.0	36.0	6.5	10	56	27	13	17	25
FSTI G1/4-AG G1/8-AG 25 VG	G1/8"-M	G1/4"-M	M18x1.5-M	101.0	36.0	6.5	10	56	27	13	17	25
FSTI G1/4-AG G1/8-IG 25	G1/8"-F	G1/4"-M	M18x1.5-M	109.5	34.5	12.0	10	56	27	13	17	25
FSTI G1/4-AG G1/8-IG 25 VG	G1/8"-F	G1/4"-M	M18x1.5-M	109.5	34.5	12.0	10	56	27	13	17	25
FSTI G2/8-AG G1/8-AG 50	G1/8"-M	G1/4"-M	M18x1.5-M	176.5	59.0	6.5	8	91	27	13	17	50
FSTI G2/8-AG G1/8-AG 50 VG	G1/8"-M	G1/4"-M	M18x1.5-M	176.5	59.0	6.5	8	91	27	13	17	50
FSTI G3/8-AG G1/8-IG 50	G1/8"-F	G1/4"-M	M18x1.5-M	180.0	59.0	12.0	8	91	27	13	17	50
FSTI G3/8-AG G1/8-IG 50 VG	G1/8"-F	G1/4"-M	M18x1.5-M	180.0	59.0	12.0	8	91	27	13	17	50
FSTI G3/8-AG G1/8-AG 10	G1/8"-M	G3/8"-M	M18x1.5-M	72.0	22.0	6.5	9	41	27	13	19	10

Spring Plungers

Spring Plungers FSTI

Stroke from 10 mm to 50 mm



Design Data Spring Plungers FSTI

Type	Dimensions in mm											
	G1	G2	G3	H	H2	LG1	LG2	LG3	SW1	SW2	SW3	Z(Stroke)
FSTI G3/8-AG G1/8-AG 10 VG	G1/8"-M	G3/8"-M	M18x1.5-M	72.0	22.0	6.5	9	41	27	13	19	10
FSTI G3/8-AG G1/8-IG 10	G1/8"-F	G3/8"-M	M18x1.5-M	82.5	22.5	12.0	9	41	27	13	19	10
FSTI G3/8-AG G1/8-IG 10 VG	G1/8"-F	G3/8"-M	M18x1.5-M	82.5	22.5	12.0	9	41	27	13	19	10
FSTI G3/8-AG G1/8-AG 25	G1/8"-M	G3/8"-M	M18x1.5-M	102.0	37.0	6.5	9	56	27	13	19	25
FSTI G3/8-AG G1/8-AG 25 VG	G1/8"-M	G3/8"-M	M18x1.5-M	102.0	37.0	6.5	9	56	27	13	19	25
FSTI G3/8-AG G1/8-IG 25	G1/8"-F	G3/8"-M	M18x1.5-M	112.5	37.5	12.0	9	56	27	13	19	25
FSTI G3/8-AG G1/8-IG 25 VG	G1/8"-F	G3/8"-M	M18x1.5-M	112.5	37.5	12.0	9	91	27	13	19	25
FSTI G3/8-AG G1/8-AG 50	G1/8"-M	G3/8"-M	M18x1.5-M	176.5	54.0	6.5	8	91	27	13	19	50
FSTI G3/8-AG G1/8-AG 50 VG	G1/8"-M	G3/8"-M	M18x1.5-M	176.5	54.0	6.5	8	91	27	13	19	50
FSTI G3/8-AG G1/8-IG 50	G1/8"-F	G3/8"-M	M18x1.5-M	180.0	54.0	12.0	8	91	27	13	19	50
FSTI G3/8-AG G1/8-IG 50 VG	G1/8"-F	G3/8"-M	M18x1.5-M	180.0	54.0	12.0	8	91	27	13	19	50

Holders for Suction Cups and Spring Plungers

Holder System HT

Connector apple core \varnothing 19 mm and ball \varnothing 28.5 mm as well as \varnothing 32 mm

Overview of Highlights



Modular system

- Standard holders as a simple and quick solution for a wide range of applications
- Holder configuration with G, M or NPT threads according to customer requirements
- Combinations with various vacuum suction cups, spring plungers and decentralized vacuum generators as well as the vacuum switch VSi-HD from the Schmalz product portfolio



Lightweight and slim gripper design

- Up to 45 percent lighter than other holder systems in use in the automotive industry
- For highly dynamic processes with maximum output
- No disruptive contours thanks to functional integration



Flexible use in automotive manufacturing

- Compatible with all current tooling and quick-change systems for press shops and car body construction
- Holder HT-SG E for combining vacuum suction cups and decentralized vacuum generation with Schmalz ejector SEAC 10
- Holder HT-SG I with integrated vacuum generation as a compact, low-maintenance unit

VERSIONS AND COMBINATION OPTIONS



Holder for Suction Cup HT-SG



Holder for Suction Cup HT-SG...E



Holder for Suction Cup HT-SG...I



Holder for Spring Plunger HT-FST



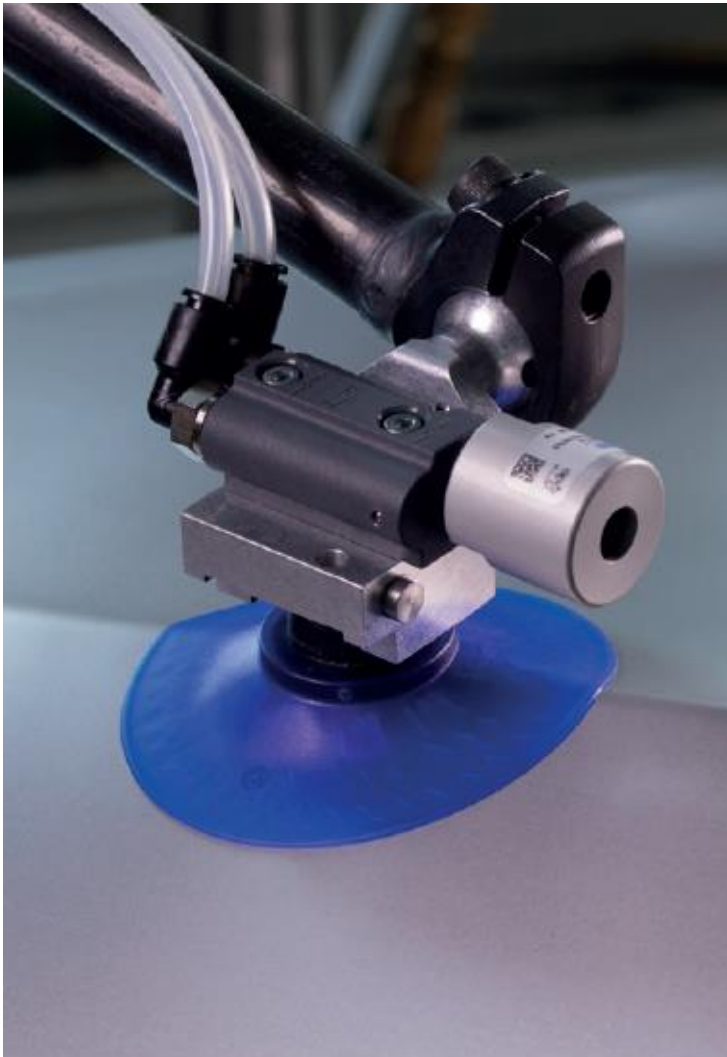
Holder for Sensor HT-SE

Type	Vacuum generation options	Combination options			
		Vacuum Suction Cup	Spring plunger	Vacuum switch	Screw union
HT-SG	Central with compact ejector or vacuum pump	✓	-	-	✓
HT-SG E	Decentralized with Schmalz ejector SEAC 10	✓	-	✓	✓
HT-SG I	Decentralized with integrated vacuum nozzle	✓	-	✓	✓
HT-FST	Central with compact ejector or vacuum pump	✓	✓	-	✓
HT-SE	-	-	-	-	-

Holder for Suction Cups and Spring Plungers

Holder System HT

Connector apple core Ø 19 mm and ball Ø 28.5 mm as well as Ø32 mm



Holder for Suction Cup HT-SG E with decentralized vacuum generator SEAC and bell-shaped Suction Cup SAX for handling car body parts



Holder for Suction Cup HT-SG E with decentralized vacuum generator SEAC and high-temperature suction cup SAB HT2 for handling curved car body parts



Holder for Suction Cup HT-SG with bell-shaped Suction Cup SAX for handling formed sheet metal parts

ADJUSTABLE, LIGHTWEIGHT HOLDER SYSTEM FOR THE AUTOMOTIVE INDUSTRY

Connection of suction cups, spring plungers, sensors and vacuum generators in toolings for:

- Destacking systems
- Press automation
- Car body construction



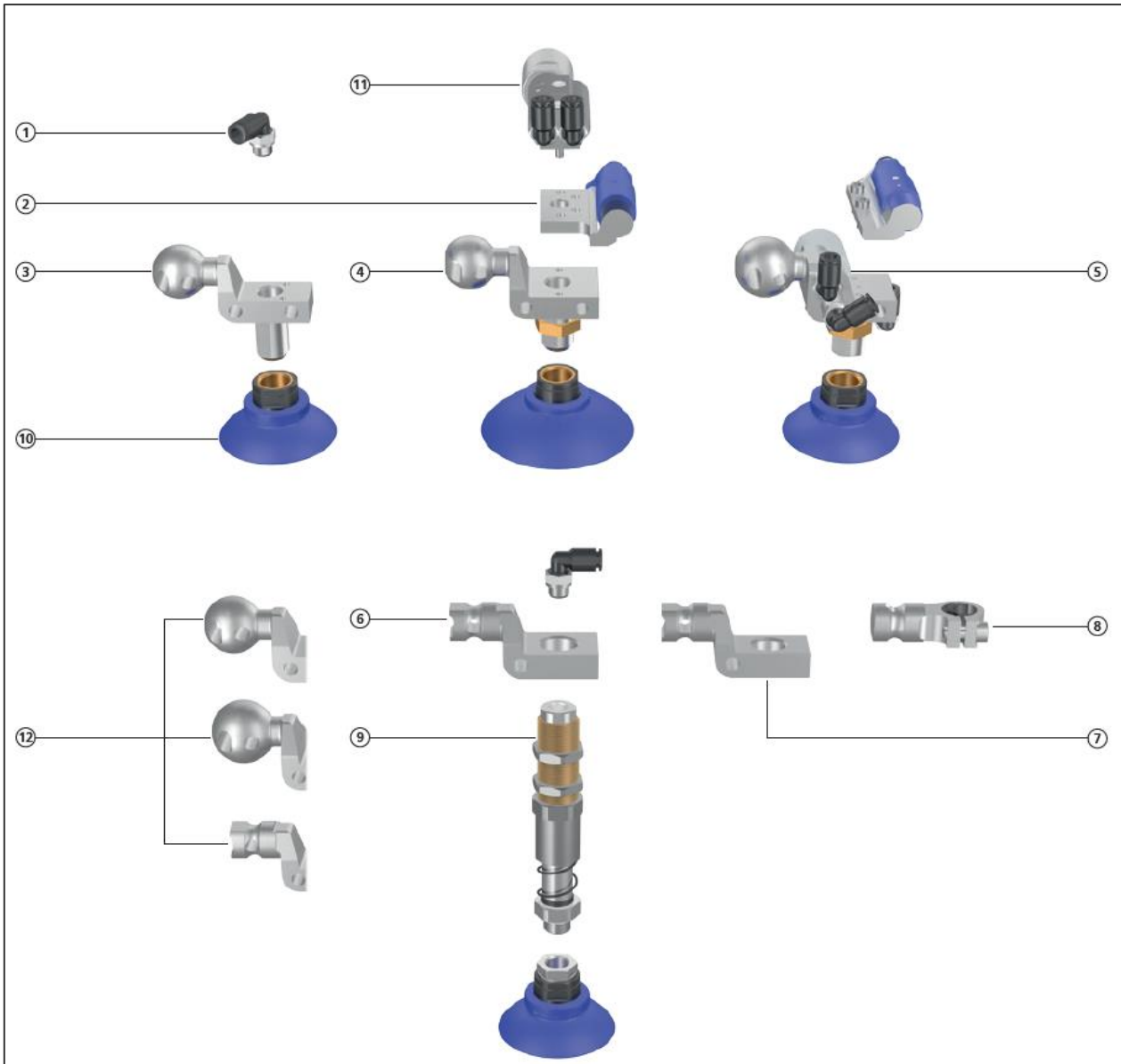
Holder for spring plunger HT-FST with spring plunger FSTE-HDB and oval Bellows Suction cup SAOB for handling elongated sheet metal parts

Holders for Suction Cups and Spring Plungers

Holder System HT

Connector apple core \varnothing 19 mm and ball \varnothing 28.5 mm as well as \varnothing 32 mm

Modular System Overview



- | | | |
|---|--|--|
| 1 Plug-in screw unions
for vacuum hoses and compressed air hoses | 5 Holder for Suction Cup HT-SG...I
with integrated vacuum nozzle | 9 Spring Plungers e.g. FSTE-HDB |
| 2 Vacuum switch VSi-HD
with matching holder | 6 Holder for Spring Plunger HT-FST... | 10 Suction Cups e.g. SAX |
| 3 Holder for Suction Cup HT-SG...
in slim design | 7 Holder for Sensor HT-SE... | 11 Decentralized vacuum generators e.g. SEAC |
| 4 Holder for Suction Cup HT-SG...E...
for decentralized vacuum generators SEAC (mounted on top) | 8 Holder for Sensor HT-SE-U...
Universal holder for sensors diameter 12 mm and 18 mm | 12 Connection to tooling beams <ul style="list-style-type: none"> • for holder types HT-SG..., HT-FST..., HT-SE... • A3 - Ball diameter 28.5 mm • A5 - Ball diameter 32 mm • A2 - "Apple-core" pin diameter 19 mm |

Holders for Suction Cups and Spring Plungers

Holder System HT

Connector apple core \varnothing 19 mm and ball \varnothing 28.5 mm as well as \varnothing 32 mm

Ordering and Configuration

The modular HT system provides two different holder solutions to suit differing requirements.

- An individual holder suitable for a wide variety of applications
- A custom-configured assembly

Combination with a wide variety of vacuum components from Schmalz

Selected parts of the following product families (selection) may be used in connection with the holder system HT.

VACUUM SUCTION CUPS



Bell-shaped suction cups SAX



Bellows suction cups SAB



Bellows suction cups FSGA VU1



Bellows suction cups SAOB HT2

SPRING PLUNGERS



Spring plungers FSTE-HD



Spring plungers FSTA-HD



Spring plungers FSTE-HDB



Spring plungers FSTI

VACUUM GENERATORS



Ejectors with active blow-off SEAC



Ejectors with blow-off system SEAC RP



Ejectors with atmospheric ventilation SEAC ECO

VACUUM SWITCHES



Vacuum and pressure switches VSi-HD

Ordering information

Ordering information for individual holders can be found in our online shop: WWW.SCHMALZ.COM/HT

For custom configurations, please contact your system consultant for vacuum automation: WWW.SCHMALZ.COM/SALES-NETWORK

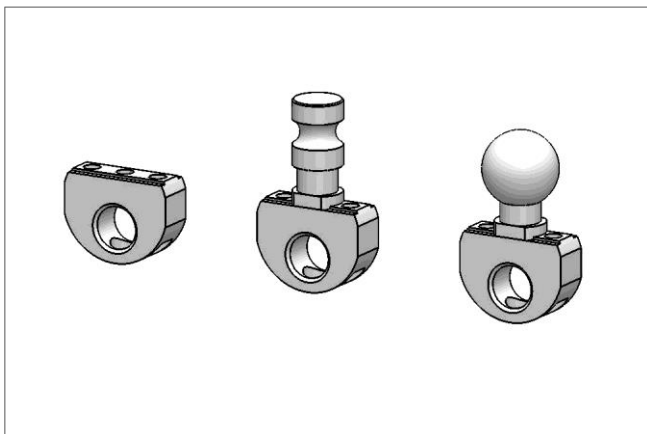
Holders for Suction Cups and Spring Plungers

Holders for Spring Plunger HTR-FST

Connector apple core \varnothing 19 mm and ball \varnothing 28.5 mm



Spring plunger holder HTR-FST



System design HTR-FST - 2N/A2/A3



Mounting example HTR-FST 2N on an aluminium section

Applications

- Used in combination with spring plungers, primarily in applications where it is necessary to compensate for workpieces with varying heights
- Typical applications are the removal of metal sheets from a stack or the handling of curved car body components in automotive factories.

Design

- Spring-plunger holder made of high-strength, anodized aluminium, consisting of a holder, optionally with clamping screw, and various adapters

Our Highlights...

- Continuous adjustment of the spring plunger FSTI with the aid of a thread
- Various mounting options for mounting on load beams
- Minimum size and weight

Your Benefits...

- > Quick and reliable adaptation to workpieces of varying sizes and shapes
- > Adaptation to all common systems possible; quick installation, changing and reuse of modules; extremely flexible
- > Lower weight and thus reduced tooling weight

Holders for Suction Cups and Spring Plungers

Holders for Spring Plunger HTR-FST

Connector apple core \varnothing 19 mm and ball \varnothing 28.5 mm

Ordering Data Holders for Spring Plunger HTR-FST

Type*	Article No.	Gewicht
HTR-FST A2	10.01.03.06134	62 g
HTR-FST A3	10.01.03.06136	80 g
HTR-FST 2 N	10.01.03.06143	80 g

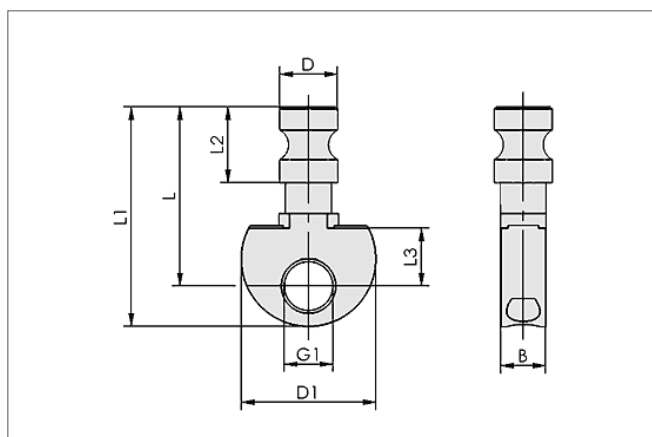
*A2 = adapter, cylindrical, notched; A3 = adapter spherical; 1N = 1 screw + 1 block; 2N = 2 screws + 2 blocks

Ordering Data Accessories Holders for Spring Plunger HTR-FST

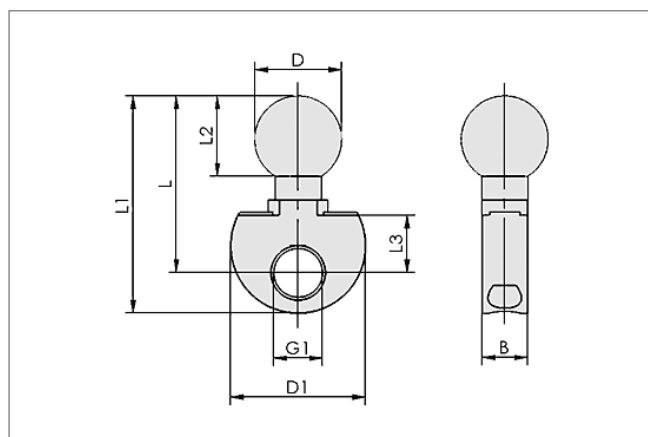
Type*	Article No.
ADP-A-A2	10.01.03.06131
ADP-A-A3	10.01.03.06133

*Mounting adapters ADP-A A2, ADP-A A3 available as spare parts under these Article Nos.

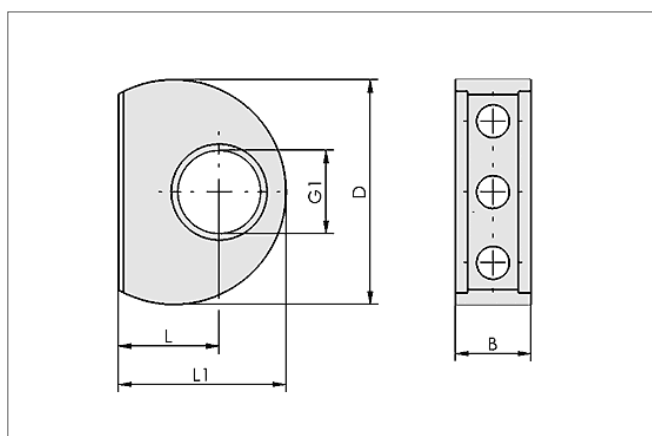
Design Data Holder for Spring Plunger HTR-FST



Holder for spring plunger HTR-FST A2



Holder for spring plunger HTR-FST A3



Holder for spring plunger HTR-FST 2N

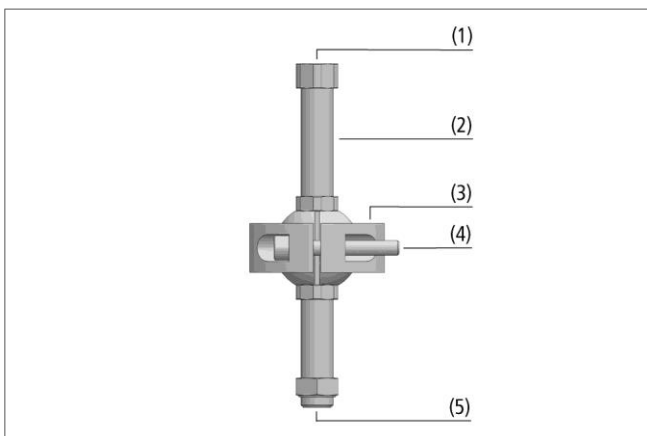
Type	Dimensions in mm								
	B	D	D1	G1	L	L1	L2	L3	
HTR-FST A 2	15	19.0	44.5	M18x1.5-F	59.0	72.3	25.0	19	
HTR-FST A 3	15	28.5	44.5	M18x1.5-F	58.3	71.5	26.4	19	
HTR-FST 2N	15	44.5	-	M18x1.5-F	20.0	33.3	-	-	

Holders for Suction Cups and Spring Plungers

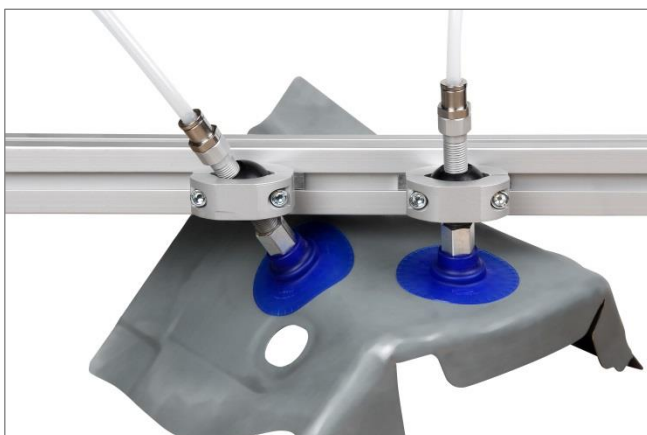
Universal Holders HTR-UNI



Universal holders HTR-UNI



System design universal holders HTR-UNI



Suction cups with universal holders HTR-UNI being used for handling sheet metal

Applications

- Universal holder for mounting of vacuum components on existing cross-beams made of square or round tubes with the aid of various adapters
- Adjustable height and inclination for flexible adaptation to workpieces
- Consistent portfolio by adding Universal Holder HTR-UNI 110mm

Design

- Holder made of high-strength, anodized aluminum, consisting of holder tube (2), ball clamp (3) and various adapters for mounting of square and round tubes
- Threaded tube (5) has a G1/4" male thread at the bottom for a suction cup and a G1/4" female thread at the top (1) for connection
- Incl. securing screws (4)

Our Highlights...

- Adjustment and fixing with ball clamp
- Adjustable height and inclination
- Suitable for mounting on square and round tubes
- Suction cups can be screwed directly into the G1/4" male thread

Your Benefits...

- > Flexible use, rapid changing, short set-up times
- > Flexible adaptation to workpieces with, e.g. curved sheet metal
- > For universal use
- > Quick and efficient construction of a load crossbeam

Holders for Suction Cups and Spring Plungers

Universal Holders HTR-UNI

Designation Code Universal Holders HTR-UNI

Abbreviated designation	Cross-beam connection	Connection thread	Dimensions in mm
Example HTR-UNI 1N G2 80:			
HTR-UNI	1N	G2	80
HTR-UNI	1N 1 sliding block	G2 connection thread	80
	2N 2 sliding blocks	G2 G1/4-AG	110
		FSTI, fixing bolt	140
		FSTE-HDB M6	200

Ordering Data Universal Holders HTR-UNI

Holder HTR-UNI is delivered unassembled. The delivery consists of:

- Holder tube – available in various lengths
- Ball clamp – available in various versions

Available accessories: section adapter, tube adapter, tube adapter reducing piece, suction cup connection

Universal Holders HTR-UNI

Type	Part Number	Weight
HTR-UNI 1N G2 80	10.01.03.00107	172 g
HTR-UNI 2N G2 80	10.01.03.00223	177 g
HTR-UNI 2N G2 80*	10.01.03.00298	195 g
HTR-UNI 2N G2 110	10.01.03.00328	205 g
HTR-UNI 2N G2 140*	10.01.03.00299	213 g
HTR-UNI 2N G2 200*	10.01.03.00309	230 g
HTR-UNI 1N FSTI M6	10.01.03.00257	142 g
HTR-UNI 2N FSTI without bolt	10.01.03.00297	145 g
HTR-UNI 2N FSTE-HDB without bolt	10.01.03.00332	142 g

*Incl. two lock nuts

Ordering Data Universal Holders HTR-UNI

Type	Part Number
HTR-STB 30x30 UNI*	10.01.03.00135
HTR-STC D32 UNI**	10.01.03.00108
BUCHSE 32-25x21PA***	10.01.03.00097

*Square adapter for mount. on square sections 30x30 mm (HTR-UNI 1N G2)

**Tube adapter for mounting on round tubes with diameter 32 mm (HTR-UNI 1N G2)

***Tube adapter reducing piece for tubes with diameter 25 mm (HTR-UNI 1N G2)

Ordering Data Universal Holders HTR-UNI

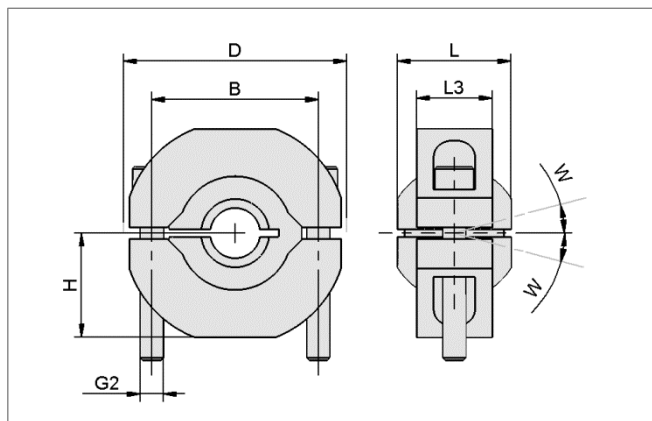
Type	Part Number
SAUG-ANB G1/4-AG 80	10.01.03.00292
SAUG-ANB G1/4-AG 110	10.01.03.00327
SAUG-ANB G1/4-AG 140	10.01.03.00291
SAUG-ANB G1/4-AG 200	10.01.03.00308

Holders for Suction Cups and Spring Plungers

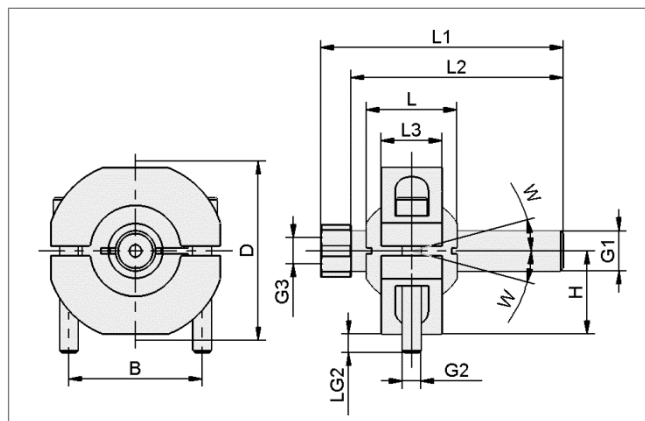
Universal Holders HTR-UNI



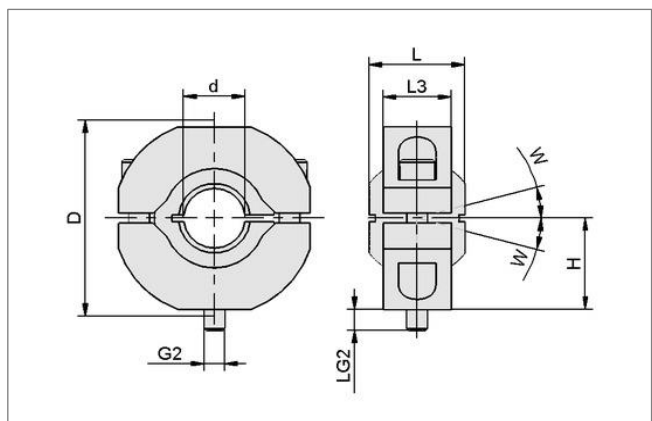
Design Data Universal Holders HTR-UNI



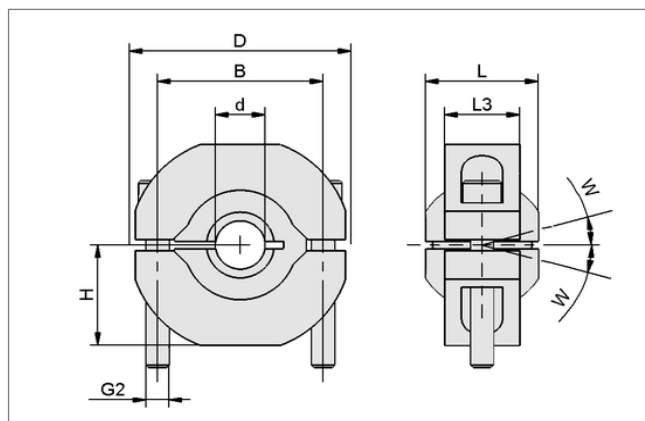
HTR-UNI 1N G2



HTR-UNI 2N G2



HTR-UNI 1N FSTI



HTR-UNI 2N FSTE-HDB

Type	Dimensions in mm*											
	B	D	G1	G2	G3	H	L	L1	L2	L3	LG2	W[*]
HTR-UNI 1N G2 80	-	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	80	70	20	6	15
HTR-UNI 2N G2 80	44	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	80	70	20	6	15
HTR-UNI 2N G2 80*	44	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	80	70	20	6	15
HTR-UNI 2N G2 110*	44	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	110	100	20	6	15
HTR-UNI 2N G2 140*	44	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	140	130	20	6	15
HTR-UNI 2N G2 200*	44	59	G1/4"-M	M6-M	G1/4"-F	27.5	30	200	190	20	6	15
HTR-UNI 1N FSTI	44	59	-	M6-M	-	27.5	28	-	-	20	-	15
HTR-UNI 2N FSTI	44	59	-	M6-M	-	27.5	28	-	-	20	-	15
HTR-UNI 2N FSTE-HDB	44	59	-	M6-M	-	27.5	28	-	-	20	-	15

*Incl. two lock nuts

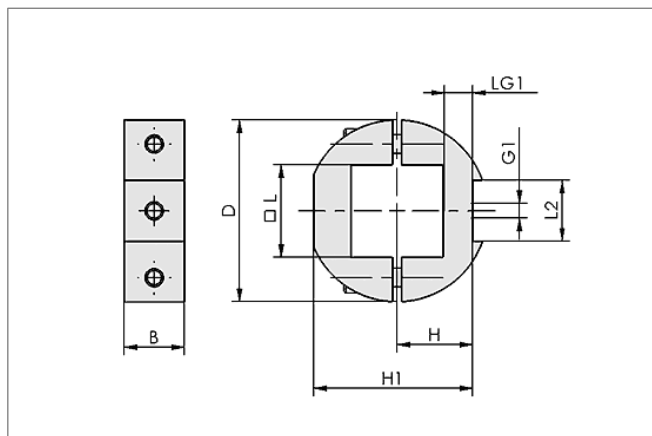


Holders for Suction Cups and Spring Plungers

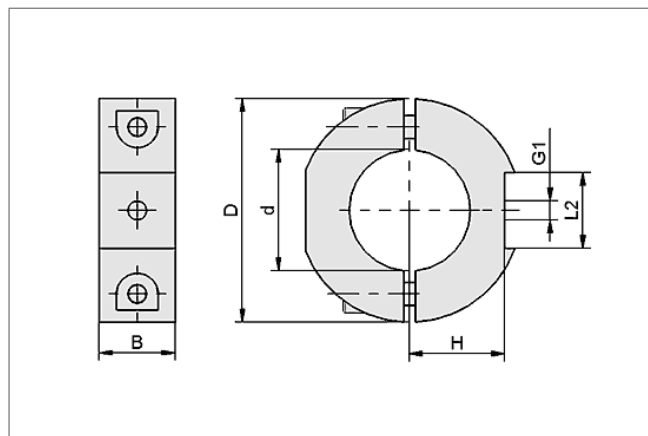
Universal Holders HTR-UNI



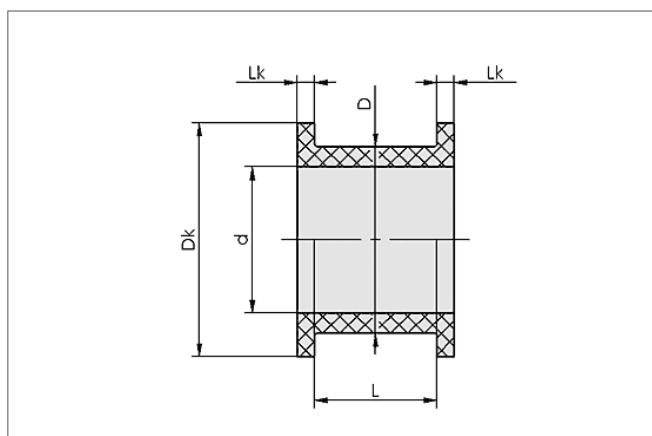
Design Data Universal Holders HTR-UNI



Square-section adapter HTR-STB 30x30 UNI



Tube adapter HTR-STC D32 UNI



Reducing piece BUCHSE 32-25x21 PA

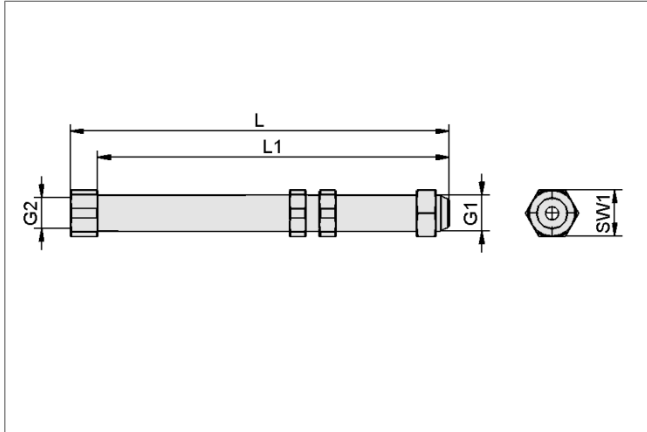
Type	Dimensions in mm													
	B	d	D	Dk	G1	G2	H	H1	L	L1	L2	LG1	Lk	SW1
HTR-STB 30x30 UNI	20	-	58.9	-	M6-F	-	25	52.5	30.5	-	20.1	10	-	-
HTR-STC D32 UNI	20	32	58.9	-	M6-F	-	25	-	-	-	20.1	12	-	-
BUCHSE 32-25x21 PA	-	25	32.0	40	-	-	-	-	21.0	-	-	-	3	-

Holders for Suction Cups and Spring Plungers

Universal Holders HTR-UNI



Design Data Universal Holders HTR-UNI



Suction-cup connection SAUG-ANB...

Type	Dimensions in mm														
	B	d	D	Dk	G1	G2	H	H1	L	L1	L2	LG1	Lk	SW1	
SAUG-ANB G1/4-AG 80	-	-	-	-	G1/4"-M	G1/4"-F	-	-	80.0	70	-	-	-	17	
SAUG-ANB G1/4-AG 110	-	-	-	-	G1/4"-M	G1/4"-F	-	-	110.0	100	-	-	-	-	
SAUG-ANB G1/4-AG 140	-	-	-	-	G1/4"-M	G1/4"-F	-	-	140.0	130	-	-	-	17	
SAUG-ANB G1/4-AG 200	-	-	-	-	G1/4"-M	G1/4"-F	-	-	200.0	190	-	-	-	17	

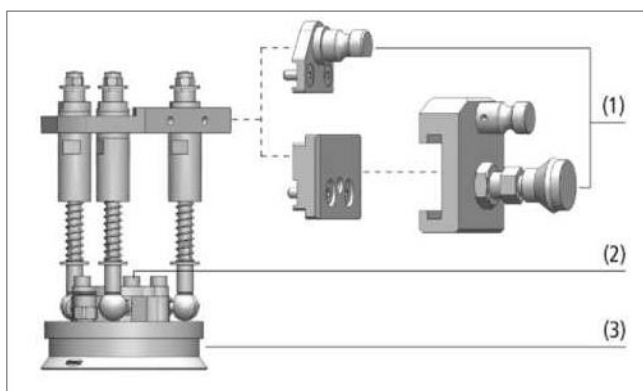
Holder for Double-Blank Sensors DBD

Holder DBD

Suction area (\varnothing) from 100 mm to 130 mm



Holder for double-blank sensors DBD



System design holder for double-blank sensors DBD



Holder for double-blank sensors DBD

Applications

- Holder for double-blank sensors ensuring process reliable detection of individual sheets during destacking process, e.g. in press shops
- Spring mounted holder for sensors with M36, M42 and M54 thread
- Suitable for using with double blank detector sensors such as Roland or Klaschka or similar

Design

- Holder for double-blank sensors in a jointed and spring-mounted design
- Replaceable bell-shaped suction ring made of oil resistant NBR (3)
- Clamping ring (2) for sensors with M36, M42 or M54 thread
- Flexible tooling connection (1) with different holders (with quick-change coupling and 19 mm apple core, alternatively permanent attached with 19mm apple core)

Our Highlights...

- Jointed fixture of sensor attachment
- Spring-mounted design with anti-blocking device
- Special bell-shaped suction ring to separate the vacuum circuit from the sensor circuit
- Simple replacement of suction ring
- For sensors with M36, M42 or M54 thread
- Quick-change-coupling with 19mm apple core
- Clamping ring for sensor assembly

Your Benefits...

- > Exact positioning of the sensor: reduction of false signals and downtime
- > Compensates differences in height, avoiding damages of the spring
- > No leakage around the sensor screw fitting
- > Reduced downtime
- > Compatible with standard double-blank sensors
- > Extremely quick replacement and installation on toolings
- > Easy and fast sensor assembly

Holder for Double-Blank Sensors DBD

Holder DBD

Suction area (\varnothing) from 100 mm to 130 mm

Ordering Data Holder for Double-Blank Sensors DBD

Type	Part number
DBD 100x145 36 M42	10.01.04.00409
DBD 100x189 80 M42	10.01.04.00415
DBD 130x187 80 M54	10.01.04.00418

Ordering Data Accessories Holder for Double-Blank Sensors DBD

Type	Part number
HTS-A2 DBD	10.01.04.00411
HTS-A2 DBD QC1-PL	10.01.04.00412
HTS-A2 DBD QC1-A	10.01.04.00413
ADP-G M42x1.5 M36x1.5 DBD	10.01.04.00422

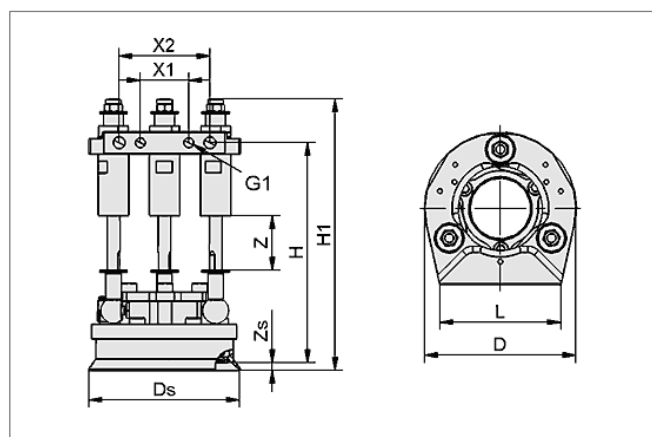
Ordering Data Spare Parts Holder for Double-Blank Sensors DBD

Type	Part number
SR-DBD 100 NBR-60	10.01.01.12591
SR-DBD 130 NBR-60	10.01.01.13054

Technical Data Holder for Double-Blank Sensors DBD

Type	Weight [g]	Stroke [mm]	Deflection [°]
DBD 100x145 36 M42	1013	36	25
DBD 100x189 80 M42	1105	80	25
DBD 130x187 80 M54	1500	80	25

Design Data Holder for Double-Blank Sensors DBD



Holder for double-blank sensors DBD

Type	Dimensions in mm									
	D	Ds	G1	H	H1	L	X1	X2	Z	Zs
DBD 100x145 36 M42	100	100	M8-F	145	179	80	32	60	36	5
DBD 100x189 80 M42	100	100	M8-F	189	223	80	32	60	80	5
DBD 130x187 80 M54	130	129	M8-F	187	221	80	32	60	80	5

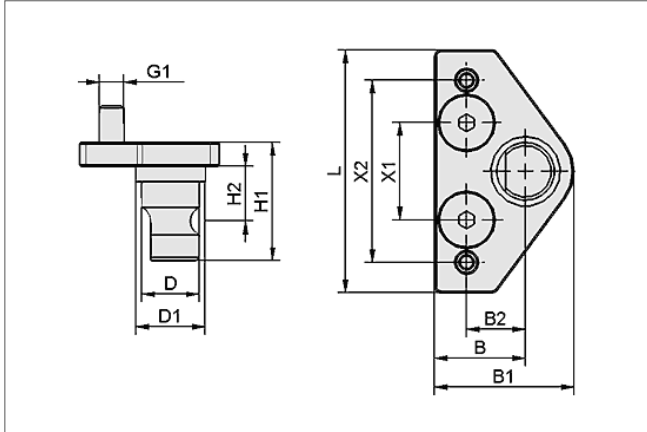
Holder for Double-blank Sensors

Holder DBD

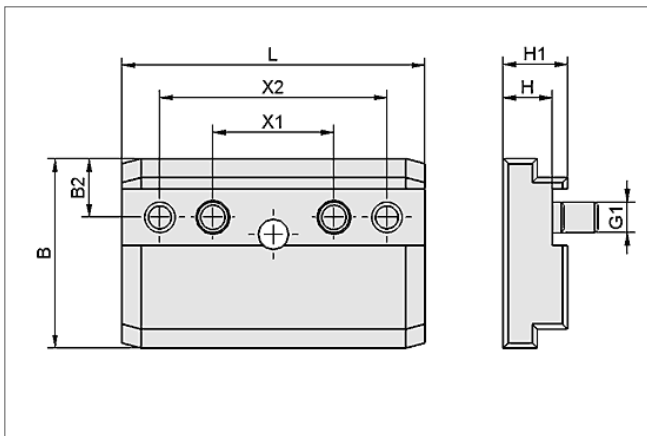
Suction area (\varnothing) from 100 mm to 130 mm



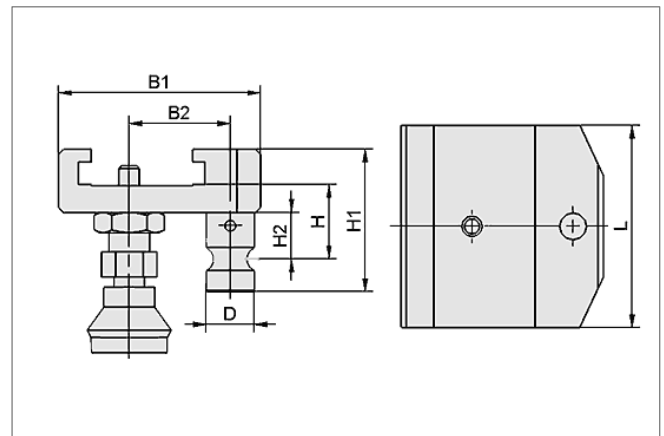
Design Data Accessories Holder for Double-Blank Sensors DBD



Holder system HTS-A2 DBD



Holder system HTS-A2 DBD QC1-PL



Holder system HTS-A2 DBD QC1-A

Type	Dimensions in mm											
	B	B1	B2	D	D1	G1	H	H1	H2	L	X1	X2
HTS-A2 DBD	30	46	19.5	19	23	M8-M	-	39	18	80	32	60
HTS-A2 DBD QC1-PL	50	-	15.5	-	-	M8-M	13	17	-	80	32	60
HTS-A2 DBD QC1-A	-	80	40.0	19	-	-	32	59	21	80	-	-

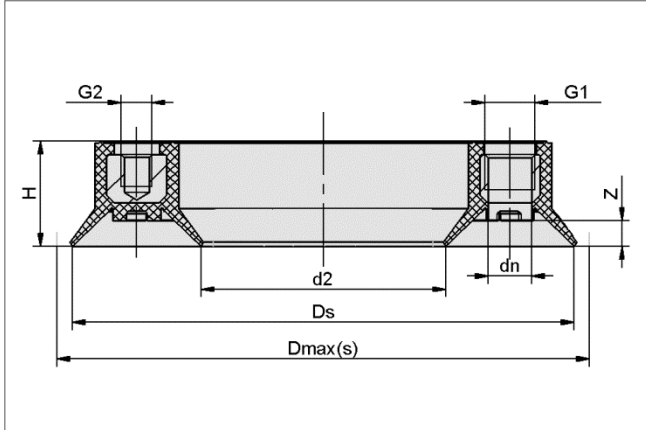
Holder for Double-Blank Sensors

Holder DBD

Suction area (\varnothing) from 100 mm to 130 mm



Design Data Spare Parts Holder for Double-Blank Sensors DBD



SR-DBD NBR-60

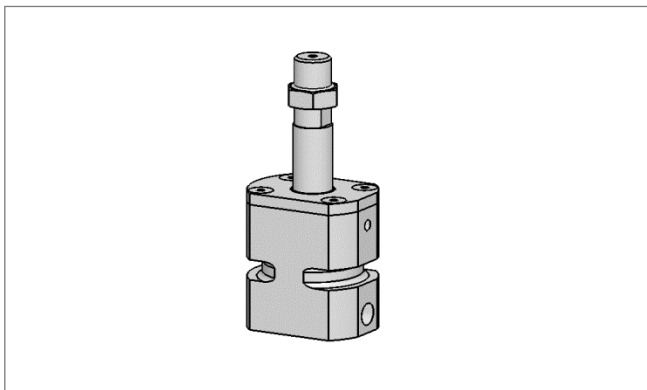
Type	Dimensions in mm								
	D2	Dn	Dmax(S)	Ds	G1	G2	H	Z	
SR-DBD 100 NBR-60	48.5	8.6	105	99.5	G1/8-F	M6-F	20.5	5	
SR-DBD 130 NBR-60	60.1	8.6	132	127.9	G1/8-F	M6-F	20.5	5	

Vacuum Cylinder

Vacuum Cylinder VSZ



Vacuum cylinder VSZ



System design vacuum cylinder VSZ

Applications

- Single acting vacuum cylinder for positioning unstable work-pieces
- For easy separation of thin aluminium sheets in destackers
- Through-hole vacuum connection inside piston rod
- Direct suction cup assembly on the piston rod

Design

- Single acting, spring extend cylinder
- Vacuum actuated with G1/8" female vacuum connection and M5 relief port
- 20mm cylinder stroke
- Through hole vacuum connection of the piston rod for direct assembly of suction cup

Our Highlights...

- Vacuum clamping piston with fixation of suction cup
- Vacuum actuated

Your Benefits...

- > Reliable positioning of flexible parts
- > Automated retraction of piston rod, when vacuum is activated and suction cup covered

Vacuum Cylinder

Vacuum Cylinder VSZ

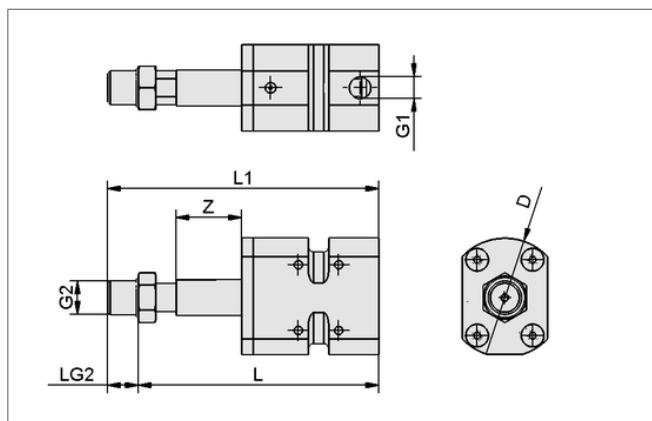


Ordering Data Vacuum Cylinder VSZ

Type	Part number
VSZ G1/4-AG 20	10.01.07.00026



Design Data Vacuum Cylinder VSZ









VSZ G1/4-AG 20

Type	Dimensions in mm*							
	D	LG2	Z	L	L1	G1	G2	H (Stroke)
VSZ G1/4-AG 20	47	12	21	90.5	102.5	G1/8"-F	G1/4"-M	20

Overview

Ejectors

Compact Ejectors		
	<p>Compact Terminal SCTMI</p> <ul style="list-style-type: none"> • Compact vacuum terminal • Up to 16 block-mounted compact ejectors 	<p style="text-align: right;">130</p> <p>Compact terminals for establishing individually controlled and monitored vacuum circuits in automated production environments.</p>
	<p>Compact Ejectors X-Pump SXPi/SXMPi with IO-Link</p> <ul style="list-style-type: none"> • Suction capacity up to 220 l/min • Max. vacuum 85 % 	<p style="text-align: right;">137</p> <p>Efficient compact ejector with condition monitoring, IO-Link, air-saving regulation and optional power blow off for highly dynamic processes above all in press shops.</p>
	<p>Compact Ejectors SCPi/SMPi</p> <ul style="list-style-type: none"> • Suction capacity up to 185 l/min • Max. vacuum 85 % 	<p style="text-align: right;">142</p> <p>Lightweight, small compact ejector with integrated system monitoring, IO-Link, air-saving regulation and optional power blow off for highly dynamic, efficient processes above all in body shops.</p>
	<p>Compact Ejectors SCPi FS</p> <ul style="list-style-type: none"> • Nozzle diameter 1,5 – 2,5 mm • Suction capacity up to 185 l/min • Max. vacuum 85 % 	<p style="text-align: right;">147</p> <p>Compact ejector for external control with pneumatic air-saving function and leakage monitoring.</p>
	<p>Ejector Tester</p> <ul style="list-style-type: none"> • Testing unit for Schmalz compact ejectors SXPi/SXMPi and SCPi/SMPi 	<p style="text-align: right;">150</p> <p>Ejector tester with plastic body for failure analysis</p>
	<p>Ejectors with Active Blow Off SEAC</p> <ul style="list-style-type: none"> • Suction capacity up to 35 l/min • Max. vacuum 85% • Body made of plastic 	<p style="text-align: right;">151</p> <p>Ejector with plastic body of the smallest possible dimensions and low weight as well as active blow off using compressed air, for decentralized vacuum generation in highly dynamic processes.</p>

Overview

Ejectors



Ejectors with Blow Off System SEAC RP

154

- Suction capacity: up to 35 l/min
- Max. vacuum 85%

Ejector with anodized aluminum body of the smallest possible dimensions with pneumatic air-saving function as well as active blow off using compressed air, for decentralized vacuum generation in highly dynamic processes.



Ejectors with Atmospheric Ventilation SEAC ECO

158

- Suction capacity up to 35 l/min
- Max. vacuum 85%
- With atmospheric ventilation

Ejector with anodized aluminum body of the smallest possible dimensions as well as atmospheric ventilation for the lowest possible operating costs, for decentralized vacuum generation in dynamic processes.



Holder for Single Ejector SEAC

161

- Holder with connections for suction cups and ejectors

The holder for suction cups with single ejector for varying cross-beams

Electrical Ejectors



ECBPi Cobot Pump

163

- Intelligent, autonomous and flexible Vacuum generation - for collaborative robots
- Suction capacity 12l/min

ECBPi Cobot Pump is a Intelligent, autonomous and flexible electrical vacuum generator, for collaborative robots. For example in autonomous warehouse or stationary handling tasks with collaborative robots (cobots).



SB Vacuum Blower

167

- Suction capacity 75 m³/h + 1.250 m³/h
- Max. vacuum 40 %

Vacuum blower for handling extremely porous workpieces with maximum flowrate.

Industry 4.0 – The Smart Production

Networked Factory

What Actually is Industry 4.0?

The “fourth industrial revolution” describes the transition of production work towards the intelligent factory. The increased networking of production and IT processes makes this flexible, efficient and sustainable. In the future, products will plan, control and optimize their own production process without human intervention. Humans will continue to dictate the pace, but with the best possible support in their work.

Visions and Benefits of Industry 4.0

- Production becomes highly flexible, highly productive and resource-efficient
- Individualization (batch size of 1) under efficient high volume production conditions
- The increasing complexity of production and processes becomes manageable
- Autonomous production units organize themselves on an “ad hoc” basis – the product determines its own production process

Energy and Process Control Data as a Basis for Industry 4.0

The basis for intelligent functions is that all of the relevant process data is available in real time. Schmalz provides an entire range of so-called smart field devices for this purpose: They are fitted with comprehensive energy and process control functions, they gather and interpret data and make it available. This allows Schmalz to support its customers to gear up for Industry 4.0 – the switch to the intelligent factory.

Visible and Intelligent Smart Field Devices Provide Valuable Data for the Smart Production of Tomorrow

Intelligent compact ejectors, for example, allow for both efficient product operation and efficient control of the entire process. All of the parameters that are relevant to energy and performance throughout the vacuum system are recorded, monitored, and analyzed via IO-Link here. Compatible systems and services connected through IO-Link, such as intra clouds or cloud services, are used to make the information visible in the different integration stages and output channels. This enables a higher degree of transparency and productivity in automated processes. The energy monitoring function guarantees optimal energy consumption throughout the system. The system status is monitored using condition monitoring, which increases system availability substantially. The predictive maintenance function improves the performance of the gripping system.



Vacuum Components with Integrated Intelligence

Ready for the Future

Our Smart Field Devices Understand „Industry 4.0”

Vacuum generators, as well as vacuum and pressure switches and needle grippers from Schmalz, come with the intelligence to communicate in the factory of tomorrow. They gather all important process data, interpret the data and communicate via IO-Link up to the master level.



Near Field Communication (NFC) – Direct and Fast Communication as a Productivity Boost for Industry 4.0

In addition to IO-Link as a common communication channel Schmalz offers with NFC other communication options for the operation of its smart devices. These captures data directly from the process and transfer the data via NFC to the Smartphone. No separate power source is needed for data transmission. The process data is displayed together with maintenance and service information on the smartphone. In addition to reading, writing over NFC is possible. This means parameters can be transferred from the smartphone to the Schmalz product using NFC. The parameterization requires a smartphone app.

Target Group	Management Meaningful and well-structured data	Commissioning Engineer Real-time data	Maintenance Data from the processor of the device
Device	Computer	Control	Mobile Device
Channel	Data in the local network	Wired transmission	Data transmission via near-field communication
Smart Field Device	 e.g. Vacuum and pressure switch VSI		

www.schmalz.com/nfc

Energy Consumption and Processes Under Control

Energy and Process Data as a Basis for Industry 4.0

Smart Field Devices with Comprehensive Functions for Energy and Process Control

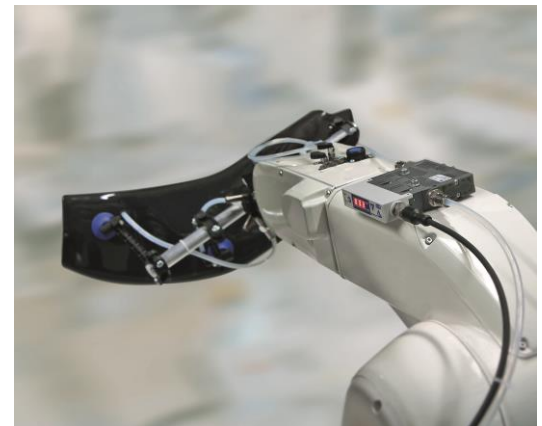
The diagnostic functions of Energy Monitoring and Condition Monitoring provide a maximum process transparency and control energy consumption. An enhanced performance and quality of gripping systems enables predictive maintenance.



Energy Monitoring

For the Optimization of Energy Consumption in Vacuum Systems

- Current energy consumption captured as real values
- Energy efficiency of vacuum system optimized even before start of operations
- Trend analysis per component, per production cycle and per shift
- Identification of disproportionate energy consumption
- Visualization in the system controller



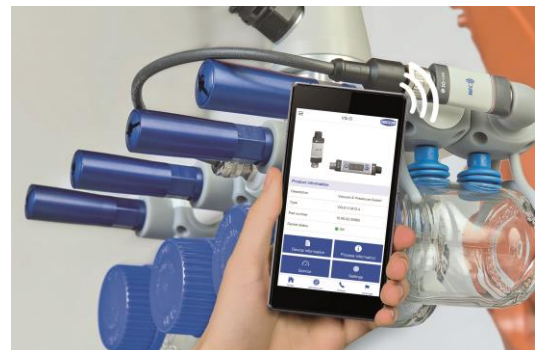
The energy efficient compact ejectors SCPSi constantly monitor energy consumption.



Condition Monitoring

For Increasing System Availability

- Continual monitoring of process parameters relevant to system functioning (e.g. leaks and operating pressure for ejectors or stroke and cycle times for needle grippers)
- Maximum system availability through detailed analysis of system condition and early detection of errors
- Fast and efficient troubleshooting in individual system parts or in the overall system
- Cost savings due to minimization of downtimes



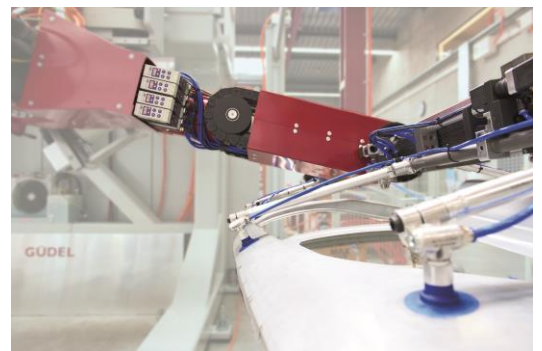
Through NFC data from the vacuum and pressure switch VSi is transmitted directly to the smartphone, where it can be then evaluated and adjusted.



Predictive Maintenance

For Increasing Performance and Quality of Gripping Systems

- Measurement of flow resistance and leak tightness in the gripping system
- Quick and easy system optimization through evaluation of gripper system performance
- Identification and prevention of faulty configurations
- Monitoring of performance relevant process data and early recognition of changes in system condition (e.g. leakage or contamination)

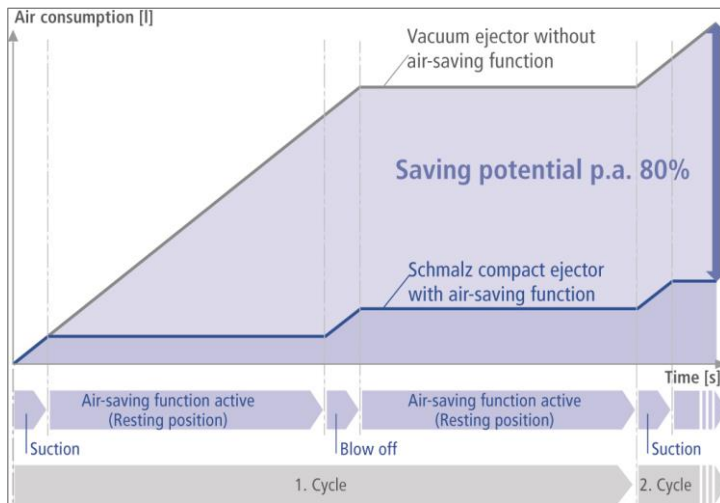


The compact ejectors SXMPi allow the user a scheduled and predictive maintenance without downtime during operation.

Compact Ejectors

Compact ejectors with Air Saving Function

Active air saving function reduces the process costs





Function	2 x 2.5 venturi w/o air-saving function	2 x SMPi 25 with air-saving function
Air consumption (l/min)	580	580
Transport time (sec./cycle)	4	4
Evac. time to -600 mbar (sec.)	0.05	0.05
Total "vacuum on" time (sec.)	4	0.05
Air consumption per cycle (l)	38.67	0.48
Annual outputs	450.000	450.000
Annual air consumption (l)	17.400.000	217.500

Result: Reduced process costs and significantly increased energy efficiency

Advantages of the suction principle IMP in emergency stop situation

The new generation of Schmalz compact ejectors with IMP suction technology reduces the air consumption tremendously by turning vacuum off when it's not necessary.

Working principle				
	Energy	Safety	Energy	Safety
NC	✓	✓	✓	✗
NO	✗	✓	✗	✓
IMP	✓	✓	✗	✓
IMP PT SO	✓	✓	✓	✓

Energy: IMP suction principle reduces the air consumption by turning suction off in case of emergency stop if no sheet is gripped (see the illustration on left). If the gripper has a part on it (see the illustration on right), IMP ejector goes into continuous suction. The air saving function stays active in case of emergency stop with IMP PT version.

Safety: The part will be gripped safely in case of emergency stop or power failure with IMP suction principle.

Compact Ejectors

Compact Terminal SCTMI

Flexible, fully networked vacuum generation



An increasing range of variants, the optimization of production processes and continuous energy and process control represent the challenges of the future. In order to meet these demands, extremely powerful, flexible and energy-efficient handling systems are required. The answer to these challenges is the Schmalz Compact Terminal SCTMI, a compact unit of several vacuum generators for simultaneously and independently handling different parts with one single vacuum system.

LEAN

- Central compressed air and power supply for up to 16 ejectors with just one connection
- Compact design and low weight make it suitable for a wide range of applications

MODULAR

- Modular design means various vacuum circuits can be installed to handle different parts with ease
- Each ejector can be selected based on nozzle size, NO, NC or nozzle type

NETWORKED

- Can be integrated in a wide range of field-bus systems
- Process and device parameters can be easily configured via ID-Link or NFC

INTELLIGENT

- All vacuum circuits can be separately controlled
- Process transparency, energy consumption control and a variety of diagnostic functions for use in intelligent factories

Compact Ejectors

Compact Terminal SCTMI

Ideal for use in the smart production of the future

Highlights of Schmalz Compact Terminal SCTMI

The Schmalz Compact Terminal SCTMI offers an enormous range of innovative energy-saving technologies and networking options for use in intelligent factories. This page introduces you to the most important features.

Near Field Communication (NFC)

- Reliable communication via an energy-neutral point-to-point connection
- Visible data – Both statistical data (such as the serial number) and dynamic process data (such as switching points) can be read out
- Parameterization option – An app can be used to parameterize the SCTMI directly from a smartphone

Networking in Industry 4.0 Systems

- The **IO-Link** connection means that recorded data can be viewed and used all the way up to the control level, which allows for bidirectional parameterization and diagnostics in all conventional field-bus systems
- **Condition monitoring** increases system availability by providing detailed analyses of the system's condition and early detection of faults
- **Predictive maintenance** improves the performance of gripping systems
- **Energy monitoring** optimizes the vacuum system's energy consumption



Automatic Air Saving Function

- Switches off the suction function once a safe vacuum value has been reached until the next cycle or until the vacuum falls below the safe vacuum value
- Various setting values and air saving settings can be programmed separately for each ejector
- Reduction of compressed air consumption by up to 80 %

Integrated Electronic Sub-Bus System

- Electronic control can be implemented with just a single cable
- Comprehensive data communication via IO-Link and near-field communication (NFC)
- All ejectors can be separately programmed and controlled



Eco-Nozzle Technology

- The new eco nozzle technology provides a considerably higher suction rate with minimized compressed air consumption or energy-efficient vacuum generation

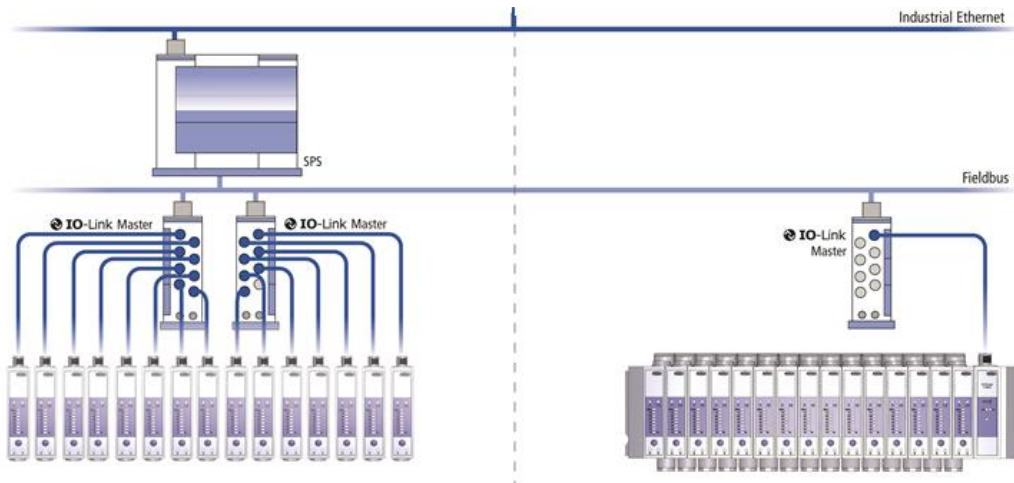


Vacuum Generators

Compact Terminal SCTMI

Flexible, fully networked vacuum generation

Simplified Integration in the Control Level

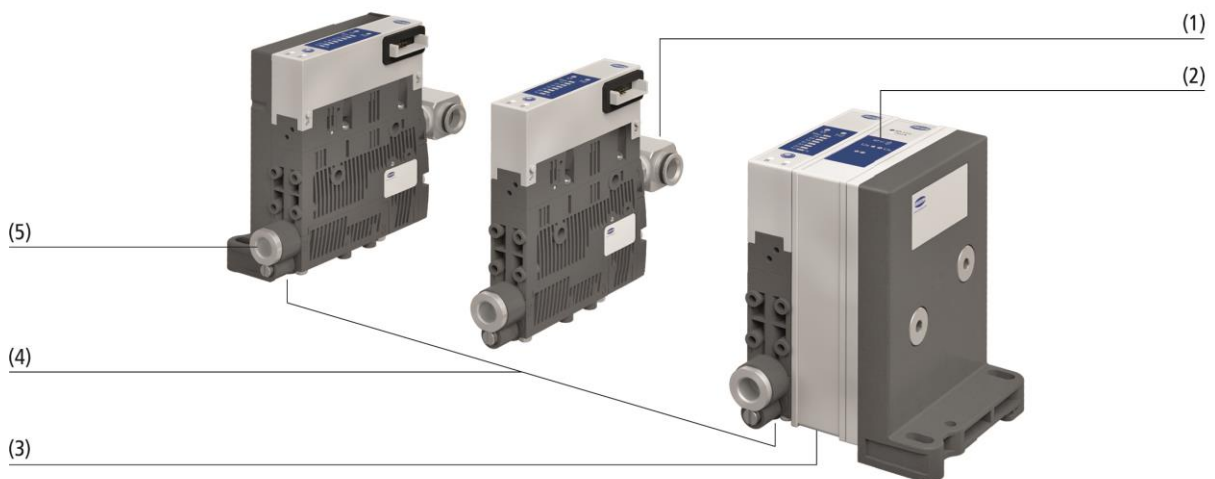


Connecting individual ejectors

Connecting the SCTMI

Design

- Lean, central compressed air supply (1)
- NFC-chip (2) for reading and writing process information
- Central power supply and IO-Link connection M12, 5-pin via the control module (3)
- Threaded vacuum connections (5)
- Compact vacuum terminal with block-manted compact ejectors (4)



System design Schmalz Compact Terminal SCTMI

Vacuum Generators

Compact Terminal SCTMI

Flexible, fully networked vacuum generation

Configuration code – Selection and ordering aid

SCTMi-IOL – 1111



Main body SCTMi

Code	Type
SCTMi-IOL	SCTMi IO-Link main body

Example: SCTMi-IOL 01

Main body and IO-Link master element with IO-Link electrical connection using M12, 5-pin plug



Ejectors

Code	Type	Part no.
1	SCPSt 07 G02 NO	10.02.02.04676
2	SCPSt 10 G02 NO	10.02.02.04681
3	SCPSt 15 G02 NO	10.02.02.04675
4	SCPSt 07 G02 NC	10.02.02.04673
5	SCPSt 10 G02 NC	10.02.02.04429
6	SCPSt 15 G02 NC	10.02.02.04678

Example: 11112200-00000000

4 ejectors SCPSt 07 G02 NO (10.02.02.04676) and 2 ejectors SCPSt 10 G02 NO (10.02.02.04681)

Ordering Code Compact Ejectors SCPSt

Kurzbezeichnung	Nozzle technology	Nozzle size	Connection	Idle valve position
For Example SCPSt 2-07 G02 NC:	2	07	G02	NC
SCPSt	2 2-stage	07 = 0,7 mm 10 = 1.0 mm 15 = 1.5 mm 2-07 = 0.7 mm 2-09 = 0.9 mm 2-15 = 1.4 mm	G02 Connection thread 2	NC Normally closed NO Normally open

Vacuum Generators

Compact Terminal SCTMI

Flexible, fully networked vacuum generation

2200-00000000

P



Code*	Type	Part no.
7	SCPSt 2-07 G02 NO	10.02.02.04677
8	SCPSt 2-09 G02 NO	10.02.02.04682
9	SCPSt 2-14 G02 NO	10.02.02.04680
A	SCPSt 2-07 G02 NC	10.02.02.04674
B	SCPSt 2-09 G02 NC	10.02.02.04683
C	SCPSt 2-14 G02 NC	10.02.02.04679

Note:
2 to 16 ejectors can be configured. A bigger inner hose diameter for air supply is required by 9 or more ejectors.



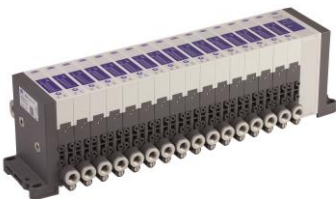
Collective pneumatic connection

Code	Type
P	With collective pneumatic connection
X	Without collective pneumatic connection

Example: P
Collective pneumatic connection for supplying all ejectors with one, two or three compressed air lines.

*Each digit represents an ejector position. Unassigned positions are indicated by „0“.

Sample SCTMi Configuration



SCTMi-IOL

88BB88BB-88BB88BB

P

Main body and IO-Link master element with IO-Link connection

8 ejector SCPSt 2-09 G02 NO (10.02.02.04682) und **8 ejector SCPSt 2-09 G02 NC** (10.02.02.04683)

Collective pneumatic connection

Note: Our experienced specialists will assist you in setting up and configuring your terminal. Contact details can be found on the back of the catalog.



Vacuum Generators

Compact Terminal SCTMI

Flexible, fully networked vacuum generation

Technical Data Schmalz Compact Terminal SCTMI

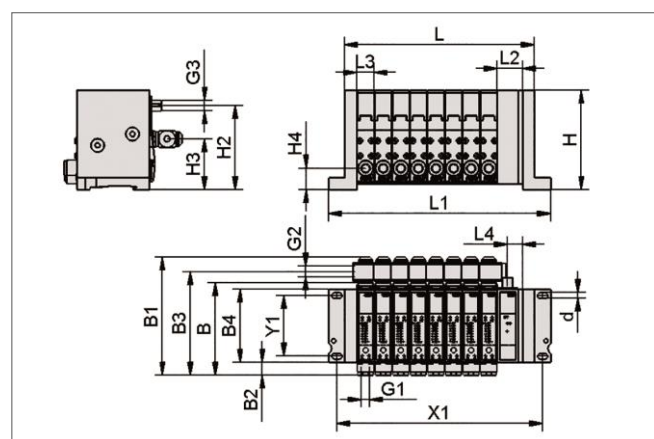
Type	Operating temperature [°C]	Pressure range (operating pressure) [bar]	Electrical connection	Communication
SCTMI-IOL	0...50	2...6	M12, 5-plug	IO-Link class B

Type	Nozzle size [mm]	Degree of evacuation [%]*	Max. suction rate [m³/h]*	Max. suction rate [l/min]*	Vacuum air consumption [m³/h]*	Air consumption blow-off [m³/h]*	Sound level free* [dB(A)]**	Sound level during gripping* [dB(A)]**
SCPSt 07...	07	85	0.98	16.0	1.35	7.25	63	58
SCPSt 10...	10	85	2.21	36.0	2.85	7.25	73	60
SCPSt 15...	15	85	4.03	65.5	6.03	7.25	73	65
SCPSt 2-07...	2-07	85	2.28	37.0	1.35	7.25	63	58
SCPSt 2-09...	2-09	85	3.05	49.5	2.49	7.25	73	60
SCPSt 2-14...	2-14	85	4.40	71.5	5.04	7.25	75	65

*At optimal operating pressure (4 bar)

**No linear increase in sound level with increase in ejector disks

Design Data Schmalz Compact Terminal SCTMI



SCTMI-IOL...

Type*	Dimensions in [mm]**																			m (g)	
	L	L1	L2	L3	L4	B	B1	B2	B3	B4	H	H2	H3	H4	d	X1	Y1	G1***	G2***		G3***
SCTMI-IOL (2)	89.2	123.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	108	64	G1/8"-F	G1/4"-F	M12x1-M	700
SCTMI-IOL (3)	107.7	141.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	125	64	G1/8"-F	G1/4"-F	M12x1-M	910
SCTMI-IOL (4)	126.2	160.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	143	64	G1/8"-F	G1/4"-F	M12x1-M	1120
SCTMI-IOL (5)	144.7	178.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	162	64	G1/8"-F	G1/4"-F	M12x1-M	1330
SCTMI-IOL (6)	163.2	197.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	180	64	G1/8"-F	G1/4"-F	M12x1-M	1540
SCTMI-IOL (7)	181.7	215.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	199	64	G1/8"-F	G1/4"-F	M12x1-M	1750
SCTMI-IOL (8)	200.2	234.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	217	64	G1/8"-F	G1/4"-F	M12x1-M	1960
SCTMI-IOL (9)	218.7	252.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	236	64	G1/8"-F	G1/4"-F	M12x1-M	2170
SCTMI-IOL (10)	237.2	271.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	254	64	G1/8"-F	G1/4"-F	M12x1-M	2380
SCTMI-IOL (11)	255.7	289.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	273	64	G1/8"-F	G1/4"-F	M12x1-M	2590
SCTMI-IOL (12)	274.2	308.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	291	64	G1/8"-F	G1/4"-F	M12x1-M	2800
SCTMI-IOL (13)	292.7	326.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	310	64	G1/8"-F	G1/4"-F	M12x1-M	3010
SCTMI-IOL (14)	311.2	345.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	328	64	G1/8"-F	G1/4"-F	M12x1-M	3220
SCTMI-IOL (15)	329.7	363.7	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	347	64	G1/8"-F	G1/4"-F	M12x1-M	3430
SCTMI-IOL (16)	348.2	382.2	27	18.5	16	97.5	125	13.5	109	77	105	89	54	22.5	5.5	365	64	G1/8"-F	G1/4"-F	M12x1-M	3640

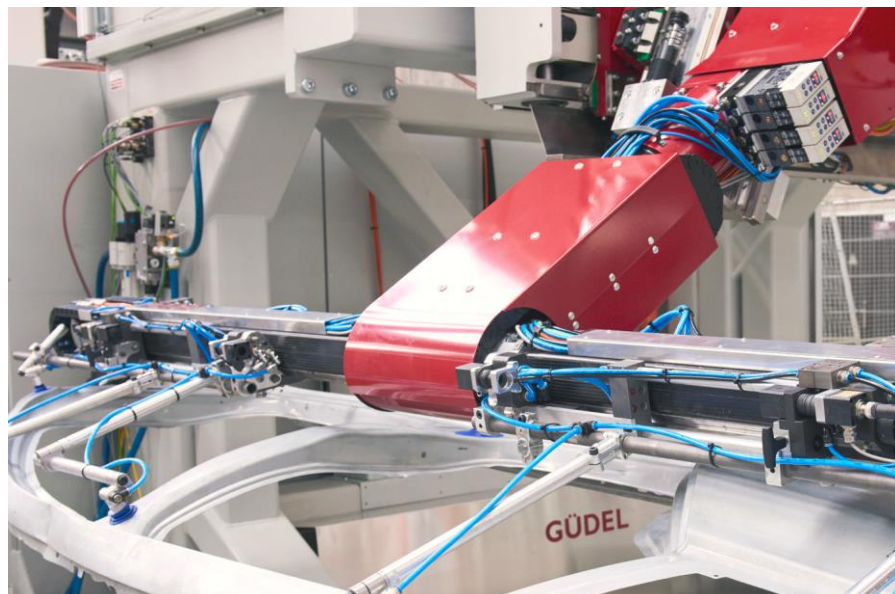
*(2...16) corresponds to the number of installed ejectors

**With compressed air distributor

***IG = female thread; AG = male tread

Industry 4.0 – A Practical Reality

Reducing Downtime in the Automated Handling of Sheet Metal Parts



Scenario:

Application

Tooling in a press line for the production of car body panels in the automotive industry

Task

- Transfer of components between individual presses
- Automated handling with minimal cycle times

Solution

The Schmalz compact ejector SXMPi with intelligent energy and process control has a very high suction rate of up to 220 l/min and a power blow-off function for minimal cycle times. The ejector can communicate with all field-bus systems via the IO-Link interface. The SXMPi records, analyzes and interprets all process data, including:

- Energy monitoring function to monitor energy consumption
- Condition monitoring function to increase system availability
- Predictive maintenance function



Schmalz compact ejector SXMPi

Customer Benefits

Function	Compact ejector SXMPi	Conventional vacuum generators without IO-Link
Air saving function	✓	Some
Power blow-off function for minimal cycle times	✓	Some
IO-Link interface – bidirectional communication in field-bus systems	✓	-
Optimization of process parameters during operation	✓	-
Condition monitoring	✓	-
Monitoring of process parameters that influence function (leak tightness / operating pressure)	✓	-
Monitoring and recording of energy consumption	✓	-
Measurement of flow resistance and leak tightness in the gripping system	✓	-
Leakage detection	✓	-
Monitoring of contamination levels	✓	-

Potential Savings for a Press Line in the Automotive Industry:

The user can initiate scheduled predictive maintenance even before the system ceases operation. The SXMPi continuously monitors the tooling status, detects subtle changes or imminent malfunctions and reports them to the system's controller. Just by reducing downtime by a minute per day, **yearly savings of up to EUR 300.000** can be achieved in the above scenario. The actual savings will vary according to the particular cost of downtime in the system.

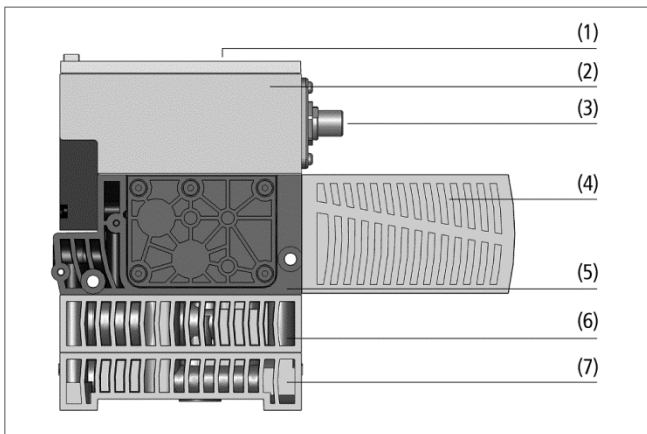
Compact Ejectors

Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

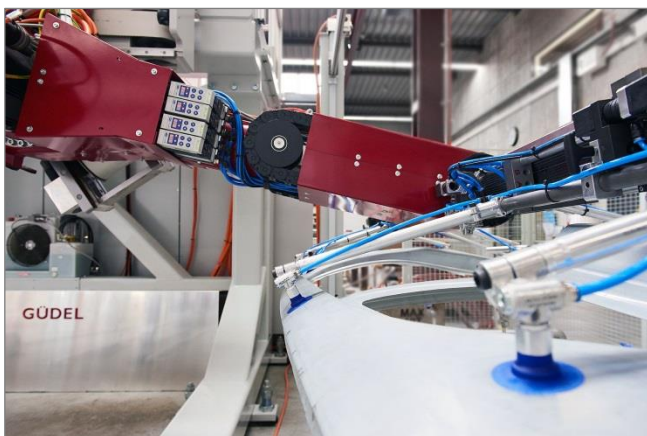
Suction rate from 185 l/min to 220 l/min



Compact ejectors X-Pump SXPi / SXMPi with IO-Link



System design compact ejectors X-Pump SXPi / SXMPi with IO-Link



Central vacuum generation by compact ejectors SXPi / SXMPi

Applications

- High-performance vacuum generator for handling air-tight workpieces under extreme conditions, e. g. in vacuum systems in press lines for handling metal sheets
- In pick-and-place applications with short cycle times
- In automated systems for preparation and precise monitoring of the vacuum system
- Optimizing of energy consumption and performance-oriented design of vacuum systems

Design

- User display (1) with large-scale operating and display elements
- Control electronics (2) with diverse monitoring functions
- Electrical connection (3) via M12 plug
- Removable silencer (4)
- Basic body (5) made of extremely robust plastic
- Compact ejector SXMPi is additionally equipped with the power blow off module (6)
- Horizontal connection plate with vacuum and compressed air connection (7); optional with quick-change adapter
- Optional integrated pressure sensor

Our Highlights...

Your Benefits...

- | | |
|--|---|
| • Communication via IO-Link technology | > Input and output of process specific data |
| • Integrated air-saving function | > Significant reduction of energy consumption |
| • Condition monitoring functions with internal and external evaluation options | > Process and system monitoring to avoid downtimes |
| • Integrated voltage regulator | > Compensation of variations in voltage |
| • Integrated pressure monitoring (optional) | > Additional information on operating status |
| • Suction function as impulse version (optional) | > No undesired air consumption in the event of power loss |

Compact Ejectors

Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Suction rate from 185 l/min to 220 l/min

Designation Code Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Abbreviated designation	Nozzle size	Idle position suction valve	Additional function	Connection pneumatical	Connection electrical
Example SXPi 25 NO H M12-8:					
SXPi	25	No	-	H	M12-8
SXPi without power module	25= 2.5 mm	IMP bistable switched with pulse	PC pressure monitoring	H horizontal	M12-8
SXMPi with power module	30= 3.0 mm	NC normally closed		Q quick-change	2xM12- 5
		NO normally opened			M12. 8-pole 2xM12; 5-pole

Ordering Data Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Compact ejector SXPi / SXMPi is delivered as a ready to connect product (without connection cable).

Available spare parts: connection cable, base plate, ejector tester

Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

SXPi 25		SXPi 30	
Type	Part Number	Type	Part Number
SXPi 25 NO H M12-8	10.02.02.03776	SXPi 30 NO H M12-8	10.02.02.03780
SXPi 25 NO Q M12-8	10.02.02.03777	SXPi 30 NO Q M12-8	10.02.02.03781
SXPi 25 NO H 2xM12-5	10.02.02.03778	SXPi 30 NO H 2xM12-5	10.02.02.03782
SXPi 25 NO O 2M12-5	10.02.02.03779	SXPi 30 NO Q 2xM12-5	10.02.02.03783
SXPi 25 NC H M12-8	10.02.02.03784	SXPi 30 NC H M12-8	10.02.02.03788
SXPi 25 NC O M12-8	10.02.02.03785	SXPi 30 NC Q M12-8	10.02.02.03789
SXPi 25 NC H 2xM12-5	10.02.02.03786	SXPi 30 NC H 2xM12-5	10.02.02.03790
SXPi 25 NC O 2xM12-5	10.02.02.03787	SXPi 30 NC Q 2xM12-5	10.02.02.03791
SXPi 25 IMP H M12-8	10.02.02.03792	SXPi 30 IMP H M12-8	10.02.02.03796
SXPi 25 IMP O M12-8	10.02.02.03793	SXPi 30 IMP Q M12-8	10.02.02.03797
SXPi 25 IMP H 2xM12-5	10.02.02.03794	SXPi 30 IMP H 2xM12-5	10.02.02.03798
SXPi 25 IMP Q 2xM12-5	10.02.02.03795	SXPi 30 IMP Q 2xM12-5	10.02.02.03799

SXMPi 25*		SXMPi 30	
Type	Part Number	Type	Part Number
SXMPi 25 NO H M12-8	10.02.02.03800	SXMPi 30 NO H M12-8	10.02.02.03804
SXMPi 25 NO Q M12-8	10.02.02.03801	SXMPi 30 NO Q M12-8	10.02.02.03805
SXMPi 25 NO H 2xM12-5	10.02.02.03802	SXMPi 30 NO H 2xM12-5	10.02.02.03806
SXMPi 25 NO Q 2xM12-5	10.02.02.03803	SXMPi 30 NO Q 2xM12-5	10.02.02.03807
SXMPi 25 NC H M12-8	10.02.02.03808	SXMPi 30 NC H M12-8	10.02.02.03812
SXMPi 25 NC Q M12-8	10.02.02.03809	SXMPi 30 NC Q M12-8	10.02.02.03813
SXMPi 25 NC H 2xM12-5	10.02.02.03810	SXMPi 30 NC H 2xM12-5	10.02.02.03814
SXMPi 25 NC Q 2xM12-5	10.02.02.03811	SXMPi 30 NC Q 2xM12-5	10.02.02.03815
SXMPi 25 IMP H M12-8	10.02.02.03816	SXMPi 30 IMP H M12-8	10.02.02.03820
SXMPi 25 IMP Q M12-8	10.02.02.03817	SXMPi 30 IMP Q M12-8	10.02.02.03821
SXMPi 25 IMP H 2xM12-5	10.02.02.03818	SXMPi 30 IMP H 2xM12-5	10.02.02.03822
SXMPi 25 IMP Q 2xM12-5	10.02.02.03819	SXMPi 30 IMP Q 2xM12-5	10.02.02.03823

*Note: All variants listed above can also be optionally configured as "PC" variants.

Compact Ejectors

Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Suction rate from 185 l/min to 220 l/min

Compact Ejectors SXPi/SXMPi X-Pump with IO-Link Technology and Pressure Monitoring "PC"

Type	Part Number
SXMPi 25 IMP H PC 2xM12-5	10.02.02.04022
SXMPi 25 NC H PC 2xM12-5	10.02.02.04021
SXMPi 25 NO H PC 2xM12-5	10.02.02.04023
SXMPi 30 IMP PC Q M12-8	10.02.02.03731

Ordering Data Accessories Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Accessories	Part Number	Weight [kg]
Connecting cable M12. 8-pole	21.04.05.00079	0.28
Connecting cable M12. 5-pole	21.04.05.00080	0.24
Connecting cable M12. 8-pole to 5-pole*	21.04.05.00167	0.35
Single base plate with quick-change connection	10.02.02.02473	0.18
Double base plate with quick-change connection	10.02.02.02154	0.47
Ejector tester	10.02.02.03588	0.75

*For IO-Link

Technical Data Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Type	Nozzle-Ø [mm]	Degree of evacuation [%]	Max. suction rate [L/min]	Max. suction rate [m³/h]	Air consumpt. during evac. [l/min]*	Air consumpt. during evac. [m³/h]*	Max. air consumption blow off [l/min]
SXPi 25	2.5	85	185	11.1	290	17.4	200
SXPi 30	3.0	85	220	13.2	380	22.8	200
SXMPi 25	2.5	85	185	11.1	290	17.4	320
SXMPi 30	3.0	85	220	13.2	380	22.8	320

! The supply voltage for vacuum switches and solenoid valves is 24V DC

*At optimal operating pressure (4.5 bar)

**For max. length 2 m

Type	Noise level free [dB]	Operating pressure [bar]	Recomm. int. hose diameter compr. air [mm]**	Recomm. int. hose diameter vacuum [mm]**	Weight [kg]*	Operating temperature [°C]
SXPi 25	67	3...6	8	9	0.77	0...50
SXPi 30	72	3...6	8	11	0.77	0...50
SXMPi 25	67	3...6	8	9	0.91	0...50
SXMPi 30	72	3...6	8	11	0.91	0...50

! The supply voltage for vacuum switches and solenoid valves is 24V DC

*At optimal operating pressure (4.5 bar)

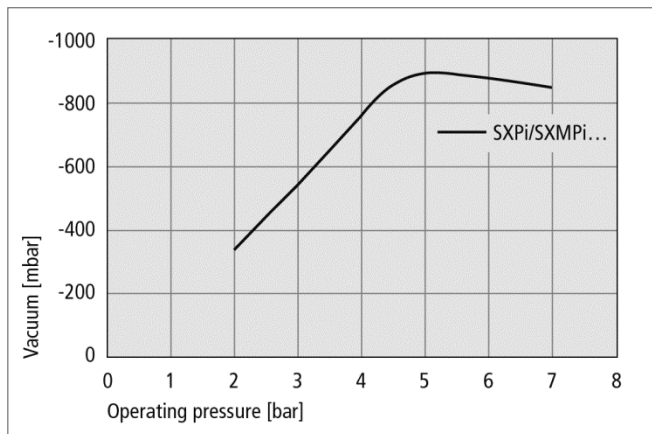
**For max. length 2 m

Compact Ejectors

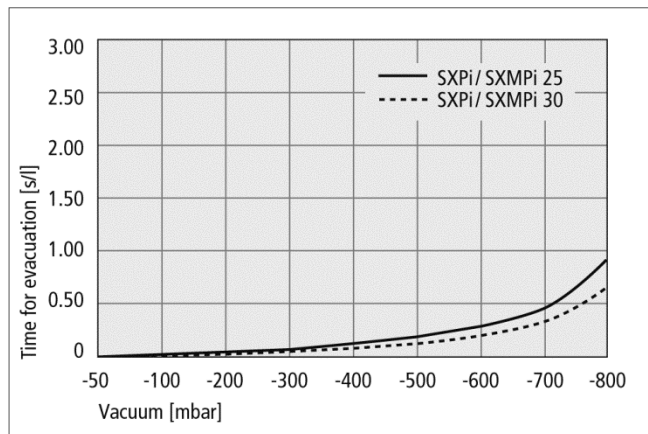
Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

Suction rate from 185 l/min to 220 l/min

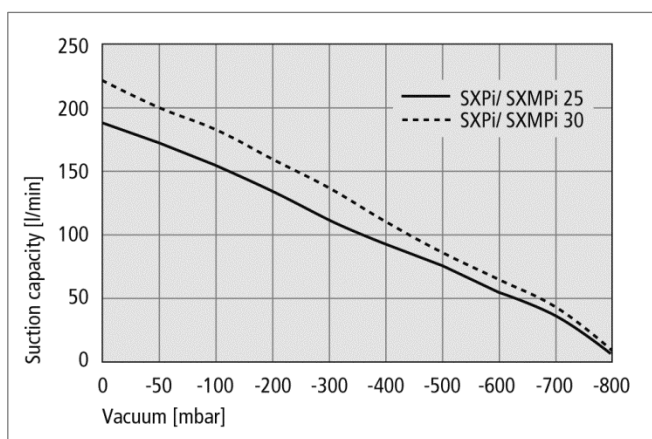
Performance Data Compact Ejectors X-Pump SXPi / SXMPi with IO-Link



Achievable vacuum at various operating pressures



Evacuation times for various vacuum ranges



Suction capacity at various degrees of evacuation

Suction Capacity in l/min at Various Degrees of Evacuation

Type	Degree of evacuation in mbar									
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800
SXPi/SXMPi 25	185	170	158	135	114	95	76	56	33	10
SXPi/SXMPi 30	220	199	184	160	138	115	91	63	39	15

Evacuation Time in s/l for Various Vacuum Ranges

Type	Degree of evacuation in mbar									
	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SXPi/SXMPi 25	0.02	0.03	0.06	0.10	0.15	0.18	0.26	0.46	0.87	
SXPi/SXMPi 30	0.01	0.02	0.05	0.08	0.11	0.15	0.22	0.37	0.69	

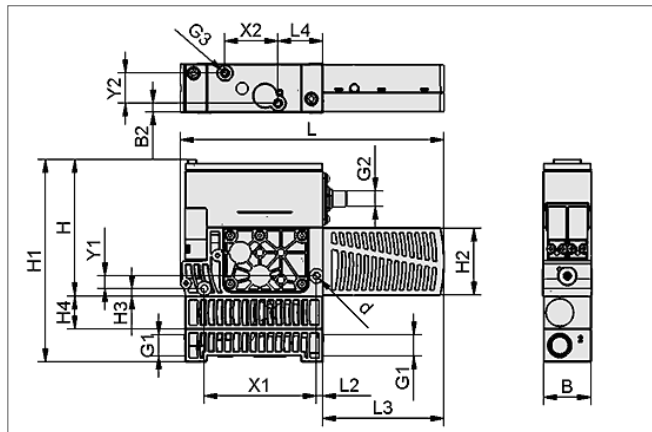
Compact Ejectors

Compact Ejectors X-Pump SXPi / SXMPi with IO-Link

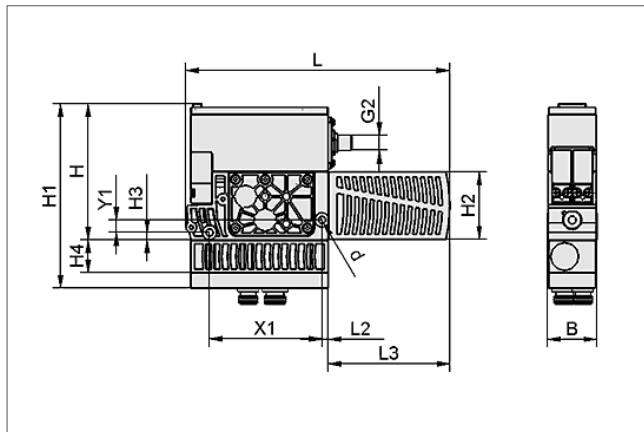
Suction rate from 185 l/min to 220 l/min



Design Data Compact Ejectors X-Pump SXPi / SXMPi with IO-Link



SXMPi H



SXMPi Q

Type	Dimensions in mm													
	B	d	G1	G2	H	H1	H2	H3	H4	L	L2	L3	X1	Y1
SXPi...H...	39	5.5	G3/8"-F	M12-M	108	134	54	6	-	210	5	97	89	10
SXPi...Q...	39	5.5	-	M12-M	108	120	54	6	-	210	5	97	89	10
SXMPi...H...	39	5.5	G3/8"-F	M12-M	108	160	54	6	26	210	5	97	89	10
SXMPi...Q...	39	5.5	-	M12-M	108	146	54	6	26	210	5	97	89	10

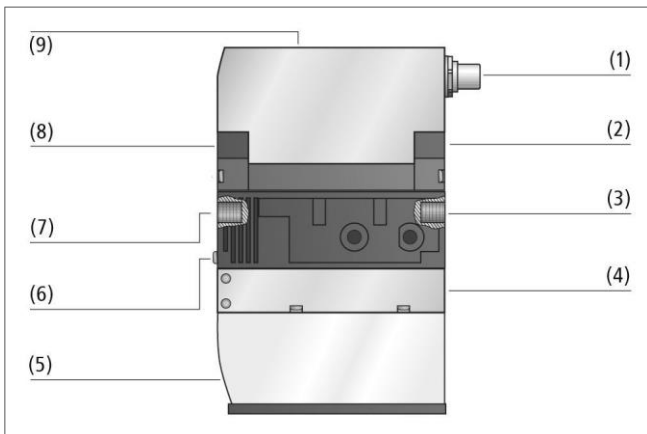
Compact Ejectors

Compact Ejectors SCPi/SMPi

Suction rate from 75 l/min to 185 l/min



Compact ejectors SCPi / SMPi



System design compact ejectors SCPi / SMPi



Centralized vacuum generation by means of compact ejectors SMPi

Applications

- Handling of air-tight as well as porous workpieces
- Vacuum supply and vacuum monitoring in automated systems
- For use in sheet metal processing, in the automotive industry, and in various robotic applications
- Pick-and-place applications with very short cycle times (fast gripping and release realized by means of the power blow-off function)

Design

- Main body made of high-strength plastic
- User display (9) with seven segments, operating keyboard and luminous display that indicates system status
- Electrical connection (1) via standard M12 plug, optional with potential separation of sensor and actor power supply
- Integrated pneumatic valves for NO, NC or pulse switch functions (2) and (8)
- Power blow-off piston for type SMPi (4) provides extremely high blow-off capacity for reduced cycle times
- Adjusting screw to adjust the blow-off capacity (6)
- Pneumatic connections (G3/8" and G1/4") with protective filters (3) and (7)
- Integrated silencer (5)

Our Highlights...

- IO-Link function with remote parameterization
- Clearly structured user display with setting buttons
- Integrated air-saving function
- Compact disk design
- Weight-optimized housing
- Suction function as pulse version is available

Your Benefits...

- > Connection to bus systems and fast data synchronization
- > Easy to enter and read vacuum parameters
- > Reduced energy costs
- > Minimal space requirements
- > Minimal stress during high accelerations
- > No undesired air consumption in case the machine is stopped

Compact Ejectors

Compact Ejectors SCPi/SMPi

Suction rate from 75 l/min to 185 l/min

Designation Code Compact Ejectors SCPi / SMPi

Abbreviated designation	Nozzle size	Idle position suction valve	System monitoring	Connection electrical	Additional function
Example SMPi 15 NO VD M12-5:					
SMPi	15	NO	VD	M12-5	PT-SO
SCPi without power blow off	15 = 1.5 mm	IMP bistable	RD air saving	M12-5 M12.5	PT Potential
SMPi with power blow off	20 = 2.0 mm	switched with pulse	function with digital vacuum switch	pole	splitting
	25 = 2.5 mm	NC normally closed			
		NO normally open			

Ordering Data Compact Ejectors SCPi / SMPi

Compact ejector SCPi / SMPi is delivered as a ready to connect product (without connection cable).

Available accessories: connection cable, compressed air connection plate, ejector blanking plate, quick change connection, ejector tester

Compact Ejectors SCPi / SMPi

SCPi 15...		SCPi 20...		SCPi 25...	
Type	Part Number	Type	Part Number	Type	Part Number
SCPi 15 NO RD M12-5	10.02.02.03345	SCPi 20 NO RD M12-5	10.02.02.03357	SCPi 25 NO RD M12-5	10.02.02.03369
SCPi 15 NC RD M 12-5	10.02.02.03346	SCPi 20 IMP RD M12-5	10.02.02.03358	SCPi 25 NC RD M12-5	10.02.02.03370
SCPi 15 IMP RD M12-5	10.02.02.03347	SCPi 20 IMP RD M12-5	10.02.02.03359	SCPi 25 IMP RD M12-5	10.02.02.03371

SMPi 15...		SMPi 20...		SMPi 25...	
Type	Part Number	Type	Part Number	Type	Part Number
SMPi 15 NO RD M12-5	10.02.02.03339	SMPi 20 NO RD M12-5	10.02.02.03351	SMPi 25 NO RD M12-5	10.02.02.03363
SMPi 15 NC RD M12-5	10.02.02.03340	SMPi 20 NC RD M12-5	10.02.02.03352	SMPi 25 NC RD M12-5	10.02.02.03364
SMPi 15 IMP RD M12-5	10.02.02.03341	SMPi 20 IMP RD M12-5	10.02.02.03353	SMPi 25 IMP RD M12-5	10.02.02.03365
SMPi 15 IMP RD M12-8 PT	10.02.02.03898	SMPi-20-IMP-RD-M12-8-PT	10.02.02.04442	SMPi-25-IMP-RD-M12-8-PT	10.02.02.03575

Ordering Data Accessories Compact Ejectors SCPi / SMPi

Accessories	Part Number	Weight [kg]
Connecting cable M12. 5-pole	21.04.05.00080	0.240
Connection distributor 3xM12. 4-pole	10.02.02.03372	0.170
Connection distributor 2xM12. 4-pole	10.02.02.03490	0.100
Connection distributor 2xM12. 4-pole for PT	10.02.02.03335	0.100
Compressed air connection plate GP 2	10.02.02.00917	0.375
Compressed air connection plate GP 3	10.02.02.00918	0.481
Compressed air connection plate GP 4	10.02.02.00919	0.595
Compressed air connection plate GP 5	10.02.02.00920	0.700
Compressed air connection plate GP 6	10.02.02.00921	0.807
Ejector blanking plate*	10.02.02.00728	0.017
Quick Change connection**	10.02.02.03463	0.163
Ejector tester EJEK-TEST SMPi/SCPi	10.02.02.03588	0.755

*Plate for covering unused connections when using compressed air connection plates

**For additional quick-mounting function (tool-free change of ejectors). When using with compressed air connection plates, order 1x per ejector.

Compact Ejectors

Compact Ejectors SCPi/SMPi

Suction rate from 75 l/min to 185 l/min

Technical Data Compact Ejectors SCPi / SMPi

Type	Nozzle -Ø [mm]	Degree of evacuation [%]	Max. suction rate [L/min]	Max. suction rate [m³/h]	Air consumpt. during evac. [l/min]*	Air consumpt. during evac. [m³/h]*	Max. air consumption blow off [l/min]
SMPi 15...	1.5	85	75	4.5	115	7.2	200
SMPi 20...	2.0	85	135	8.1	180	10.8	200
SMPi 25...	2.5	85	185	11.1	290	17.4	200
SCPi 15...	1.5	85	75	4.5	115	7.2	200
SCPi 20...	2.0	85	140	8.4	180	11.7	200
SCPi 25...	2.5	85	195	11.7	290	17.4	200

! The supply voltage is 24V DC

*At optimal operating pressure

**For max. length 2 m

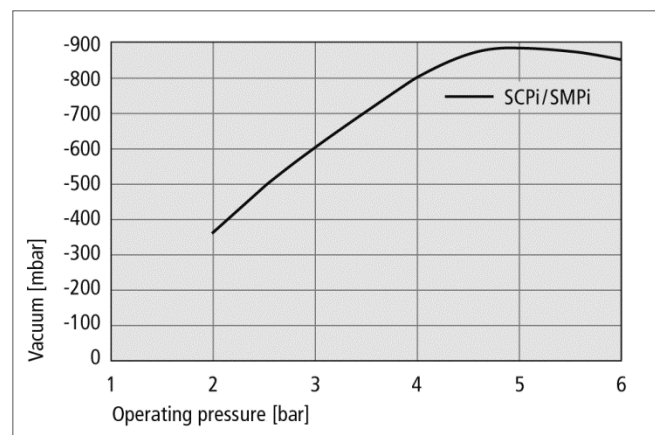
Type	Noise level free [dB]	Noise level workp. gripped [dB]	Operating pressure [bar]	Recomm. int. hose diameter compr. air [mm]**	Recomm. int. hose diameter vacuum [mm]**	Weight [kg]*	Operating temperature [°C]
SMPi 15...	75	74	4...7 bar	6	6	0.56	0...50
SMPi 20...	75	70	4...7 bar	6	8	0.56	0...50
SMPi 25...	78	77	4...7 bar	8	9	0.56	0...50
SCPi 15...	75	70	4...7 bar	6	6	0.56	0...50
SCPi 20...	75	65	4...7 bar	6	8	0.56	0...50
SCPi 25...	78	75	4...7 bar	8	9	0.56	0...50

! The supply voltage is 24V DC

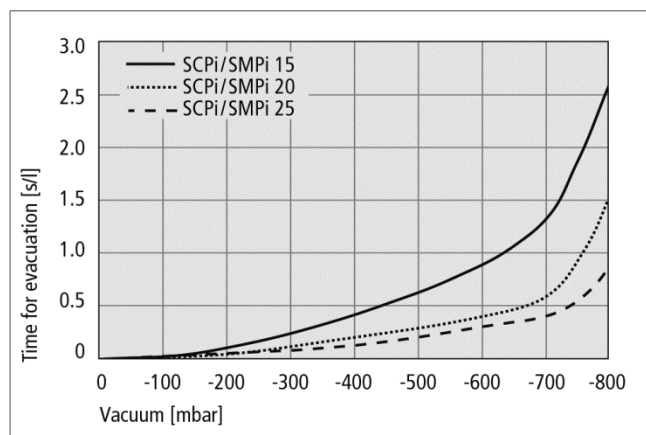
*At optimal operating pressure

**For max. length 2 m

Performance Data Compact Ejectors SCPi / SMPi



Achievable vacuum at various operating pressures



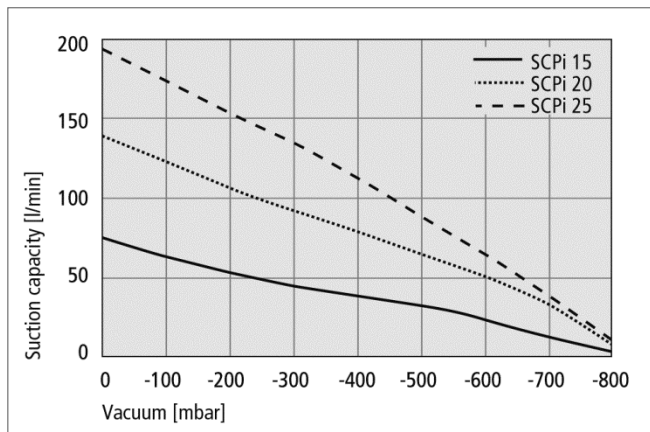
Evacuation times for various vacuum ranges

Compact Ejectors

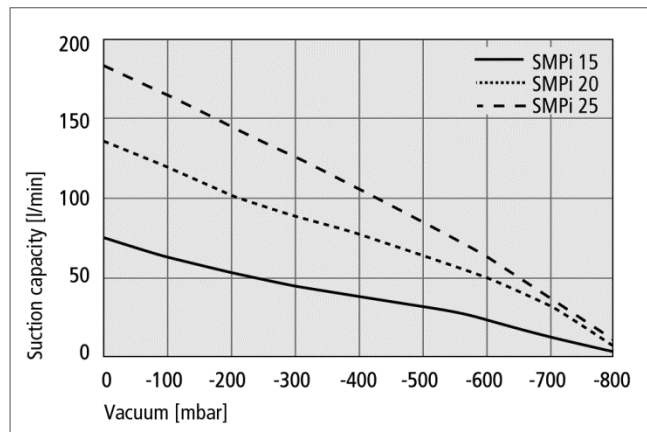
Compact Ejectors SCPi/SMPi

Suction rate from 75 l/min to 185 l/min

Performance Data Compact Ejectors SCPi / SMPi



Suction capacity SCPi... at various degrees of evacuation



Suction capacity SMPi... at various degrees of evacuation

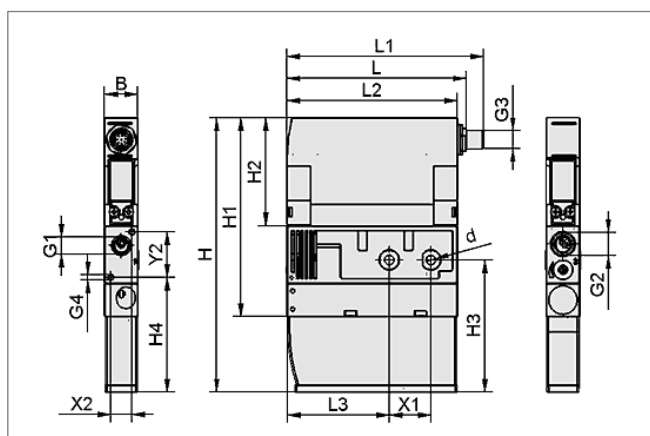
Suction Capacity in l/min at Various Degrees of Evacuation

Type	Degree of evacuation in mbar										
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SCPi 15	75	70.3	65.4	55.2	46.3	38.3	31.2	23.9	13.5	3.4	
SCPi 20	139	131.3	123.1	106.8	92.5	79.3	65.2	51.9	32.1	8.5	
SCPi 25	195	188.2	176.8	153.6	133.6	112.0	89.3	67.4	39.7	11.7	
SMPi 15	75	70.3	65.4	55.2	46.3	38.3	31.2	23.9	13.5	3.4	
SMPi 20	135	127.5	119.5	103.7	89.8	77.0	63.3	50.4	31.1	8.2	
SMPi 25	185	178.6	167.8	145.8	126.7	106.2	84.7	64.0	37.6	11.1	

Evacuation Time in s/l for Various Vacuum Ranges

Type	Degree of evacuation in mbar									
	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SCPi/SMPi 15	0.03	0.07	0.16	0.27	0.42	0.63	0.91	1.37	2.60	
SCPi/SMPi 20	0.02	0.04	0.08	0.14	0.22	0.31	0.44	0.66	1.54	
SCPi/SMPi 25	0.01	0.02	0.05	0.09	0.14	0.20	0.28	0.42	0.86	

Design Data Compact Ejectors SCPi / SMPi



SCPi.../SMPi...

Compact Ejectors

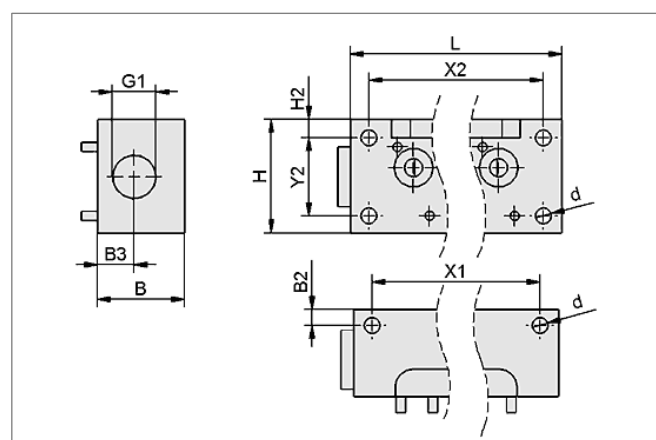
Compact Ejectors SCPi/SMPi

Suction rate from 75 l/min to 185 l/min

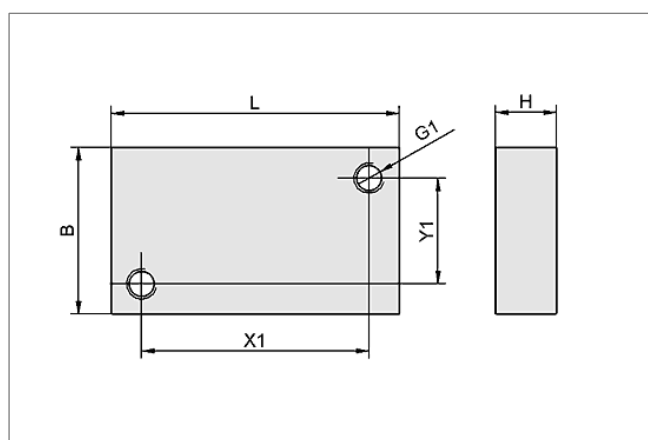
Design Data Compact Ejectors SCPi / SMPi

Type	Dimensions in mm																	
	B	d	G1	G2	G3	G4	H	H1	H2	H3	H4	L	L1	L2	L3	X1	X2	Y2
SMPi 15	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30
SMPi 20	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30
SMPi 25	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30
SCPi 15	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30
SCPi 20	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30
SCPi 25	22	6.6	G1/4"-F	G3/8"-F	M12x1-M	M4-F	181.5	131.5	71.5	87.5	76	118.5	129.7	112.5	67.5	27.5	14	30

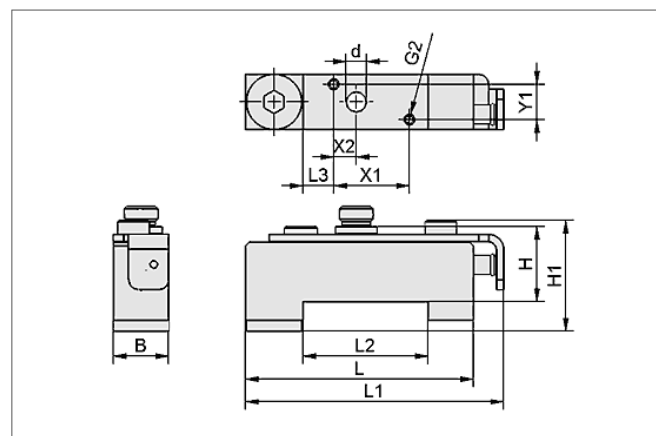
Design Data Accessories Compact Ejectors SCPi / SMPi



Compressed air connection plate GP...



Ejector blanking plate EJEK-PL...



Quick Change Connection ADP-Q1...

Type	Dimensions in mm																	Number of outputs
	B	B2	B3	d	G1	G2	H	H1	H2	X1	X2	Y1	Y2	L	L1	L2	L3	
GP 2 SMP(i)15..30/SCP(i)15..30	38	7	16	7	G1/2"-F	-	49.5	-	8	62	62	-	34	78.0	-	-	-	2
GP 3 SMP(i)15..25/SCP(i)15..25	38	7	16	7	G1/2"-F	-	49.5	-	8	85	85	-	34	101.0	-	-	-	3
GP4 SMP(i)15...20/SCP(i)15..20	38	7	16	7	G1/2"-F	-	49.5	-	8	108	108	-	34	124.0	-	-	-	4
GP5 SMP(i)15/SCP(i)15	38	7	16	7	G1/2"-F	-	49.5	-	8	131	131	-	34	147.0	-	-	-	5
GP6 SMP(i)15/SCP(i)15	38	7	16	7	G1/2"-F	-	49.5	-	8	154	154	-	34	170.0	-	-	-	6
EJEK-PL SMP(i)15.30/SCP(i)20..30	22	-	-	-	M4-F	-	8.0	-	-	30	-	14	-	38.0	-	-	-	-
ADP-Q1 90.5x22x29.7 SMPi/SCPi	22	-	-	8	-	M5-F	29.7	43.9	-	30	9	14	-	90.5	102.5	49.6	12.1	1

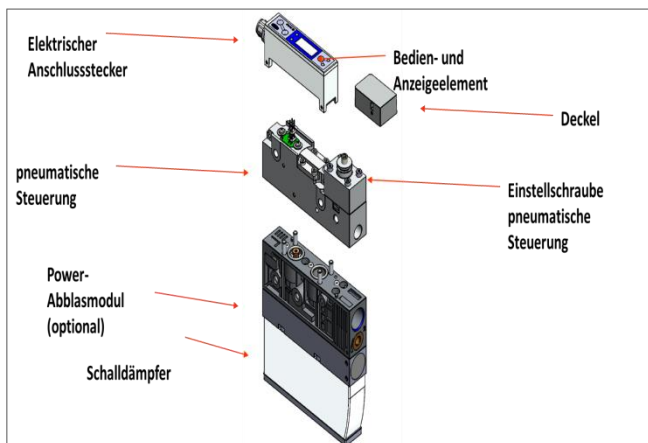
Compact Ejectors

Compact Ejectors SCPi FS

Suction rate from 75 l/min and 185 l/min



Compact ejector SCPi-NO-FS-RP-VD-M12-5



System design Compact ejector SCPi NO FS RP

Applications

- Handling of air-tight as well as porous workpieces
- For use in sheet metal processing, in the automotive industry and in various robotic applications
- Vacuum supply and vacuum monitoring in automated systems
- Externally controlled vacuum ejector with pneumatically controlled air-saving function and leakage monitoring

Design

- Main body made of high-strength plastic and air saving system in aluminum body
- User display with three segments and operating keyboard
- Electrical connection via standard M12 plug
- Integrated air saving function
- Pneumatic connections (G3/8" and G1/4") with protective filters
- Integrated silencer

Our Highlights...

- Digital leakage monitoring
- Pneumatic air-saving function Externally controlled compact ejector
- High suction and blow-off capacity
- Compact disk design
- Weight optimized housing
- Active air saving function in emergency stop

Your Benefits...

- > E-stop air-saving function, thus minimum energy costs and continuous operation
- > No additional lines required, since everything is controllable via external valve
- > Minimal gripping and blow-off times
- > Easy adjustment with settings shown on an LED display
- > Minimal space requirements and minimal stress during high accelerations
- > Safe handling of the workpieces

Compact Ejectors

Compact Ejectors SCPi FS

Suction rate from 75 l/min and 185 l/min

Designation Code Compact Ejectors SCPi-25-NO-FS-RP-VD-M12-5

Abbreviated designation	Nozzle size in mm	Blow-off and safety valve	System monitoring	Connection electrical
Example: SCPi	25	FS	RP	M12-5
SCPi NO FS RP VD M12-5	15 1.5 mm 20 2.0 mm 25 2.5 mm	FS external control	RP pneumatic RP air-saving	M12-5 M12. 5 pole

Ordering Data Compact Ejectors SCPi-25-NO-FS-RP-VD-M12-5

Type	Article No.
SCPi-FS-15-NO-RP	10.02.02.05400
SCPi-FS-20-NO-RP	10.02.02.05450
SCPi-FS-25-NO-RP	10.02.02.04521
SCPi-FS-15-NO-RP	10.02.02.05436
SCPi-FS-20-NO-RP	10.02.02.05438
SCPi-FS-25-NO-RP	10.02.02.05440

Ordering Data Accessories Compact Ejektoren SCPi NO FS RP

Type	Article No.	Weight [kg]
Connecting cable M12, 5-pole	21.04.05.00080	0,24

Ordering Data Spare Parts Compact Ejectors SCPi 25 NO FS RP

Type	Article No.
Silencer	10.02.02.03381

Compact Ejectors

Compact Ejectors SCPI FS

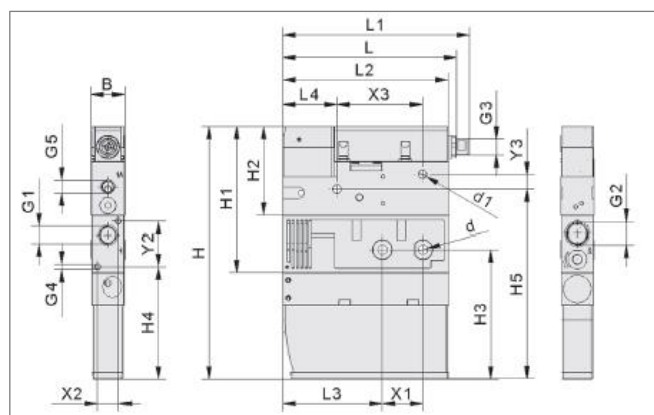
Suction rate from 75 l/min and 185 l/min

Technical Data Compact Ejectors SCPI NO FS RP

Type	Operating pressure [bar]	Air consumpt. during evac. [l/min]	Air consumption blow-off [l/min]	Max. suction rate [l/min]	Max. air consumption blow off [l/min]
SCPI-FS-15-NO-RP-M12-5	4...7	115	310	75	300
SCPI-FS-15-NO-RP-M12-55	4...7	115	310	75	300
SCPI-FS-20-NO-RP-M12-5	4...7	190	310	135	300
SCPI-FS-20-NO-RP-M12-55	4...7	190	310	135	300
SCPI-FS-25-NO-RP-M12-55	4...7	290	310	185	300
SCPI-FS-25-NO-RP-M12-55	4...7	290	310	185	300

Type	SP1 Switching point „Part present control“ [mbar]	rP1 Release point „Part present control“	SP2 Switching point „Leakage control“	rP2 Release point „Leakage control“	L_2 Leakage
SCPI-FS-15-NO-RP-M12-5	450	440	570	500	100
SCPI-FS-15-NO-RP-M12-55	550	540	680	610	100
SCPI-FS-20-NO-RP-M12-5	450	440	570	500	100
SCPI-FS-20-NO-RP-M12-55	550	540	680	610	100
SCPI-FS-25-NO-RP-M12-55	450	440	570	500	100
SCPI-FS-25-NO-RP-M12-55	550	540	680	610	100

Design Data Compact Ejectors SCPI NO FS RP



SCPI-NO-FS-RP

Type	Dimensions in mm											
	B	d	d1	G1	G2	G3	G4	G5	H	H1	H2	H3
SCPI-15-NO-FS-RP-VD-M12-5	22,8	6,6	5,5	G1/4" - IG	G3/8" - IG	M12x1-AG	M4-IG	G1/8" - IG	170	98	460	87,5

Type	Dimensions in mm											
	H4	H5	L	L1	L2	L3	L4	X1	X2	X3	Y2	Y3
SCPI-15-NO-FS-RP-VD-M12-5	76	127,5	118	126,5	112	67,5	36,75	27,5	14	58	30	10

Compact Ejectors

Ejector Tester



Ejector tester

Our Highlights...

- Quick and easy failure diagnosis
- Simple and quick placement and adjustment of tooling

Your Benefits...

- > Reduced maintenance time
- > Cost saving
- > Predictive maintenance
- > Saving of time during installation
- > Increase availability of line

Applications

- Inspection of Schmalz compact ejectors
- Permit suitable remote diagnostics
- Adjustment and inspection of tooling

Design

- Housing and switch made of plastic



Ordering Data Ejector Tester

Type	Article No.
Ejector tester	10.02.02.03588
Connection cable with male and female connector M12-5 pins	21.04.05.00158
Connection cable with male and female connector M12-8 pins	21.04.05.00157
Power supply unit	10.02.02.01581



Technical Data Ejector Tester

Line voltage	230V-AC or 24V-DC
Display	Green LED indicates if SXPI/SCMPi connected Green LED indicates if SCPi/SMPi connected Green LED indicates if H1 achieved Green LED indicates if H2 achieved Green LED indicates if diagnostic input
Handling	Button for selecting SCPI/SMPi or SXPI/SXMPi Button for selecting PNP/NPN Button for diagnostic Button for suction Button for blow-off
Power connector	M8.4-pole
Ejector connectors	1xM12-coupler, 8-pole 2xM12-coupler, 5-pole

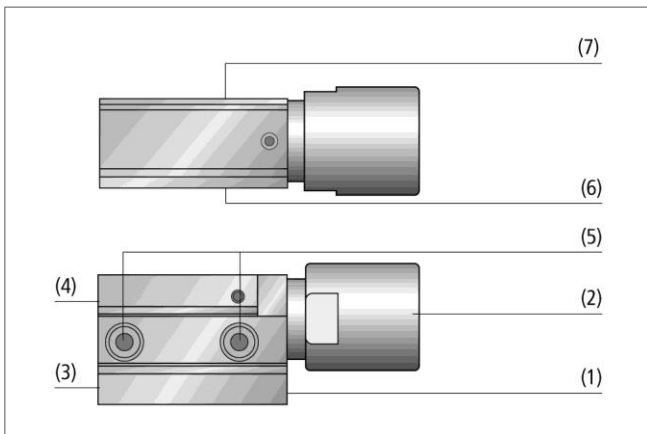
Compact Ejectors

Ejectors with Active Blow Off System SEAC

Suction rate 35 l/min



Ejectors with active blow off SEAC



System design ejectors with active blow off SEAC



Decentral vacuum generation by ejector SEAC directly at the suction cup

Applications

- Ejector for many different applications with active blow off to realize shortest cycle times, e.g. in sheet-metal handling, the automotive industry, in packaging machines and robot technology

Design

- Main body (1) made of plastic; smallest possible dimensions and low weight
- Silencer (2) made of anodized aluminium
- Compressed air connection for blow off (3)
- Compressed air connection for suction (4)
- Two holes (5) for connecting to tooling
- Vacuum connection (6)
- Two M4 mounting screws included in delivery
- Optional with vacuum switch (7) with fixed switching point at 600 mbar, 3 m connection cable and protective cover with pullrelief (SEAC VE-SH)

Our Highlights...

- Short gripping and blow off times
- Main body made of plastic
- Connection to holdersystem HTS
- With silencer
- Optionally available with vacuum switch

Your Benefits...

- > Very short cycle times in automated operations
- > Minimum size and low weight particularly suitable for highly dynamic systems
- > Flexible adaptation to all common toolings, holder does not have to be adjusted again if the ejector is replaced
- > Reduced noise level
- > Part present signal for optimization of processes

Ejectors

Ejectors with Active Blow Off SEAC

Suction rate 35 l/min

Designation Code Ejectors with Active Blow Off SEAC

Abbreviated designation	Nozzle size in mm * 10	System monitoring
Example: SEAC 10 VE-SH:		
SEAC	10	VE-SH
SEAC	10...1.0 mm	VE-SH vacuum switch with cover

Ordering Data Ejectors with Active Blow Off SEAC

Ejector SEAC is delivered as a ready to connect product.

Ejectors with Active Blow Off SEAC

Type	Ejector
SEAC 10	10.02.02.03875
SEAC 10 VE-SH	10.02.02.03876

Spare Parts for Ejectors with Active Blow Off SEAC

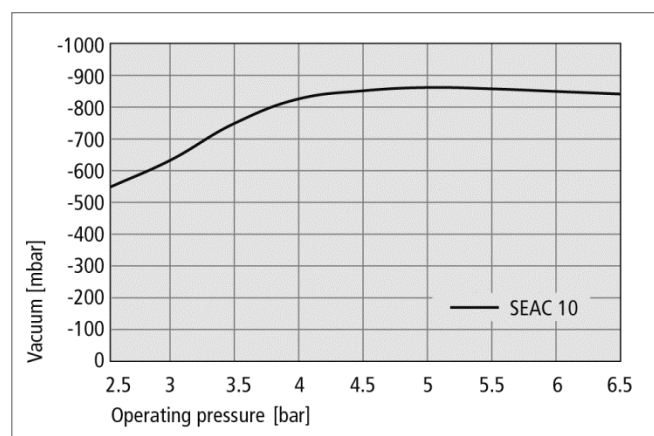
Type	Ejector
VS-V-SD-60-M5 Vacuum switch	10.06.02.00257
ABDK 38x26x21 Protection hood vacuum switch	10.02.02.03170

Technical Data Ejectors with Active Blow Off SEAC

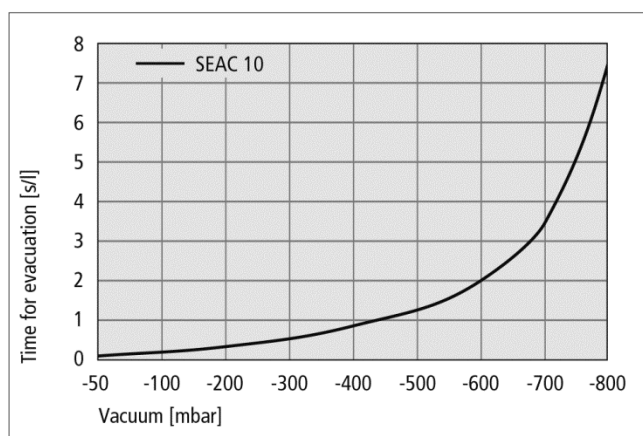
Type	Nozzle- Ø [mm]	Degree of evacuation [%]	Max. suction rate [l/min]	Max. suction rate [m³/h]	Air consumpt. during evac. [l/min]*	Max. air consumption blow off [l/min]	Operating pressure [bar]	Weight [g]
SEAC 10	1	85	35	2.1	52	117	3...6bar	62
SEAC 10 VE-SH	1	85	35	2.1	52	117	3...6bar	157

*At optimal operating pressure (4.5 bar)

Performance Data Ejectors with Active Blow Off SEAC



Achievable vacuum at various operating pressures



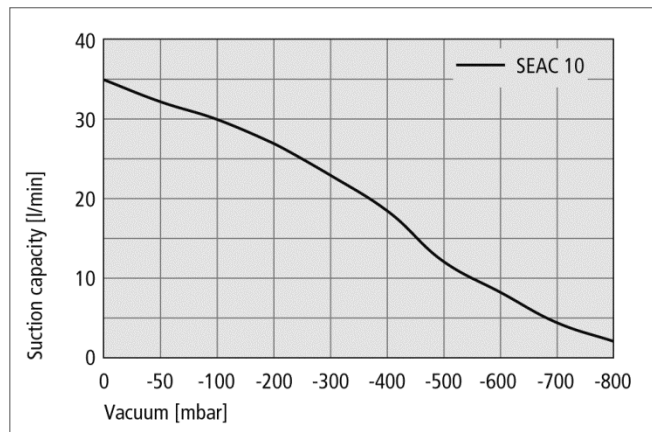
Evacuation times for various vacuum ranges

Ejectors

Ejectors with Active Blow Off SEAC

Suction rate 35 l/min

Performance Data Ejectors with Active Blow Off SEAC



Suction capacity at various degrees of evacuation

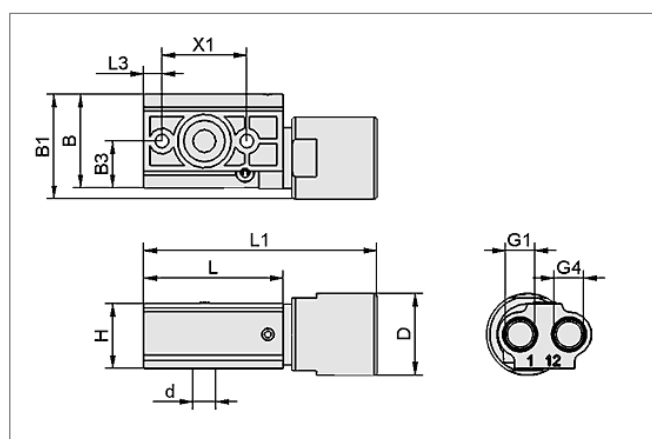
Suction Capacity in l/min at Various Degrees of Evacuation

Type	Degree of evacuation in mbar									
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800
SEAC 10	35	32	30	27	23.5	18	12	8	4.5	2.0

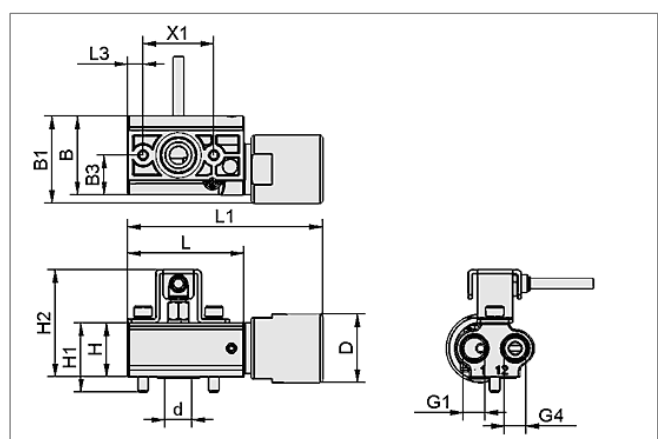
Evacuation Time in s/l for Various Vacuum Ranges

Type	Degree of evacuation in mbar									
	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SEAC 10	0.09	0.16	0.34	0.59	0.96	1.42	2.03	3.30	7.36	

Design Data Ejectors with Active Blow Off SEAC



SEAC 10



SEAC 10 VE-SH

Type	Dimensions in mm													
	B	B1	B3	d	D	G1	G4	H	H1	H2	L	L1	L3	X1
SEAC 10	31	34.6	15.5	7	27	G1/8"-F	G1/8"-F	21.5	-	-	46	77	6	28
SEAC 10 VE-SH	31	34.6	15.5	7	27	G1/8"-F	G1/8"-F	21.5	27.5	42.5	46	77	6	28

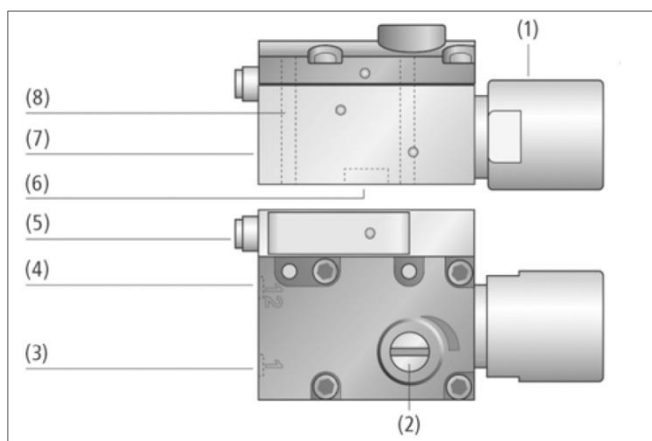
Ejectors

Ejectors with Blow Off System SEAC RP

Suction rate 35 l/min



Ejectors with blow off system SEAC RP



System design ejectors with blow off system SEAC RP



Decentralized vacuum generation by means of ejectors SEAC RP with blow off system right on suction cup

Applications

- Ejector for vacuum generation in decentralized vacuum systems in many different applications on tooling-systems with short cycle times and high process safety
- Decentral vacuum generation with integrated pneumatical air saving function

Design

- Body made of anodized aluminium (7)
- Integrated blow-off function
- Optional vacuum switch VS-V-AH-T-PNP-S (5) with adjustable switching point (connection cable not included in delivery)
- Two mounting screws included in delivery
- Passage for fixation (8)
- Integrated Silence (6)
- Compressed-air inlet for suction (3) and Compressed-air inlet blow-off (4)
- Adjusting screw for air-saving function (2)

Our Highlights...

- Integrated pneumatical air saving function
- Short gripping and blow off times
- Minimum size and low weight
- Connection to holder system HTS
- With silencer
- Optionally available with vacuum switch
- Active air saving function in emergency stop

Your Benefits...

- > Minimum compressed air consumption, minimal requiring of fitting
- > Very short cycle times in automated operations
- > Particularly suitable for highly dynamic systems
- > Flexible adaptation to all common toolings; holder does not have to be adjusted again if the ejector is replaced.
- > Reduced noise level
- > System monitoring function for optimisation of cycle times
- > Safe handling of the work-pieces

Ejectors

Ejectors with Blow Off System SEAC RP

Suction rate 35 l/min

Designation Code Ejectors with Blow Off System SEAC RP

Abbreviated designation	Nozzle size in mm * 10	Product addition	Mounting orientation	
Example SEAC 10 RP VS-T R:				
SEAC RP	10	VS-T	R	
SEAC RP	10 = ... 1.0 mm	VS-T vacuum switch	L	left
			R	right

Ordering Data Ejectors with Blow Off System SEAC RP

Ejector SEAC RP is delivered as a ready to connect product.
Available accessories: connection cable

Ejectors with Blow Off System SEAC RP

Type	Part Number
SEAC 10 RP R	10.02.02.03289
SEAC 10 RP VS-T R	10.02.02.03290
SEAC 10 RP L	10.02.02.03296
SEAC 10 RP VS-T L	10.02.02.03297

Spare Parts for Ejectors with Blow Off System SEAC RP

Type	Part Number
VS-V-AH-T-PNP-S vacuum switch	10.06.02.00434

Ordering Data Accessories Ejectors with Blow Off System SEAC RP

Type*	Article-No.
Connection cable	10.06.02.0031

*For SEAC RP VS-T... order 1x per ejector

Technical Data Ejectors with Blow Off System SEAC RP

Type	Nozzle- Ø [mm]	Degree of evacuation [%]	Max. suction rate [l/min]	Max. suction rate [m³/h]	Air consumpt. during evac. [l/min]*	Air consumpt. during evac.[m³/h]*	Max. air consumption blow off [l/min]	Operating pressure [bar]	Weight [g]
SEAC 10 RP...	1	85	35	2.1	65	3.9	90	3..6	180

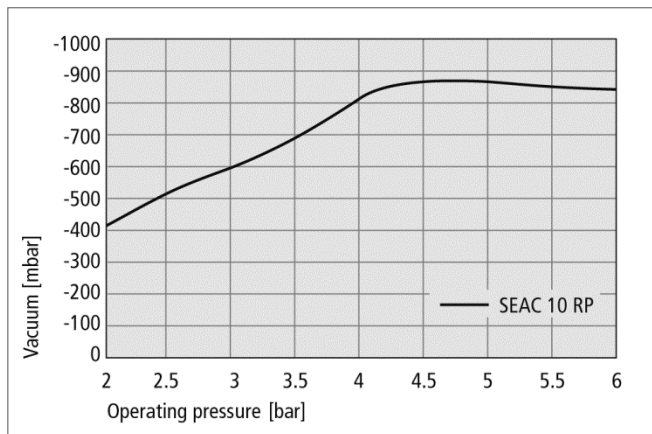
*At optimal operating pressure

Ejectors

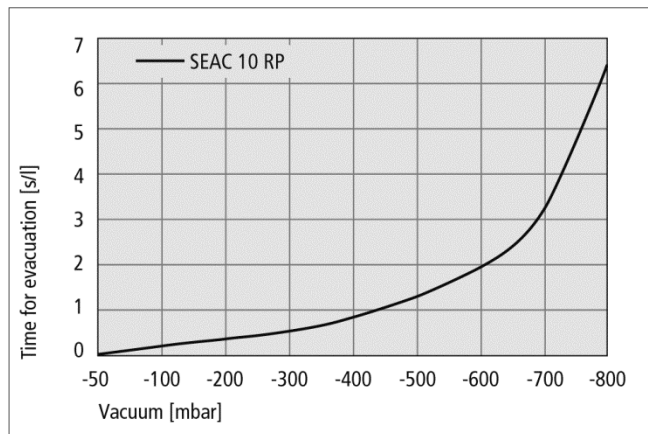
Ejectors with Blow Off System SEAC RP

Suction rate 35 l/min

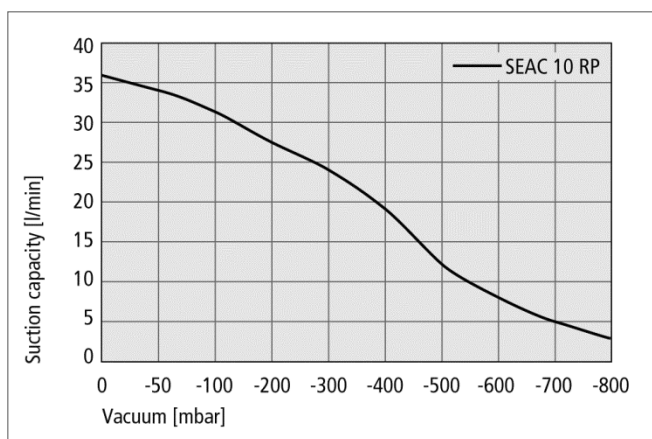
Performance Data Ejectors with Blow Off System SEAC RP



Achievable vacuum at various operating pressures



Evacuation times for various vacuum ranges



Suction capacity at various degrees of evacuation

Suction Capacity in l/min at Various Degrees of Evacuation

Type	Degree of evacuation in mbar									
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800
SEAC 10 RP	35	34	32	27.5	24	19.5	12	8	5	3

Evacuation Time in s/l for Various Vacuum Ranges

Type	Degree of evacuation in mbar									
	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SEAC 10 RP	0.12	0.20	0.39	0.62	0.93	1.35	1.98	3.26	6.50	

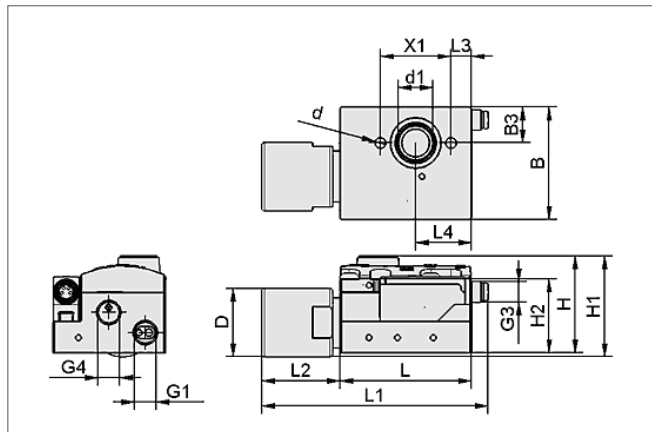
Ejectors

Ejectors with Blow Off System SEAC RP

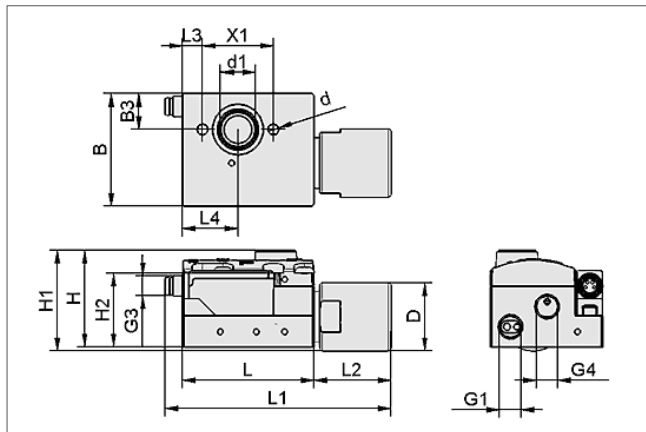
Suction rate 35 l/min



Design Data Ejectors with Blow Off System SEAC RP



SEAC 10



SEAC 10 VE-SH



Design Data Ejectors with Blow Off System SEAC RP

Type	Dimensions in mm																
	B	B3	d	d1	D	G1	G3	G4	H	H1	H2	L	L1	L2	L3	L4	X1
SEAC 10 RP...	44.5	14.2	4.3	13.8	27	G1/8"-F	-	G1/8"-F	38.3	39.8	29.3	52	-	29.5	8	22	28
SEAC 10 RP VS-T...	44.5	14.2	4.3	13.8	27	G1/8"-F	M8-M	G1/8"-F	38.3	39.8	29.3	52	88.1	29.5	8	22	28

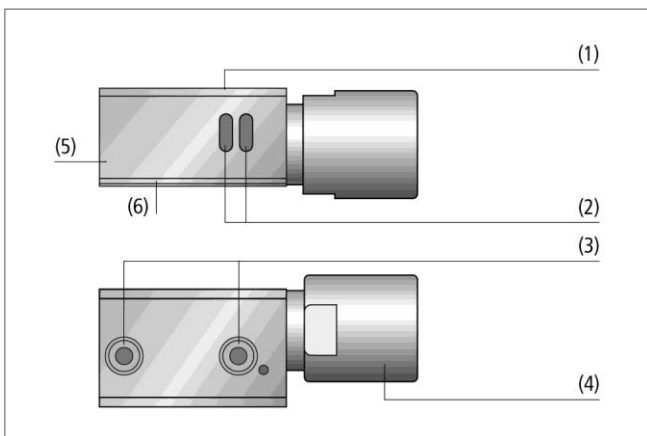
Ejectors

Ejectors with Atmospheric Ventilation SEAC ECO

Suction rate 35 l/min



Ejectors with atmospheric ventilation SEAC ECO



System design ejectors with atmospheric ventilation SEAC ECO



Decentral vacuum generation by ejectors SEAC ECO directly at the suction cup

Applications

- Ejector for decentralized vacuum generation for the use in many different applications with short cycle times
- In vacuum systems as economic solution thanks to the automatic release using atmospheric ventilation

Design

- Main body (1) made of anodized aluminum; smallest possible dimensions and low weight
- Openings for atmospheric ventilation (2)
- Two holes for connecting to holder (3)
- Silencer (4) made of anodized aluminum
- Compressed air connection (5)
- Vacuum connection (6)
- Two securing screws and one o-ring included in delivery

Our Highlights...

- Operation with only one compressed air line
- Atmospheric ventilation
- Connection to holder system HTS
- No filter, no spare parts

Your Benefits...

- > Half installation effort and reduced costs for pn. Installation material such as valves, hoses etc.
- > Reduced energy costs by more than 50%, since no air is consumed during quick and accurate release of parts
- > Flexible adaptation to all common toolings; holder does not have to be adjusted again if the ejector is replaced
- > Maintenance-free operation, thus reduced costs of maintenance and spare parts

Ejectors

Ejectors with Atmospheric Ventilation SEAC ECO

Suction rate 35 l/min

Designation Code Ejectors with Atmospheric Ventilation SEAC ECO

Abbreviated designation	Nozzle size	
Example SEAC 10 ECO:		
SEAC ECO	10	
SEAC ECO	10=	1.0 mm

Ordering Data Ejectors with Atmospheric Ventilation SEAC ECO

Ejector SEAC ECO is delivered as a ready to connect product.

Ejectors with Atmospheric Ventilation SEAC ECO

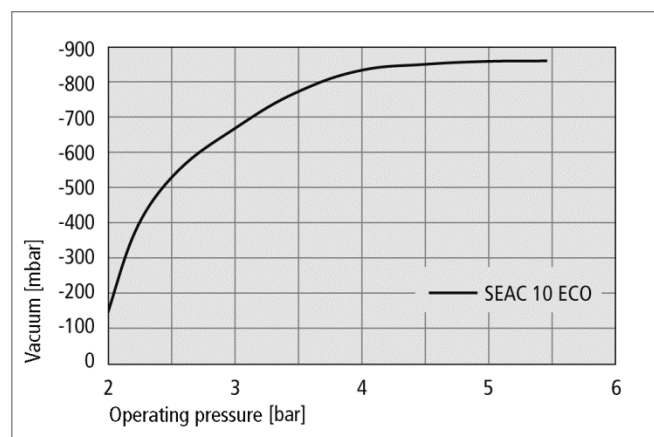
Type	Part Number
SEAC 10 ECO	10.02.02.03702

Technical Data Ejectors with Atmospheric Ventilation SEAC ECO

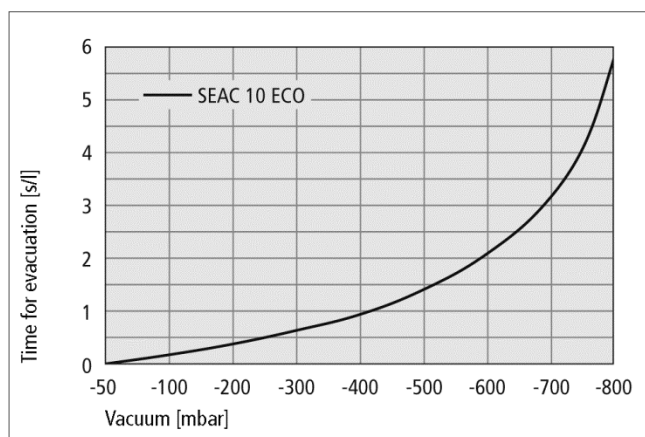
Type*	Nozzle- Ø [mm]	Degree of evacuation [%]	Max. suction rate [l/min]	Max. suction rate [m³/h]	Air consumpt. during evac. [l/min]*	Operating pressure [bar]	Weight [g]
SEAC 10 ECO...	1	85	35	2.1	52	4...6	95

*At optimal operating pressure (4.5 bar)

Performance Data Ejectors with Atmospheric Ventilation SEAC ECO



Achievable vacuum at various operating pressures



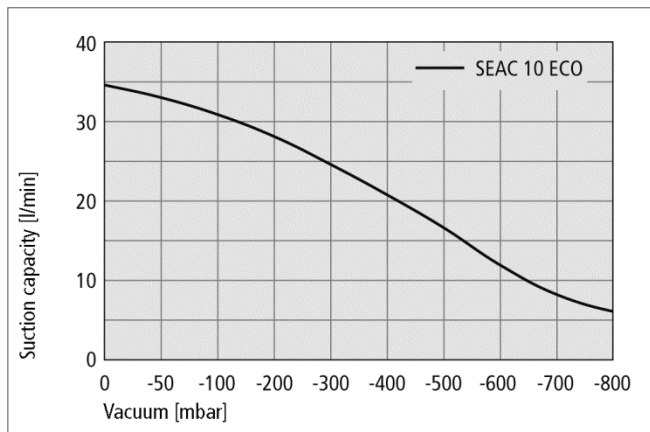
Evacuation times for various vacuum ranges

Ejectors

Ejectors with Atmospheric Ventilation SEAC ECO

Suction rate 35 l/min

Performance Data Ejectors with Atmospheric Ventilation SEAC ECO



Suction capacity at various degrees of evacuation

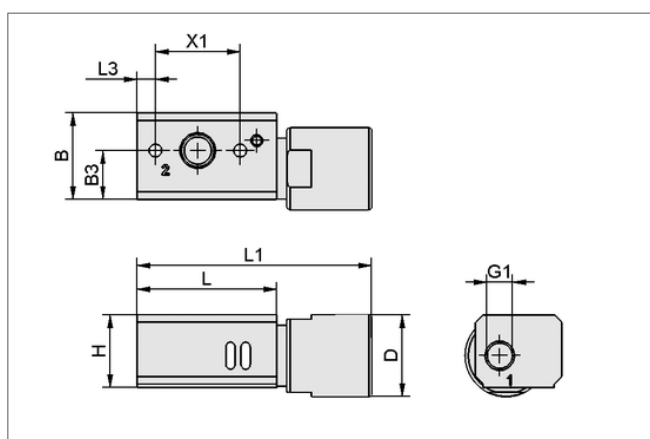
Suction Capacity in l/min at Various Degrees of Evacuation

Type	Degree of evacuation in mbar									
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800
SEAC 10 ECO	35	33	31.6	28	24.3	20.7	16.8	12	8.2	6.5

Evacuation Time in s/l for Various Vacuum Ranges

Type	Degree of evacuation in mbar									
	-50	-100	-200	-300	-400	-500	-600	-700	-800	
SEAC 10 ECO	0.10	0.18	0.36	0.61	0.95	1.42	2.10	3.13	5.80	

Design Data Ejectors with Atmospheric Ventilation SEAC ECO



SEAC 10 ECO

Design Data Ejectors with Atmospheric Ventilation SEAC ECO

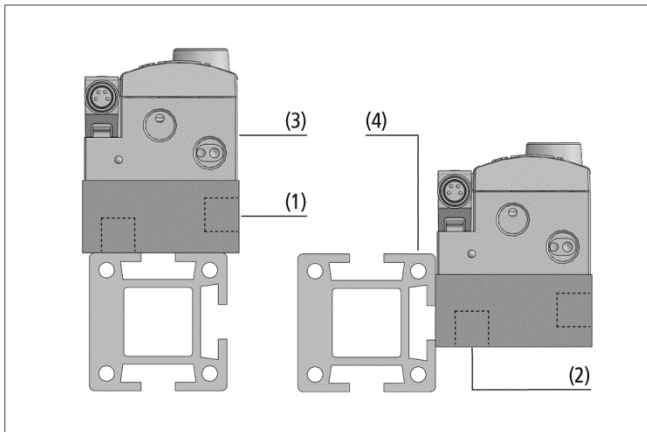
Type	Dimensions in mm									
	B	B3	D	G1	H	L	L1	L3	X1	
SEAC 10 ECO	28.5	16.1	27	G1/8"-F	24	46	77.5	6	28	

Ejectors

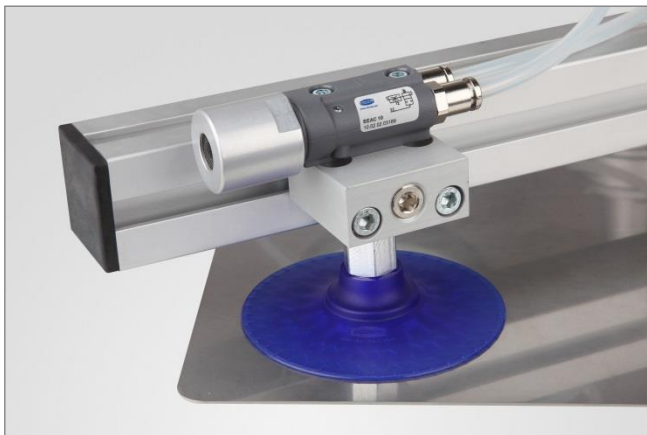
Holders for Ejectors SEAC



Holders for ejectors SEAC



System design holders for ejectors SEAC



Holders for ejectors SEAC being used for handling sheet metal parts

Applications

- Holder for mounting of the single ejectors SEAC, SEAC RP and SEAC ECO on tooling systems and profiles with the direct connection for single suction cups
- For use in the handling of sheet metal, in the automobile industry and in industrial robot technology
- Pick-and-place applications with very short cycle time

Design

- Aluminum holder with two possible vacuum connections for connecting ejectors (3) and sections (4)
- Mounting option from top (-L): Vacuum connection on the side (1)
- Side mounting option (-S): Vacuum connection underneath (2)

Our Highlights...

- Single ejector can be directly mounted
- Flexible connection
- Flexible connection to the suction cup (bottom or side)

Your Benefits...

- > No additional connection required
- > Can be mounted with all beam and profile systems
- > Realisation of different applications

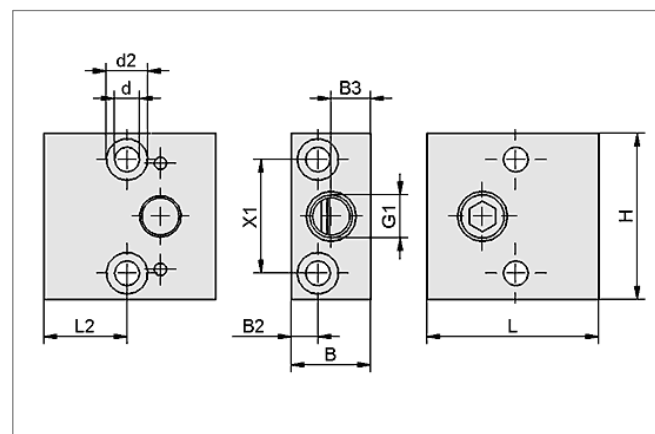
Ejectors

HOLDERS for Ejectors SEAC

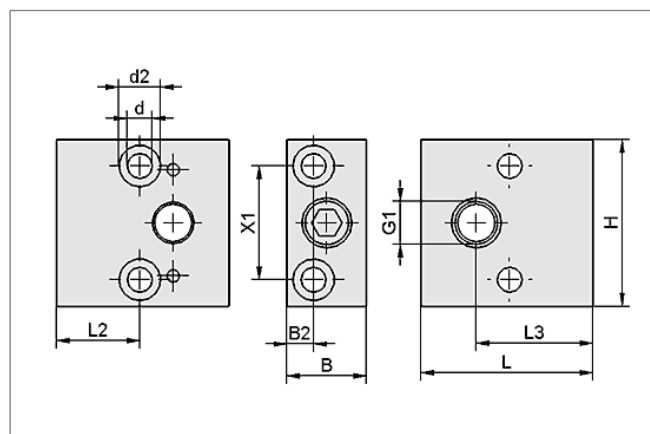
Ordering Data Holders for Ejectors SEAC

Type	Short designation	Article No.
ADP-EJ-45.5x21	Holder for single ejector with vacuum connection on the side	10.02.02.03484
ADP-EJ-45.5x21	Holder for single ejector with vacuum connection at the bottom	10.02.02.03483
ADP-EJ 38x20x11	Ejector adapter ADP-EJ 38x20x11-G1/8-IG SEAC	10.02.02.04068

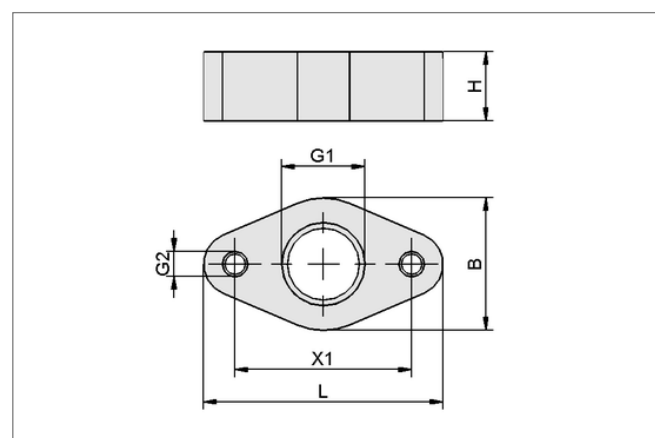
Design Data Holders for Ejectors SEAC



Ejector holder for vacuum connection at the bottom



Ejector holder for vacuum connection on the side



Ejector adapter for vacuum connection at the bottom

Type	Dimensions in mm											
	B	B2	B3	d	d2	G1	G2	L	L2	L3	H	X1
ADP-EJ-45.5x21	21	7	-	6,6	11	G1/4"-F	-	45.5	22	30,8	44	30
ADP-EJ-45.5x21	21	7	10.5	6,6	11	G1/4"-F	-	45.5	22	-	44	30
ADP-EJ 38x20x11	20	-	-	-	-	G1/8"-F	M4-IG	38,0	-	-	11	28

Electrical Vacuum Generators

ECBPI Cobot Pump

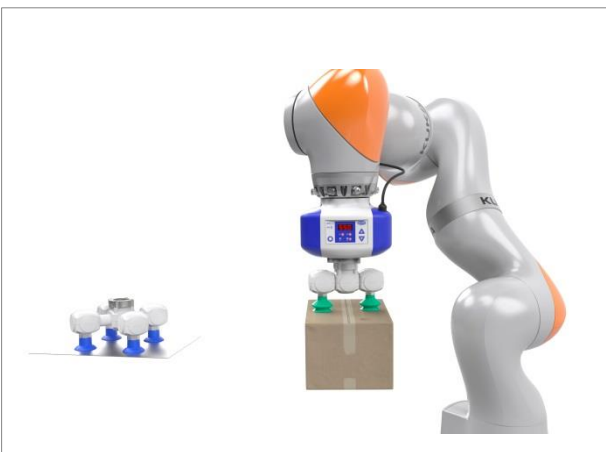
Suction rate up to 12 l/min



Electrical Vacuum Pump ECBPI



System design ECBPI Cobot Pump



ECBPI Electrical Vacuum Pump

Applications

- Intelligent electrical vacuum generator for handling air-tight and slightly porous workpieces
- Integrated interface for controlling and monitoring the handling process
- For use in mobile robotics, fully automated small parts handling and stationary handling tasks

Design

- Collaborative robot (all common cobot models) (1)
- Robot flange for mechanical connection of the electrical vacuum generator ECBPI Flange adapter plate (2)
- Flange adapter plate (3)
- M12 8-pin plug connection or terminal block as digital interface between the CobotPump and the robot (4)
- Flange for gripper connection (5)
- Flexibly configurable grippers from the modular system for vacuum end effectors VEE (6)

Our Highlights...

- Intelligent electrical vacuum generator for handling air-tight and slightly porous workpieces
- Integrated interface for controlling and monitoring the handling process
- For use in mobile robotics, fully automated small parts handling and stationary handling tasks

Your Benefits...

- > Connection via IO-Link allows process monitoring and predictive maintenance from the machine to the cloud
- > Condition monitoring reduces errors and downtime –this ensures the availability of the system
- > NFC interface features direct access to processes and the device via smartphone
- > Energy efficient thanks to integrated automatic adaptation of the performance to the handling process

Electrical Vacuum Generators

ECBPi Cobot Pump

Suction rate up to 12 l/min

Ordering Code for Electrical Vacuum Generator ECBPi

Type	Voltage	Electrical Connection	
Example ECBPi-12-24V-DC M12-8: ECBPi	24V-DC	M12-8	
ECBPi	24V-DC	M12-8	Plug M12. 8 pin
		TB-8	Terminal Block

The electrical vacuum generator ECBPi comes ready to connect.

Available accessories: Flange plate

Ordering Data for Electrical Vacuum Generator ECBPi

Type	Part number
ECBPi 24V-DC M12-8	10.03.01.00314
ECBPi 24V-DC TB-8	10.03.01.00364

Ordering Data for Electrical Vacuum Generator ECBPi

Type	Part number
FLAN-PL 63x13 AL-EL	10.03.01.00313
FLAN-PL 90x16 AL-EL	10.03.01.00357
FLAN-PL 63x13.5 AL-EL	10.03.01.00358
FLAN-PL 63x19.5 AL-EL	10.03.01.00373

Technical Data for Electrical Vacuum Generator ECBPi

Type	Suction rate [l/min]	Rated power [W]	Voltage [V]	Rated current [A]	Temperature range [C°]*	Weight [g]
ECBPi 24V-DC M12-8	12	13	24V-DC	0.6	5...40	775
ECBPi 24V-DC TB-8	12	13	24V-DC	0.6	5...40	775

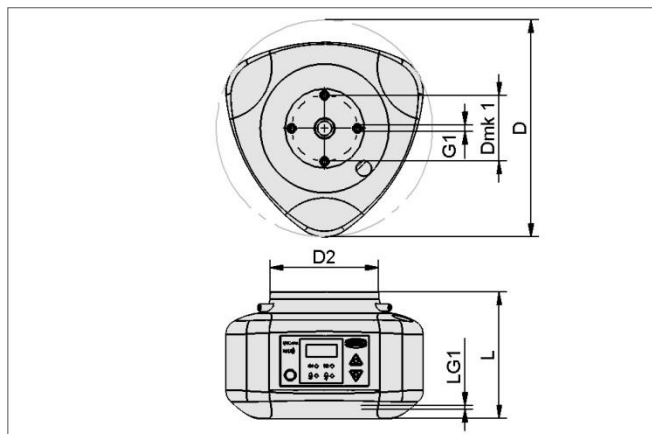
Electrical Vacuum Generators

ECBPI Cobot Pump

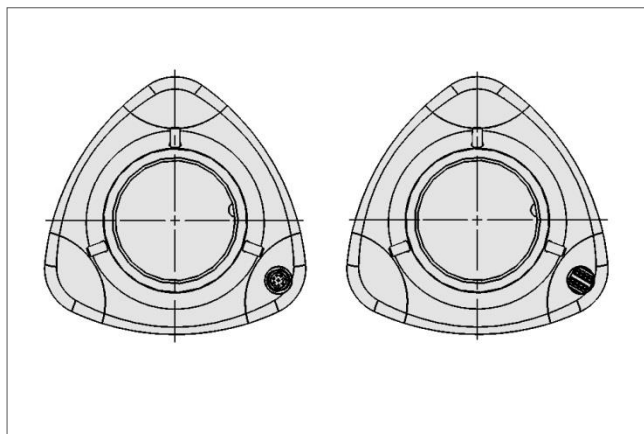
Suction rate up to 12 l/min



Design Data for Electrical Vacuum Generator ECBi



ECBPI...

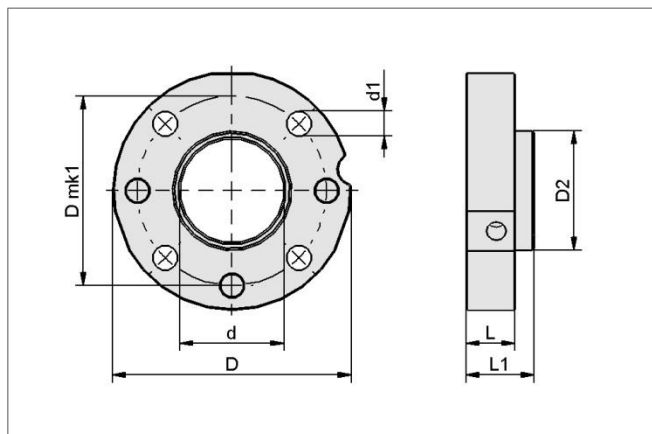


ECBPI...connection options M12-8 and TB-8

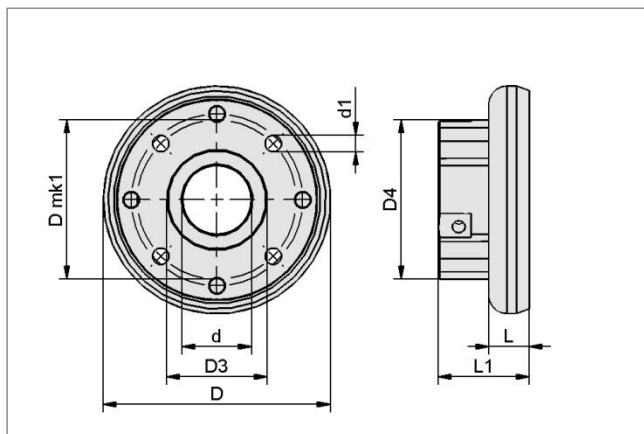
Type	Dimensions in mm*						
	D	Dmk 1	D2	G1	L	LG1	
ECBPI 24V-DC M12-8	151.5	46	76.0	M4-IG	88.6	6.0	
ECBPI 24V-DC TB-8	151.5	46	76.0	M4-IG	88.6	6.0	



Design Data for Accessories for Electrical Vacuum Generator ECBPI



FLAN-PL 63x13 AL-EL



FLAN-PL 90x16 AL-EL

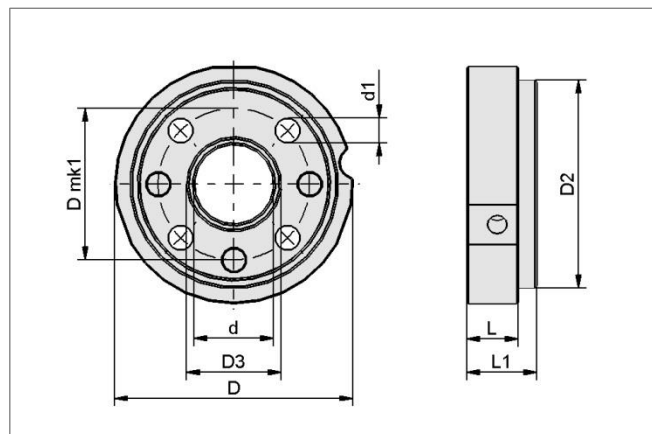
Electrical Vacuum Generators

ECBPi Cobot Pump

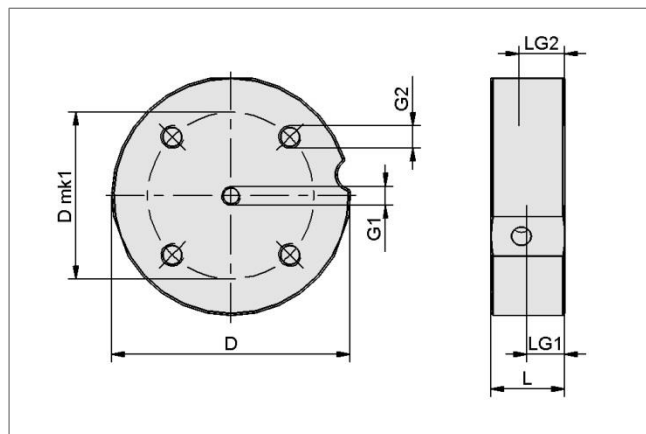
Suction rate up to 12 l/min



Design Data for Accessories for Electrical Vacuum Generator ECBi



FLAN-PL 63x13.5 AL-EL



FLAN-PL 63x19.5 AL-EL

Type	Dimension in mm*												
	d	d1	D	Dmk1	D2	D3	D4	G1	G2	L	LG1	LG2	L1
FLAN-PL 63x13 AL-EL	27.5	6.6	63	50	31.5	-	-	-	-	13.0	-	-	18.0
FLAN-PL 90x16 AL-EL	27.5	6.6	90	63	-	40	63	-	-	16.0	-	-	36.0
FLAN-PL 63x13.5 AL-EL	21.0	6.6	63	40	55.0	25	-	-	-	13.5	-	-	18.5
FLAN-PL 63x19.5 AL-EL	-	-	63	44	-	-	-	M5-IG	M6-IG	19.5	10	12	-



Vacuum Generators

Vacuum Blowers SB

Suction rate from 75 m³/h to 1.250 m³/h



Vacuum blowers SB

Applications

- Vacuum blower for handling cardboard, insulating material, recycled material and other porous materials
- Enormous suction rate compensates for leaks
- Vacuum blower for vacuum conveyor belts in front of the press line

Design

- Vacuum blower with high-precision die-cast aluminium housing and impeller
- Preconfigured pressure limiting valve included
- Motor in top energy efficiency class (IE3)

Our Highlights...

- Blower with extreme suction rate
- Die-cast aluminum housing and impeller
- Broad performance range

Your Benefits...

- > Reliable handling of porous materials
- > Vibration-free operation and high suction rate
- > Optimized to meet customer requirements

Vacuum Generators

Vacuum Blowers SB

Suction rate from 75 m³/h to 1.250 m³/h

Ordering Code Vacuum Blowers SB

Type	Performance class	Max. vacuum	Rated power	Motortyp
SB	Suction rate in m ³ /h	Vacuum in mbar	Power in kw	Type
SB	75...1250 75 bis 1.250	-105... -400 -105 bis -400	0.37... 13.2 0.37 bis 13.2	IE1 IE1 IE3-Typ1 IE3-Typ1 IE3-Typ2 IE3-Typ1 IE3-Typ3 IE3-Typ3

Ordering Data for Electrical Vacuum Generator ECBPi

The vacuum blower SB is delivery ready to connect.

Available accesories: silencer box, filter

Vacuum Blowers SB

Type	Motor type 1	Motor type 2	Motor type 3
SB-75-105-0.37-IE1	-	10.04.01.00065	-
SB-130-125-0.75-IE3	10.04.01.00066	-	10.04.01.00067
SB-160-115-0.9-IE3	-	10.04.01.00068	-
SB-90-330-1.5-IE3	10.04.01.00087	-	10.04.01.00088
SB-110-350-1.8-IE3	-	10.04.01.00089	-
SB-180-215-1.5-IE3	10.04.01.00069	-	10.04.01.00070
SB-230-230-1.8-IE3	-	10.04.01.00071	-
SB-325-265-3-IE3	10.04.01.00072	-	10.04.01.00073
SB-390-245-3.6-IE3	-	10.04.01.00074	-
SB-210-370-3-IE3	10.04.01.00090	-	10.04.01.00091
SB-250-350-3.6-IE3	-	10.04.01.00092	-
SB-260-410-4-IE3	10.04.01.00093	-	10.04.01.00094
SB-305-400-4.8-IE3	-	10.04.01.00095	-
SB-440-260-4-IE3	10.04.01.00075	-	10.04.01.00076
SB-500-250-4.8-IE3	-	10.04.01.00077	-
SB-510-200-4-IE3	10.04.01.00078	-	10.04.01.00079
SB-610-175-4.8-IE3	-	10.04.01.00080	-
SB-370-390-5.5-IE3	10.04.01.00096	-	10.04.01.00097
SB-440-360-6.6-IE3	-	10.04.01.00098	-
SB-750-300-7.5-IE3	10.04.01.00081	-	10.04.01.00082
SB-900-280-9-IE3	-	10.04.01.00083	-
SB-520-390-11-IE3	10.04.01.00099	-	10.04.01.00100
SB-610-390-13.2-IE3	-	10.04.01.00101	-
SB-1050-290-11-IE3	10.04.01.00084	-	10.04.01.00085
SB-1250-270-13.2-IE3	-	10.04.01.00086	-

Vacuum Generators

Vacuum Blowers SB

Suction rate from 75 m³/h to 1.250 m³/h

Ordering Data Assesories Vacuum Blowers SB

Type	Silencer box	Recommended filter
SB-75-105-0.37-IE1	-	10.07.01.00008
SB-130-125-0.75-IE3	-	10.07.01.00398
B-160-115-0.9-IE3	-	10.07.01.00398
B-90-330-1.5-IE3	10.04.04.00234	10.07.01.00259
SB-110-350-1.8-IE3	10.04.04.00234	10.07.01.00259
SB-180-215-1.5-IE3	10.04.04.00234	10.07.01.00259
SB-230-230-1.8-IE3	10.04.04.00234	10.07.01.00259
SB-325-265-3-IE3	10.04.04.00235	10.07.01.00384
SB-390-245-3.6-IE3	10.04.04.00235	10.07.01.00384
SB-210-370-3-IE3	10.04.04.00236	10.07.01.00259
SB-250-350-3.6-IE3	10.04.04.00236	10.07.01.00259
SB-260-410-4-IE3	10.04.04.00237	10.07.01.00260
SB-305-400-4.8-IE3	10.04.04.00237	10.07.01.00260
SB-440-260-4-IE3	10.04.04.00236	10.07.01.00263
SB-500-250-4.8-IE3	10.04.04.00236	10.07.01.00399
SB-510-200-4-IE3	10.04.04.00237	10.07.01.00399
SB-610-175-4.8-IE3	10.04.04.00237	10.07.01.00399
SB-370-390-5.5-IE3	10.04.04.00238	10.07.01.00263
SB-440-360-6.6-IE3	10.04.04.00238	10.07.01.00263
SB-750-300-7.5-IE3	10.04.04.00239	10.07.01.00400
SB-900-280-9-IE3	10.04.04.00239	10.07.01.00400
SB-520-390-11-IE3	10.04.04.00239	10.07.01.00406
SB-610-390-13.2-IE3	10.04.04.00239	10.07.01.00406
SB-1050-290-11-IE3	10.04.04.00239	10.07.01.00401
SB-1250-270-13.2-IE3	10.04.04.00239	10.07.01.00401

Technical Data Vacuum Blowers SB

Type	Motor type 1		Motor type 2	Motor type 3
	≤ 4.8kW	> 4.8kW		
50Hz w/t IE3	230V / Y400V	400V	-	200V / Y350V
60Hz w/ IE3	265V / Y460V	460V	YY230V / Y460V	220V / Y380-400V
60Hz w/o IE3	230V / Y400V	400V	YY208V	200V / Y350V

Vacuum Generators

Vacuum Blowers SB

Suction rate from 75 m³/h to 1.250 m³/h

Technical Data Vacuum Blowers SB

Type	Suction rate at 50 Hz	Suction rate at 60 Hz	Max. vacuum at 50 Hz	Protection IP
SB-75-105-0.37-IE1	75	91	-105	IP55
SB-130-125-0.75-IE3-Typ1/Typ3	130	160	-125	IP55
SB-160-115-0.9-IE3-Typ2	-	160	-	IP55
SB-90-330-1.5-IE3-Typ1/Typ3	90	110	-330	IP55
SB-110-350-1.8-IE3-Typ2	-	110	-	IP55
SB-180-215-1.5-IE3-Typ1/Typ3	180	230	-215	IP55
SB-230-230-1.8-IE3-Typ2	-	230	-	IP55
SB-325-265-3-IE3-Typ1/Typ3	325	390	-265	IP55
SB-390-245-3.6-IE3-Typ2	-	390	-	IP55
SB-210-370-3-IE3-Typ1/Typ3	210	250	-370	IP55
SB-250-350-3.6-IE3-Typ2	-	250	-	IP55
SB-260-410-4-IE3-Typ1/Typ3	260	305	-410	IP55
SB-305-400-4.8-IE3-Typ2	-	305	-	IP55
SB-440-260-4-IE3-Typ1/Typ3	440	500	-260	IP55
SB-500-250-4.8-IE3-Typ2	-	500	-	IP55
SB-510-200-4-IE3-Typ1/Typ3	510	610	-200	IP55
SB-610-175-4.8-IE3-Typ2	-	610	-	IP55
SB-370-390-5.5-IE3-Typ1/Typ3	370	440	-390	IP55
SB-440-360-6.6-IE3-Typ2	-	440	-	IP55
SB-750-300-7.5-IE3-Typ1/Typ3	750	900	-300	IP55
SB-900-280-9-IE3-Typ2	-	900	-	IP55
SB-520-390-11-IE3-Typ1/Typ3	520	610	-390	IP55
SB-610-390-13.2-IE3-Typ2	-	610	-	IP55
SB-1050-290-11-IE3-Typ1/Typ3	1050	1250	-290	IP55
SB-1250-270-13.2-IE3-Typ2	-	1250	-	IP55

Type	Rated power at 50 Hz	Rated power at 60 Hz	Sound pressure level at 50 Hz	Sound pressure level at 60 Hz	Weight (kg)
SB-75-105-0.37-IE1	0.37	0.44	62.0	63.0	13.0
SB-130-125-0.75-IE3-Typ1/Typ3	0.75	0.90	56.8	61.7	22.0
SB-160-115-0.9-IE3-Typ2	-	0.90	-	61.7	22.0
SB-90-330-1.5-IE3-Typ1/Typ3	1.50	1.80	63.7	68.4	28.5
SB-110-350-1.8-IE3-Typ2	-	1.80	-	68.4	28.5
SB-180-215-1.5-IE3-Typ1/Typ3	1.50	1.80	63.9	69.2	28.5
SB-230-230-1.8-IE3-Typ2	-	1.80	-	69.2	28.5
SB-325-265-3-IE3-Typ1/Typ3	3.00	3.60	70.1	71.0	42.5
SB-390-245-3.6-IE3-Typ2	-	3.60	-	71.0	42.5
SB-210-370-3-IE3-Typ1/Typ3	3.00	3.60	71.1	73.0	52.5
SB-250-350-3.6-IE3-Typ2	-	3.60	-	73.0	52.5
SB-260-410-4-IE3-Typ1/Typ3	4.00	4.80	68.9	71.7	62.5
SB-305-400-4.8-IE3-Typ2	-	4.80	-	71.7	62.5
SB-440-260-4-IE3-Typ1/Typ3	4.00	4.80	72.5	74.4	52.0
SB-500-250-4.8-IE3-Typ2	-	4.80	-	74.4	52.0
SB-510-200-4-IE3-Typ1/Typ3	4.00	4.80	75.5	76.7	61.5
SB-610-175-4.8-IE3-Typ2	-	4.80	-	76.7	61.5
SB-370-390-5.5-IE3-Typ1/Typ3	5.50	6.60	70.0	74.0	89.0
SB-440-360-6.6-IE3-Typ2	-	6.60	-	74.0	89.0
SB-750-300-7.5-IE3-Typ1/Typ3	7.50	9.00	72.0	73.0	112.0
SB-900-280-9-IE3-Typ2	-	9.00	-	73.0	112.0
SB-520-390-11-IE3-Typ1/Typ3	11.00	13.20	74.0	78.0	125.0
SB-610-390-13.2-IE3-Typ2	-	13.20	-	78.0	125.0
SB-1050-290-11-IE3-Typ1/Typ3	11.00	13.20	75.0	79.0	125.0
SB-1250-270-13.2-IE3-Typ2	-	13.20	-	79.0	125.0

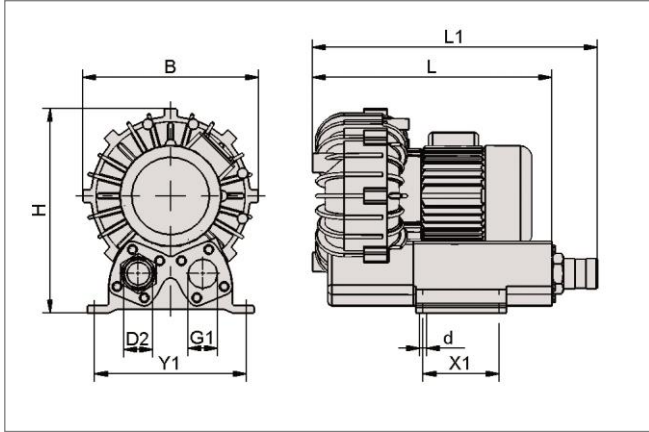
Vacuum Generators

Vacuum Blowers SB

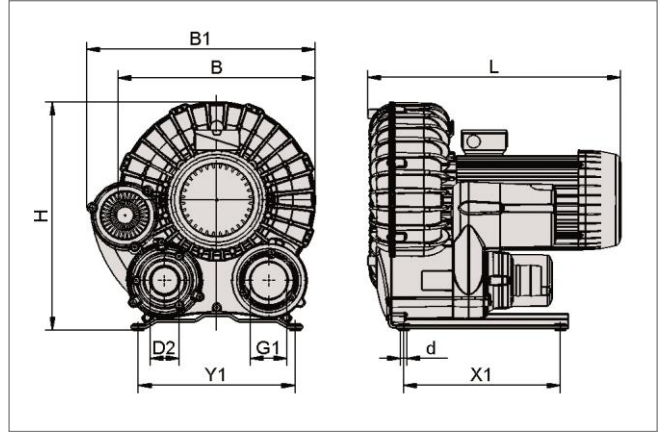
Suction rate from 75 m³/h to 1.250 m³/h



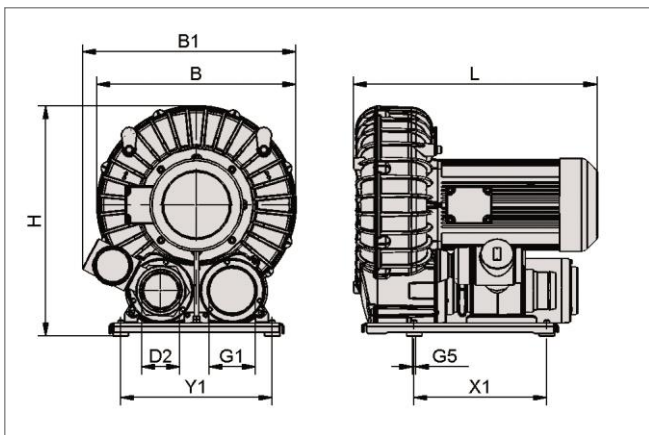
Design Data Vacuum Blowers SB



SB...0.37



SB...0.75 bis SB...4.8



SB...5.5 bis SB...13.2

Vacuum Generators

Vacuum Blowers SB

Suction rate from 75 m³/h to 1.250 m³/h

Type	Dimension in mm										
	B	B1	d	D2	G1	G5	H	L	L1	X1	Y1
SB-75-105-0.37-IE1	232.0	-	9.0	38.0	G1-1/4"-IG	-	271.0	316.4	376.4	100.0	200.0
SB-130-125-0.75-IE3	264.0	295.3	10.2	40.0	G1-1/4"-IG	-	309.0	387.0	-	240.0	240.0
SB-160-115-0.9-IE3	264.0	295.3	10.2	40.0	G1-1/4"-IG	-	309.0	387.0	-	240.0	240.0
SB-90-330-1.5-IE3	306.0	316.7	10.2	59.0	G1-1/4"-IG	-	357.0	431.0	-	240.0	240.0
SB-110-350-1.8-IE3	306.0	316.7	10.2	59.0	G1-1/4"-IG	-	357.0	431.0	-	240.0	240.0
SB-180-215-1.5-IE3	306.0	317.0	10.2	59.0	G1-1/4"-IG	-	357.0	431.0	-	240.0	240.0
SB-230-230-1.8-IE3	306.0	317.0	10.2	59.0	G1-1/4"-IG	-	357.0	431.0	-	240.0	240.0
SB-325-265-3-IE3	370.0	439.0	10.2	59.0	G1-1/4"-IG	-	426.0	494.0	-	290.0	290.0
SB-390-245-3.6-IE3	370.0	439.0	10.2	59.0	G1-1/4"-IG	-	426.0	494.0	-	290.0	290.0
SB-210-370-3-IE3	390.0	452.0	12.0	59.0	G2"-IG	-	454.0	479.0	-	310.0	310.0
SB-250-350-3.6-IE3	390.0	452.0	12.0	59.0	G2"-IG	-	454.0	479.0	-	310.0	310.0
SB-260-410-4-IE3	474.0	495.0	12.0	59.0	G2-1/2"-IG	-	523.0	496.0	-	310.0	310.0
SB-305-400-4.8-IE3	474.0	495.0	12.0	59.0	G2-1/2"-IG	-	523.0	496.0	-	310.0	310.0
SB-440-260-4-IE3	496.0	495.0	12.0	75.0	G2-1/2"-IG	-	596.0	563.0	-	350.0	350.0
SB-500-250-4.8-IE3	390.0	549.0	12.0	75.0	G2-1/2"-IG	-	454.0	502.0	-	310.0	310.0
SB-510-200-4-IE3	474.0	452.0	12.0	75.0	G2-1/2"-IG	-	523.0	496.0	-	310.0	310.0
SB-610-175-4.8-IE3	474.0	496.0	12.0	75.0	G2-1/2"-IG	-	523.0	496.0	-	310.0	310.0
SB-370-390-5.5-IE3	496.0	496.0	-	75.0	G4"-IG	M8-IG	596.0	563.0	-	350.0	400.0
SB-440-360-6.6-IE3	496.0	549.0	-	75.0	G4"-IG	M8-IG	596.0	563.0	-	350.0	400.0
SB-750-300-7.5-IE3	496.0	549.0	-	98.0	G4"-IG	M8-IG	596.0	614.0	-	350.0	400.0
SB-900-280-9-IE3	496.0	548.0	-	98.0	G4"-IG	M8-IG	596.0	614.0	-	350.0	400.0
SB-520-390-11-IE3	525.0	548.0	-	98.0	G4"-IG	M8-IG	611.0	643.0	-	350.0	400.0
SB-610-390-13.2-IE3	525.0	563.0	-	98.0	G4"-IG	M8-IG	611.0	643.0	-	350.0	400.0
SB-1050-290-11-IE3	525.0	563.0	-	98.0	G4"-IG	M8-IG	611.0	643.0	-	350.0	400.0
SB-1250-270-13.2-IE3	525.0	563.0	-	98.0	G4"-IG	M8-IG	611.0	643.0	-	350.0	400.0

Overview

Vacuum Switches

Vacuum Switches



Vacuum Switches VSi

174

- Electronic vacuum and pressure switch with and without display
- Measuring range: -1 to 10 bar
- Switching function: PNP, NPN

Electronic vacuum and pressure switch with IO-Link interface for measuring and monitoring vacuum and overpressure in automation and handling systems; output and configuration via smart-phone using NFC technology.



Manometerset

178

- Measuring range: von -1.0 ... 10.0 bar
- Vacuum connection: G1/8"-AG

Vacuum manometer for measuring and monitoring of vacuum values (version: set).

Vacuum and Pressure Switches

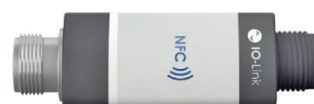
Vacuum and Pressure Switches VSi

Measuring range from -1 bar to 10 bar

Keep everything in your sights with the new vacuum and pressure switches VS and VSi from Schmalz. The electronic switches are modular in design, simple to integrate in the automation environment and visible throughout the entire process thanks to the use of innovative communication technology.



Sensor without display; switching output analog (VS)

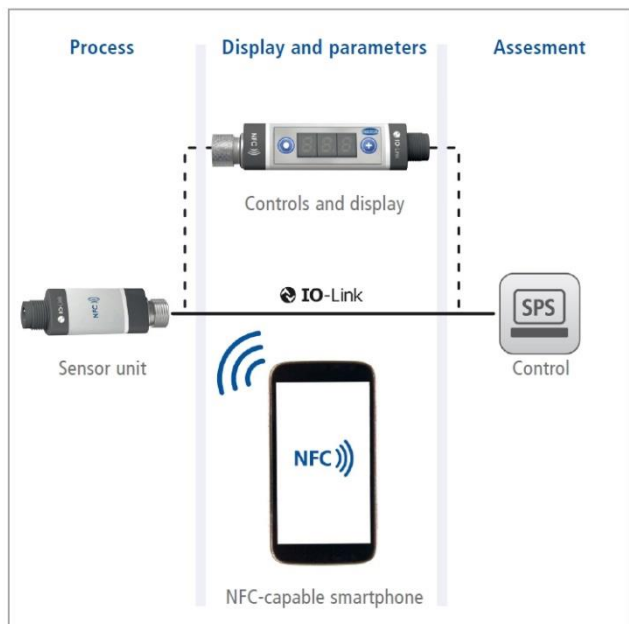


Switch (VSi) for in-process measurements; digital switching output with IO-Link interface + NFC function



Switch VSi with integrated display; digital switching output; IO-Link interface + NFC function

Measuring range: -1 to 10 bar
Degree of protection: IP 65



IO links and NFC technology allow for new innovative possibilities of communication

MODULAR

- Switch in two versions: without display and with integrated display
- Compact sensor unit for installation directly on the suction cup for measurement with no power losses

VISIBLE

- Device and process information is available in real time because the switch gathers direct measurements during the process and communicates with the controllers via IO-Link
- Device and process information can be parameterized and read on a smartphone via NFC
- Current vacuum or pressure level visible on the display

INTEGRATED

- Switch can be integrated into a system quickly and easily via IO-Link
- Process and device parameters can be quickly configured via IO-Link or NFC

Vacuum and Pressure Switches

Vacuum and Pressure Switches VSi

Measuring range from -1 bar to 10 bar



Vacuum and pressure switches VSi



System design vacuum and pressure switch VSi



Easy access to information for maintenance, displayed on a smartphone

Applications

- Electronic vacuum and pressure switch with IO-Link interface for measuring and monitoring vacuum and overpressure in automation and handling systems
- Input and output of parameters via the controller
- Switch unit can be positioned independently of the control and indicator display in the system
- Compact sensor unit for installation directly on the suction cup, particularly in decentralized vacuum systems
- Setting and programming of the vacuum and pressure switch even at points in the process that are difficult to work on manually
- Output of device data such as type or operating instructions via smartphone, even with variants without display

Design

- M8-4 pin or M12-4 pin connection plug (1)
- Mode and switching point display using LEDs that are visible from all sides (2)
- Installation via stainless steel vacuum/compressed air connection (3) and with optional additional mounting bracket
- Integrated NFC tag (4) for connecting, reading and writing the process and status information on the smartphone
- VSi-D with 3-digit display and foil keypad on the front for adjustment of the settings (5)

Unsere Highlights...

- Electronic vacuum and pressure switch, available with and without display
- Output and configuration via smartphone using NFC technology
- Communication in all standard field bus systems via IO-Link interface

Ihr Nutzen...

- > Precise measurement and output of digital signals directly in the process
- > Simple access to service and maintenance information
- > Input and output of all relevant process data via the controller; minimal installation and set-up

Vacuum and Pressure Switches

Vacuum and Pressure Switches VSi

Measuring range from -1 bar to 10 bar

Designation Code Vacuum Switches VSi

Abbreviated designation	Measuring range in bar	Display	Electronical connection	Vacuum connection
Example: VSi-V-D-M8-4:				
VSi	V	D	M8-4	
VSi	V -1 to 0 VP -1 to 8 P 0 bis 10	D digital with integrated display	M8-4 male connect. M8. 4 pole M12-4 male connect. M12. 4 pole	SDI with external display

Ordering Data Vacuum and Pressure Switches VSi

Vacuum and pressure switch VSi is delivered as a ready to connect product (without connection cable). The product consists of:

- Vacuum and pressure switch of type VSi - available as vacuum version, pressure version or combined version without display, or with integrated display

Available accessories: connection cable, mounting bracket

Vacuum and Pressure Switches VSi

Type	VSi..P	VSi..VP	VSi..V
VSi...M8-4	10.06.02.00568	10.06.02.00569	10.06.02.00567
VSi...M12-4	10.06.02.00571	10.06.02.00572	10.06.02.00570
VSi...D...M8-4	10.06.02.00578	10.06.02.00579	10.06.02.00577
VSi...D...M12-4	10.06.02.00581	10.06.02.00582	10.06.02.00580

Ordering Data Accessories Vacuum and Pressure Switches VSi

Type	Designation	Part Number	Description
Mounting bracket	BEF-WIN 21x34.5x59 1.5	10.06.02.00427	-
Connection cable VSi...	ASK 8-M8-4 5000 PUR GE	10.06.02.00031	M8-4 socket, open cable end
Connection cable VSi...	ASK 8-M12-4 5000 PUR GE	21.04.05.00263	M12-4 socket, open cable end

Vacuum and Pressure Switches

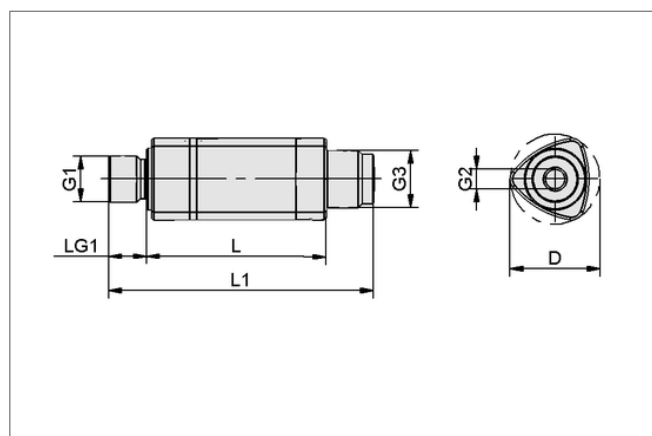
Vacuum and Pressure Switches VSi

Measuring range from -1 bar to 10 bar

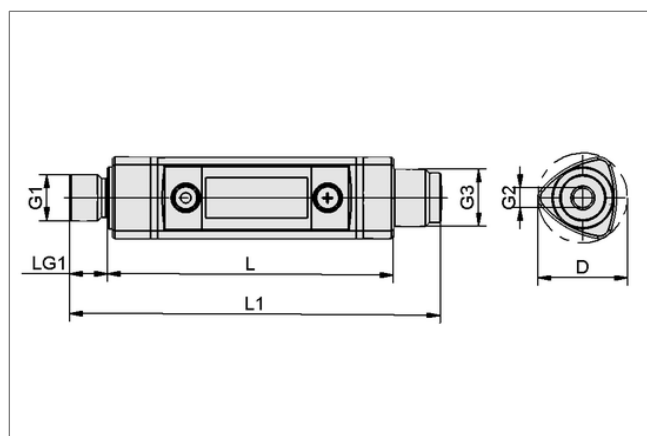
Technical Data Vacuum and Pressure Switches VSi

Type	VSi...V	VSi...P	VSi...VP
Measured medium	Non-aggressive gases; dry, oil-free air	Non-aggressive gases; dry, oil-free air	Non-aggressive gases; dry, oil-free air
Measuring range [bar]	-1...0	0...10 bar	-1...8 bar
Max. overpressure resistance [bar]	8	15	12
Repeatability	± 3% of full-scale value	± 3% of full-scale value	± 3% of full-scale value
Hysteresis	Adjustable	Adjustable	Adjustable
Output signal	2 digital	2 digital	2 digital
Switching capacity [mA]	200	200	200
Indication	LED	LED	LED
Electrical connection	Male connect. M8/M12. 4 pole	Male connect. M8/M12. 4 pole	Male connect. M8/M12. 4 pole
Measured medium connection	G1/8" male + M5 fem.	G1/8" male + M5 fem	G1/8" male + M5 fem
Voltage	10-30V DC	10-30V DC	10-30V DC
Current consumption [mA]	20	20	20
Protection IP	IP 65	IP 65	IP 65
Temperature Influence	± 3% of full-scale value	± 3% of full-scale value	± 3% of full-scale value
Operating temperature [°C]	0...60	0...60	0...60
Weight [g]	16	16	16

Design Data Vacuum and Pressure Switches VSi



VSi...



VSi...D

Vacuum and Pressure Switches

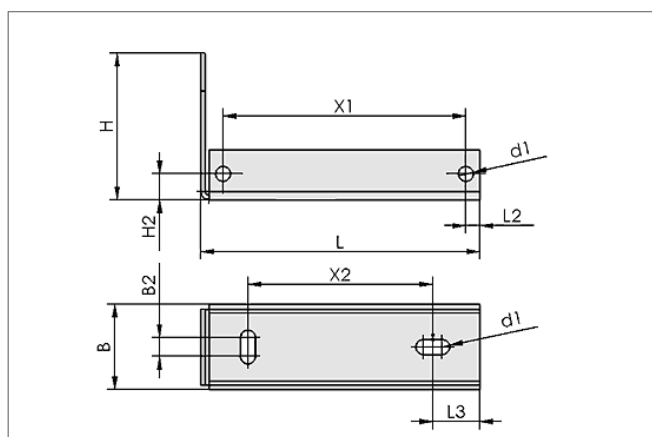
Vacuum and Pressure Switches VSi

Measuring range from -1 bar to 10 bar

Type	Dimensions in mm							Length of cable [m]
	D	G1	G2	G3	L	LG1	L1	
VSi V M8-4	19	G1/8"-M	M5-F	M8x1-M	38.0	8	56.0	-
VSi P M8-4	19	G1/8"-M	M5-F	M8x1-M	38.0	8	56.0	-
VSi VP M8-4	19	G1/8"-M	M5-F	M8x1-M	38.0	8	56.0	-
VSi V M12-4	19	G1/8"-M	M5-F	M12x1-M	38.0	8	56.0	-
VSi P M12-4	19	G1/8"-M	M5-F	M12x1-M	38.0	8	56.0	-
VSi VP M12-4	19	G1/8"-M	M5-F	M12x1-M	38.0	8	56.0	-
VSi V D M8-4	19	G1/8"-M	M5-F	M8x1-M	60.5	8	78.5	-
VSi P D M8-4	19	G1/8"-M	M5-F	M8x1-M	60.5	8	78.5	-
VSi VP D M8-4	19	G1/8"-M	M5-F	M8x1-M	60.5	8	78.5	-
VSi V D M12-4	19	G1/8"-M	M5-F	M12x1-M	60.5	8	78.5	-
VSi VP D M12-4	19	G1/8"-M	M5-F	M12x1-M	60.5	8	78.5	-
VSi P D M12-4	19	G1/8"-M	M5-F	M12x1-M	60.5	8	78.5	-



Design Data Accessories Vacuum and Pressure Switches VSi



Mounting bracket

Type	Dimensions in mm														
	B	B2	d1	D	G2	G3	H	H2	L	LG3	L1	L2	L3	X1	X2
Mounting bracket	21	4	3.2	-	-	-	34.5	5.5	59.0	-	-	3	10	52	39

Measuring and Control Devices

Manometer VAM-D

Measuring range from -1 bar to 10 bar



Manometer-Set VAM-D

Design

- Battery powered digital manometer in a robust polycarbonate housing
- Connection of the measuring medium (vacuum and pressure) with male thread G1/8" or female thread M5
- Mounting bracket and mounting frame available as accessory for switch panel mounting
- Integrated battery indicator on the display (changeable battery)
- LCD display showing 3 ½ digits and seven segments

Applications

- Electronic manometer with digital display for use in vacuum and pressure systems for recording and displaying of vacuum (-1 to 0 bar) and pressure (0-10 bar)
- Installation into panels due to cubic design
- Installation in handling systems directly at the site thanks to minimal size and low weight
- Ideal for mobile use (battery operated)
- Quick and easy troubleshooting in vacuum and pressure systems (optionally available in set)

Our Highlights...

- Electronic manometer with digital display
- Compact design, very light weight (only 40 g) and battery-operated
- Recording and display of vacuum or pressure values
- Manometer optionally available in the set for troubleshooting

Your Benefits...

- > Clear, visual monitoring of the system and the process
- > Ideal for mobile use; no external power source required
- > For universal use in vacuum and pressure systems
- > Quick and easy troubleshooting directly on site by all necessary components ("Plug & Play")

Measuring and Control Devices

Manometer VAM-D

Measuring range from -1 bar to 10 bar

Designation Code Manometer VAM-D

Abbreviated designation	Dimensions in mm	Measuring range in bar	Connection thread	Product addition
Example VAM-D 30x30 P G1/8-AG:				
VAM-D	30x30	P	G1/8-AG	
VAM-D	30x30	P -10 to 10	G1/8-AG (AG = male (M))	SET Set for troubleshooting

Ordering Data Manometer VAM-D

Electronic manometer VAM-D is delivered as a ready to connect product.
Available accessories: mounting bracket, mounting frame

Manometer VAM-D

Type	Part Number
VAM-D 30x30 P G1/8-AG	10.07.02.00055
VAM-D 30x30 P G1/8-AG SET*	10.07.02.00057

*Set consists of manometer VAM-D, suitable screw in push fittings, plugs and needle probe

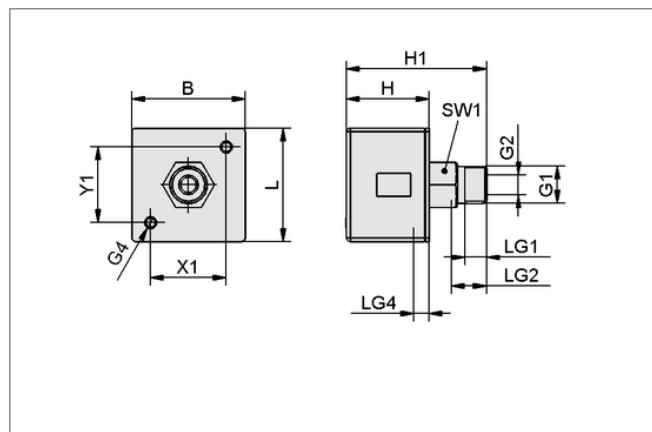
Ordering Data Accessories Manometer VAM-D

Type	Part Number
Mounting bracket	10.06.02.00425
Mounting frame	10.06.02.00427

Technical Data Manometer VAM-D

Type	VAM-D 30x30 P G1/8-AG
Measured medium	Non-aggressive gases; dry, oil-free air
Measuring range [bar]	-1...10
Operating temperature [°C]	0...50
Max. overpressure resistance [bar]	3
Measured-value display	3-digit 7-segment LED
Protection IP	IP 40/65 (with hose)
Repeatability	± 1% of full-scale value
Weight [g]	40

Design Data Manometer VAM-D



VAM-D 30x30 P

Measuring and Control Devices

Manometer VAM-D

Measuring range from -1 bar to 10 bar

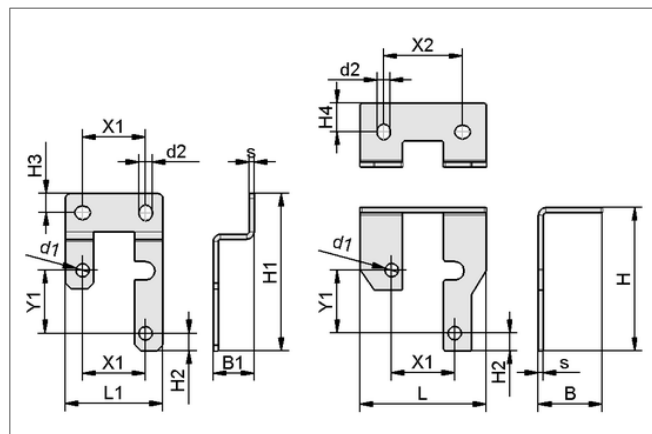


Design Data Manometer VAM-D

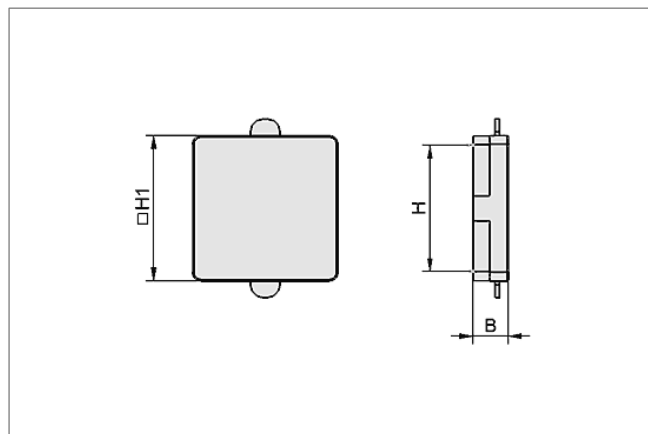
Type	Dimensions in mm													
	B	G1	G2	G4	H	H1	L	LG1	LG2	LG4	SW1	X1	Y1	
VAM-D 30x30 P G1/8-AG	30	G1/8"-AG	M5-IG	M3-IG	22	37	30	6	9	4	12	20	20	



Design Data Accessories Manometer VAM-D



Mounting bracket






Mounting frame

Type	Dimension in mm														
	B	B1	d1	d2	H	H1	H2	H3	H4	L	L1	X1	X2	Y1	
Mounting bracket	20.3	13	4.3	4.2	46	50.0	6	6.1	9.1	40	31	20	25	20	
Mounting frame	8.5	-	-	-	30	34.5	-	-	-	-	-	-	-	-	

Overview

Vacuum Filters

Vacuum Filters		
	<p>Inline Filters VFI</p> <ul style="list-style-type: none"> • Nominal flow rates: from 32 to 66 l/min • Filter mesh: 50 µm • Connection options: hose 4/2, 6/4 or 8/6 	<p>183</p> <p>Inline filter for simple, decentralized installation directly on the suction cup, in vacuum systems with light to medium degrees of contamination for protection of the vacuum generator.</p>
	<p>Vacuum Filters VF/STF/STF-D</p> <ul style="list-style-type: none"> • Nominal flow rates: from 6 to 360 m³/h • Pore sizes 3 to 30 µm 	<p>186</p> <p>Vacuum filter for use in very dusty environments with a degree of separation of almost 100%; central installation in the vacuum system for protection of the vacuum generator.</p>
	<p>Vacuum Cup Filters VFT</p> <ul style="list-style-type: none"> • Pore sizes 80 and 100 µm • Connection thread 1/8" to 3/4" • Materials PE and stainless steel • Nominal flow rate: from 45 to 770 l/min 	<p>189</p> <p>Vacuum cup filter for central integration in vacuum systems with light to medium degrees of contamination for protection of the vacuum generator; filter elements can be cleaned.</p>

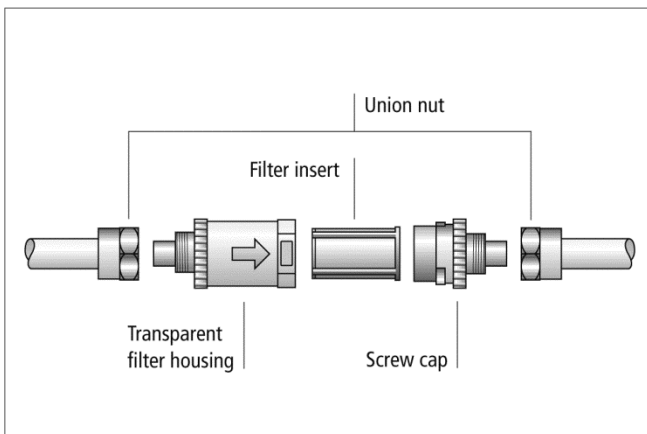
Vacuum Filters

Inline Filters VFI

Nominal flow from 32 l/min to 66 l/min



Inline filters VFI



System design inline filters VFI



Mounting example inline filters VFI

Applications

- Inline filter for use in vacuum systems with light to medium dirt levels
- Simple hose connection

Design

- Nozzles with union nuts on both ends for connection of hoses (internal hose diameter 4 and 6 mm); alternatively available with a push-in hose connection (version S1 and S2)
- Transparent filter housing with arrow for indication of the flow direction
- Filter head with knurled screw cap
- Slide-in filter element made of transparent material for visual monitoring

Our Highlights...

- Fast and easily replaceable filter insert
- Indication of degree of contamination through transparent housing
- Vacuum filter capable of withstanding short-term pressures of up to 7 bar

Your Benefits...

- > Low operating costs, environment friendly product
- > Fast identification permits efficient maintenance
- > Suitable for universal use in systems with vacuum and pressure

Vacuum Filters

Inline Filters VFI

Rated flow from 32 l/min to 66 l/min

Designation Code Inline Filters VFI

Abbreviated designation	Diameter in mm	Filter fineness
Example VFI 6/4 50:		
VFI	CN6/4	50
VFI	CN6/4 outside/inside	50
	CN8/6	
	4/2 quick-action push-in coupling (Ø 4/2)	
	6/4 quick-action push-in coupling (Ø 6/4)	

Ordering Data Inline Filters VFI

Inline filter VFI is delivered as a ready to connect product.

Available spare parts: replacement filter cartridge

Inline Filters VFI

Type	Part Number
VFI CN6/4 50	10.07.01.00241
VFI CN8/6 50	10.07.01.00245
VFI 4/2 50	10.07.01.00329
VFI 6/4 50	10.07.01.00328

Ordering Data Spare Parts Inline Filters VFI

Type	Replacement filter cartridge*
VFI CN6/4 50	10.07.01.00244
VFI CN8/6 50	10.07.01.00248
VFI 4/2 50	10.07.01.00244
VFI 6/4 50	10.07.01.00248

*Packaging unit: 5 pieces

Technical Data Inline Filters VFI

Type	Filter pore size [µm]	Nominal flow rate [l/min]*	Nominal flow rate [m³/min]*	Max. vacuum [mbar]	Max. overpressure at 25°C [bar]	Max. overpressure at 50°C [bar]	Weight [g]
VFI CN 6/4 50	50	32	1.92	-990	7	5	6
VFI CN 8/6 50	50	66	3.96	-990	7	5	10
VFI 4/2 50	50	32	1.92	-990	7	5	6
VFI 6/4 50	50	66	3.96	-990	7	5	17

*In the case of a pressure drop of max. 40 mbar while gripping

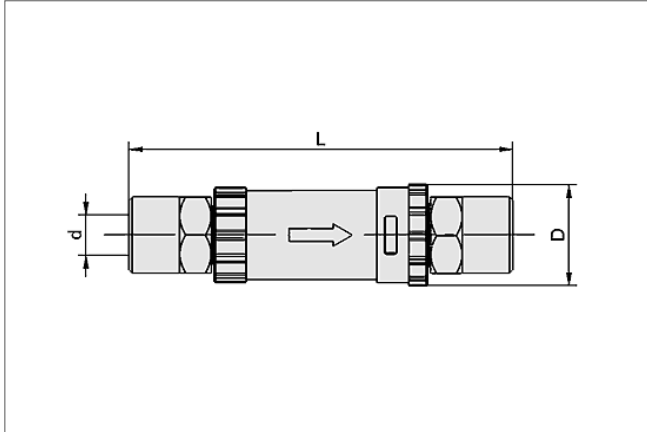
Vacuum Filters

Inline Filters VFI

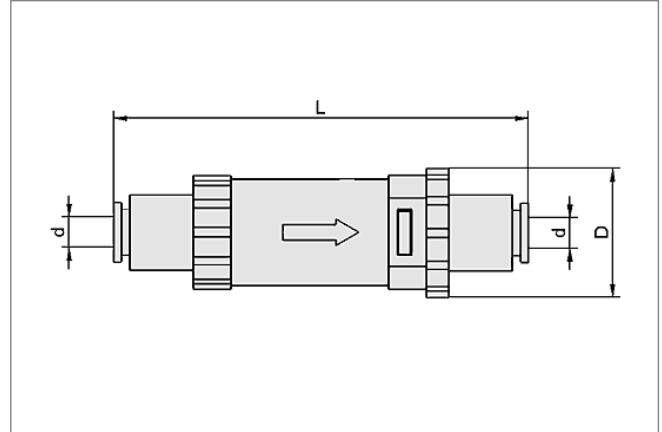
Rated flow from 32 l/min to 66 l/min



Design Data Inline Filters VFI



VFI CN6/4 and VFI CN8/6



VFI 4/2 and VFI 6/4

Type	Dimensions in mm		
	d	D	L
VFI CN6/4 50	6	16	61
VFI CN8/6 50	8	23	68
VFI 4/2 50	4	17	55
VFI 6/4 50	6	25	69

Vacuum Filters

Vacuum Filters VF / STF / STF-D

Rated flow from 100 l/min to 8.000 l/min



Vacuum filters VF / STF / STF-D

Applications

- Vacuum filter for protection of easily damaged vacuum generators (such as pumps and blowers) by filtering the incoming air
- For use in dusty surroundings; removal of almost 100% of the dust and dirt

Design

- Vacuum filter type VF: aluminum filter housing, cover screwed on, filter cartridge with wire mesh (VF G-1/4-F) or paper (VF G-3/8-F) filter
- Vacuum filter type STF N: sheet-steel filter housing, cover clipped on, filter cartridge with special paper filter
- Vacuum filter types STF P: plastic filter housing, cover clipped on, with mounting bracket, filter cartridge with special paper filter, large-size connections
- Type STF-D P: with additional pressure monitor for measuring the degree of contamination

Our Highlights...

- Wide range of sizes with various performance figures
- Replaceable filter cartridges
- Filter elements with almost 100% removal of dust and dirt
- Optionally with monitoring of the degree of contamination of the filter cartridge

Your Benefits...

- > The right filter for each vacuum generator
- > Low operating costs, environmental friendly design
- > Optimum protection of vacuum generators against dust and dirt
- > Maximum system availability



Ordering Data Vacuum Filters VF / STF / STF-D

Vacuum filter VF/STF/STF-D is delivered as a ready to connect product.

Available spare parts: replacement filter cartridge
Available accessories: mounting bracket

Vacuum Filters

Vacuum Filters VF / STF / STF-D

Rated flow from 100 l/min to 8.000 l/min

Vacuum Filters VF / STF / STF-D

Type*	Part Number
VF-6 G1/4-IG 15	10.07.01.00003
VF-10 G3/8-IG 30	10.07.01.00004
STF G3/4-IG N	10.07.01.00007
STF G1-1/4-IG	10.07.01.00008
STF G2-1/2-IG N	10.07.01.00010
STF 60 P 4.5 SSD	10.07.01.00259
STF 60 P 6.0 SSD	10.07.01.00260
STF 75 P 8.0 SSD	10.07.01.00263
STF-D 60 P 4.5 F SSD*	10.07.01.00266
STF-D 60 P 6.0 F SSD*	10.07.01.00262
STF-D 75 P 8.0 F SSD*	10.07.01.00265

*STF-D: incl. differential pressure monitor to control the filter

Ordering Data Spare Parts and Accessories Vacuum Filters VF / STF / STF-D

Type	Mounting bracket	Type	Replacement filter cartridge
VF-6 G1/4-IG 15	10.07.01.00011	VF-6 G1/4-IG 15	10.07.01.00013
VF-10 G3/8-IG 30	10.07.01.00011	VF-10 G3/8-IG 30	10.07.01.00014
STF G3/4-IG N	-	STF G3/4-IG N	10.07.01.00017
STF G1-1/4-IG N	-	STF G1-1/4-IG N	10.07.01.00018
STF G2-1/2-IG N	-	STF G2-1/2-IG N	10.07.01.00020
STF 60 P 4.5 SSD	-	STF 60 P 4.5 SSD	10.07.01.00060
STF 60 P 6.0 SSD	-	STF 60 P 6.0 SSD	10.07.01.00054
STF 75 P 8.0 SSD	-	STF 75 P 8.0 SSD	10.07.01.00079
STF-D 60 P 4.5 F SSD	-	STF-D 60 P 4.5 F SSD	10.07.01.00060
STF-D 60 P 6.0 F SSD	-	STF-D 60 P 6.0 F SSD	10.07.01.00054
STF-D 75 P 8.0 F SSD	-	STF-D 75 P 8.0 F SSD	10.07.01.00079

Technical Data Vacuum Filters VF / STF / STF-D

Type	Filter pore size [µm]	Nominal flow rate [m³/h]	Nominal flow rate [l/min]	Max. vacuum [mbar]	Max. overpressure at 25°C [bar]	Weight [kg]
VF-6 G1/4-IG 15	15	100	6	-950	6.0	0.13
VF-10 G3/8-IG 30	30	166	10	-950	6.0	0.22
STF G3/4-IG N	3	700	42	-950	1.0	0.50
STF G1-1/4-IG N	3	1600	96	-950	1.0	1.00
STF G2-1/2-IG N	3	6000	360	-950	1.0	4.30
STF 60 P 4.5 SSD	3	4500	270	-500	0.3	2.00
STF 60 P 6.0 SSD	3	6000	360	-500	0.3	2.40
STF 75 P 8.0 SSD	3	8000	480	-500	0.3	2.60
STF-D 60 P 4.5 F SSD	3	4500	270	-500	0.3	2.10
STF-D 60 P 6.0 F SSD	3	6000	360	-500	0.3	2.40
STF-D 75 P 8.0 F SSD	3	480	8000	-500	0.3	2.60

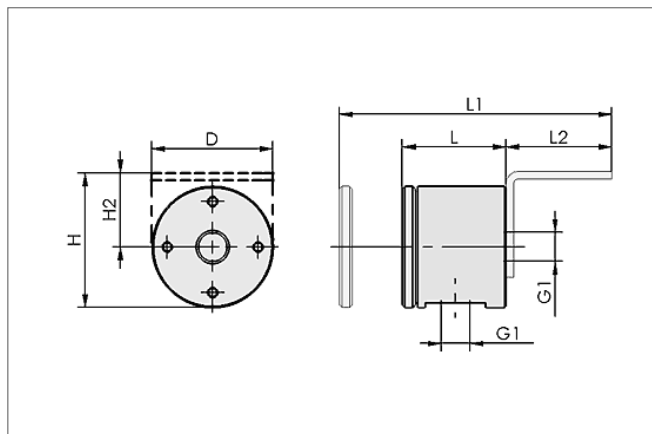
Vacuum Filters

Vacuum Filters VF / STF / STF-D

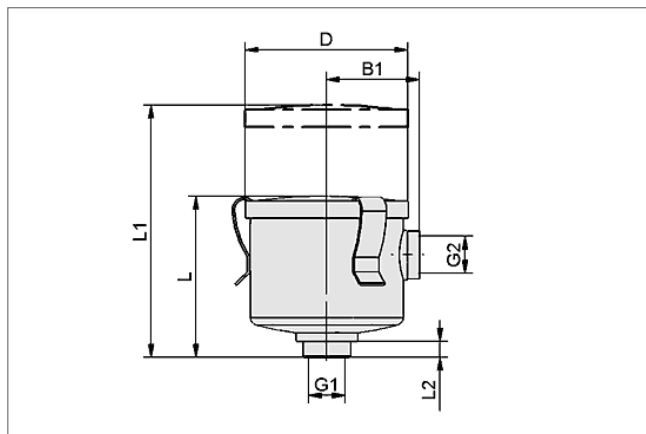
Rated flow from 100 l/min to 8.000 l/min



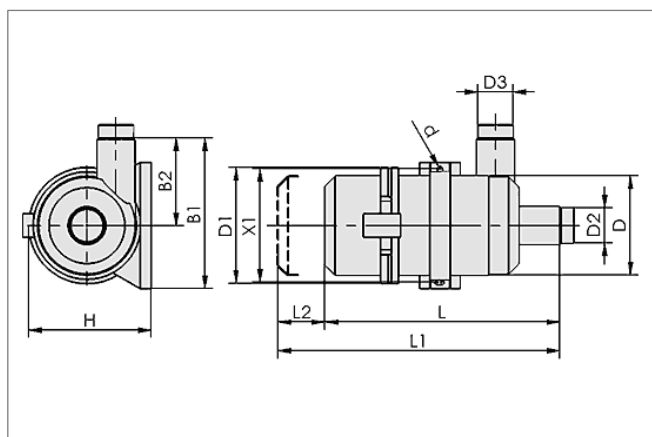
Design Data Vacuum Filters VF / STF / STF-D



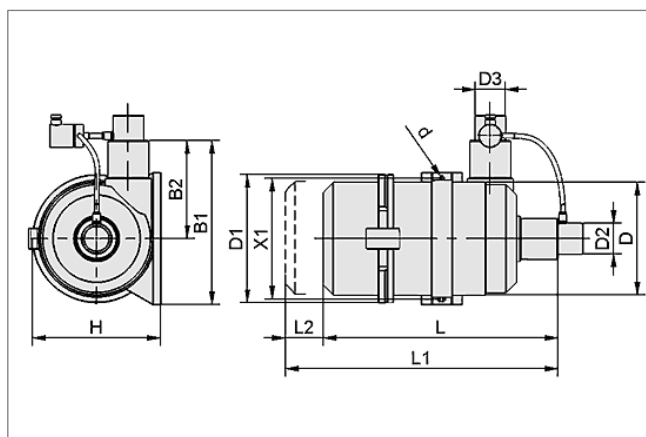
VF G1/4 to G3/8



STF G3/4 to STF G2-1/2



STF 60 / STF 75



STF-D 60 / STF-D 75

Type	Dimensions in mm													
	B1	B2	D	D1	G1	G2	H	H2	L	L1	L2	LG1	X1	d
VF-6 G1/4-IG 15	-	-	48	-	G1/4"-F	-	54	30	41	108	42	-	-	-
VF-10 G3/8-IG 30	-	-	48	-	G3/8"-F	-	54	30	70	157	42	-	-	-
STF G3/4-IG N	59	-	97	-	G3/4"-F	G3/4"-F	-	-	89	159	-	5.5	-	-
STF G1-1/4-IG N	81	-	136	-	G1-1/4"-F	G1-1/4"-F	-	-	116	191	-	17.0	-	-
STF G2-1/2-IG N	123	-	200	-	G2-1/2"-F	G2-1/2"-F	-	-	250	490	-	12.0	-	-
STF 60 P 4.5 SSD	221	112	-	60	-	-	218	-	355	658	-	-	192	9
STF 60 P 6.0 SSD	265	142	-	60	-	-	253	-	390	741	-	-	220	9
STF 75 P 8.0 SSD	280	148	-	75	-	-	260	-	415	774	-	-	237	9
STF-D 60 P 4.5 F SSD	221	112	-	60	-	-	218	-	355	658	-	-	192	9
STF-D 60 P 6.0 F SSD	265	142	-	60	-	-	253	-	390	741	-	-	220	9
STF-D 75 P 8.0 F SSD	280	148	-	75	-	-	260	-	415	774	-	-	192	9

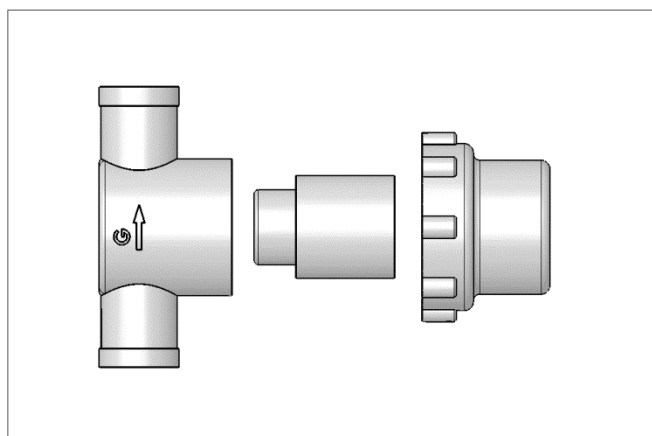
Vacuum Filters

Vacuum Cup Filters VFT

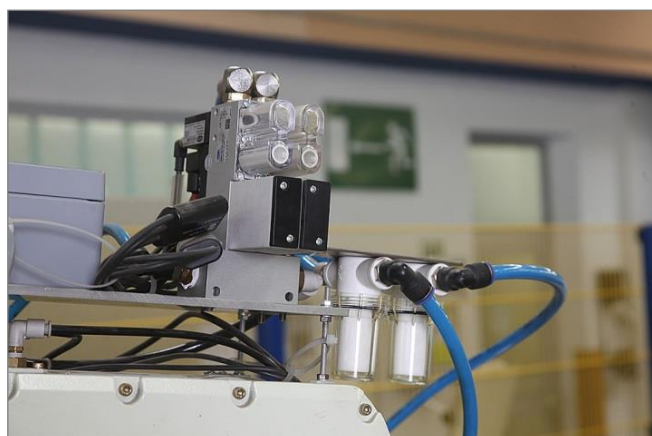
Rated flow from 45 l/min to 770 l/min



Vacuum cup filter VFT



System design VFT



Assembly example VFT

Applications

- Vacuum cup filter for protection of easily damaged vacuum generators (such as pumps and blowers) by filtering the incoming air
- Filtering of vacuum and compressed air at pressures up to 7 bar
- Filtering with pore size 80 µm of air with a small to medium amount of contamination
- Filtering with pore size 100 µm of air with larger amounts of contamination

Design

- Vacuum cup filter with filter cup made of clear nylon
- Filter cartridge made of polyethylene (pore size 80 µm) or stainless steel (pore size 100 µm)
- Stainless steel cartridge can be cleaned and reused several times

Our Highlights...

- Wide range of sizes
- Filter elements with very good separation
- Filter pore sizes 80 and 100 µm
- Filter elements made of stainless steel (100 µm) and polyethylene (80 µm)
- Filter cup made of clear nylon

Your Benefits...

- > Suitable filter for all vacuum generators
- > Optimum protection of vacuum generators against dust and dirt
- > Ideal for use as pre-filters and fine filters for air with varying amounts of contamination
- > Long-life filter elements which can be cleaned and reused
- > Degree of contamination easily visible

Vacuum Filters

Vacuum Cup Filters VFT

Rated flow from 45 l/min to 770 l/min

Designation Code Vacuum Cup Filters VFT

Abbreviated designation	Connection thread	Filter fineness
Example VFT G1/8-IG 80: VFT	G1/8-IG	80
VFT	G1/8-IG (IG = female (F))	80
	G1/4-IG	100
	G3/8-IG	
	G1/2-IG	
	G3/4-IG	

Ordering Data Vacuum Cup Filter VFT

Vacuum filter VFT is delivered as a ready to connect product.

Available spare parts: replacement filter cartridge

Available accessories: holder

Vacuum Cup Filters VFT

Type	Part Number
VFT- G1/8-IG 80	10.07.01.00116
VFT G1/8-IG 100	10.07.01.00117
VFT G1/4-IG 80	10.07.01.00119
VFT G1/4-IG 100	10.07.01.00120
VFT G3/8-IG 80	10.07.01.00122
VFT G3/8-IG 100	10.07.01.00123
VFT G1/2-IG 80	10.07.01.00125
VFT G1/2-IG 100	10.07.01.00126
VFT G3/4-IG 80	10.07.01.00128
VFT G3/4-IG 100	10.07.01.00129

Ordering Data Spare Parts and Accessories Vacuum Cup Filters VFT

Type*	Holder*	Type	Replacement filter cartridge
VFT G1/8-IG 80	10.07.01.00228	VFT G1/8-IG 80	10.07.01.00141
VFT G1/8-IG 100	10.07.01.00228	VFT G1/8-IG 100	10.07.01.00132
VFTG G1/4-IG 80	10.07.01.00228	VFT G1/4-IG 80	10.07.01.00141
VFTG G1/4-IG 100	10.07.01.00228	VFT G1/4-IG 100	10.07.01.00132
VFT G3/8-IG 80	10.07.01.00228	VFT G3/8-IG 80	10.07.01.00143
VFT G3/8-IG 100	10.07.01.00228	VFT G3/8-IG 100	10.07.01.00135
VFT G1/2-IG 80	10.07.01.00228	VFT G1/2-IG 80	10.07.01.00143
VFT G1/2-IG 100	10.07.01.00228	VFT G1/2-IG 10	10.07.01.00135
VFT G3/4-IG 80	10.07.01.00229	VFT G3/4-IG 80	10.07.01.00145
VFT G3/4-IG 100	10.07.01.00229	VFT G3/4-IG 100	10.07.01.00138

*complete with 2 mounting screws

Vacuum Filter

Vacuum Cup Filters VFT

Rated flow from 45 l/min to 770 l/min

Technical Data Vacuum Cup Filters VFT

Type	Filter pore size [µm]	Nominal flow rate [l/min]	Nominal flow rate [m³/h]	Max. vacuum [mbar]	Max. overpressure at 25°C [bar]	Max. overpressure at 50°C [bar]	Weight [g]
VFT G1/8-IG 80	80	45	2.7	-990	7	5	49
VFT G1/8-IG 100	100	50	3.0	-990	7	5	49
VFT G1/4-IG 80	80	110	6.6	-990	7	5	47
VFT G1/4-IG 100	100	140	8.4	-990	7	5	47
VFT G3/8-IG 80	80	245	14.7	-990	7	5	79
VFT G3/8-IG 100	100	290	17.4	-990	7	5	79
VFT G1/2-IG 80	80	300	18.0	-990	7	5	76
VFT G1/2-IG 100	100	320	19.2	-990	7	5	76
VFT G3/4-IG 80	80	600	36.0	-990	7	5	164
VFT G3/4-IG 100	100	770	46.2	-990	7	5	164

Filters for Ejectors

Vacuum generator	Recommended filter*	
	Filter element PE, 80 µm	Filter element stainless steel, 100 µm
SCPM 05, SEG 05, VR 05	VFT G1/8-IG 80	VFT G1/8-IG 100
SCPM 07, SEG 07, VR 07, VRI 07	VFT G1/8-IG 80	VFT G1/8-IG 100
VR 09, VRI 09	VFT G1/8-IG 80	VFT G1/8-IG 100
SCP 10, SCPM 10, SEG 10, SEA 10	VFT G1/8-IG 80	VFT G1/8-IG 100
SCP 15, SEG 15, VE/VER 15, SMP 15	VFT G1/4-IG 80	VFT G1/4-IG 100
SCP 20, SEG 20, SMP 20	VFT G3/8-IG 80	VFT G3/8-IG 100
SCP 25, SEG 25, SMP 25	VFT G1/2-IG 80	VFT G3/8-IG 100
SCP 30, SEG 30, SMP 30	VFT G3/4-IG 80	VFT G1/2-IG 100

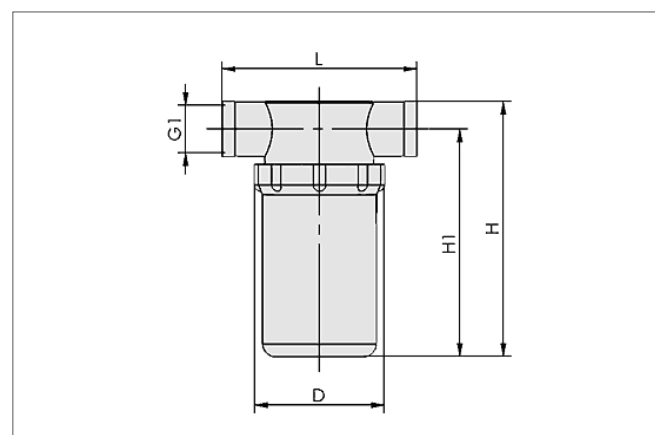
*These recommendations are valid for low to medium dirt levels commonly encountered in industrial applications. In dirty surroundings, select the next larger filter.

Filters for Vacuum Pumps

Vacuum pump	Recommended filter*	
	Filter element PE, 80 µm	Filter element stainless steel, 100 µm
EVE-TR 4...	VFT G1/4-IG 80	VFT G1/8-IG 100
EVE-TR 8...	VFT G1/2-IG 80	VFT G1/4-IG 100
EVE-TR 10...	VFT G1/2-IG 80	VFT G1/4-IG 100
EVE-TR 16...	VFT G1/2-IG 80	VFT G3/8-IG 100
EVE-TR 25...	VFT G3/4-IG 80	VFT G3/4-IG 100

*These recommendations are valid for low to medium dirt levels commonly encountered in industrial applications. In dirty surroundings, select the next larger filter.

Design Data Vacuum Cup Filters VFT



VFT G1/8 to G3/4

Vacuum Filters

Vacuum Cup Filters VFT

Rated flow from 45 l/min to 770 l/min

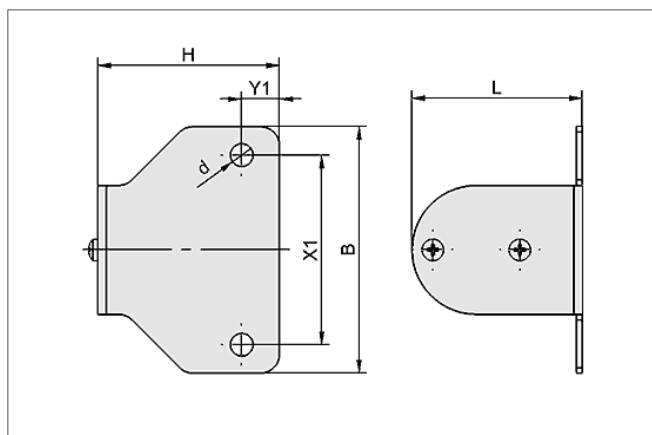


Design Data Vacuum Cup Filters VFT

Type	Dimensions in mm					
	D	G1	H	H1	L	
VFT G1/8-IG 80	48.0	G1/8"-F	60	50	76.0	
VFT G1/8-IG 100	48.0	G1/8"-F	60	50	76.0	
VFT G1/4-IG 80	48.0	G1/4"-F	60	50	76.0	
VFT G1/4-IG 100	48.0	G1/4"-F	60	50	76.0	
VFT G3/8-IG 80	48.5	G3/8"-F	101	88	77.2	
VFT G3/8-IG 100	48.5	G3/8"-F	101	88	77.2	
VFT G1/2-IG 80	48.0	G1/2"-F	101	88	77.2	
VFT G1/2-IG 100	48.5	G1/2"-F	101	88	77.2	
VFT G3/4-IG 80	75.0	G3/4"-F	137	118	90.5	
VFT G3/4-IG 100	75.0	G3/4"-F	137	118	90.5	



Design Data Accessories Filter Holders






Filter holder HTR-FIL

Type	Dimensions in mm					
	B	d	H	L	X1	Y1
HTR-FIL 25 WI VFT1/8-1/2	65	6	48	45	50	10
HTR-FIL 25 WI VFT3/4	85	6	52	70	70	10

Overview

Vacuum Gripping Systems

Vacuum Gripping Systems		
	<p>Vacuum area gripper FXP for Destacker</p> <ul style="list-style-type: none"> • Suction area (LxW) 442 x 130 mm • Sealing element : Suction gripper SAB 40-NBR-60 	<p style="text-align: right;">194</p> <p>Universal area gripper for sheet metal handling in different sizes especially for destackers</p>
	<p>Vacuum area gripper FX for Starter battery handling</p> <ul style="list-style-type: none"> • Suction area (LxW) 238 x 182 mm • Sealing element: Foam 	<p style="text-align: right;">200</p> <p>Special area gripper for starter battery handling with integrated vacuum ejectors and digital vacuum switch.</p>
	<p>Vacuum area gripper FXC for bumper handling</p> <ul style="list-style-type: none"> • Suction area (LxB) von 217 x 120 mm • Sealing element: Suction gripper FSG-32-HT1-60 	<p style="text-align: right;">202</p> <p>Universal area gripper for handling of different bumper types with integrated vacuum ejector and HT1 suction grippers</p>

Vacuum Area Gripping Systems FXP / FMP

Modular Design with Individually Adapted Vacuum Generation

FXP: Integrated Vacuum Generation

As a unit that is ready for connection, the area gripping system FXP is equipped with a plug-in ejector for vacuum generation. It can be individually configured and quickly retooled in case of changing application conditions. The modular design ensures easy maintenance and enables the integration of additional functions for energy and process optimization directly in the gripper.

Aluminum base section

- High stiffness and low weight
- Lateral T-slots for fixation of sensors
- Integrated air duct for separation
- Variable gripper length possible

Vacuum booster

- Faster evacuation due to reduced inner volume
- Maximum power is reached instantly

End cover with integrated functions

- Compressed air connection, vacuum gauge as well as optional vacuum switch and control valve

Silencer

Vacuum generation

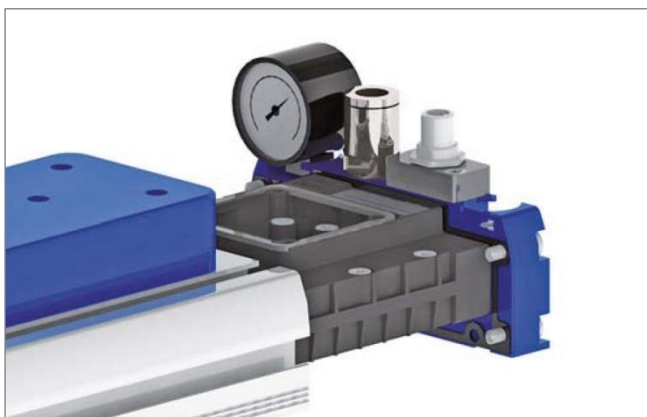
- Plug-in ejector

Valve film

- For quickly changing the valve type and size
- Self-cleaning effect

Sealing elements

- Fig. shows suction pads with push-in function
- Also available with sealing foam with optimized adhesive film



Integrated Plug in Ejector

- Optimized ejector performance: with comparatively low maximum vacuum, the ejector generates a high volume flow and thus provides high holding forces, especially for applications with porous workpieces
- Fast evacuation and high suction flow even at low vacuum values
- Control valves integrated into the end cover for controlling
- Silencer for reducing the sound level to 74 dB(A)
- Ready to connect unit, easy to clean

Vacuum Area Gripping Systems FXP / FMP

Modular Design with Individually Adapted Vacuum Generation

FMP: External Vacuum Generation

The area gripping system FMP has the same modular design as the type FXP, but is equipped with a connection piece for external vacuum generators. It is therefore suitable for use in combination with powerful pumps and blowers.

Connection piece for external vacuum generators

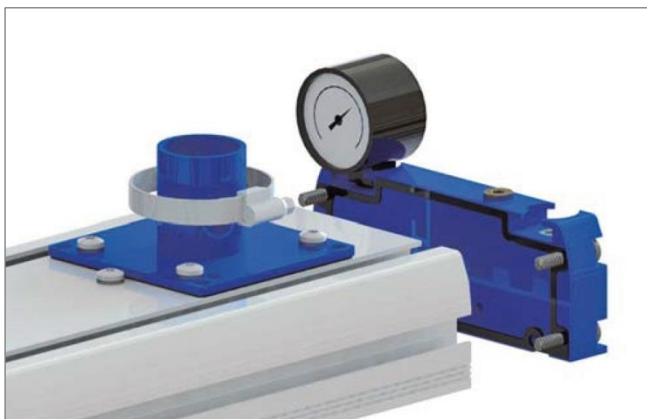
Aluminum base section with vacuum booster

End cover



Valve film and sealing element

- Fig. shows sealing foam



Connection Piece for External Vacuum Generation

- Allows use of an electrical vacuum generator (blower or pump)
- Suitable for handling very porous or warped workpieces due to high flow rate

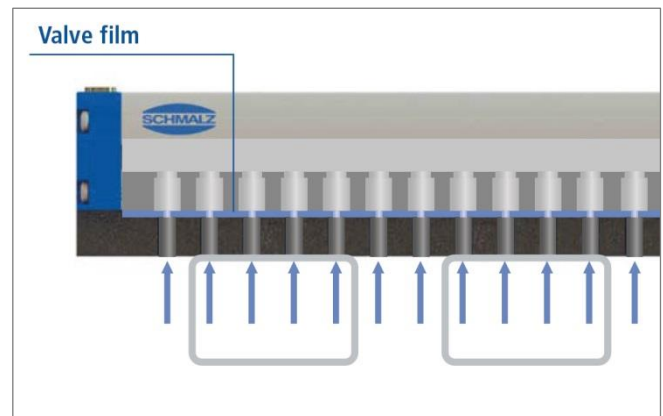
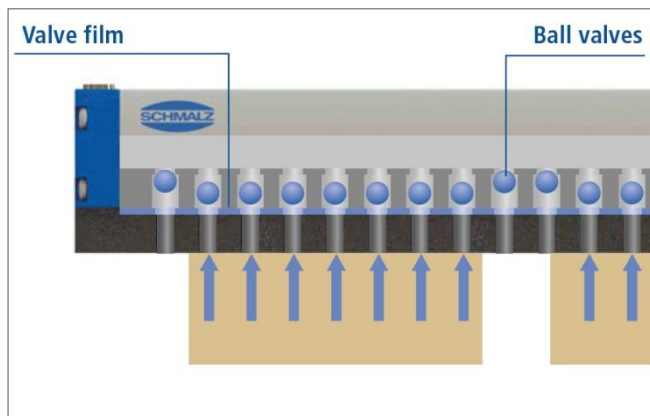
Selection Aid

Application features	FXP	FMP
Minimization of interfering edges caused by hoses and attached vacuum generator (integration of functions)	✓	
Easy mounting and quick connection of the gripper	✓	
Minimal system costs (investment costs including vacuum generation, hoses and controller)	✓	
Minimal operating costs (because of the option of electrical vacuum generation), especially for applications with multiple grippers		✓
Handling of highly porous workpieces		✓

Vacuum Area Gripping Systems FXP / FMP

Innovative Valve Technology

Valve type and size can be changed easily and quickly in case of changing requirements



Check Valves SVK

- Ball valves integrated in the base section for closing off uncovered suction cells
- Leak-free integrated, resulting in a higher vacuum as well as improved energy efficiency and holding force
- Valve film with clover shape for high flow rate and quick picking up and blowing off
- Proper functioning ensured even with unplanned surfaces

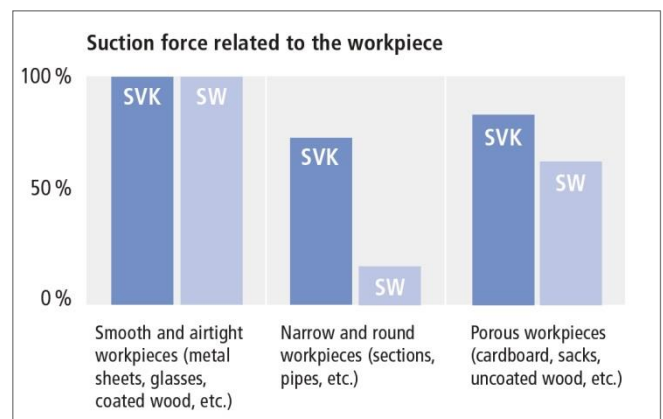
Flow Restrictors SW

- Valve film with integrated flow restrictors to minimize leakage losses due to uncovered suction cells
- Suitable for swiveling operations and high accelerations
- Different flow diameters available (optional)

Selection Aid



The higher nominal flow of the SVK valve type allows it to achieve significantly shorter blow off times than the SW type can (values in fig. measured at a gripper length of 442 mm)



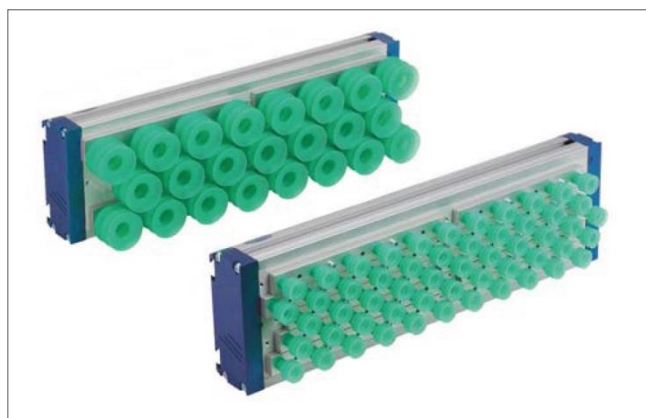
The valve type SVK achieves a higher suction force than the SW in case of porous workpieces and low degree of gripper coverage

Application features	SVK	SW
Smooth and airtight workpieces (e.g. metal sheets, glass, coated wood)	✓	✓
Porous workpieces (e.g. boxes, sacks, uncoated wood)	✓	
Structured surfaces	✓	
Workpieces with low of gripper coverage (e.g. pipes, sections)	✓	
Minimum cycle times (active blow off)	✓	
Optimization of energy efficiency	✓	
Swiveling movements > 45°		✓

Vacuum Area Gripping Systems FXP / FMP

Flexible, Quick-Change Sealing

Dichtschaum und Sauggreifer lassen sich durch optimierte Klebefolie und Push-in-Funktion einfach und schnell wechseln



Sealing Foam with Quick-Change Adhesive Film

- Optimal adjustment capabilities
- Quick rebound for short cycle times
- Replaceable without adhesive residue and without the need to clean the sheet
- Intended for workpieces wider than 20 mm (in the design with 5 suction rows, on request)
- With optional filter mat

Suction Pads with Push-in Function

- Optimal height compensation and damping effect
- Quick replacement due to the push-in mechanism
- Diameters 20 mm and 40 mm
- Different suction gripper materials
- With optional insert filter

Selection Aid

Application features	Sealing foam	Suction pads
Rigid workpieces such as sheets, metal sheets, boards, sections and pallets	✓	
Flexible workpieces such as cardboard boxes, sacks, bags and trays		✓
Elongated workpieces such as strips, sections, boards	✓	
Workpieces with rough and structured surface	✓	
Handling of smaller product layers such as jars (open or closed) and cans with a continuous edge	✓	

Additional Functions, Compactly Integrated



End Cover with Integrated Functions

Minimization of system costs and installation times through integration of:

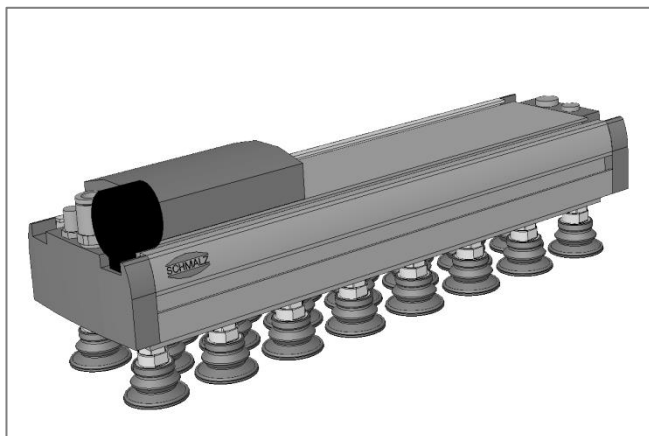
- Compressed air connection for ejector supply (type FXP)
- Control valves for switching the suction and blow off functions on/off (optional for type FXP-S)
- Connection for the blow off and separation functions
- Option to attach a vacuum gauge or vacuum switch

Vacuum Area Gripping Systems FXP-S-SW

Universal Gripper for destackers



Universal gripper for destacking machines FXP-S-SAB



System design FXP-S-SAB



Handling of steel sheets

Application

- Flexible handling and destacking of metal sheets in various formats
- Usage in destacking machines which are processing a high quantity of different blank versions
- Ideal for loading hot forming furnaces
- Flexible production lines with strongly reduced setup times during tool changes

Design

- Main body with integrated multi stage vacuum ejectors
- Integrated flow restrictors minimize the leakage less due to uncovered suction cells
- Equipped with SAB 40 Schmalz automotive suction pads for high lateral forces

Highlights...

- Integrated pneumatic vacuum generator
- Suction cup with integrated flow restrictors
- 1,5 bellows cup type SAB-40

Benefits...

- > Compact design; no additional vacuum ejector is necessary
- > Safe handling of metal sheets even if gripper is only partly covered
- > Integrated height compensation and transfer of high lateral forces

Vacuum Area Gripping Systems FXP-S-SW

Universal Gripper for destackers

Ordering Code Vacuum Area Gripping System FXP-S-SW

Abbreviated designation	Connection thread	Filter fineness
Example Gripping System FX-SV 238x182 O10S05 VSi-V: FX-SV	G1/8-IG (IG=female (F))	80
FX-SV	G1/8-IG	80

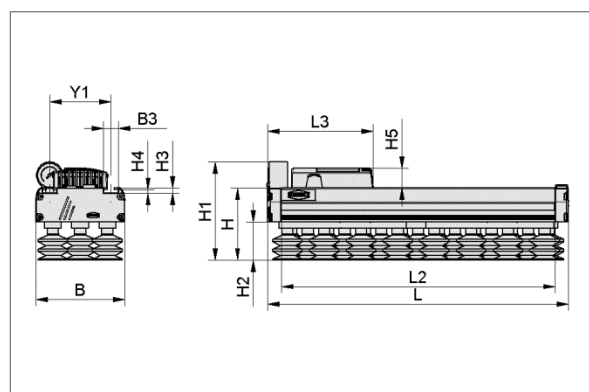
Vacuum Area Gripping System FXP-S-SW

Type	Article-No.	Type Spare Part Gripping System	Article-No.
FXP-S-SW140 442 3R54 SAB-40	10.01.38.02897	SAB 40 NBR-60 G1/4-IG	10.01.06.00670

Technical Data Vacuum Gripping System FXP-S-SW

Type	Suction force [N]	Air consumption [l/min]	Suction rate [l/min]	Suction cell quantity	Weight [kg]
10.01.38.02897	200	250	1050	23 pcs.	3,2

Design Data V FXP-S-SW



Destacker gripper FXP-S-SW

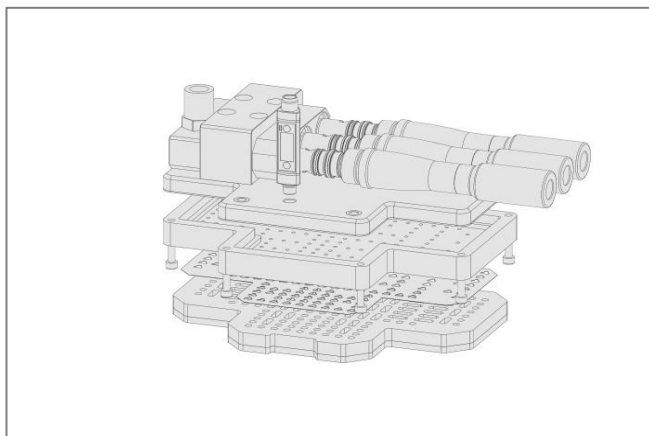
Type	Dimensions in mm		
	B	H	L
10.01.38.02897	130	105	442

Vacuum Area Gripping Systems FX-SV

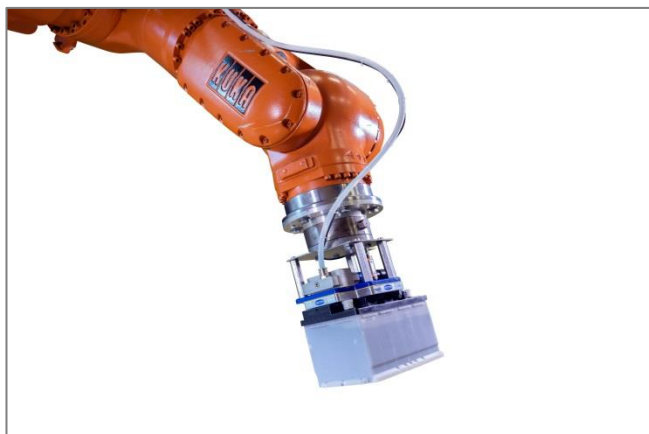
Special Gripper for Starter battery handling



Vacuum Area Gripping Systems FX-SV



System design FX-SV



Handling of starter battery

Application:

- Flexible handling of starter batteries in different sizes
- Used in end assembly as well as battery production
- Ideal for the robotic starter battery handling

Design:

- Main body with integrated Multistage vacuum ejector
- Integrated ball valves for closing off the uncovered suction cells
- Special foam with optimal adjustment capability

Highlights...

- Integrated pneumatic vacuum ejector
- Special foam with battery compatible form
- Integrated ball valves

Benefits...

- > Compact design: no additional vacuum ejector needed
- > Safe handling of different battery types
- > Safe handling of batteries even with uncovered suction cells

Vacuum Area Gripping Systems FX-SV

Special Gripper for Starter battery handling

Ordering Code Vacuum Area Gripping Systems FX-SV

Abbreviated designation	Connection thread	Filter fineness
Example Gripping Systems FX-SV 238x182 O10S05 VSi-V:		
FX-SV	G1/8-IG (IG=female (F))	80
FX-SV	G1/8-IG	80

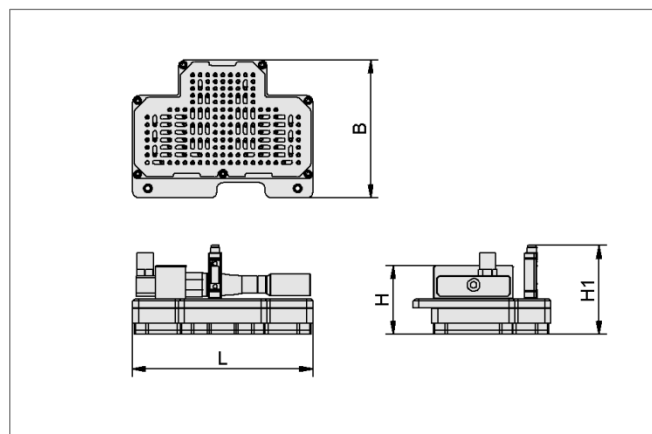
Vacuum Area Gripping Systems FX-SV

Type	Article-No.	Type Spare Part Gripping System	Article-No.
FX-SV	10.01.11.03336	Sealing plate (FX/FM)	10.01.11.03357

Technical Data Vacuum Area Gripping Systems FX-SV

	Suction force [N] (40% Vacuum)	Suction force [N] (60% Vacuum)	Suction force [N] (80% Vacuum)	Air consumption [l/min]	Suction rate [l/min]	Suction cell quantity	Weight [kg]
10.01.11.03336	230 N	345 N	460 N	309	927	149 pcs.	2,9

Design Data Vacuum Area Gripping Systems FX-SV



Battery gripper FX-SV

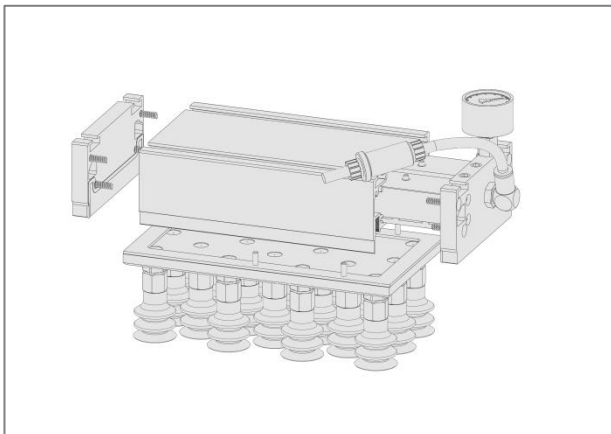
Type	Dimensions in mm		
	B	H	L
10.01.11.03336	182	91	238

Vacuum Area Gripping Systems FXC-SW

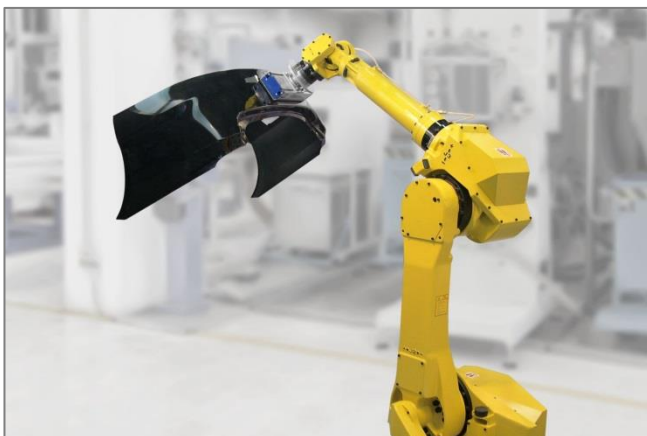
Universal gripper for Bumper Handling



Vacuum Area Gripping System FXC-SW



System design FXC-SW



Handling of bumper plate

Application:

- Flexible handling of instable plastic components in different shapes such as bumper plates and interiors
- Used in end assembly as well as bumper production
- For flexible production systems to reduce the setup time in tooling change

Design:

- Main body with integrated multi-stage vacuum ejector
- Integrated flow restrictors minimize the leakage loss due to uncovered suction cells
- Equipped with markless suction pads for handling of painted parts

Highlights...

- Integrated pneumatic vacuum ejector
- Suction grippers with integrated flow restrictors
- 2,5-bellows suction grippers type FSG-32

Benefits...

- > Compact design; no additional vacuum ejector needed
- > Safe handling of instable bumper plates even with uncovered suction cells
- > Optimal height compensation and markless handling

Vacuum Area Gripping Systems FXC-SW

Universal gripper for Bumper Handling

Ordering Code Vacuum Gripping System FXC-SW

Abbreviated designation	Connection thread	Filter fineness
Example Gripping Systems FXC-SW:		
FXC-SW	G1/8- IG (IG=female (F))	80
FXC-SW	G1/8-IG	80

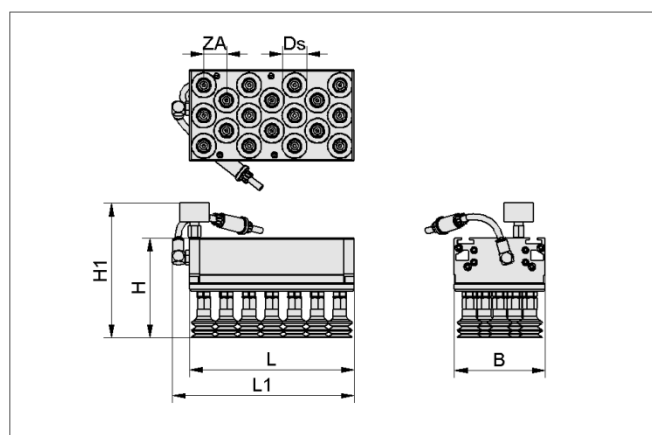
Vacuum Gripping System FXC-SW

Type	Articel-No.	Type Spare part Gripping System	Article-No.
Universal gripper FXC-SW	10.01.21.05713	FSG-32-HT1-60-G1/4-IG	10.01.06.01246

Technical Data Vacuum Gripping System FXC-SW

Type	Suction force [N] (40% Vakuum)	Suction force [N] (60% Vakuum)	Suction force [N] (80% Vakuum)	Air consumption [l/min]	Suction rate [l/min]	Suction cell quantity	Weight [kg]
10.01.21.05713	144	216	288	197	706	18 pcs.	2,6

Design Data Vacuum Gripping System FXC-SW



Universal gripper FXC-SW

Type	Dimensions in mm		
	B	H	L
10.01.21.05713	120	131,5	217

Overview

Clamping-Solution

Clamping-Solution



Suction Cup Balance SSCB

205

- Gripper area (Ø) 60 mm
- Individually lockable positioning pins

Suction cup balance for automatic gripping and clamping, especially uneven 3D freeform surfaces in production.

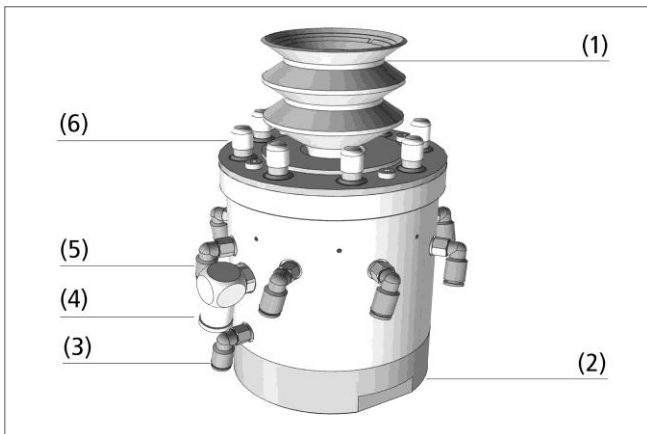
Clamping Solutions for 3D Free-form Surfaces

Suction Cup Balance SSCB

Gripper area (\varnothing) 60 mm



Suction Cup Balance - SSCB



System design Suction Cup Balance SSCB



Automated gripping and clamping with the Suction Cup Balance SSCB

Applications

- Suction Cup Balance SSCB for automated, precise gripping and clamping of various workpieces in a production line
- Ideal for securely gripping and clamping uneven 3D free-form surfaces
- Mirrored gripping and clamping available
- Driveless adjusting with no mechanical stops or positioning aids

Design

- Flexible bellows suction cup (1) for adapting perfectly to the workpiece
- Aluminum main body (2)
- Compressed air supply (3) for spring force
- Vacuum supply (4) for suction cup
- Compressed air supply (5) for releasing positioning pins
- Positioning pins (6) with padded tips that are gentle on the workpiece

Our Highlights...

- End effector for precise workpiece positioning
- Softwarecontrolled 3D free-form surface mapping using 2D reference surface
- Individually lockable, unpressurized positioning pins
- Special supporting material on workpiece contact surfaces

Your Benefits...

- > Flexible gripping and clamping system design possibilities
- > Automated set-up process for gripping and clamping systems
- > Gripping and clamping systems automatically adjust to workpiece contours
- > Reliable and precise fixation of complex parts

Clamping Solutions

Suction Cup Balance – SSCB

Gripper area (\varnothing) 60 mm

Ordering Code Suction Cup Balance SSCB

Abbreviated designation	Positioning pins	Suction cup	Locking positioning pin
Example SSCB: SSCB	S	VU1 30-M6-IG FSG	EP
SSCB	60 mm diameter 171 mm height	VU1 30-M6-IG FSG	EP Individually locking pins ZP Simultaneously locking pins

Note on ordering: The Suction Cup Balance SSCB comes assembled. The delivery consists of:

- Suction cup consisting of aluminium body, positioning pins and suction cups VU1 30-M6-IG FSG in diameter 60 mm

Available spare parts: suction cup, cap

Ordering Data Suction Cup Balance SSCB

Type	Part No.
SSCB 60x171 VU1 30-MG-IG FSG-EP	10.01.15.00850
SSCB 60x171 VU1 30-MG-IG FSG-ZP	10.01.15.00922

Ordering Data Spare Parts Suction Cup Balance SSCB

Type	Suction cup	Cap
SSCB 60x171 VU1 30-M6-IG FSG...	10.01.15.00953	10.01.15.00918

Technical Data Suction Cup Balance SSCB

Type	Suction force [N]*	Pull-off force [N]*	Operating force [N]*	Positioning pin pressure		Max. normal positioning pin force [N]	Vacuum connection (outer/inner)**	Compressed air connection (outer/inner)**
				Clamping clamp [bar]	Compressed air spring [bar]			
SSCB 60x171 VU1 30-M6-IG FSG-EP	61.0	100	50	Min. 6	Max. 2	400	1 x 8/6	9 x 4/2
SSCB 60x171 VU1 30-M6-IG FSG -ZP	61.0	100	50	Min. 6	Max 2	100	1 x 8/6	2 x 4/2

*Specifications are theoretical values at a -0.6 bar vacuum on dry, flat and even workpieces surfaces – they do not include safety factors.

**The recommended hose diameter is based on a hose length of approx. 2m

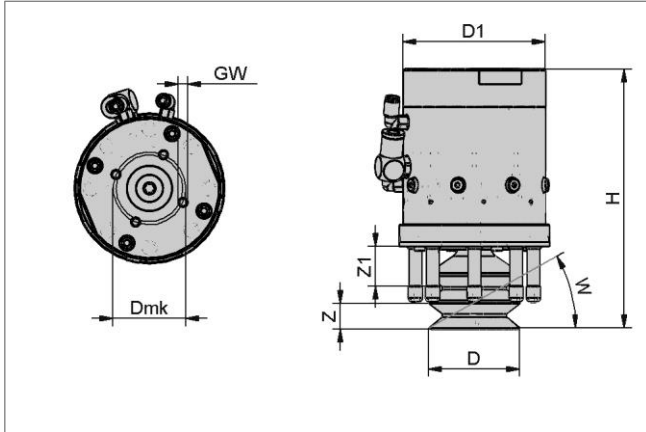
Clamping Solutions

Suction Cup Balance – SSCB

Gripper area (\varnothing) 60 mm



Design Data Suction Cup Balance SSCB



Art.: SSCB 60x171 VU1 30-M6-IG FSG-ZP

Type	Dimensions in mm							
	D	D1	H	Z	Z1 max.	W man.	GW	Dmk
SSCB 60x171 VU1 30-M6-IG FSG-EP*	60	94	171	30	46	30°	4x M6	48
SSCB 60x171 VU1 30-M6-IG FSG-ZP*	60	94	171	30	46	30°	4x M6	48

*Technical data and design data are max. values, actual values depend on application probably. We recommend that before handling, you would better to test every kind of workpiece. This is the only way to guarantee a safe handling process.



Up to **40 Percent**
Reduced Procurement Costs

- Thanks to the external and convenient control possibilities via app interface, additional displays and input modules on the gripping systems can be saved

Up to **75 Percent**
Shorter Commissioning Times

- Scan device, collect information, adjust values intuitively through the app via NFC
- The app can be used to clone settings to other devices within a few seconds

Up to **80 Percent**
Shorter Service Times

- Fast and uncomplicated error analysis by clear text messages and references to the operating instructions stored on the device
- Predictive wear monitoring and reminder function
- Optional storing of service information (storage location, installation date) directly on the device



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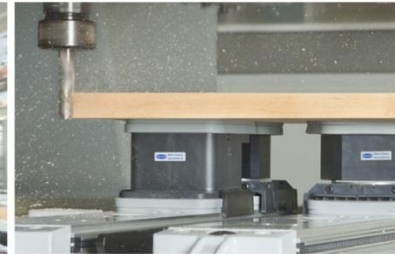
Vacuum Components
Tel. +49 7443 2403-102



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Tel. +49 7443 2403-109

NORTH AMERICA

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J. Schmalz GmbH
Aacher Straße 29
D-72293 Glatten
Tel. +49 7443 2403-0
Fax +49 7443 2403-259
schmalz@schmalz.de
www.schmalz.com