

# Vacuum Automation 2.0

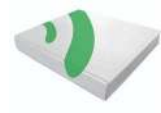
The future depends on good product choices



## ***Our Mission***

*“The Piab mission is to increase productivity for industrial customers and provide energy saving solutions by promoting our superior technology universally.”*





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*In 1951, the company took its name from its first product, an innovative compass that simplified the work for designers and draftsmen. Pi,  $\pi$  (=3,14) AB.*

## Introducing Piab

*“The Piab mission is to increase productivity for industrial customers and provide energy saving solutions by promoting our superior technology universally.”*

### **Giving you the best solution possible**

We share our knowledge and experience with our customers and offer the vacuum solution most suited to their particular situation, contributing to reduced energy consumption, increased productivity and improved working environment.

### **Through vacuum expertise and industry competence**

Piab's ground breaking work within vacuum technology is based on investments in R&D and experience working with a broad variety of manufacturing industries globally. Combining expertise with an understanding of many different industry settings enables us to provide customers with the best vacuum solutions on the market.

### **Past & Present**

The history of Piab starts in 1951 when the inventive company was established. The first product, an innovative pair of compasses, gave Piab ( $\pi$ + AB) its name. In 1960, the first Piab vacuum product, the “Pneucette”, was developed for the electronic industry. The foundation for today's compressed-air driven vacuum system was laid in 1972 when the first multi-stage ejector was patented. Since then, Piab has continued to lead the way in the development of vacuum technology.

### **A powerful business partner**

Piab's objective is to improve our customers' profitability and competitiveness. We strive to increase productivity, reinforcing their edge in the market. We also aim to contribute to our customers' reduced energy consumption and improve the work environment, aiding in their ability to attract and keep qualified personnel. Partnering with Piab means more than having a reliable vacuum solution supplier.

### **Technical leadership**

We take pride in being the innovators in vacuum technology. Technical leadership means finding and developing solutions that have not yet been found. Our customers should feel confident in

knowing that their relationship with us will keep them on the cutting edge.

### **Local presence and global competence**

Being the global leader means designing, building and installing vacuum solutions in every corner of the world. Therefore, Piab has a worldwide organization with subsidiaries and distributors in more than 50 countries.

### **Contributing to a sustainable world**

We believe strongly in taking responsibility for our shared environment. Therefore, we have developed an ambitious Environmental Policy and implemented an ISO 14001 certified Eco Management System. In addition, we always look for the most environmentally-friendly means of transportation for our products, and encourage our suppliers to research and develop materials that allow for sound manufacture, function and recycling. For our customers, our vacuum solutions are in themselves a mean to reduce energy and hence contribute to a better environment. Piab focuses on developing systems that consume minimal energy and have minimal environmental impact, reducing the user's carbon footprint. Performance is never sacrificed, so productivity is consistently maximized. Contact Piab for information about our Energy Saving Innovations that will increase your productivity.

## COAX® technology

COAX® is an advanced solution for creating vacuum with compressed air. Based on Piab's multi-stage technology, COAX® cartridges are smaller, more efficient and more reliable than conventional ejectors, which allows for the design of a flexible, modular and efficient vacuum system.

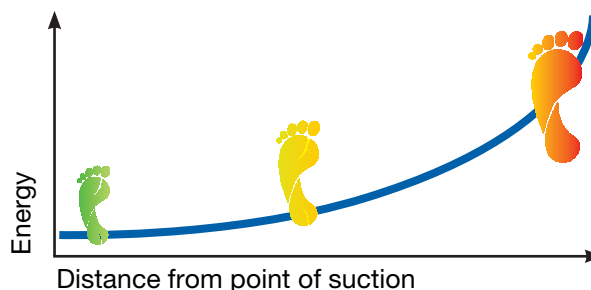
## Environmental index

At the basis of the highest performing, energy-efficient production process is an optimised handling solution. By never using more energy than absolutely necessary, companies can reduce their carbon footprint as well as their costs. From the vacuum pump itself down to each and every control accessory, Piab can work with you to achieve the lowest possible energy consumption.

Your pump will require less compressed air when it is placed close to the point of suction, thus

A vacuum system based on COAX® technology can provide you with three times more vacuum flow than conventional systems, allowing you to increase speed with high reliability, while reducing energy consumption.

reducing CO<sub>2</sub>-emissions and energy consumption. The graph below demonstrates the relationship between environmental impact and the distance of the pump from the point of suction.





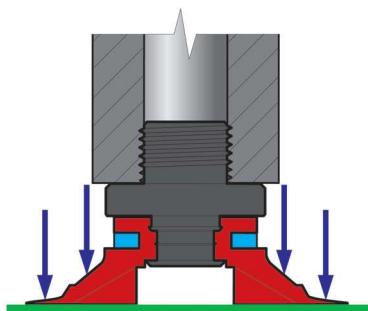
## Vacuum theory

### What is vacuum?

When using the terms "vacuum", "negative pressure", "suction", etc., we mean a pressure that is lower than the atmospheric pressure, which is the pressure of the weight of the air above us. At sea level it is usually 1,013 mbar = 101.3 kPa. 1 Pa equals 1 N/m<sup>2</sup> which means that a column of air with a cross-sectional area of 1 m<sup>2</sup> presses on the surface of the earth with a force of around 100,000 N. By reducing the pressure in a closed space the atmospheric pressure becomes a potential energy source.



*A vacuum cleaner does not suck. Air and dust are pressed into the vacuum cleaner by the surrounding higher atmospheric pressure.*



*A suction cup adheres to a surface by the surrounding higher pressure.*

### Altitude above sea level

As the atmospheric pressure is the working force, the force will consequently change with the atmospheric pressure. This means that the present barometric pressure and the altitude above sea level must be taken into consideration. Up to 2,000

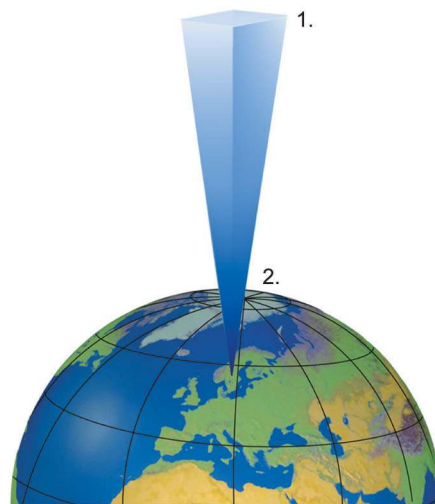
### A definition for vacuum is:

"A room without matter". In everyday language; "Air-free or almost air-free space".

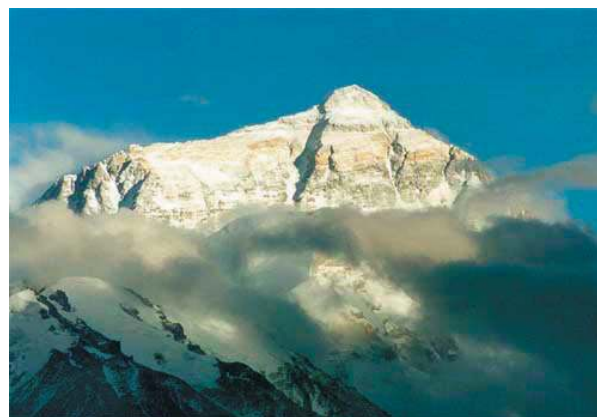
Source: Nationalencyklopedin, Bra Böcker, Höganäs, Sweden.

m, the pressure is reduced by around 1% per 100 m. An application which is dimensioned to hold 100 kg at sea level, can manage only 89 kg at an altitude of 1,000 m.

The chapter "Tables" shows the effect of the atmospheric pressure on the vacuum level.



1. Atmospheric pressure = 0 at an altitude of 1,000 km
2. 1 bar (101.3 kPa) at sea level



*At the summit of Mount Everest (8,848 m) the atmospheric pressure is approximately 330 mbar (33 kPa).*

## Expressions and units

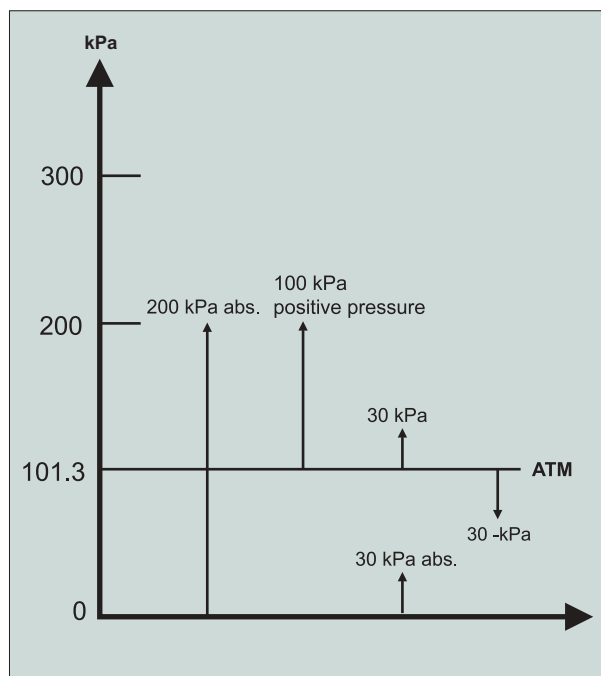
In everyday speech there are many different expressions and units for pressure below the atmospheric pressure. It is therefore important to relate to the same vocabulary in discussions. The adjoining table shows some common expressions and units used in connection with vacuum. For conversion tables between the different units, see tables No. 1, 2 and 3 in the “Tables” chapter.

Expressions
Under pressure
Absolute pressure
% vacuum (% of vacuum)
Negative pressure

Units	
-kPa	bar
inHg	mm H <sub>2</sub> O
mmHg	torr
hPa	mbar

### Different terms for pressure in relation to "absolute vacuum"

Physically there is only one kind of "pressure" and that is the one that starts from "0" or absolute vacuum. All above "0" is pressure and correctly named absolute pressure. Normal atmospheric pressure (101.3 kPa) is used as a reference, which is why the terms "positive pressure" or "negative pressure" are used. Earlier the term "% vacuum" was used, where 0% was atmospheric pressure and 100% absolute vacuum. Consequently, in industry -kPa is the unit used most often since it nearly corresponds to "% vacuum". In the chemical branch of industry, and in deep vacuum, mbar is generally used. Thus, it is very important to be clear about which unit and reference point is meant. In this catalogue, -kPa is generally used (as in industry), and for laboratory pumps, mbar absolute is specifically used.



*This diagram shows the relation between absolute, negative and positive pressures. It also illustrates the problem that may occur if the pressure is not clearly specified. 30 kPa can "carelessly spoken" imply three different values.*

### Applied vacuum can normally be divided into three main categories

Blowers or low vacuum	0–20 -kPa	For ventilation, cooling, vacuum cleaning, ...
Industrial vacuum	20–99 -kPa	For picking, holding, automation, ...
Process vacuum	99 -kPa –	Deep vacuum for laboratories, manufacturing of microchips, plating, ...

**Energy needs for different vacuum levels**

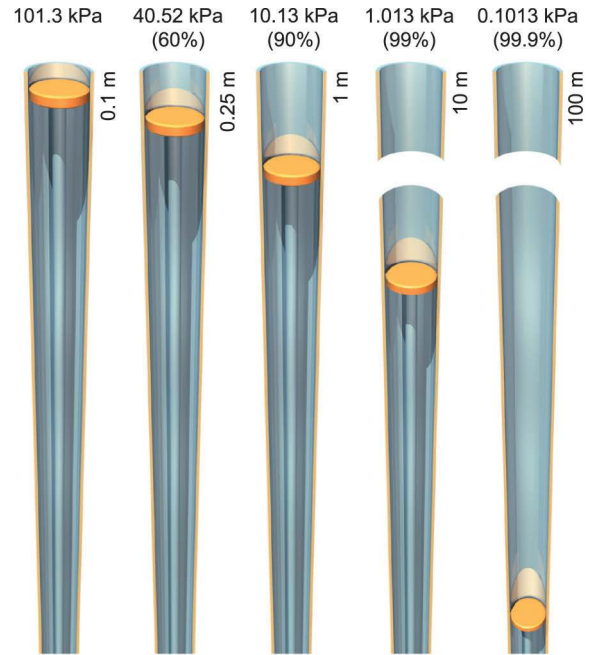
The energy required to create vacuum increases asymptotically towards infinity with increased vacuum. To obtain optimum energy exchange it is very important to choose the least possible vacuum. To illustrate the energy needs, a cylinder with a piston (piston pump) is suitable.

According to Boyle’s Law the pressure (p) in a gas is inversely proportional to its volume (V) at constant temperature:

$$P_1 \times V_1 = P_2 \times V_2$$

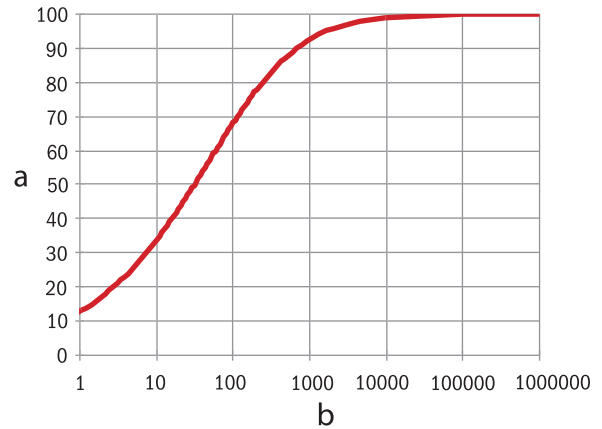
This means that increased volume gives a lower pressure.

By pulling the piston slowly, the distance extended will show the increased energy needs. The temperature is not constant in practice. However, at a slow operation the temperature effect is negligible.



**Energy requirement at increased vacuum**

The diagram illustrates the energy requirement at increased vacuum. As can be seen, the energy requirement increases drastically above 90 -kPa, which is why a vacuum level below this is always advisable.



a) Pressure below atmospheric -kPa

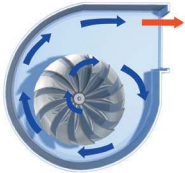
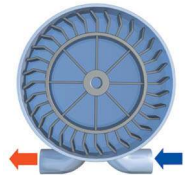
b) Energy factor

## Vacuum pumps




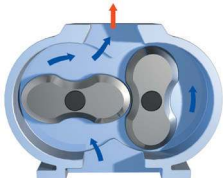
### Mechanical pumps

The main principle for all mechanical pumps is that they convey, in one way or another, a certain volume of air from the suction side (the vacuum side) to the exhaust side. In that way they create a

vacuum. Mechanical pumps usually have an electric motor as power source, but it can also be an internal combustion engine, a hydraulic or a compressed air-driven pump.

Fans		Advantages	Disadvantages
	Centrifugal blower	Few moving parts Large suction volumes Strong	Low maximum vacuum Slow start-up and long stop time High noise level
	Regenerative blower	Few moving parts Large suction volumes Low energy consumption	Low maximum vacuum Slow start-up and long stop time High noise level

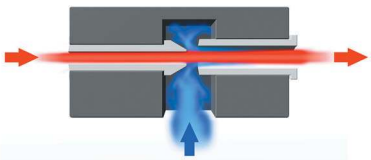
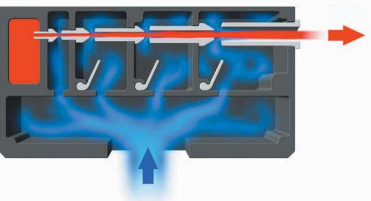

### Displacement pumps

Displacement pumps		Advantages	Disadvantages
	Piston pump	Relatively low price	High heat emission Low maximum vacuum
	Membrane pump	Few moving parts Compact Low price	Small suction volumes
	Vane pump	High vacuum and flow Relatively low noise level	Sensitive to contamination Relatively high price High service requirements High heat emission
	Roots pump	High flow Low service requirements	High price High heat emission High noise level

## Compressed air-driven ejector pumps

All ejector pumps are driven with pressurised gas, usually compressed air. The compressed air flows into the ejector pump, where it expands in one or more ejector nozzles. When expanding, the stored energy (pressure and heat) is converted into motive

energy. The speed of the compressed air jet increases rapidly, while the pressure and the temperature go down, attracting more air and thereby creating a vacuum on the suction side. Some ejector pumps may also be used to blow air.

Compressed air-driven ejector pumps		Advantages	Disadvantages
	Single-stage ejector	<ul style="list-style-type: none"> <li>Low price</li> <li>No heat emission</li> <li>Compact</li> </ul>	<ul style="list-style-type: none"> <li>High noise level</li> <li>Gives either high flow or high vacuum</li> <li>Poor efficiency</li> </ul>
	Multi-stage ejector	<ul style="list-style-type: none"> <li>High efficiency</li> <li>Low energy consumption</li> <li>High reliability</li> <li>Low noise level</li> <li>No heat emission</li> </ul>	
	COAX® technology	<ul style="list-style-type: none"> <li>High efficiency</li> <li>Low energy consumption</li> <li>High reliability</li> <li>Low noise level</li> <li>No heat emission</li> <li>Operates even at low feed pressure</li> <li>Integrated features</li> <li>Modularly built</li> <li>Easy to supplement and upgrade later on</li> <li>Easy to clean</li> </ul>	

## Vacuum flow, how is it measured?

In order to obtain pressure lower than atmospheric pressure in a container, some of the air mass must be removed by a vacuum pump. For example, half the air mass must be removed to obtain a vacuum level of 50 -kPa. The air evacuated by the pump per unit of time is called the vacuum flow and is a measure of how quickly the pump can perform this function.

Many manufacturers of mechanical vacuum pumps state vacuum flow in terms of the pump's displacement volume. This flow is called "displacement flow" or "volume flow". Displacement flow equals the chamber volume times the number of revolutions per unit time. In mechanical pumps, this value is constant and can lead the observer to think, incorrectly, that the vacuum flow is constant during the entire evacuation process.

In the evacuation process the air actually becomes thinner and thinner for every stroke of the cylinder until the pump reaches the maximum vacuum level

which is that point where the vacuum flow would then be zero. The pump is still pumping the same volume flow but the air mass is so thin that compared to air at normal atmospheric pressure it is as if there was no air.

To account for the change in air mass during the evacuation process Piab provides flow data in terms of normal litre per second (NI/s). Also called free air flow, this method normalizes the flow to standard atmospheric conditions. As the vacuum becomes deeper and the air is thinner, a higher actual volume must be displaced to evacuate each normal litre. The table below lists one pump's performance in terms of displacement flow (l/s) and free air flow (NI/s). At zero vacuum, the flows are equal. This is because the actual conditions are in fact standard conditions. But as the vacuum level increases, the values diverge. At 50 kPa (50%) vacuum, the displacement flow figure is twice the free air flow figure. At deeper vacuum levels, the difference is even greater.

## Displacement flow vs free air flow

Units		Vacuum level -kPa									
		0	10	20	30	40	50	60	70	80	90
Displacement flow	l/s	10	10	10	10	10	10	10	10	10	10
	m <sup>3</sup> /h	36	36	36	36	36	36	36	36	36	36
Free air	NI/s	10	9	8	7	6	5	4	3	2	1
	Nm <sup>3</sup> /h	36	32.4	28.8	25.2	21.6	18	14.4	10.8	7.2	3.6

## Vacuum systems

When making a vacuum system/lifting device there are several different methods to increase safety and reliability. To give efficient operation and good economy it is important that the designed system is made for a specific application. In addition to the choice of suction cups with attachments, the type and size of vacuum pumps, accessories, safety level and type of system must also be decided upon.

### Sealed systems

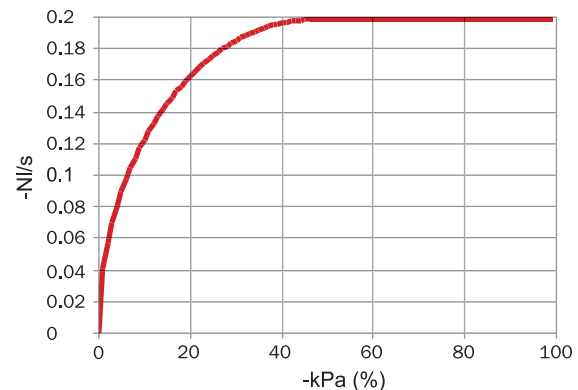
For sealed systems the capacity of the pump is determined by how fast the system can be evacuated to a certain vacuum level. This capacity is called the evacuation time of the pump and is normally specified in s/l. This value is multiplied by the volume of the system in order to obtain the evacuation time to the desired vacuum level.

### Non-sealed systems

With non-sealed systems (lifting of porous materials) the case is different. To maintain the desired vacuum level the pump must have the capacity to pump away the air leaking in. Leakage can be due to, for example, porous material or that one is forced to lift over holes. By establishing the leaking flow, it is possible, by reading the pump data, to find the right pump for the application in question.

If the leakage occurs via a known aperture, the flow can be established according to the adjoining diagram. The diagram gives values for leakage flow when the leakage area is known. The leakage flow is valid when there is an opening of 1 mm<sup>2</sup> (normal atmospheric pressure at sea level). To obtain the total flow, the value is multiplied by the total leakage area.

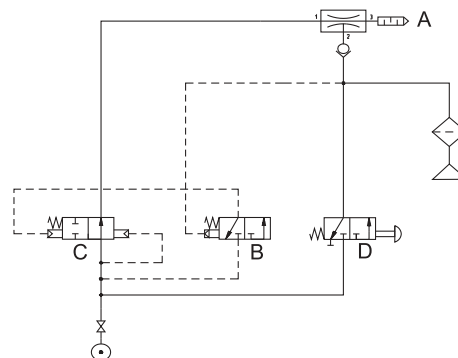
When the leakage occurs through a porous material or in an unknown way, the flow can be established by a test with a vacuum pump. The pump is connected to the system and the obtained vacuum level is read. (It should be at least 20 -kPa.) The flow that is pumped away at this vacuum level can be seen on the page of the particular pump. This flow roughly corresponds to the leaking flow.



At 47 -kPa the air reaches sonic velocity, and consequently the flow is constant.

### Energy-saving systems

Electrically driven, mechanical vacuum pumps normally work during the whole operating cycle and the vacuum requirements are controlled by a valve on the vacuum side. In systems with compressed air-driven vacuum pumps it is often possible to save a lot of energy. As these pumps have a faster reaction time (fast start-up and stop time) the pump can be shut off when the vacuum is no longer needed. The principles of a simple energy-saving system are shown to the right. Many pumps can be delivered with an energy-saving system as standard.



- A = Vacuum pump with non-return valve.
- B = Vacuum control unit.
- C = Feed valve for compressed air.
- D = Release valve.

## Vacuum system calculations

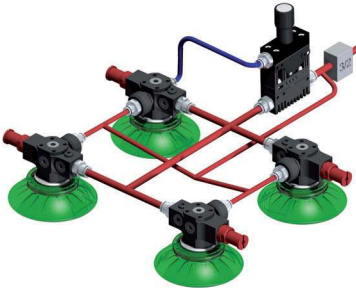
### General input

Vacuum systems for material handling can be decentralized or centralized. A decentralized vacuum system is designed so that each suction cup has a dedicated, independent vacuum source. A centralized vacuum system is designed to have one vacuum source for multiple suction cups. Handling sheet metal is an example of a sealed system and handling cardboard is an example of a leaking system.

### The examples are calculated using the following general assumptions:

Initial flow required are for the sealed system examples is 0.7 NI/s per suction cup FC75P, and the corresponding value is 1.2 NI/s for the leaking system examples using the suction cup BX75P. CO<sub>2</sub>-emission, world index: 0.019 kg CO<sub>2</sub> per produced m<sup>3</sup> of compressed air and 0.19 kg CO<sub>2</sub> per kWh. Machine operating hours per year: 3.000 h.

## Sealed systems/handling non-porous material



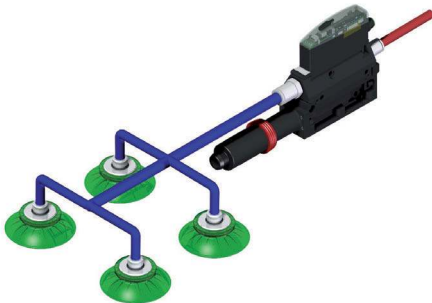
### System description:

Decentralized vacuum system using: Vacuum Gripper System VGS™3010 with suction cup FC75P and COAX® cartridge Xi10 2-stage vacuum pump with non-return valve, AQR Atmospheric Quick Release, Vacustat and 3/2 on/off-valve.

**Annual cost of ownership:** 188 €

**Annual CO<sub>2</sub> emission:** 13 kg

**Annual energy usage:** 17 kWh



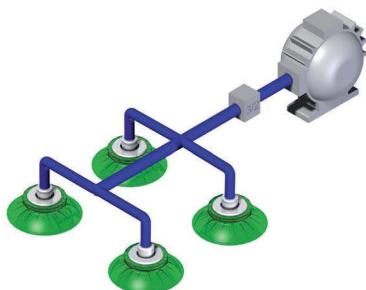
### System description:

Centralized vacuum system using: P5010 with AVM™ – Automatic Vacuum Management control, COAX® cartridge Xi40 3-stage vacuum pump with non-return valve and suction cup FC75P.

**Annual cost of ownership:** 301 €

**Annual CO<sub>2</sub> emission:** 171 kg

**Annual energy usage:** 900 kWh



### System description:

Centralized vacuum system using: 550 W electro-mechanical vacuum pump with suction cup FC75P and vacuum on/off-valve.

**Annual cost of ownership:** 722 €

**Annual CO<sub>2</sub> emission:** 443 kg

**Annual energy usage:** 1656 kWh



- ▶ Electric vane vacuum pumps are running constantly.
- ▶ Energy cost: 1.5 Euro-cent per produced 1 m<sup>3</sup> compressed air and 12 Euro-cent per kWh.
- ▶ Annual cost of ownership include: energy costs, purchase price, annual cost, service and CO<sub>2</sub> emission tax 0.025 Euro per kg. Suction cups excluded.
- ▶ Capital interest rate: 5%
- ▶ Pump life time: 5 years

Red tubing = Compressed air

Blue tubing = Vacuum

## Calculating carbon footprint:

Based on the world average of power generation, 1 NI of compressed air will result in a 19 mg CO<sub>2</sub> emission footprint. To calculate your specific footprint, just multiply your air consumption (NI/s) by 19. The result is your CO<sub>2</sub> emission footprint per second.



## Leaking systems/handling porous material



### System description:

Decentralized vacuum system using: Vacuum Gripper System VGS™3010 with suction cup BX75P and COAX® cartridge Si08 3-stage vacuum pump and 3/2 on/off-valve.

**Annual cost of ownership:** 249 €

**Annual CO<sub>2</sub> emission:** 145 kg

**Annual energy usage:** 762 kW/h



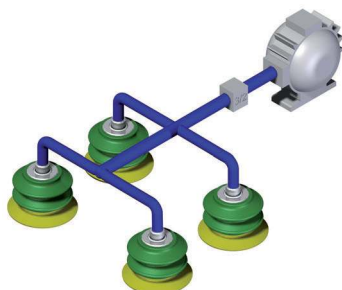
### System description:

Centralized vacuum system using: P5010 with COAX® cartridge Si32 3-stage vacuum pump, suction cup BX75P and 3/2 on/off valve.

**Annual cost of ownership:** 227 €

**Annual CO<sub>2</sub> emission:** 203 kg

**Annual energy usage:** 1067 kW/h



### System description:

Centralized vacuum system using: 750 W electro-mechanical vacuum pump with suction cup BX75P and vacuum on/off-valve.

**Annual cost of ownership:** 808 €

**Annual CO<sub>2</sub> emission:** 429 kg

**Annual energy usage:** 2258 kW/h

## Optimising controls

Aside from placing the pump close to the point of suction, it is important to complete and optimise your vacuum system with control accessories that will limit the use of compressed air to the amount that the system requires. This way, you will have an efficient vacuum system with minimum usage of compressed air. Piab has a range of optimising controls and this selection guide will help you to choose the one(s) optimal for your system.

### Regulators

Energy saving can be achieved in many ways, but the most simple way is by using a pressure regulator to control your pump's optimum feed pressure.

### AQR – Atmospheric Quick Release

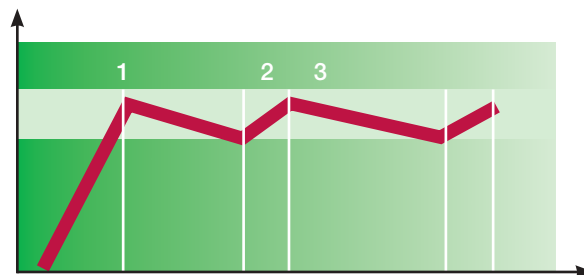
Instead of using compressed air to release objects you can use AQR's to provide a fast release. The AQR is a valve that breaks vacuum seal in e.g. suction cups by equalizing pressure with atmospheric air and at the same time do not consume additional compressed air.

### PCC – Piab Cruise Control

The PCC automatically regulates the feed pressure towards an optimal programmed vacuum level. Fluctuations in vacuum pressure caused by product variations or changes in cycle time allow the pump to only consume the amount of air that the optimised vacuum level requires.

### Vacustat

When handling sealed objects many times the vacuum pump can be turned off when not needed. The Vacustat's are vacuum-controlled valves that shut off the flow of compressed air to the pump when the pre-set vacuum level is reached (1). From micro leakage in the system, the vacuum level drops, and after a while the start-up level of the valve is reached (2). At this point, the pump will start and work until the shut-off level is reached again (3) etc.



### AVM™ – Automatic Vacuum Management

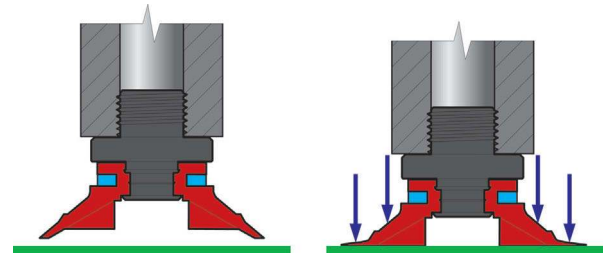
Like the Vacustat the AVM™ instantly shuts off the flow of compressed air when the pre-programmed vacuum level is reached and turns on again when the start-up level of the valve is reached. The AVM™ not only saves energy it also features a complete monitoring system with on/off valves and vacuum switches.

Contact Piab for information about our products that will increase your productivity and provide for energy savings.

## Suction cups

### How does a suction cup work?

A suction cup adheres to a surface as the surrounding pressure (atmospheric pressure) is higher than the pressure between the suction cup and the surface. To create the low pressure in the suction cup it is connected to a vacuum pump. The lower the pressure (higher vacuum), the greater the force on the suction cup.



$$\Delta p = P_{AT} - P_1$$

### Advantages and limitations of the suction cup

Material handling with suction cups is a simple, inexpensive and reliable technique. It is therefore a solution worth considering before going over to

more complicated methods. Suction cups can lift, move and hold objects that weigh just a few grams up to several hundred kilograms.

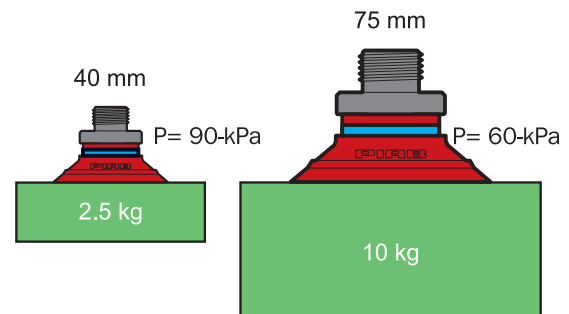
Advantages	Limitations
Easy installation Low service requirements Low price Does not damage the material handled Quick attachment and detachment	Limited force (atmospheric pressure) Positioning accuracy

### Sizing suction cups

Suction cups have quite different capacities depending on the design. Please see the values in the tables for respective suction cup.

### Energy requirements at different vacuum levels

A deep vacuum means that the suction cup has to work harder and thus wears out quicker; also the energy requirements increase at higher vacuum levels. If the vacuum level increases from 60 to 90 -kPa, the lifting force increases by 1.5 times but with ten times the energy requirement. It is better to maintain a lower vacuum level and instead increase the suction cup area. In many applications, a good target for the vacuum level could be 60 -kPa; at this level you get a high lifting force with relatively low energy requirements.



### Consider the height above sea level

Atmospheric pressure decreases with increased height. This means that the available force decreases at the same rate. An application designed for lifting 100 kg at sea level, can only manage to hold 89 kg at 1,000 metres. A vacuum gauge is normally calibrated with atmospheric pressure as a reference. This means that the gauge shows available vacuum levels at different heights.

### Lifting force in different directions

A suction cup can be used irrespective of whether the force is perpendicular or parallel to the surface. If the force is parallel, it is transferred through friction between the suction cup and the surface. A suction cup with cleats is most suitable in this case because it is rigid and provides high friction.

## Thread systems

### ISO thread:

- ▶ Cylindrical metric thread: designated with the letter M. Example M5.
- ▶ Cylindrical Inch thread (also called Unified thread): designated with the letter UNF. Example 10-32UNF.

### Dry seal thread (American system of pipe threads):

The dry seal system consists of cylindrical and conical pipe-threads. The threads have a 60° profile angle and are sealed without packing or seal rings (please note that when these are used in other combination of thread systems, that "sealing" is not applicable). The dimensions are given in inches and Piab's catalogue uses the letters NPT and NPSF:

- ▶ Conical thread is designated NPT. Example: 1/8" NPT.
- ▶ Cylindrical thread is designated NPSF: Example: 1/8" NPSF.

### BSP thread (British system of pipe threads):

- ▶ The threads have a 55° profile angle and are dimensioned in inches.
- ▶ Cylindrical thread is designated with the letter G. Example: G1/8".

### Compatibility of different thread systems

Please note that some thread size in different thread systems not always fit. See below table.

	M5 male	M5 fem.	G1/8" male	G1/8" fem.	G1/4" male	G1/4" fem.	G3/8" male	G3/8" fem.	G1/2" male	G1/2" fem.	G3/4" male	G3/4" fem.	G1" male	G1" fem.	G2" male	G2" fem.
10-32UNF female or male	+	+++														
NPSF1/8" female			+++													
NPT1/8" female or male			-	+												
NPSF1/4" female					+											
NPT1/4" female or male					-	-										
NPSF3/8" female							-									
NPT3/8" female or male							-	-								
NPSF1/2" female									+							
NPT1/2" female or male									-	+++						
NPSF3/4" female											+					
NPT3/4" female or male											-	+++				
NPT1" female or male													-	-		
NPT2" female or male															-	-

+++ Fits

+ Fits with short thread

- Does not fit

## Tables

In everyday speech, many different expressions and units are used for both pressure and flow. It is important to agree on what is meant by them.

### Pressure

$P=F/A$  (Force/Area).

SI unit (Système International d'Unités): Pascal (Pa). 1 Pa = 1 N/m<sup>2</sup>.

Common multiple units: MPa and kPa.

Pa (N/m <sup>2</sup> )	bar	kp/cm <sup>2</sup>	torr	psi (lb/in <sup>2</sup> )
1	0.00001	10.1972x10 <sup>-6</sup>	7.50062x10 <sup>-3</sup>	0.145038x10 <sup>-3</sup>
100 000	1	1.01972	750.062	14.5038
98 066.5	0.980665	1	735.559	14.2233
133.322	1.33322x10 <sup>-3</sup>	1.35951x10 <sup>-3</sup>	1	19.3368x10 <sup>-3</sup>
6 894.76	68.9476x10 <sup>-3</sup>	0.145038x10 <sup>-3</sup>	51.7149	1

Table No. 1

1 torr = 1 mm HG à 0 °C

1 mm column of water = 9.81 Pa

### Pressure above atmospheric

kPa	bar	psi	kp/cm <sup>2</sup>
1,013	10.13	146.9	10.3
1,000	10	145	10.2
900	9	130.5	9.2
800	8	116	8.2
700	7	101.5	7.1
600	6	87	6.1
500	5	72.5	5.1
400	4	58	4.1
300	3	43.5	3.1
200	2	29	2
100	1	14.5	1
0	0	0	0

Table No. 2

### Pressure below atmospheric

	kPa	mbar	torr	-kpa	-mmHg	-inHg	% vacuum
Sea level	101.3	1,013	760	0	0	0	0
	90	900	675	10	75	3	10
	80	800	600	20	150	6	20
	70	700	525	30	225	9	30
	60	600	450	40	300	12	40
	50	500	375	50	375	15	50
	40	400	300	60	450	18	60
	30	300	225	70	525	21	70
	20	200	150	80	600	24	80
	10	100	75	90	675	27	90
Absolute vacuum	0	0	0	101.3	760	30	100

Table No. 3

## Change in atmospheric pressure in relation to altitude (height above sea level)

A vacuum gauge is normally calibrated with normal atmospheric pressure at sea level as a reference, 1013.25 mbar, and is influenced by the surrounding atmospheric pressure in accordance with the table below. The vacuum gauge shows the differential pressure between atmospheric pressure and absolute pressure. This means that the gauge shows what vacuum level is available at different heights.

### Atmospheric pressure

mmHg	Barometric pressure		The reading on the vacuum gauge at 1,013.25 mbar				
	mbar	Equivalent m above sea level *	60 -kPa	75 -kPa	85 -kPa	90 -kPa	99 -kPa
593	790.6	2,000	37.7	52.7	62.7	67.7	76.7
671	894.6	1,000	48.1	63.1	73.1	78.1	87.1
690	919.9	778	50.7	65.7	75.7	80.7	89.7
700	933.3	655	52.0	67.0	77.0	82.0	91.0
710	946.6	545	53.3	68.3	78.3	83.3	92.3
720	959.9	467	54.7	69.7	79.7	84.7	93.7
730	973.3	275	56.0	71.0	81.0	86.0	95.0
740	986.6	200	57.3	72.3	82.3	87.3	96.3
750	999.9	111	58.7	73.7	83.7	88.7	97.7
760	1,013.25	0	60.0	75.0	85.0	90.0	99.0

Table No. 4

\*) At normal barometric pressure.

### Flows

Flows, volume per unit of time. Quantity designations: Q, q, = V/t (volume/time).

SI Unit: cubic metres per second (m³/s).

Common multiple units: l/min, l/s, m³/h.

m³/s	m³/h	l/min	l/s	ft³/min (cfm) *
1	3,600	60,000	1,000	2,118.9
0.28x10 <sup>-3</sup>	1	16.6667	0.2778	0.5885
16.67x10 <sup>-6</sup>	0.06	1	0.0167	0.035
1x10 <sup>-3</sup>	3.6	60	1	2.1189
0.472x10 <sup>-3</sup>	1.6992	28.32	0.4720	1

Table No. 5

\*) 1 ft » 0.305 m

### Leakage flows

The table below shows the leakage flow at different levels and through an opening of 1 mm<sup>2</sup>.

Vacuum level -kPa	Leakage flow l/s and mm <sup>2</sup>
10	0.11
20	0.17
30	0.18
40	0.2 *

Table No. 6

\*) From about 47 to 100 -kPa the flow is constant.

### Pressure drop in compressed air hoses

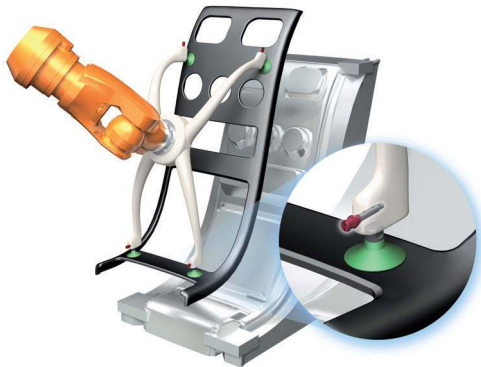
When installing compressed air hoses it is important that the dimension (diameter) and length do not lead to excessive pressure drops. Piab vacuum pumps are supplied with recommended hose dimensions that will not cause excessive pressure drops at lengths below 2 m. In cases when the pressure drop has to be calculated, the formula below can be used.

$$\Delta P = \frac{1,6 \times 10^{12} \times qv^{1,85} \times L}{d^5 \times P1}$$

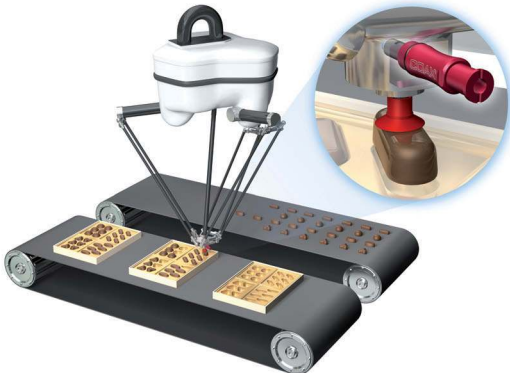
Δ P = Pressure drop in kPa  
 qv = Flow in m³/s  
 d = Inner diameter in mm  
 L = Length of compressed air hoses in m  
 P1 = The absolute starting pressure in kPa

$$\Delta d = \left( \frac{1,6 \times 10^{12} \times qv^{1,85} \times L}{\Delta P \times P1} \right)^{0,2}$$

Applications and solutions



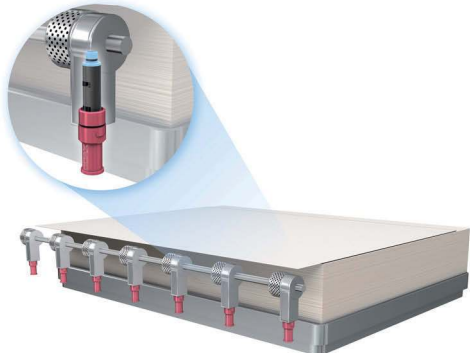
Injection moulding



Pick-and-place



Vacuum moulding tires

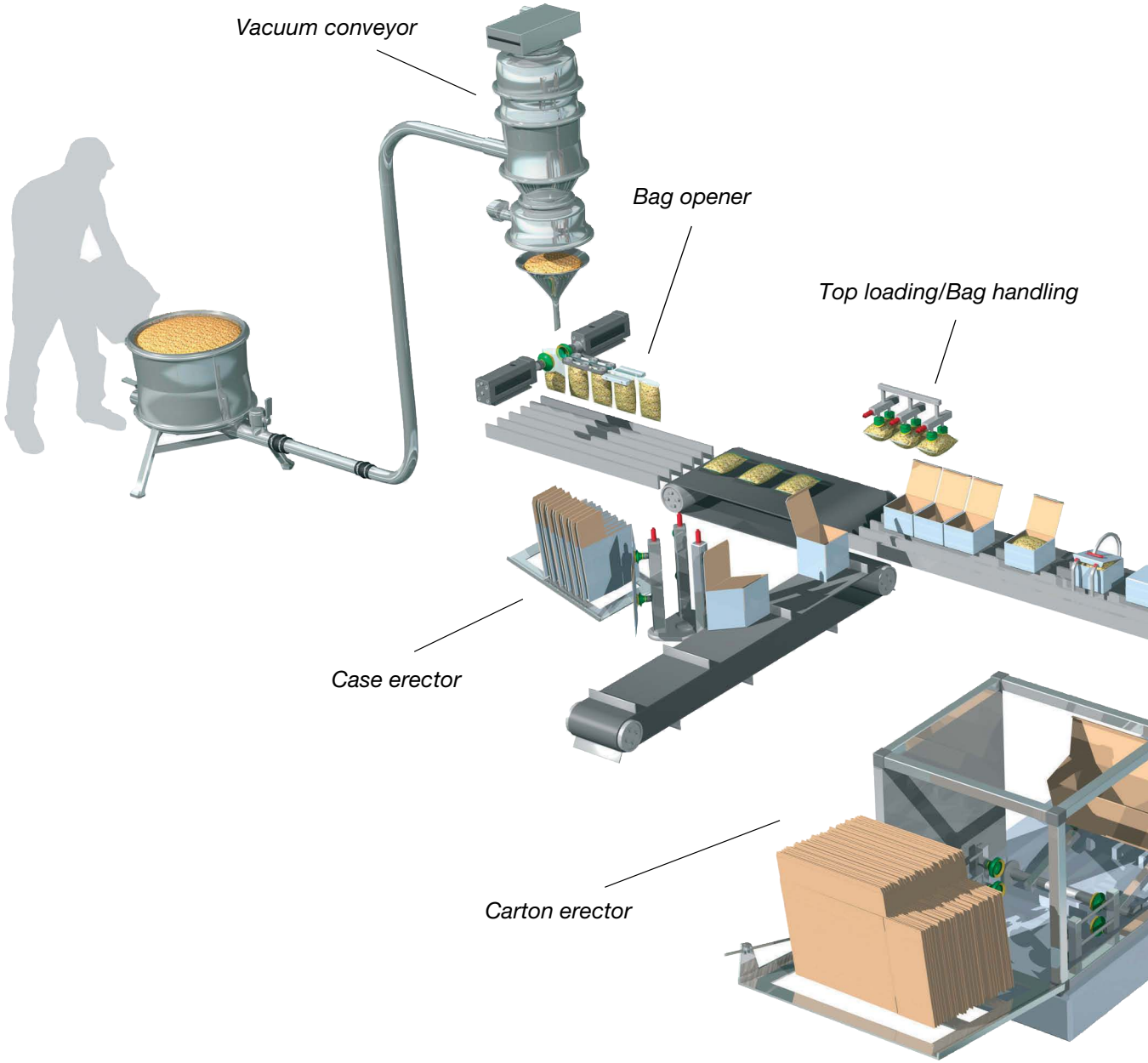


Sheet brake

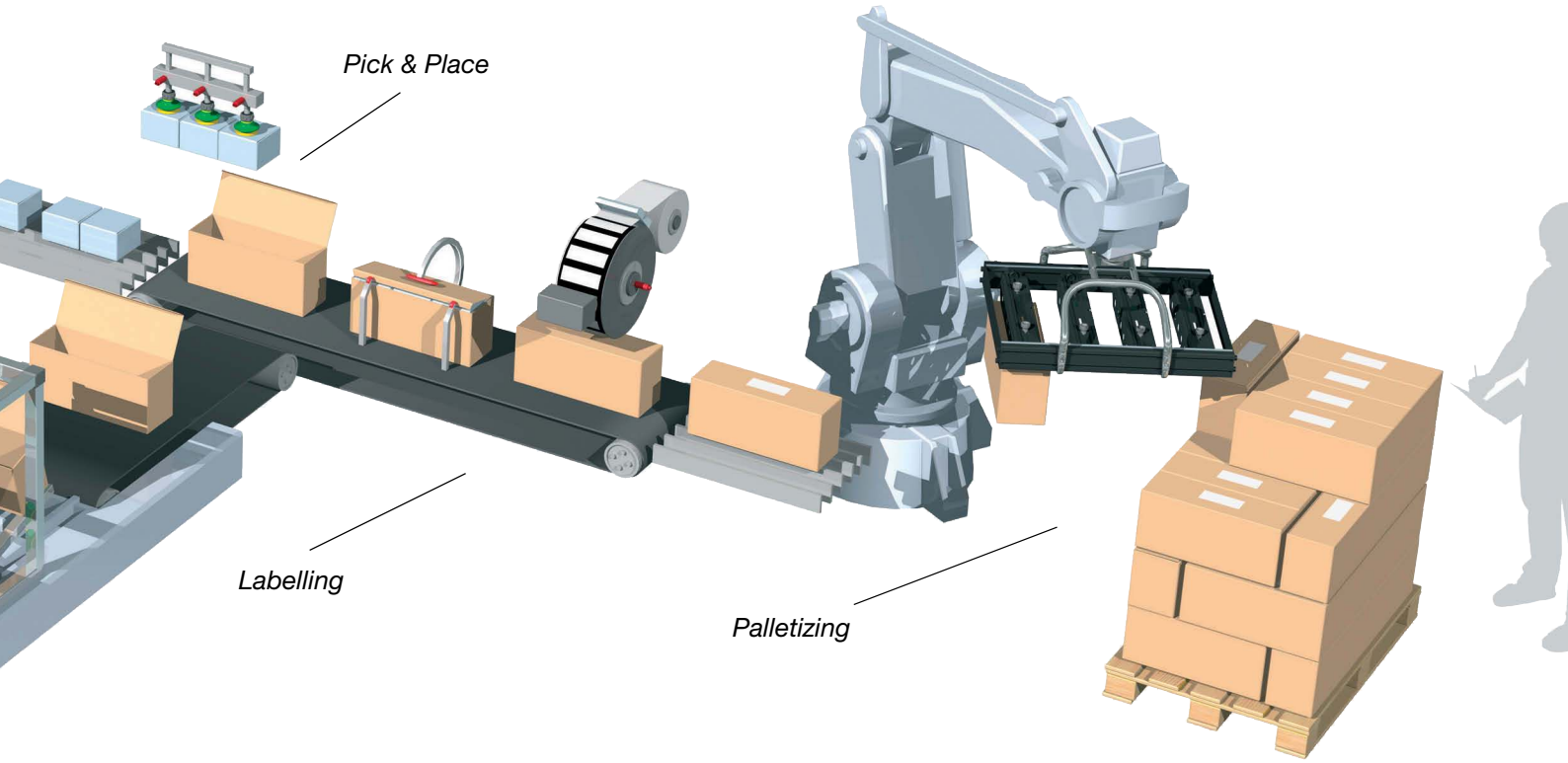


Press to press transfer

Applications and solutions










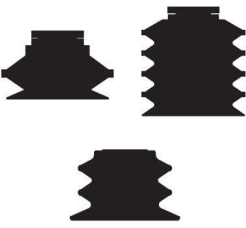


























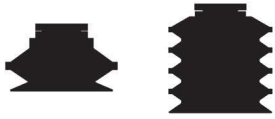
















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## Suction cup selection

Suction cup category		Features	Applications
	<p>piGRIP® Modular suction cups</p>	<ul style="list-style-type: none"> <li>▶ Unique modular suction cup concept with individually optimized lips and bellows for gripping, lifting and height compensation on almost any kind of object.</li> <li>▶ A large selection of fittings makes piGRIP® cups ready to fit new machines and easy to retrofit.</li> <li>▶ The material is 100% recyclable.</li> <li>▶ Available in FDA approved qualities; silicone (PWIS) free and mark free versions.</li> <li>▶ The combination of firm bellows and soft lips will allow for high machine speeds.</li> </ul>	<p>Smooth, textured, uneven and also very rough surfaces on objects such as plastic pieces, wood, sheet metal (dry), glass, corrugated cardboard, carton, food, tiles, etc.</p>
	<p>DURAFLEX® Single durometer</p>	<ul style="list-style-type: none"> <li>▶ Manufactured in a material that features the elasticity of rubber and wear resistance of polyurethane.</li> <li>▶ The material is silicone free and mark free.</li> <li>▶ Has an exceptional elastic memory.</li> <li>▶ The single durometer DURAFLEX® cups are extra wear resistant and long lasting.</li> </ul>	<p>Smooth surfaces on objects such as plastic pieces, furniture parts, sheet metal (dry), glass, solar panels, etc.</p>
	<p>DURAFLEX® Dual durometer</p>	<ul style="list-style-type: none"> <li>▶ Manufactured in a material that features the elasticity of rubber and wear resistance of polyurethane.</li> <li>▶ The material is silicone free and mark free.</li> <li>▶ Has an exceptional elastic memory.</li> <li>▶ The dual durometer DURAFLEX® cups have firm bellows or body and a soft pliable lip.</li> <li>▶ The suction cup is then stable, durable and flexible with excellent sealing properties.</li> </ul>	<p>Textured, uneven and also very rough surfaces on objects such as plastic pieces, wood, sheet metal (dry), glass, corrugated cardboard, carton, tiles, etc.</p>
	<p>DURAFLEX® Friction</p>	<ul style="list-style-type: none"> <li>▶ Manufactured in a material that features the elasticity of rubber and wear resistance of polyurethane.</li> <li>▶ The material is silicone free and mark free.</li> <li>▶ Has an exceptional elastic memory.</li> <li>▶ Have an exceptional grip/shear force on oily surfaces.</li> <li>▶ Wear on the cups will not degrade the shear/grip performance, it will improve.</li> <li>▶ These cups are outstanding for handling oily metal sheets with high speed and accelerations.</li> </ul>	<p>Oily metal sheets and other lubricated surfaces.</p>
	<p>DURAFLEX® Bag</p>	<ul style="list-style-type: none"> <li>▶ Manufactured in a material that features the elasticity of rubber and wear resistance of polyurethane.</li> <li>▶ The material is silicone free and mark free.</li> <li>▶ Has an exceptional elastic memory.</li> <li>▶ Specially designed for plastic bag handling.</li> <li>▶ The unique suction cup fitting allows the high initial flow needed for a secure grip.</li> <li>▶ The dual-hardness suction cup with soft lip and firm bellows offers better sealing capabilities.</li> <li>▶ Stable and secure handling.</li> </ul>	<p>Plastic bag handling.</p>

Model/Size range (mm)							
25-77 (B, BL, BX) 		25-77 (F, FC) 					
10-110 (B, BX) 		80-110 (BF) 	20-150 (F, FC) 		20 (U) 	20x60-65x170 (OB, OBL) 	10x30-70x175 (OC, OF) 
10-110 (B, BX) 		80-110 (BF) 	75-110 (F) 		35x90-65x170 (OB) 		
40-110 (BFF) 		35-125 (FCF) 	35x90-65x170 (OBF) 		20x80-40x110 (OCF) 		
30-50 (BL) 							

Suction cup category		Features	Applications
	Silicone	<ul style="list-style-type: none"> <li>▶ Durable and food grade silicone material (FDA approved).</li> <li>▶ Soft and pliable.</li> <li>▶ Possible to get a good grip on non-smooth surfaces, e.g. food parts.</li> <li>▶ Wide temperature range.</li> <li>▶ Available from very small sizes.</li> <li>▶ Options with detectable silicone material and conductive/anti-static silicone.</li> </ul>	Contact with food or FDA environments, packages, pre-coloured plastic parts (high temperature) , bakery (detectable), electronics/ semiconductor (conductive/anti-static).
	Silicone Bag	<ul style="list-style-type: none"> <li>▶ Durable and food grade silicone material (FDA approved).</li> <li>▶ Soft and pliable.</li> <li>▶ Tailor-made for handling different types of bags and pouches with varying content.</li> <li>▶ The design is optimized for uneven, wrinkled bags and pouches.</li> <li>▶ It will minimize the “surface leakage” and maximize the grip.</li> <li>▶ The unique fitting allows the high initial flow needed for a secure grip.</li> </ul>	Bags with fragile contents and food, bags with liquids, viscous contents and frozen food, “easy” bags, open bags.
	Nitrile-PVC and CR	<ul style="list-style-type: none"> <li>▶ Oil, petrol and ozone resistant material.</li> <li>▶ Larger sizes are made of Nitrile-PVC and smaller sizes of CR (Chloroprene).</li> </ul>	Conventional suction cup material for general purposes.
	TPU	<ul style="list-style-type: none"> <li>▶ Probably the most mark-free suction cups on the market! (Almost all suction cups will leave detectable marks or traces on a “micro” level, some washable, others not. Tests have proven that these TPU cups are the best options when marks are not allowed.)</li> </ul>	Solar panels, glass, displays, screens.
	HNBR	<ul style="list-style-type: none"> <li>▶ High temperature applications where silicone or other paint-wetting impairment substances (PWIS) are not allowed.</li> <li>▶ Made of HNBR.</li> <li>▶ Very durable and wear resistant.</li> </ul>	Removing hot plastic parts from injection molding equipment, glass handling.
	PUR and EPDM	<ul style="list-style-type: none"> <li>▶ High quality cups made from machined aluminum plates with Polyurethane or EPDM foam rubber lips.</li> <li>▶ Wear resistant and strong PUR cups.</li> </ul>	<p>PUR is optimal for large heavy objects with flat surfaces.</p> <p>EPDM foam rubber is suitable for uneven and coarse surfaces. Loading and unloading of large and heavy steel sheets, blocks of stone, concrete or textured plates. Parts that can be found in the sheet metal, construction, train/railway industries as well as other heavy industries.</p>

Model/Size range (mm)				
5-150 (B, BBL) 	15-150 (F) 	15-50 (D) 	2-50 (U) 	
20-50 (BL) 	15 (U) 			
5-150 (B, BL) 	15-150 (F) 	15-50 (D) 	4-50 (U) 	60x140 (OC) 
15-50 (B) 	15-50 (F) 			
20-110 (B) 	50-110 (F) 			
35-300 (F) 	20x100-40x200 (OF) 			

## Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
Conductive silicone, CSIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Thermoelastic polyurethane, TPU	Excellent	Excellent	Excellent	Poor	Poor	Poor	Good	Good
Polyurethane, PUR	Excellent	Excellent	Excellent	Poor	Fair	Poor	Fair	Good
Ethylene propylene, EPDM	Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent
Nitrile, NBR	Excellent	Excellent	Fair	Good	Good	Fair	Good	Good
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Polyurethane, PU	Excellent	Excellent	Excellent	Fair*	Fair	Fair*	Fair	Poor	Poor

\*Please contact Piab.

Material	FDA approved	PWIS free	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Acids	Ethanol	Methanol oxidation
TPE (piGRIP® Support)	No	Yes	Excellent	Excellent	Excellent	Fair	Poor	Poor	Good	Good
TPE (piGRIP® Lip)	Yes	No	Fair	Poor	Excellent	Poor	Poor	Poor	Excellent	Good

## Examples of applications

	Chloroprene	Silicone	Conductive silicone	Nitrile-PVC	Nitrile	Polyurethane			Ethylene propylene	HNBR	Thermo Plastic Elastomers
	CR	SIL	CSIL	NPV	NBR	PU	PUR	TPU	EPDM	HNBR	TPE
Food-stuff		x									x
Oily objects	x			x	x	x	x	x		x	
Mark free requirements						x	x	x			
High temperature environments		x	x							x	
Low temperature environments	x	x	x							x	
Rough/uneven surfaces									x		
Electrical components			x						x		
Sensitivity to static electricity			x								



## piGRIP® – Thousands of suction cups ready to improve your machine

A unique modular suction cup concept with individually optimized parts for gripping, lifting and height compensation.

### FITTING & FLOW RESTRICTORS

A large selection of fittings makes piGRIP® cups ready to fit new machines and easy to retrofit existing cups. Available are both threaded and push on fittings. In applications with a centralized vacuum pump, flow restrictors reduce vacuum flow and maintain vacuum when handling non-leaking objects.

### BELLOWS

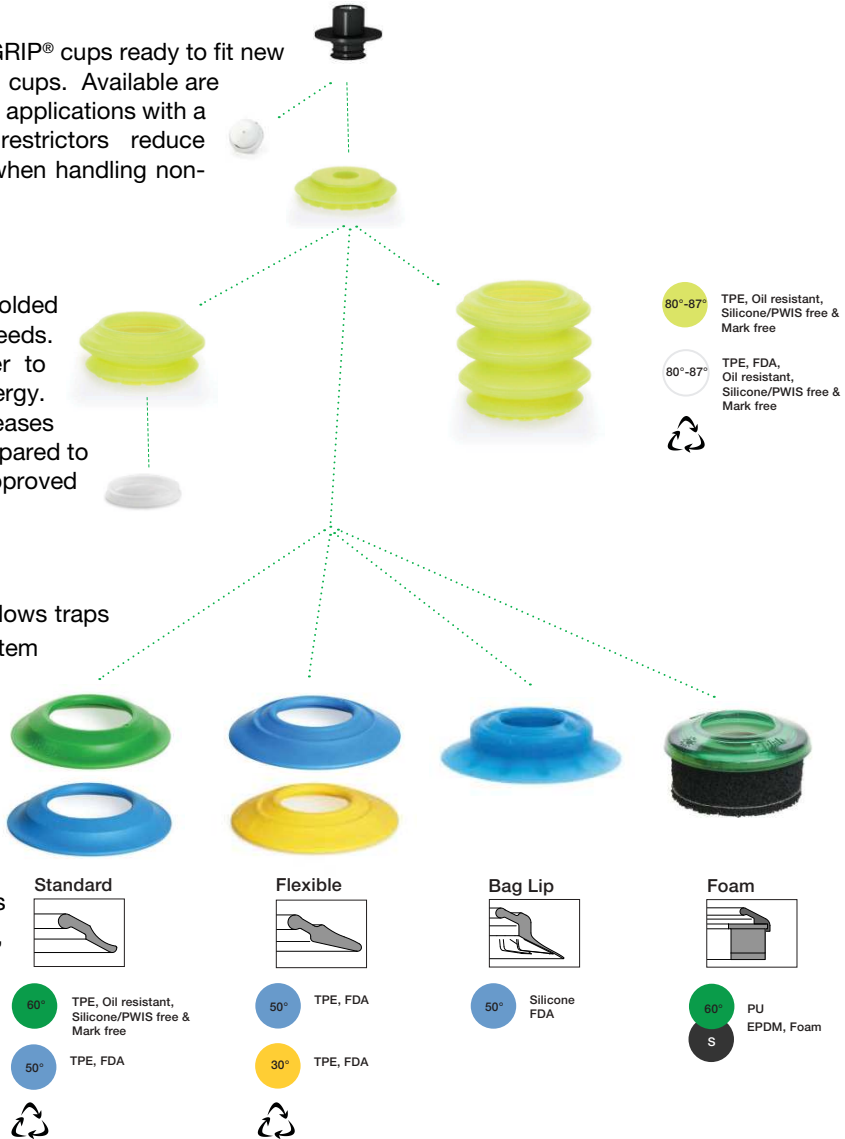
Firm and Stable 1-, 3- and 6- folded bellows allows for faster machine speeds. Thin-wall design makes them faster to compress using less force and energy. The strength of the material increases lifting capacity between 30-50% compared to similar conventional cups. FDA-approved material available (transparent).

### FILTERS




A low micron filter disc inside the bellows traps dust and particles increasing system reliability. A mesh filter is available in the fitting.

### LIPS

Get an excellent grip on almost anything with the right lip for your application. Choose standard lips from 60° shore to extremely flexible, soft lips in 30° shore. Tailor-made Bag lips for handling bags and pouches. Even foam lips for objects which are difficult to grip with traditional cups.



## piGRIP® Configurable products

<b>Product Group</b>  <b>piGRIP®</b>  <b>Code</b> G								
	<b>Dimension &amp; Type</b>		<b>Lip</b>		<b>Bellows or Flat Cup</b>		<b>Support</b>	
	<b>Code</b> S25 S35 S50 S70 FX28 FX39 FX55 FX77 FLI25 FLI35 FLI50 FLI70 BG34 BG48 BG63	<b>Description</b> Ø 25 mm Standard lip Ø 35 mm Standard lip Ø 50 mm Standard lip Ø 70 mm Standard lip Ø 28 mm Flexible lip Ø 39 mm Flexible lip Ø 55 mm Flexible lip Ø 77 mm Flexible lip Ø 25 mm Foam lip Ø 35 mm Foam lip Ø 50 mm Foam lip Ø 70 mm Foam lip Ø 34 mm Bag lip Ø 48 mm Bag lip Ø 63 mm Bag lip	<b>Code</b> T60 T50  T50 T30  S  S50	<b>Description</b> TPE 60° Shore A TPE 50° Shore A  TPE 50° Shore A TPE 30° Shore A  Foam EDPM (soft)  Silicone 50° Shore A	<b>Code</b> B1 B3 B6 F	<b>Description</b> 1 Bellows 3 Bellows 6 Bellows (3+3) Flat	<b>Code</b> S1	<b>Description</b> Support

Lips are available as spare parts.

**G . S50T60 . B3 . S1 .**



Code	Type Description	Fitting		Code	Style Description
		Code	Size Description		
G NT	G-Thread NPT-Thread	18	1/8"	M	Male
		14	1/4"		
		38	3/8"		
		12	1/2"		
GL NTL	G-Thread low NPT-Thread low	18	1/8"	M	Male
		14	1/4"		
		38	3/8"		
NS G*	NPSF-Thread G-Thread	18*	1/8"	F	Female
		14	1/4"		
		38	3/8"		
		12	1/2"		
		518*	5x1/8"		
NT	NPT-Thread	14	1/4"	F	Female
		38	3/8"		
M	M-Thread	M6	M6	M	Male
		MF8	M8x1		
		M10	M10		
		MF14	M14x1		
		MF16	M16x1.5		
M	M-Thread	M5	M5	F	Female
		M6	M6		
		M8	M8		
		M10	M10		
		M12	M12		
		MF16	M16x1.5		
U	UNC-Thread	12	1/2"	F	Female
X	No type	X	No size	X	No style

Push-on fitting sold separately.



Code	Description
00	No filter
01	Filter mesh
02	Filter disc (only bellows cup)
03	Flow restrictor Ø 0.7
04	Flow restrictor Ø 1.0
05	Flow restrictor Ø 1.3
06	Flow restrictor Ø 0.7 and filter disc
07	Flow restrictor Ø 1.0 and filter disc
08	Flow restrictor Ø 1.3 and filter disc



FDA approved option  
incl. material certificate

Code	Description
FDA	No* US Food and Drug Administration

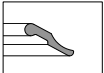
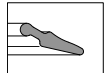
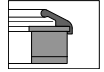

\*) Leave blank for no certificate.

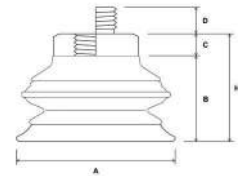
**G38M . 01 . ( )**

- Option
- Fitting
- Support
- Bellows
- Lip



## Suction cup dimensions, mm

Lip type & size	Dim. A	Dim. B.				
		F (Flat)	B-1 (1 Bellows)	B-3 (3 Bellows)	B-6 (3+3 Bellows)	
	S25	25	10.9	18.7	29.8	48.7
	S35	35	12.4	23.3	38.8	65.2
	S50	50	14.7	30.3	52.4	90.1
	S70	70	17.8	39.6	70.6	123.4
	FX28	28	11.4	19.2	30.3	49.2
	FX39	38	13.1	24.0	39.5	65.9
	FX55	55	15.7	31.3	53.4	91.1
	FX77	77	19.2	41	72	124.8
	FLI25	25	17.5	25.3	36.4	55.3
	FLI35	35	21.5	32.4	47.9	74.3
	FLI50	50	32.1	47.7	69.8	107.5
	FLI70	70	34.1	55.9	86.9	139.7
	BG34	34	15.5	23.3	34.4	53.3
	BG48	48	18.4	29.3	44.8	71.2
	BG63	63	21.3	36.9	59	96.7



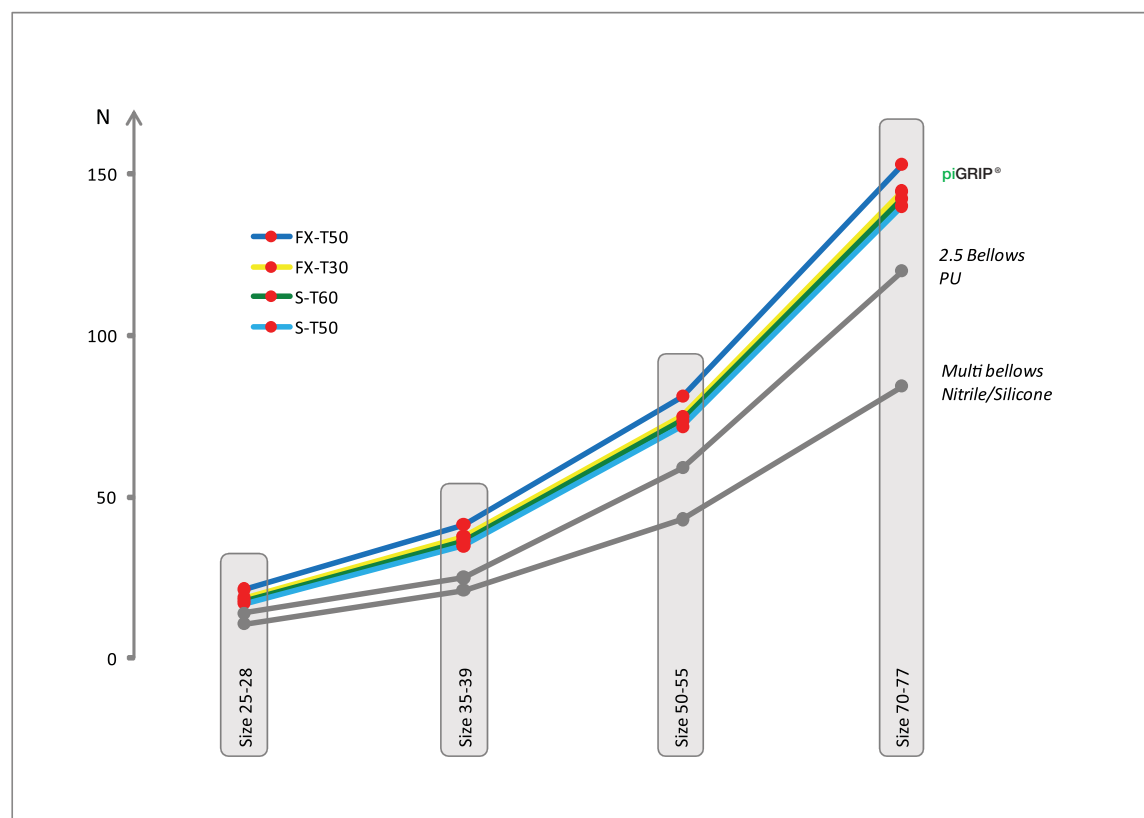
**Build height:**

$$B + C = H$$

$$18.7 + 5 = 23.7 \text{ mm}$$

## piGRIP® Material Data

Up to 50% improved lifting force with piGRIP®. Use fewer cups or smaller sizes.



Proven function and lifting capacity within specified area of operation.  
See suction cup selection guide on [www.piab.com](http://www.piab.com) for specified performance data.











## Material Specifications

Material	Hardness Shore A °	Item(s)	Colour	Temp. range ° C	Special qualities
TPE	80-87	Support S1	Lime/Transparent	-20 – 80 / 120*	FDA**, silicone/PWIS free, mark free, oil resistant
TPE	87	Bellows	Lime/Transparent	-20 – 80 / 120*	FDA**, silicone/PWIS free, mark free, oil resistant
TPE	60	Standard Lip (S) T60	Green	-20 – 80 / 120*	Silicone/PWIS free, mark free, oil resistant
TPE	50	Standard Lip (S) T50	Blue	-40 – 80 / 120*	FDA
TPE	50	Flexible Lip (FX) T50	Blue	-40 – 80 / 120*	FDA
TPE	30	Flexible Lip (FX) T30	Yellow	-40 – 80 / 100*	FDA
EPDM	-	Foam Lip (FLI)	Black	-40 – 120	Ultra soft cellular rubber
PU	60	Foam Lip holder	Green	10 – 50	

\*) Max Temperature short term contact, <10 sec and 50% intermittence, ambient temperature 15-30 °C, mechanical properties will start to degrade.

\*\*\*) FDA approved option in transparent material.

## Fitting dimensions, mm

Type	Code	Dim. C	Dim. D	Description	Recommended fitting size for best performance*			
					S25 FX28 FLI25	S35 FX39 FLI35	S50 FX55 FLI50	S70 FX77 FLI70
	G18M	5	6	Fitting G1/8" male	x	x	x	
	G14M	6	9	Fitting G1/4" male	x	x	x	x
	G38M	6	10	Fitting G3/8" male		x	x	x
	G12M	6	10	Fitting G1/2" male			x	x
	GL18M	1.5	6	Fitting G1/8" low male	x	x	x	
	GL14M	1.5	9	Fitting G1/4" low male	x	x	x	x
	GL38M	1.5	10	Fitting G3/8" low male		x	x	x
	NT18M	5	7	Fitting 1/8" NPT male	x	x	x	
	NT14M	6	11	Fitting 1/4" NPT male	x	x	x	x
	NT38M	6	11.5	Fitting 3/8" NPT male		x	x	x
	NT12M	6	15	Fitting 1/2" NPT male			x	x
	NTL18M	1.5	7	Fitting 1/8" NPT low male	x	x	x	
	NTL14M	1.5	11	Fitting 1/4" NPT low male	x	x	x	x
	NTL38M	1.5	11.5	Fitting 3/8" NPT low male		x	x	x
	MM6M	5	6	Fitting M6 male	x	x		
	MMF8M	5	6	Fitting M8 x 1 male	x	x	x	
	MM10M	6	10	Fitting M10 male	x	x	x	
	MMF14M	6	12	Fitting M14 x 1 male	x	x	x	x
	MMF16M	6	12	Fitting M16 x 1.5 male		x	x	x
	G14F	10	-	Fitting G1/4" fem	x	x	x	
	G38F	13	-	Fitting G3/8" fem		x	x	x
	G12F	14	-	Fitting G1/2" fem			x	x
	NS18F**	7	-	Fitting 1/8" NPSF fem	x	x	x	
	NS14F	10	-	Fitting 1/4" NPSF fem	x	x	x	x
	NS38F	13	-	Fitting 3/8" NPSF fem		x	x	x
	NS12F	14	-	Fitting 1/2" NPSF fem			x	x
	NS518F**	18	-	Fitting 5x1/8" NPSF fem	x	x	x	
		NT14F	12	-	Fitting 1/4" NPT fem	x	x	x
NT38F		13	-	Fitting 3/8" NPT fem		x	x	x
	U12F	12	-	Fitting 1/2" UNC fem			x	x
		MM5F	6	-	Fitting M5 fem	x	x	
MM6F		6	-	Fitting M6 fem	x	x		
MM8F		7	-	Fitting M8 fem	x	x	x	
MM10F		7	-	Fitting M10 fem	x	x	x	
MM12F		12	-	Fitting M12 fem	x	x	x	
MMF16F		13	-	Fitting M16 x 1.5 fem		x	x	x

\*) No flow restriction or excessive volume to evacuate, which will deteriorate the performance of the vacuum system.

\*\*) Fitting code G18F and G518F are automatically changed to NS18F and NS518F due to identical threads.

Go to suction cup selection guide on [www.piab.com](http://www.piab.com) to configure your suction cup.

## B75P



### Suction cup with short bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material of the DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	61	149	202	44	96	114	110	90	20	48
PU60°	83	196	255	121	229	298	110	90	20	72

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

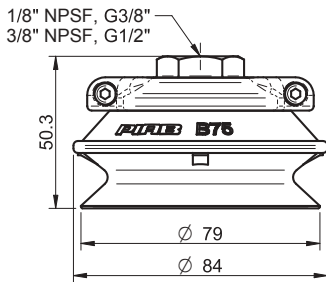
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

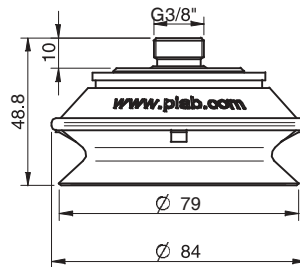
\*\*Please contact Piab.

## Ordering information

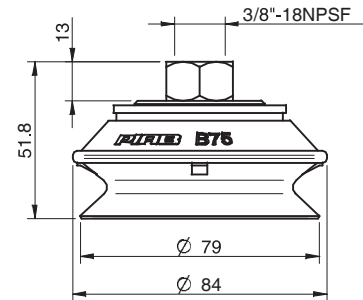
	Complete suction cups	Art. No
A	Suction cup B75P Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0106345
A	Suction cup B75P Polyurethane 30/60, G3/8" female, with mesh filter	0106346
A	Suction cup B75P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106347
A	Suction cup B75P Polyurethane 30/60, G1/2" female, with mesh filter	0106348
A	Suction cup B75P Polyurethane 60, 1/8" NPSF female, with mesh filter	0111600
A	Suction cup B75P Polyurethane 60, G3/8" female, with mesh filter	0111601
A	Suction cup B75P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111602
A	Suction cup B75P Polyurethane 60, G1/2" female, with mesh filter	0111603
B	Suction cup B75P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0106833
B	Suction cup B75P Polyurethane 60, thread insert G3/8" male with mesh filter	0107319
C	Suction cup B75P Polyurethane 30/60, 3/8" NPSF female	0108790
C	Suction cup B75P Polyurethane 60, 3/8" NPSF female	0108791



A

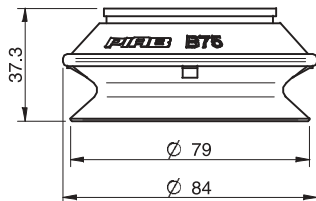


B

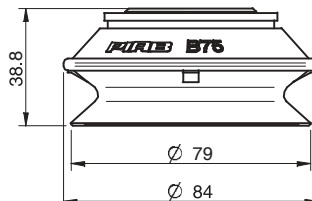


C

	Rubber parts	Art. No
A	Suction cup B75P Polyurethane 30/60	0104723
A	Suction cup B75P Polyurethane 60	0111594
B	Suction cup B75P Polyurethane 30/60, for thread insert	0106832
B	Suction cup B75P Polyurethane 60, for thread insert	0107318



A



B

	Fittings	Art. No.
	Fitting 75, 1/8" NPSF female, with mesh filter	0100548
	Fitting 75, G3/8" female, with mesh filter	0100551
	Fitting 75, 3/8" NPSF female, with mesh filter	0100553
	Fitting 75, G1/2" female, with mesh filter	0100555
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## BF80P



### Suction cup with short bellows

- ▶ Suitable for uneven surfaces.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material of the DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/50°	73	157	196	54	88	117	40	132	15	53
PU60°	98	225	294	68	127	166	40	132	15	53

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10-50
Polyurethane, PU50	Blue transparent	50	10-50
Polyurethane, PU60	Green transparent	60	10-50

### Material resistance

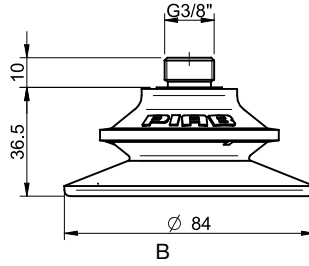
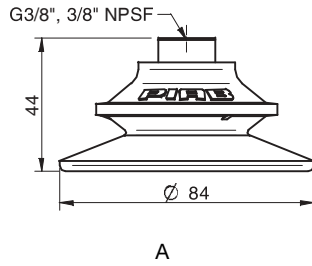
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.



## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BF80P Polyurethane 30/50, G3/8" female	0102370
A	Suction cup BF80P Polyurethane 30/50, 3/8" NPSF female	0102371
A	Suction cup BF80P Polyurethane 60, G3/8" female	0103307
A	Suction cup BF80P Polyurethane 60, 3/8" NPSF female	0103309
B	Suction cup BF80P Polyurethane 30/50, G3/8" male with mesh filter	0107326
B	Suction cup BF80P Polyurethane 60, G3/8" male with mesh filter	0107327
B	Suction cup BF80P Polyurethane 30/50, G3/8" male	0106985
B	Suction cup BF80P Polyurethane 60, G3/8" male	0107476



## BF110P



### Suction cup with short bellows

- ▶ Suitable for uneven surfaces.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material of the DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	128	229	225	106	210	246	110	55	24	110
PU60°	161	334	293	123	231	305	110	70	24	110

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

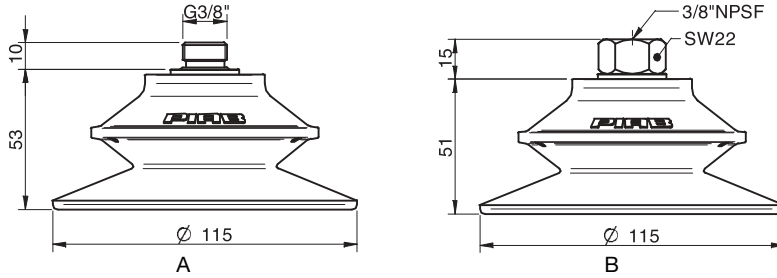
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

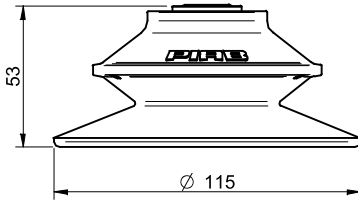
\*\*Please contact Piab.

## Ordering information

Complete suction cups		Art. No.
A	Suction cup BF110P Polyurethane 30/60, thread insert G3/8" male with mesh filter	0110290
B	Suction cup BF110P Polyurethane 30/60, 3/8" NPSF female	0110291
A	Suction cup BF110P Polyurethane 60, thread insert G3/8" male with mesh filter	0110287
B	Suction cup BF110P Polyurethane 60, 3/8" NPSF female	0110288



Rubber parts		Art. No.
Suction cup BF110P Polyurethane 30/60 with O-ring		0110289
Suction cup BF110P Polyurethane 60, with O-ring		0110286



Fittings		Art. No.
Thread insert G3/8" male, with O-ring and mesh filter		0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## BX10P



- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	1	2.3	3.7	—	—	—	0.56	4.0	4.5	1
PU60°	1	2.3	3.7	—	—	—	0.56	6.0	4.5	1

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

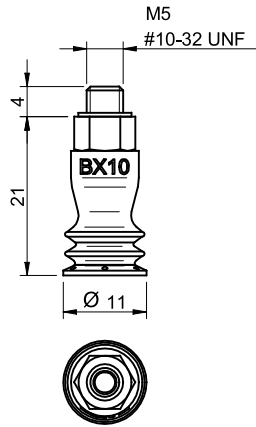
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

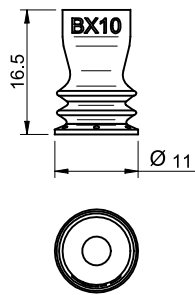
\*\*Please contact Piab.

## Ordering information

Description	Art. No.
Suction cup BX10P Polyurethane 30/60, M5 male	0122869
Suction cup BX10P Polyurethane 60, M5 male	0122967



Rubber parts	Art. No.
Suction cup BX10P Polyurethane 30/60	0118329
Suction cup BX10P Polyurethane 60	0122966



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

## BX15P



- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	2.0	4.0	4.5	—	—	—	0.92	5.5	5.5	1.15
PU60°	2.0	6.0	6.0	—	—	—	0.92	6.0	5.5	1.14

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

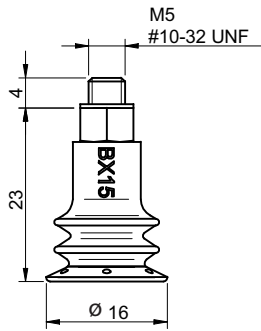
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

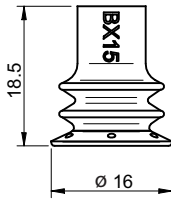
\*\*Please contact Piab.

## Ordering information

Complete suction cups	Art. No.
Suction Cup BX15P Polyurethane 30/60, M5 male	0124344
Suction Cup BX15P Polyurethane 60, M5 male	0124345



Rubber parts	Art. No.
Suction cup BX15P Polyurethane 30/60	0118505
Suction cup BX15P Polyurethane 60	0124237



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

## BX20P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	4.8	7.0	11.0	—	—	—	1.16	8.5	6.5	1.43
PU60°	4.5	7.0	9.5	—	—	—	1.16	10.0	6.5	1.43

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

### Material resistance

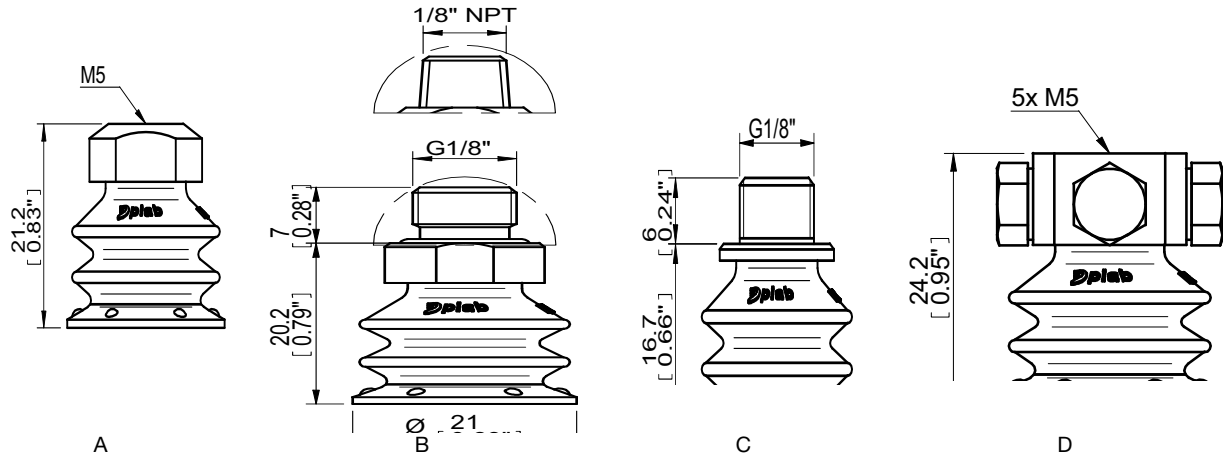
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

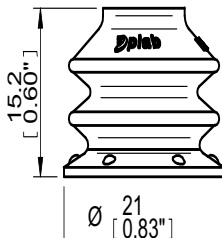


## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BX20P Polyurethane 30/60, M5 female	0125104
B	Suction cup BX20P Polyurethane 30/60, G1/8" male	0125108
C	Suction cup BX20P Polyurethane 30/60, G1/8" male / M5 female	0125105
C	Suction cup BX20P Polyurethane 30/60, G1/8" male / M5 female, with dual flow control valve	0125106
D	Suction cup BX20P Polyurethane 30/60, 5xM5 female	0125107
A	Suction cup BX20P Polyurethane 60, M5 female	0125109
B	Suction cup BX20P Polyurethane 60, G1/8" male	0125112
C	Suction cup BX20P Polyurethane 60, G1/8" male / M5 female	0125110
D	Suction cup BX20P Polyurethane 60, 5xM5 female	0125111



	Rubber parts	Art. No.
	Suction cup BX20P Polyurethane 30/60	0118507
	Suction cup BX20P Polyurethane 60	0124249



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting G1/8" male, with mesh filter	3250085
	Fitting 1/8" NPT male, with mesh filter	3250088
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## BX25P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	8.0	13.0	18.0	5.0*	10.0*	12.0*	3.0	6.0	8.5	3
PU60°	9.0	14.0	18.0	7.0*	11.0*	15.0*	3.0	8.0	8.5	3

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

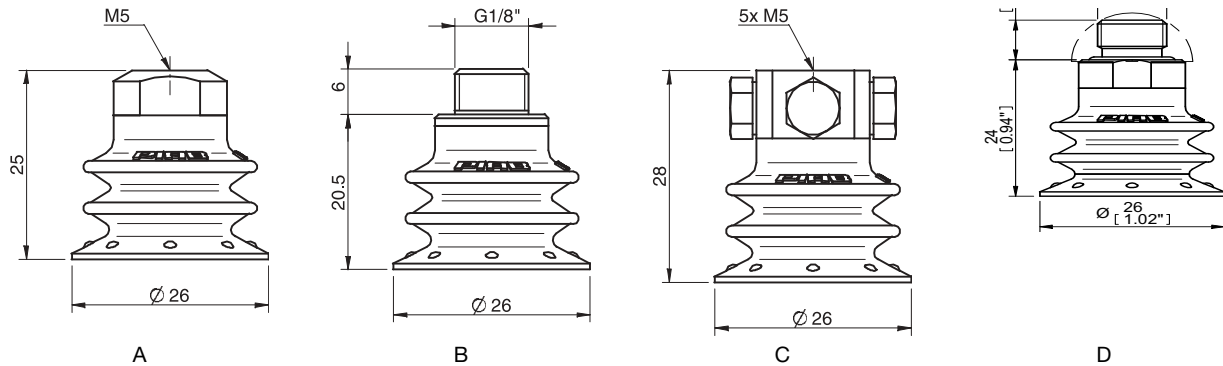
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

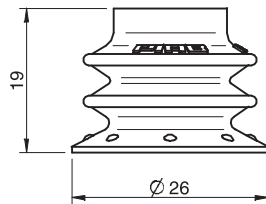
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BX25P Polyurethane 30/60 with filter, M5 female	0109404
B	Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male / M5 female	0109402
B	Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male / M5 female, with dual flow control valve	0109403
C	Suction cup BX25P Polyurethane 30/60 with filter, 5xM5 female	0109405
D	Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male	0114131
A	Suction cup BX25P Polyurethane 60 with filter, M5 female	0109400
B	Suction cup BX25P Polyurethane 60 with filter, G1/8" male / M5 female	0109398
C	Suction cup BX25P Polyurethane 60 with filter, 5xM5 female	0109401
D	Suction cup BX25P Polyurethane 60 with filter, G1/8" male	0114149



	Rubber parts	Art. No.
	Suction cup BX25P Polyurethane 30/60	0109006
	Suction cup BX25P Polyurethane 30/60, with filter	0109312
	Suction cup BX25P Polyurethane 60	0108240
	Suction cup BX25P Polyurethane 60, with filter	0109397



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male/M5 female	3250004
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for BX25P	Polyester/TPE	-40-90	0109311

## BX35P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	12.0	20.0	28	14.0*	27*	34*	10.0	10.0	14.0	8.0
PU60°	15.0	25	30	22.0*	30*	36*	10.0	10.0	14.0	8.0

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

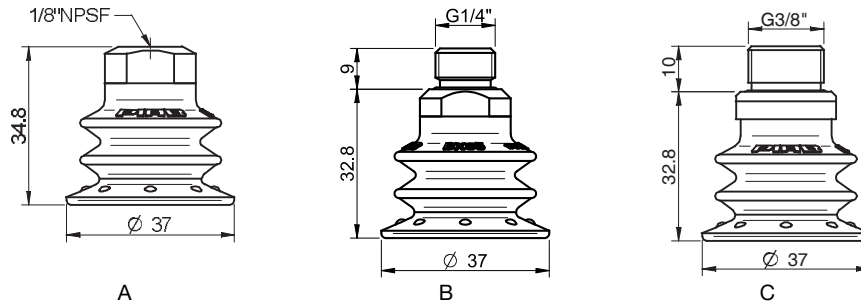
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

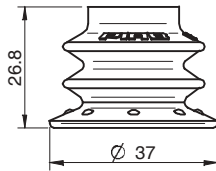
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BX35P Polyurethane 30/60 with filter, 1/8" NPSF female	0106604
A	Suction cup BX35P Polyurethane 30/60 with filter, 1/8" NPSF female, with dual flow control valve	0106605
B	Suction cup BX35P Polyurethane 30/60 with filter, G1/4" male, with mesh filter	0114449
C	Suction cup BX35P Polyurethane 30/60 with filter, G3/8" male, with mesh filter	0107377
C	Suction cup BX35P Polyurethane 30/60 filter, G3/8" male, mesh filter, dual flow control valve	0107378
A	Suction cup BX35P Polyurethane 60 with filter, 1/8" NPSF female	0107561
A	Suction cup BX35P Polyurethane 60 with filter, 1/8" NPSF female, with dual flow control valve	0107562
C	Suction cup BX35P Polyurethane 60 with filter, G3/8" male, with mesh filter	0107379
C	Suction cup BX35P Polyurethane 60 with filter, G3/8" male, with mesh filter and dual flow control valve	0107380



	Rubber parts	Art. No.
	Suction cup BX35P Polyurethane 30/60, with filter	0106619
	Suction cup BX35P Polyurethane 60, with filter	0107376
	Suction cup BX35P, Polyurethane 30/60	0106292
	Suction cup BX35P, Polyurethane 60	0107477



	Fittings	Art. No.
	Fitting 1/8" NPSF female, 30-40	3250005
	Fitting 1/8" NPSF female, 30-40, with dual flow control valve	3251006
	Fitting G1/4" male, 30-40, with mesh filter	3250091
	Fitting G3/8" male, 30-40, with mesh filter	3250086
	Fitting G3/8" male, 30-40, with mesh and dual flow control valve	3251009

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for BX35P	Polyester/TPE	-40-90	0106373

## BX52P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	32	56	75	28*	44*	54*	30	32	19.0	24
PU60°	37	59	80	27*	49*	56*	30	32	19.0	24

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

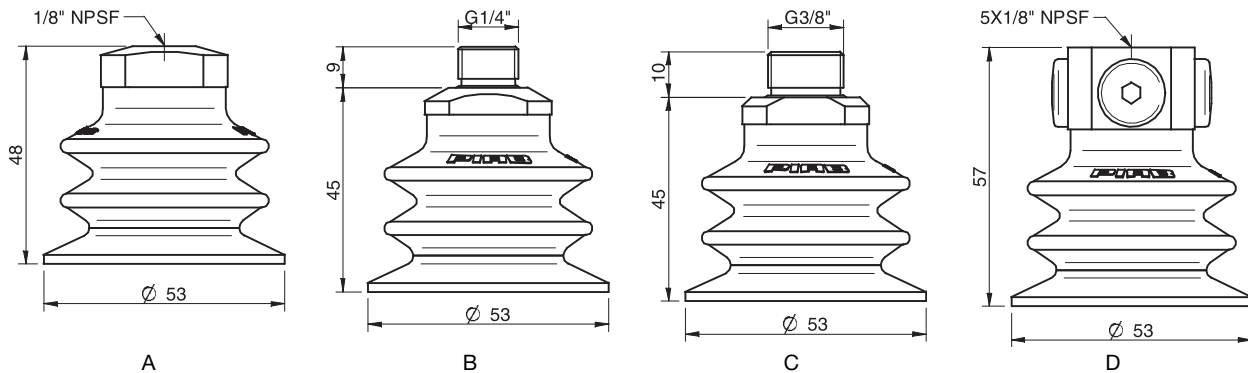
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

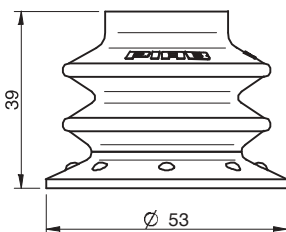
\*\*Please contact Piab.

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female	0104727
A	Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female, with mesh filter	0106044
A	Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female, with dual flow control valve	0106019
B	Suction cup BX52P Polyurethane 30/60 with filter, G1/4" male, with mesh filter	0106045
B	Suction cup BX52P Polyurethane 30/60 with filter, G1/4" male, with dual flow control valve	0106739
C	Suction cup BX52P Polyurethane 30/60 with filter, G3/8" male, with mesh filter	0106740
C	Suction cup BX52P Polyurethane 30/60 with filter, G3/8" male, with dual flow control valve	0106741
D	Suction cup BX52P Polyurethane 30/60 with filter, 5x1/8" NPSF female	0106046
D	Suction cup BX52P Polyurethane 30/60 with filter, 5x1/8" NPSF female, with dual flow control valve	0106742
A	Suction cup BX52P Polyurethane 60 with filter, 1/8" NPSF female	0107383
A	Suction cup BX52P Polyurethane 60 with filter, 1/8" NPSF female, with mesh filter	0107382
B	Suction cup BX52P Polyurethane 60 with filter, G1/4" male, with mesh filter	0107385
B	Suction cup BX52P Polyurethane 60 with filter, G1/4" male, with dual flow control valve	0107386
C	Suction cup BX52P Polyurethane 60 with filter, G3/8" male, with mesh filter	0107387
C	Suction cup BX52P Polyurethane 60 with filter, G3/8" male, with dual flow control valve	0107388
D	Suction cup BX52P Polyurethane 60 with filter, 5x1/8" NPSF female	0107389
D	Suction cup BX52P Polyurethane 60 with filter, 5x1/8" NPSF female, with dual flow control valve	0107390



Rubber parts	Art. No.
Suction cup BX52P Polyurethane 30/60, with filter	0104729
Suction cup BX52P Polyurethane 60, with filter	0108039
Suction cup BX52P Polyurethane 30/60	0104529
Suction cup BX52P Polyurethane 60	0107381



Fittings	Art. No
Fitting 1/8" NPSF female, 50	3250017
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for BX52P	Polyester/TPE	-40-90	0104726

## BX75P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	62	110	141	39*	83*	116*	80	23.0	26	71
PU60°	80	120	166	78*	114*	150*	80	23.0	26	71

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

### Material resistance

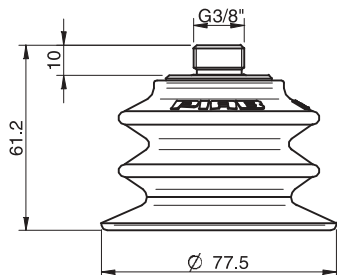
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

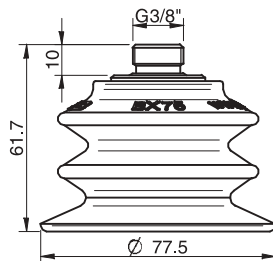


## Ordering information

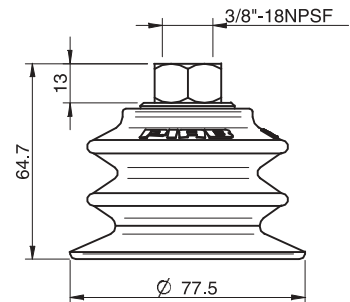
	Complete suction cups	Art. No.
A	Suction cup BX75P Polyurethane 30/60, G3/8" male / 1/8" NPSF female	0106293
A	Suction cup BX75P Polyurethane 30/60 with filter, G3/8" male / 1/8" NPSF female	0106606
B	Suction cup BX75P Polyurethane 30/60 with filter, thread insert G3/8" male	0107151
B	Suction cup BX75P Polyurethane 60 with filter, thread insert G3/8" male	0107149
C	Suction cup BX75P Polyurethane 30/60 with filter, 3/8" NPSF female	0108794
C	Suction cup BX75P Polyurethane 60 with filter, 3/8" NPSF female	0108795



A

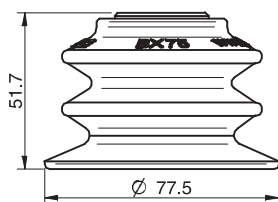


B



C

	Rubber parts	Art. No.
	Suction cup BX75P Polyurethane 30/60 with filter, for thread insert	0107145
	Suction cup BX75P Polyurethane 60 with filter, for thread insert	0107150



	Fittings	Art. No.
	Thread insert G3/8" male, with O-ring	0106797

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for BX75P	Polyester/TPE	-40-90	0106374

## BX110P



### Suction cup with 2½ bellows

- ▶ Suitable for level adjustment and for uneven and porous surfaces such as cardboard, etc.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.
- ▶ The material DURAFLEX® is mark free.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	158	306	346	83*	258*	260*	230	55	39	237
PU60°	181	426	424	158*	244*	293*	230	55	39	237

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

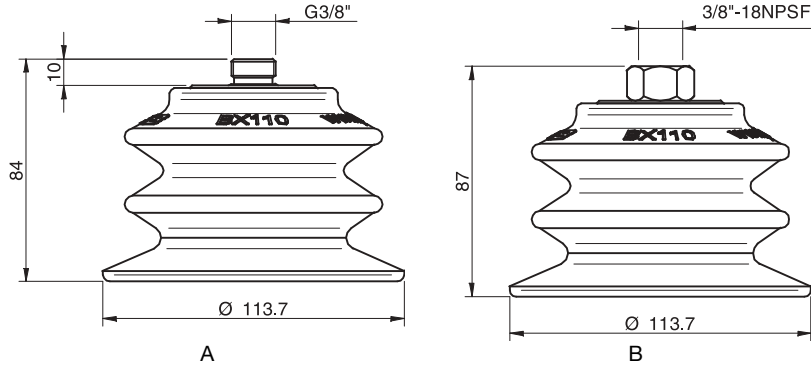
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

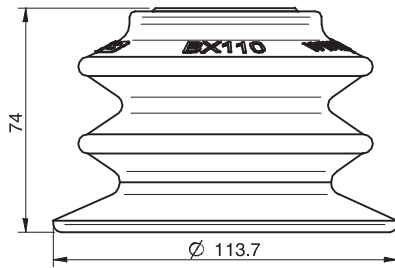
\*\*Please contact Piab.

## Ordering information

Complete suction cups		Art. No.
A	Suction cup BX110P Polyurethane 30/60 with filter, thread insert G3/8" male	0108273
B	Suction cup BX110P Polyurethane 30/60 with filter, 3/8" NPSF female	0108403
A	Suction cup BX110P Polyurethane 60 with filter, thread insert G3/8" male	0108341
B	Suction cup BX110P Polyurethane 60 with filter, 3/8" NPSF female	0108404



Rubber parts		Art. No.
Suction cup BX110P Polyurethane 30/60		0107093
Suction cup BX110P Polyurethane 30/60, with filter		0108164
Suction cup BX110P Polyurethane 60, with filter		0108340



Fittings		Art. No.
Thread insert G3/8" male, with O-ring		0106797

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for BX110P	Polyester/TPE	-40-90	0108163

## F75P



### Flat suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber parts g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	70	193	273	44	176	308	19	150	2	28
PU60°	82	231	330	47	113	169	19	150	2	53

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10-50
Polyurethane, PU60	Green transparent	60	10-50

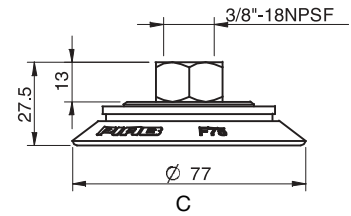
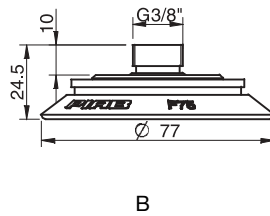
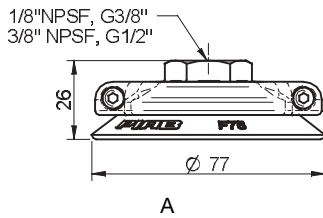
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

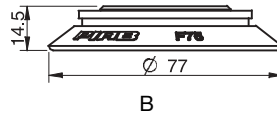
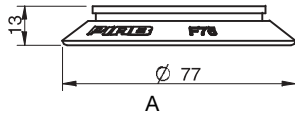
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup F75P Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0106349
A	Suction cup F75P Polyurethane 30/60, G3/8" female, with mesh filter	0106350
A	Suction cup F75P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106351
A	Suction cup F75P Polyurethane 30/60, G1/2" female, with mesh filter	0106352
A	Suction cup F75P Polyurethane 60, 1/8" NPSF female, with mesh filter	0111585
A	Suction cup F75P Polyurethane 60, G3/8" female, with mesh filter	0111586
A	Suction cup F75P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111587
A	Suction cup F75P Polyurethane 60, G1/2" female, with mesh filter	0111588
B	Suction cup F75P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0106830
B	Suction cup F75P Polyurethane 60, thread insert G3/8" male, with mesh filter	0107321
C	Suction cup F75P Polyurethane 30/60, 3/8" NPSF female	0108800
C	Suction cup F75P Polyurethane 60, 3/8" NPSF female	0108801



	Rubber parts	Art. No.
A	Suction cup F75P Polyurethane 30/60	0104724
A	Suction cup F75P Polyurethane 60	0111584
B	Suction cup F75P Polyurethane 30/60, for tread insert	0106829
B	Suction cup F75P Polyurethane 60, for tread insert	0107320



	Fittings	Art. No.
	Fitting 75, G3/8" female, with mesh filter	0100551
	Fitting 75, 1/8" NPSF female, with mesh filter	0100548
	Fitting 75, G1/2" female, with mesh filter	0100555
	Fitting 75, 3/8" NPSF female, with mesh filter	0100553
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F110P



### Flat suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ In the two-coloured suction cup the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber parts g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU30°/60°	167	432	591	149	441	617	60	250	4	82
PU60°	191	498	705	297	523	664	60	250	4	133

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10-50
Polyurethane, PU60	Green transparent	60	10-50

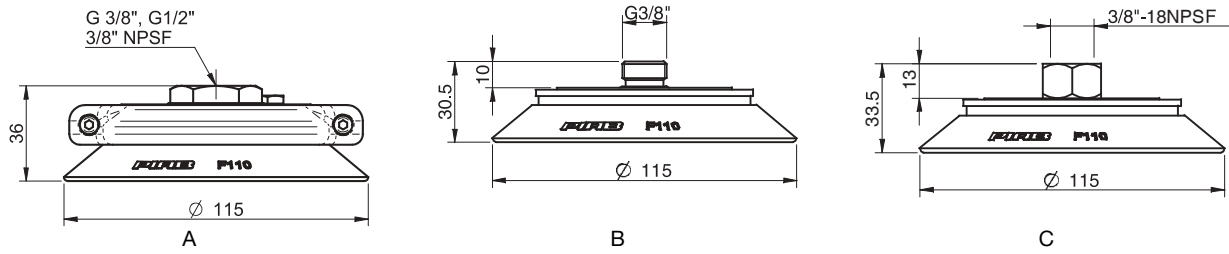
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

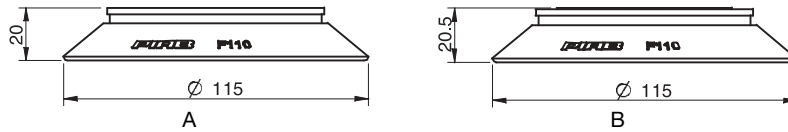
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup F110P Polyurethane 30/60, G3/8" female, with mesh filter	0106353
A	Suction cup F110P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106354
A	Suction cup F110P Polyurethane 30/60, G1/2" female, with mesh filter	0106355
A	Suction cup F110P Polyurethane 60, G3/8" female, with mesh filter	0111595
A	Suction cup F110P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111596
A	Suction cup F110P Polyurethane 60, G1/2" female, with mesh filter	0111597
B	Suction cup F110P Polyurethane 30/60, thread insert G3/8" with mesh filter	0106798
B	Suction cup F110P Polyurethane 60, thread insert G3/8", with mesh filter	0107323
C	Suction cup F110P Polyurethane 30/60, 3/8" NPSF female	0108802
C	Suction cup F110P Polyurethane 60, 3/8" NPSF female	0108803



	Rubber parts	Art. No.
A	Suction cup F110P Polyurethane 30/60	0104725
A	Suction cup F110P Polyurethane 60	0111593
B	Suction cup F110P Polyurethane 30/60, for thread insert	0106796
B	Suction cup F110P Polyurethane 60, for thread insert	0107322



	Fitting	Art. No.
	Fitting 110 G3/8" female, with mesh filter	0100557
	Fitting 110, 3/8" NPSF female, with mesh filter	0100559
	Fitting 110, G1/2" female, with mesh filter	0100561
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## FC20P



### Flat, concave suction cup with cleats

- ▶ Suitable for lifting small objects and narrow parts, also slightly domed, flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
4.5	12.0	16.0	4.5	9.0	12.0	1.0	25	1.9	1.3

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU50	Blue transparent	50	10–50

### Material resistance

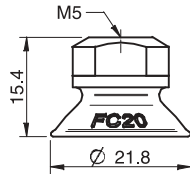
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

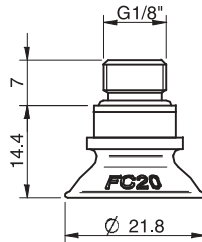


## Ordering information

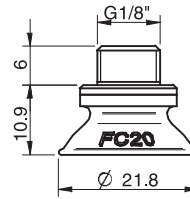
Complete suction cups		Art. No.
A	Suction cup FC20P Polyurethane 50, M5 female	0106717
B	Suction cup FC20P Polyurethane 50, G1/8" male, with mesh filter	0106722
C	Suction cup FC20P Polyurethane 50, G1/8" male / M5 female, with mesh filter	0106718



A

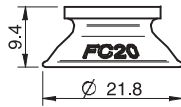


B



C

Rubber part		Art. No.
Suction cup FC20P Polyurethane 50		0106016



Fittings		Art. No.
Fitting M5 female		3250003
Fitting G1/8" male, with mesh filter		3250085
Fitting G1/8" male/M5 female, with mesh filter		0101152

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## FC25P



### Flat, concave suction cup with cleats

- ▶ Suitable for lifting small objects and narrow parts, also slightly domed, flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
8.0	20.0	27	9.0	12.0	18.0	3.0	45	4.0	3

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU50	Blue transparent	50	10–50

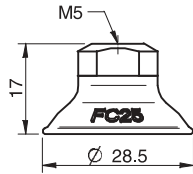
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

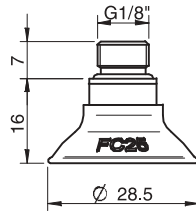
\*\*Please contact Piab.

## Ordering information

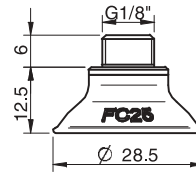
	Complete suction cups	Art. No.
A	Suction cup FC25P Polyurethane 50, M5 female	0106719
B	Suction cup FC25P Polyurethane 50, G1/8" male, with mesh filter	0106721
C	Suction cup FC25P Polyurethane 50, G1/8" male / M5 female, with mesh filter	0106720



A



B



C

	Rubber part	Art. No.
	Suction cup FC25P Polyurethane 50	0104803



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male/M5 female, with mesh filter	0101152

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## FC35P



### Flat, concave suction cup with cleats

- ▶ Suitable for slightly domed and flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU50°	11.0	36	51	27	51	62	5.0	32	5.5	6
PU60°	11.0	34	49	27	41	51	5.0	32	5.5	6

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU50	Blue transparent	50	10-50
Polyurethane, PU60	Green transparent	60	10-50

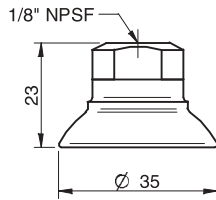
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

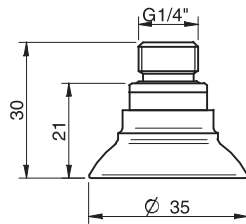
\*\*Please contact Piab.

## Ordering information

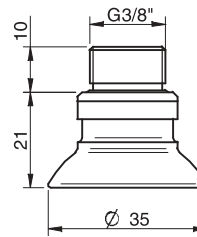
	Complete suction cups	Art. No.
A	Suction cup FC35P Polyurethane 50, 1/8" NPSF female, with mesh filter	0103705
A	Suction cup FC35P Polyurethane 50, 1/8" NPSF female, with dual flow control valve	0103709
B	Suction cup FC35P Polyurethane 50, G1/4" male, with mesh filter	0103711
B	Suction cup FC35P Polyurethane 50, G1/4" male, with mesh filter and dual flow control valve	0103713
C	Suction cup FC35P Polyurethane 50, G3/8" male, with mesh filter	0103719
A	Suction cup FC35P Polyurethane 60, 1/8" NPSF female, with mesh filter	0103706
B	Suction cup FC35P Polyurethane 60, G1/4" male, with mesh filter	0103712
C	Suction cup FC35P Polyurethane 60, G3/8" male, with mesh filter	0103720
C	Suction cup FC35P Polyurethane 60, G3/8" male, with mesh filter and dual flow control valve	0103722
D	Suction cup FC35P Polyurethane 60, 5x1/8" NPSF female	0103728



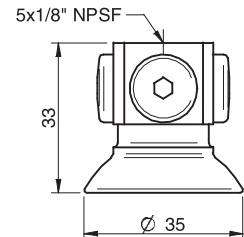
A



B

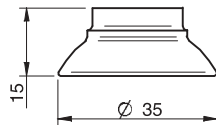


C



D

	Rubber parts	Art. No.
	Suction cup FC35P Polyurethane 50	0103290
	Suction cup FC35P Polyurethane 60	0103291



	Fittings	Art. No
	Fitting 1/8" NPSF female, 30–40, with mesh filter	0101153
	Fitting 1/8" NPSF female, 30–40, with dual flow control valve	3251006
	Fitting G1/4" male, 30–40, with mesh filter	3250091
	Fitting G1/4" male, 30–40, with mesh filter and dual flow control valve	3251007
	Fitting G3/8" male, 30–40, with mesh filter	3250086
	Fitting G3/8" male, 30–40, with mesh and dual flow control valve	3251009
	Fitting 5x1/8" NPSF female, 30–40	0100261
	Fitting 5x1/8" NPSF female, 30–40, with dual flow control valve	3251011

For further information and dimensioned drawings, see section Suction cups/grippers Fittings..

## FC50P



### Flat, concave suction cup with cleats

- ▶ Suitable for slightly domed and flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	28	77	103	49	82	100	10	53	5.0	28
PU60°	28	77	104	52	93	111	10	53	5.0	28

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

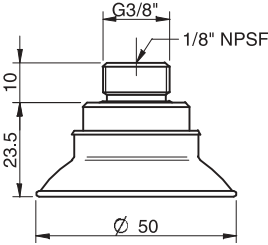
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

## Ordering information

Complete suction cups	Art. No.
Suction cup FC50P Polyurethane 40, G3/8" male - 1/8" NPSF female	0103289
Suction cup FC50P Polyurethane 60, G3/8" male - 1/8" NPSF female	0103293



## FC75P



### Flat, concave suction cup with cleats

- ▶ Suitable for slightly domed and flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	73	157	215	107	200	230	30	78	6.5	45
PU60°	73	168	225	93	225	255	30	78	6.5	45

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

### Material resistance

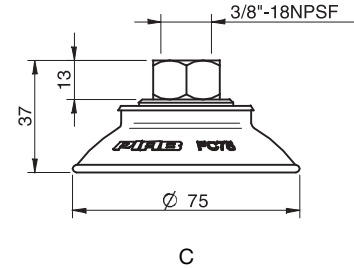
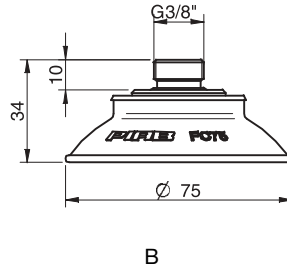
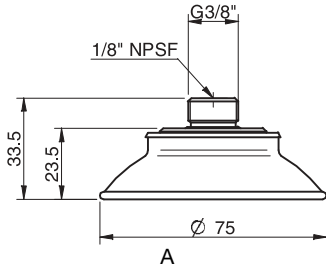
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

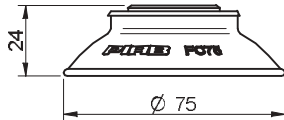


## Ordering information

	Complete suction cups	Art. No.
A	Suction cup FC75P Polyurethane 40, G3/8" male - 1/8" NPSF female	0103294
A	Suction cup FC75P Polyurethane 60, G3/8" male - 1/8" NPSF female	0103296
B	Suction cup FC75P Polyurethane 40, thread insert G3/8" with mesh filter	0106959
B	Suction cup FC75P Polyurethane 60, thread insert G3/8" with mesh filter	0107303
C	Suction cup FC75P Polyurethane 40, 3/8" NPSF female	0108796
C	Suction cup FC75P Polyurethane 60, 3/8" NPSF female	0108797



	Rubber parts	Art. No.
	Suction cup FC75P Polyurethane 40, for tread insert	0106948
	Suction cup FC75P Polyurethane 60, for tread insert	0107302



	Fitting	Art. No.
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## FC100P



### Flat, concave suction cup with cleats

- ▶ Suitable for slightly domed and flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	137	284	377	176	318	420	80	110	10.2	64
PU60°	152	328	446	112	264	382	80	110	10.2	64

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

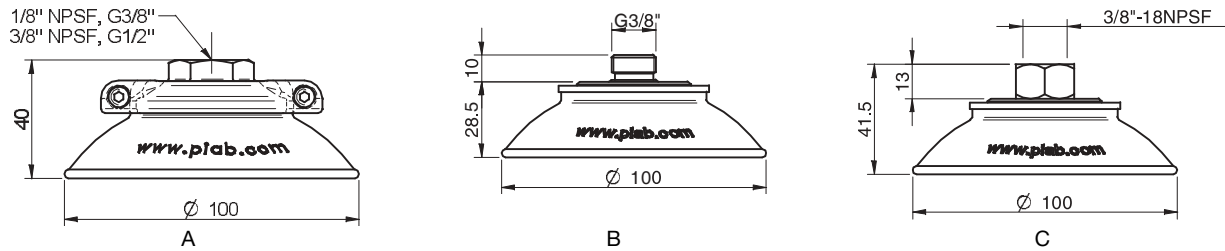
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

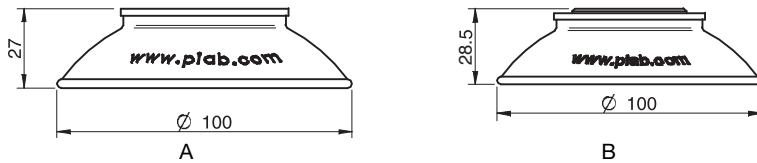
\*\*Please contact Piab.

## Ordering information

Complete suction cups		Art. No.
A	Suction cup FC100P Polyurethane 40, 1/8" NPSF female, with mesh filter	0103731
A	Suction cup FC100P Polyurethane 40, G3/8" female, with mesh filter	0103734
A	Suction cup FC100P Polyurethane 40, 3/8" NPSF female, with mesh filter	0103737
A	Suction cup FC100P Polyurethane 40, G1/2" female, with mesh filter	0103740
A	Suction cup FC100P Polyurethane 60, 1/8" NPSF female, with mesh filter	0103733
A	Suction cup FC100P Polyurethane 60, G3/8" female, with mesh filter	0103736
A	Suction cup FC100P Polyurethane 60, G1/2" female, with mesh filter	0103742
A	Suction cup FC100P Polyurethane 60, 3/8" NPSF female, with mesh filter	0103739
B	Suction cup FC100P Polyurethane 40, thread insert G3/8" male, with mesh filter	0106836
B	Suction cup FC100P Polyurethane 60, thread insert G3/8" male, with mesh filter	0107305
C	Suction cup FC100P Polyurethane 40, 3/8" NPSF female	0108798
C	Suction cup FC100P Polyurethane 60, 3/8" NPSF female	0108799



Rubber parts		Art. No.
A	Suction cup FC100P Polyurethane 40	0103297
A	Suction cup FC100P Polyurethane 60	0103299
B	Suction cup FC100P Polyurethane 40, for tread insert	0106835
B	Suction cup FC100P Polyurethane 60, for tread insert	0107304



Fittings		Art. No.
Fitting 75, 1/8" NPSF female, with mesh filter		0100548
Fitting 75, G3/8" female, with mesh filter		0100551
Fitting 75, 3/8" NPSF female, with mesh filter		0100553
Fitting 75, G1/2" female, with mesh filter		0100555
Thread insert G3/8" male, with O-ring and mesh filter		0107148

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## FC150P



### Flat, concave suction cup with cleats

- ▶ Suitable for slightly domed and flat and oily surfaces, e.g., such as those encountered when handling steel sheets in press processes.
- ▶ Thanks to the high friction of the rubber material, the suction cups can withstand high forces at rapid accelerations in horizontal directions, even on oily surfaces.
- ▶ The suction cups have cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	274	716	932	343	765	902	250	165	14.2	213
PU60°	284	647	922	215	568	863	250	165	14.2	213

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

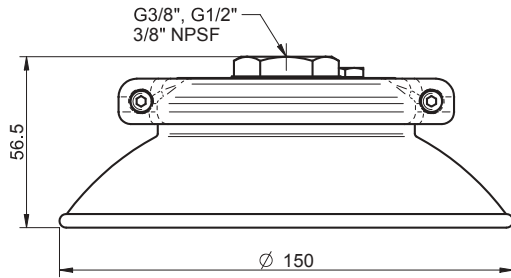
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

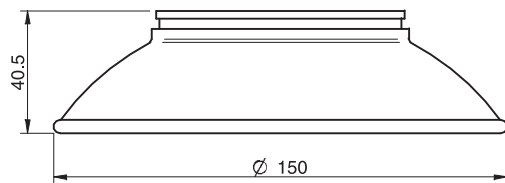
\*\*Please contact Piab.

## Ordering information

Complete suction cups	Art. No.
Suction cup FC150P Polyurethane 40, G3/8" female, with mesh filter	0103743
Suction cup FC150P Polyurethane 40, 3/8" NPSF female, with mesh filter	0103749
Suction cup FC150P Polyurethane 40, G1/2" female, with mesh filter	0103755
Suction cup FC150P Polyurethane 60, G3/8" female, with mesh filter	0103745
Suction cup FC150P Polyurethane 60, 3/8" NPSF female, with mesh filter	0103751
Suction cup FC150P Polyurethane 60, G1/2" female, with mesh filter	0103757



Rubber parts	Art. No.
Suction cup FC150P Polyurethane 40	0101946
Suction cup FC150P Polyurethane 60	0103301



Fittings	Art. No.
Fitting 110 G3/8" female, with mesh filter	0100557
Fitting 110, 3/8" NPSF female, with mesh filter	0100559
Fitting 110, G1/2" female, with mesh filter	0100561

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## OB20x60P with swivel fitting



### Oval suction cup with short bellows

- ▶ Suitable for level adjustment. Can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.
- ▶ Swivel option, prior to the locking operation, for easy positioning of the oval cup.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight with fitting
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
13.0	34	57	13.0	37	48	24.0	7.0	4.5	11.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU60	Green transparent	60	10–50

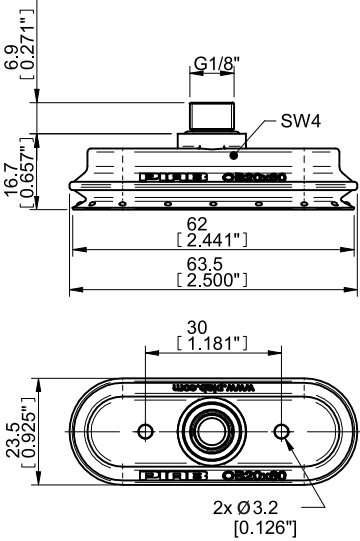
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

## Ordering information

Complete suction cups	Art. No.
Suction cup OB20x60P Polyurethane 60, G1/8" male	0115291



## OB35x90P



### Oval suction cup with short bellows

- ▶ Suitable for level adjustment. Can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ In the two coloured suction cup, the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU60°	42	117	185	32	85	111	38	30.0	10.5	55
PU30°/60°	42	119	174	48	73	100	38	30.0	10.5	55

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10-50
Polyurethane, PU60	Green transparent	60	10-50

### Material resistance

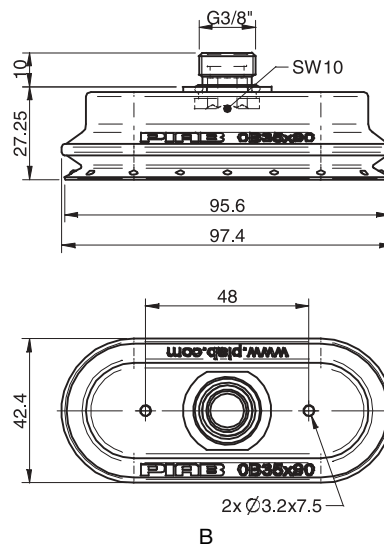
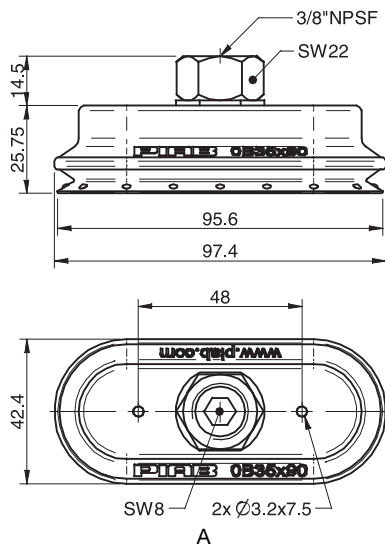
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

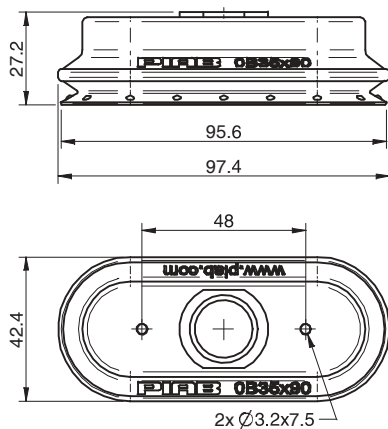


## Ordering information

Complete suction cups		Art. No.
A	Suction cup OB35x90P Polyurethane 60, 3/8" NPSF female	0108672
B	Suction cup OB35x90P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108673
A	Suction cup OB35x90P Polyurethane 30/60, 3/8" NPSF female	0109857
B	Suction cup OB35x90P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109856



Rubber parts		Art. No.
Suction cup OB35x90P Polyurethane 60		0109912
Suction cup OB35x90P Polyurethane 30/60		0109913



Fittings		Art. No.
Thread insert G3/8" male, with O-ring and mesh filter		0107148

## OB50x140P



### Oval suction cup with short bellows

- ▶ Suitable for level adjustment. Can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ In the two coloured suction cup, the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU60°	77	231	368	122	292	396	95	26	11.3	129
PU30°/60°	58	235	366	110	260	349	95	23.0	11.3	129

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

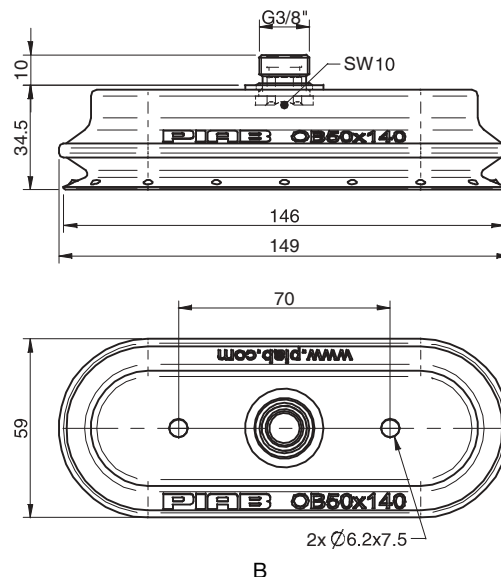
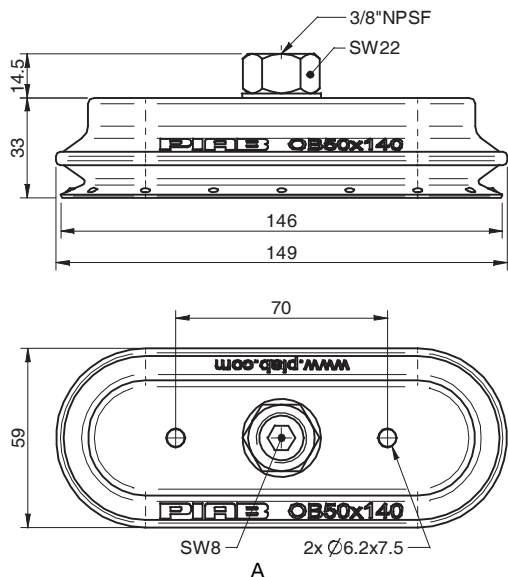
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

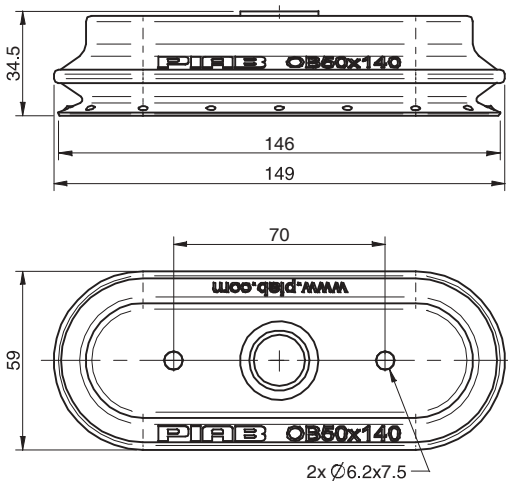
\*\*Please contact Piab.

## Ordering information

Complete suction cups		Art. No.
A	Suction cup OB50x140P Polyurethane 60, 3/8" NPSF female	0108674
B	Suction cup OB50x140P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108675
A	Suction cup OB50x140P Polyurethane 30/60, 3/8" NPSF female	0109859
B	Suction cup OB50x140P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109858



Rubber parts		Art. No.
Suction cup OB50x140P Polyurethane 60		0109914
Suction cup OB50x140P Polyurethane 30/60		0109915



Fittings		Art. No.
Thread insert G3/8" male, with O-ring and mesh filter		0107148

## OB65x170P



### Oval suction cup with short bellows

- ▶ Suitable for level adjustment. Can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ In the two coloured suction cup, the bellows and the sealing lip are of different hardnesses, which makes the suction cup strong and stable and, at the same time, soft and flexible.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU60°	130	310	533	170	440	600	175	38	16.0	241
PU30°/60°	119	335	541	141	379	532	175	38	16.0	241

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow transparent	30	10–50
Polyurethane, PU60	Green transparent	60	10–50

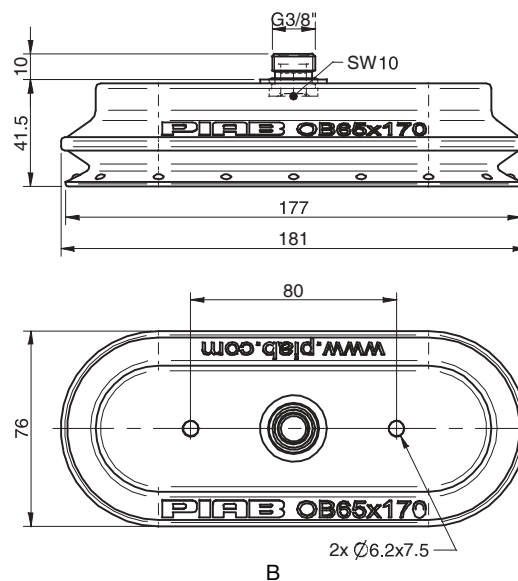
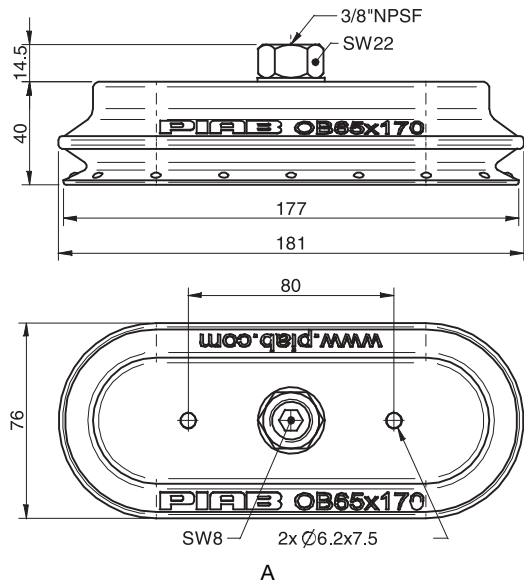
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

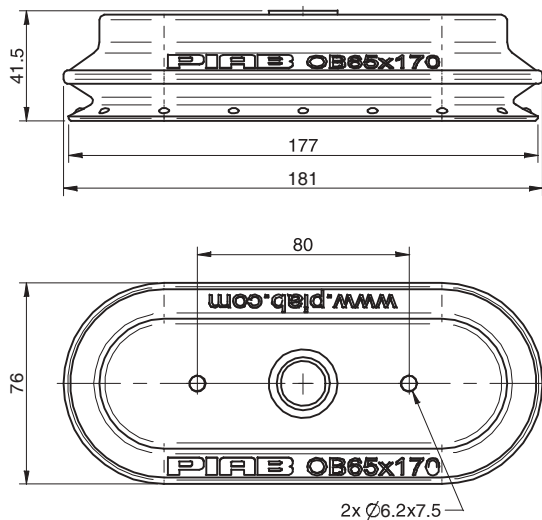
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup OB65x170P Polyurethane 60, 3/8" NPSF female	0108676
B	Suction cup OB65x170P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108677
A	Suction cup OB65x170P Polyurethane 30/60, 3/8" NPSF female	0109861
B	Suction cup OB65x170P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109860



	Rubber parts	Art. No.
	Suction cup OB65x170P Polyurethane 60	0109916
	Suction cup OB65x170P Polyurethane 30/60	0109917



	Fittings	Art. No.
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

## OC35x90P



### Oval, concave suction cup

- ▶ Suitable for oblong objects with slightly domed or flat and oily surfaces, such as those encountered in body parts in the automotive industry.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.
- ▶ Fitting option, male G3/8", with a swivel function prior to the locking operation, for easy positioning of the oval cup.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g	Weight with adj. thread insert g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa					
PU40°	49	117	171	53	112	147	20.0	—	3.0	27	40
PU60°	49	132	171	68	161	206	20.0	—	3.0	27	40

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

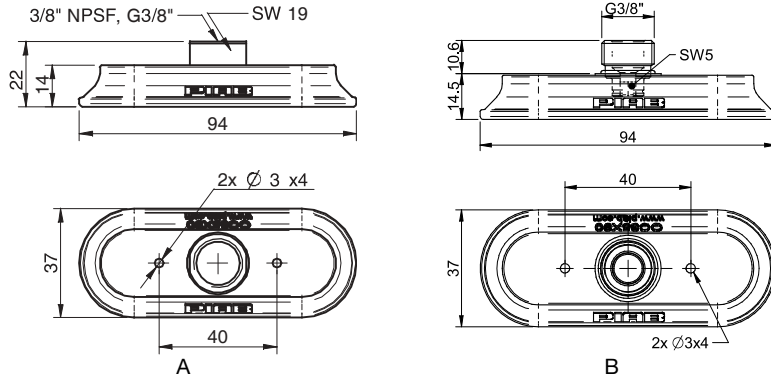
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

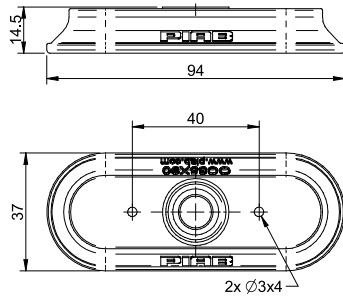
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup OC35x90P Polyurethane 40, G3/8" female	0102374
A	Suction cup OC35x90P Polyurethane 40, 3/8" NPSF female	0102375
A	Suction cup OC35x90P Polyurethane 60, G3/8" female	0103305
A	Suction cup OC35x90P Polyurethane 60, 3/8" NPSF female	0103303
B	Suction cup OC35x90P Polyurethane 40, adjustable thread insert G3/8" male with mesh filter	0115307
B	Suction cup OC35x90P Polyurethane 60, adjustable thread insert G3/8" male with mesh filter	0115313



Rubber parts	Art. No.
Suction cup OC35x90P Polyurethane 40	0115306



## OF10x30P



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
4.0	11.0	17.0	6.0	12.0	17.0	0.5	15.0	1.0	4.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU50	Blue transparent	50	10–50

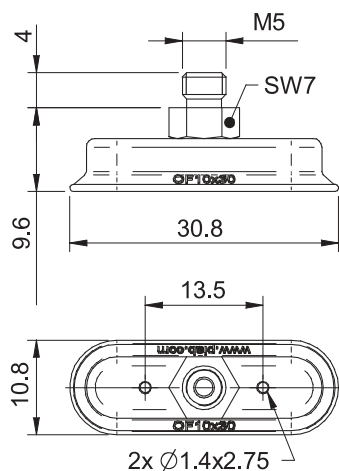
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

### Ordering information

Complete suction cups	Art. No.
Suction cup OF10x30P Polyurethane 50, M5 male	0110084





## OF15x45P with swivel fitting



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.
- ▶ Swivel option, prior to the locking operation, for easy positioning of the oval cup.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
9.0	27	41	6.0	20.0	34	1.0	30	1.0	8.25

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU50	Blue transparent	50	10–50

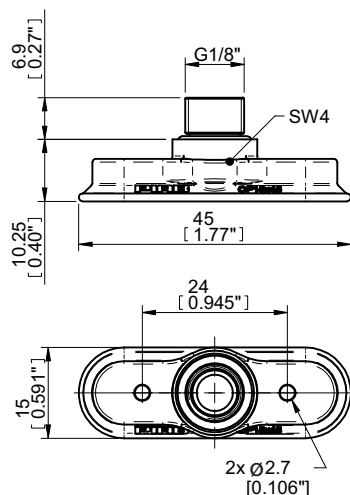
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

### Ordering information

Complete suction cups	Art. No.
Suction cup OF15x45P Polyurethane 50, G1/8" male	0115285



## OF25x70P with swivel fitting



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.
- ▶ Swivel option, prior to the locking operation, for easy positioning of the oval cup.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	24.0	66	107	46	90	105	6.0	50	1.9	19
PU60°	24.0	77	118	42	127	161	6.0	50	1.9	19

### Material specifications

Material	Color	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU60	Green transparent	60	10–50

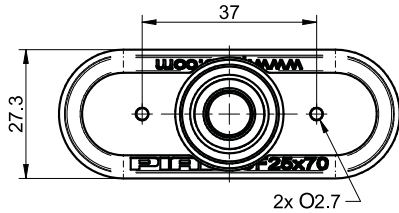
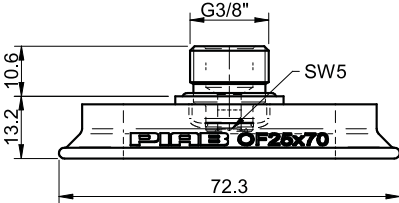
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

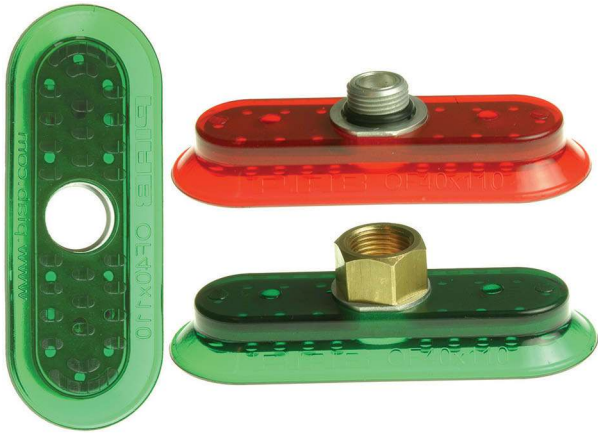
\*\*Please contact Piab.

## Ordering information

Complete suction cups	Art. No.
Suction cup OF25x70P Polyurethane 40, G3/8" male	0115304
Suction cup OF25x70P Polyurethane 60, G3/8" male	0115311



## OF40x110P



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	69	203	293	120	230	296	21.0	77	3.1	48
PU60°	74	200	303	98	228	410	21.0	77	3.1	48

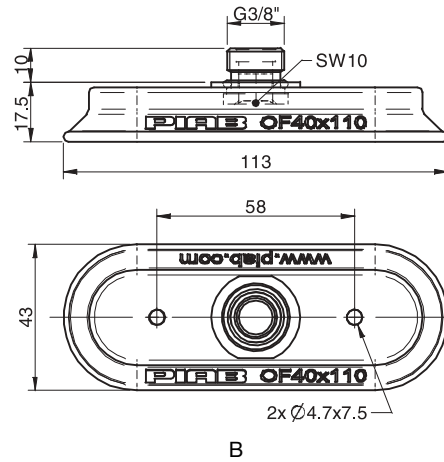
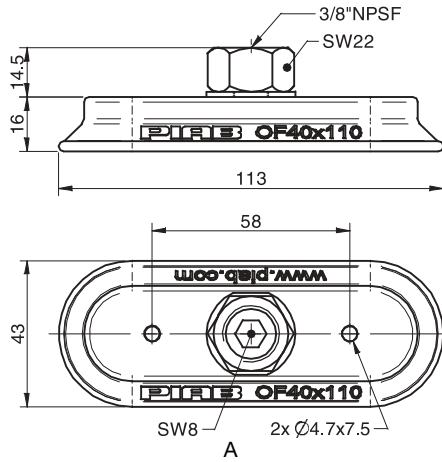
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

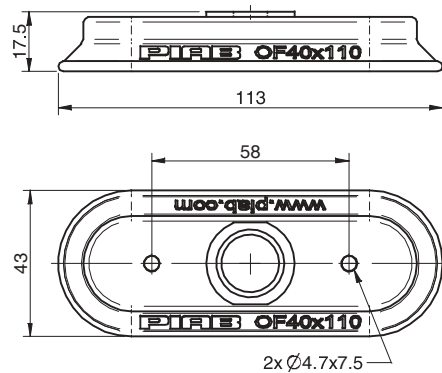
\*\*Please contact Piab.

## Ordering information

Complete suction cups		Art. No.
A	Suction cup OF40x110P Polyurethane 40, 3/8" NPSF female	0109851
B	Suction cup OF40x110P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109850
A	Suction cup OF40x110P Polyurethane 60, 3/8" NPSF female	0108265
B	Suction cup OF40x110P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108263



Rubber parts		Art. No.
Suction cup OF40x110P Polyurethane 40		0109907
Suction cup OF40x110P Polyurethane 60		0109906



Fittings		Art. No.
Thread insert G3/8" male, with O-ring and mesh filter		0107148

## OF55x150P



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	131	366	527	155	350	455	37	150	3.0	109
PU60°	134	376	558	128	338	477	37	150	3.0	109

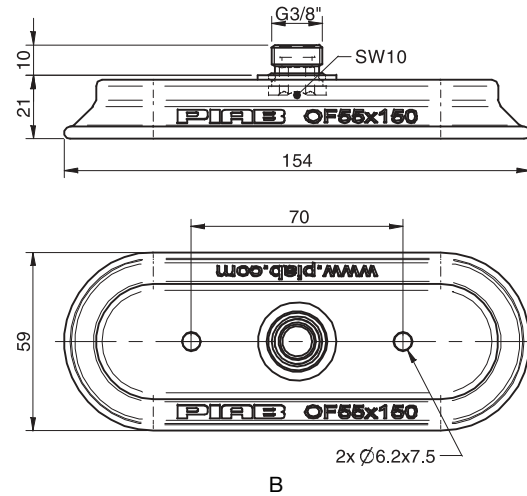
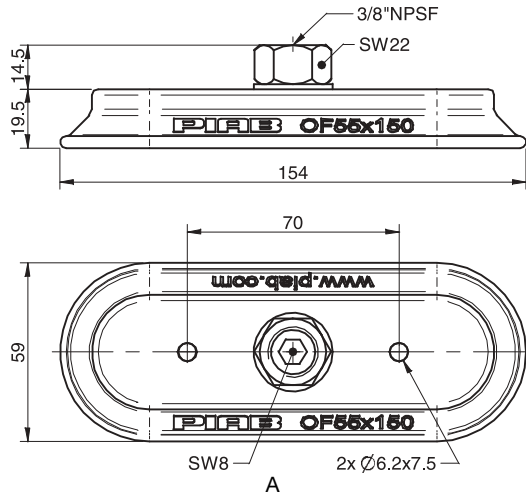
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

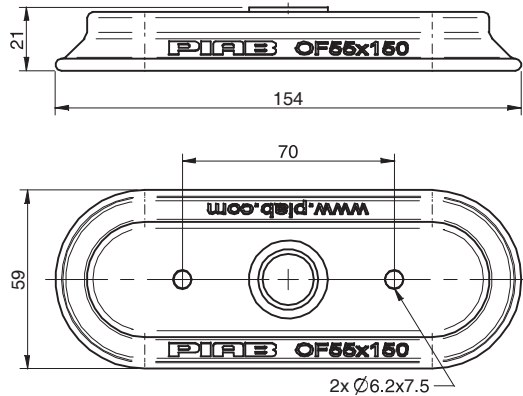
\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup OF55x150P Polyurethane 40, 3/8" NPSF female	0109853
B	Suction cup OF55x150P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109852
A	Suction cup OF55x150P Polyurethane 60, 3/8" NPSF female	0108036
B	Suction cup OF55x150P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108030



	Rubber parts	Art. No.
	Suction cup OF55x150P Polyurethane 40	0109909
	Suction cup OF55x150P Polyurethane 60	0109908



	Fittings	Art. No.
	Thread insert G3/8" male, with O-ring and mesh filter	0107148

## OF70x175P



### Flat, oval suction cup with cleats

- ▶ Suitable for flat and rough surfaces.
- ▶ Fair stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and give extra friction when the lifting force is parallel to the surface of the object.
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40°	190	530	785	170	440	630	80	130	5.7	193
PU60°	180	570	860	200	555	750	80	130	5.7	193

### Material resistance

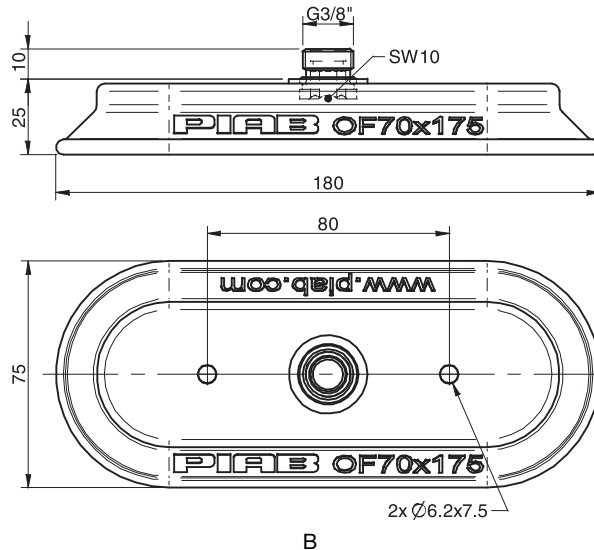
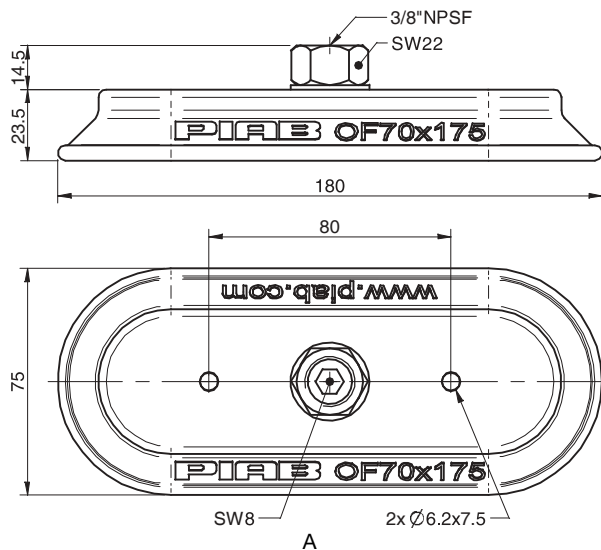
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

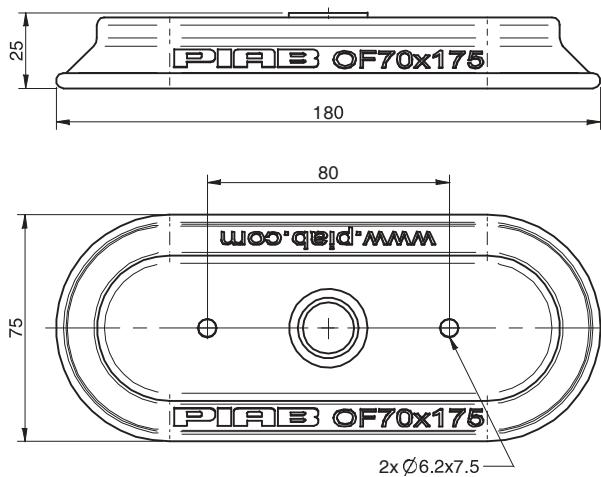


## Ordering information

Complete suction cups		Art. No.
A	Suction cup OF70x175P Polyurethane 40, 3/8" NPSF female	0109855
B	Suction cup OF70x175P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109854
A	Suction cup OF70x175P Polyurethane 60, 3/8" NPSF female	0108264
B	Suction cup OF70x175P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108671



Rubber parts		Art. No.
Suction cup OF70x175P Polyurethane 40		0109911
Suction cup OF70x175P Polyurethane 60		0109910



Fittings		Art. No.
Thread insert G3/8" male, with O-ring and mesh filter		0107148

## U20-2P



### Universal suction cup

- ▶ Long life time suction cup
- ▶ Suitable for several book binding applications
- ▶ Easy to handle different paper qualities due to the possibilities to order the U20-2P in three different shore
- ▶ DURAFLEX® are suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane.

### Lifting forces & Technical data

Material	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
PU40	3	10.5	14	1.5	3	6	0.7	9	5	1.7
PU50	3	11.5	15	1.5	3	6	0.7	9	5	1.7
PU60	3	14	21	3	6	8	0.7	12	5	1.7

### Material specifications

Material	Color	Hardness °Shore A	Temperature range °C
Polyurethane, PU40	Red transparent	40	10–50
Polyurethane, PU50	Blue transparent	50	10–50
Polyurethane, PU60	Green transparent	60	10–50

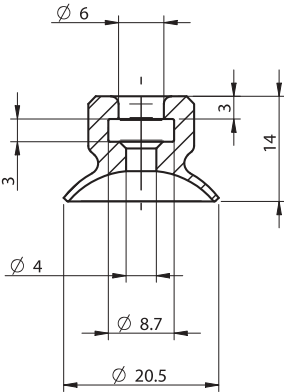
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

## Ordering information

Rubber parts	Art. No.
Suction cup U20-2P Polyurethane 40	0119994
Suction cup U20-2P Polyurethane 50	0119995
Suction cup U20-2P Polyurethane 60	0119996



## BFF40P, BFF60P, BFF80P, BFF110P



### Features

- ▶ Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- ▶ Normal wear on friction cup will not affect the long term shear force performance.
- ▶ Best choice if  $> 0,1\text{g/m}^2$  press oil is used on the sheet.
- ▶ Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- ▶ The "BFF" design is suitable for uneven/curved surfaces or if level compensation is needed, for example in de-stacking applications.
- ▶ The flat inner support gives stability during movement in any orientation.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Model	Material to be handled	Lifting forces vertical to the surface, N, at vacuum level		Friction/shear forces parallel to the surface, N, at vacuum level		Volume cm <sup>3</sup>	Min. curve radius mm	Weight g
		60 -kPa	90 -kPa	60 -kPa	90 -kPa			
BFF40P	Oily steel plate	45	60	35	45	10	23	20–34
BFF60P	Oily steel plate	82	106	76	93	20	35	30–58
BFF80P	Oily steel plate	174	207	110	160	50	50	66–96
BFF110P	Oily steel plate	284	345	235	253	110	95	160–178

Values valid for steel sheet with surface finish Ra 1 and 2-3g/m<sup>2</sup> of press oil.

### Material specifications

Material	Colour	Hardness, °Shore A	Temperature range, °C
Polyurethane, PU55	Orange	55	10–50
Polyurethane, PU60	Green transparent	60	10–50

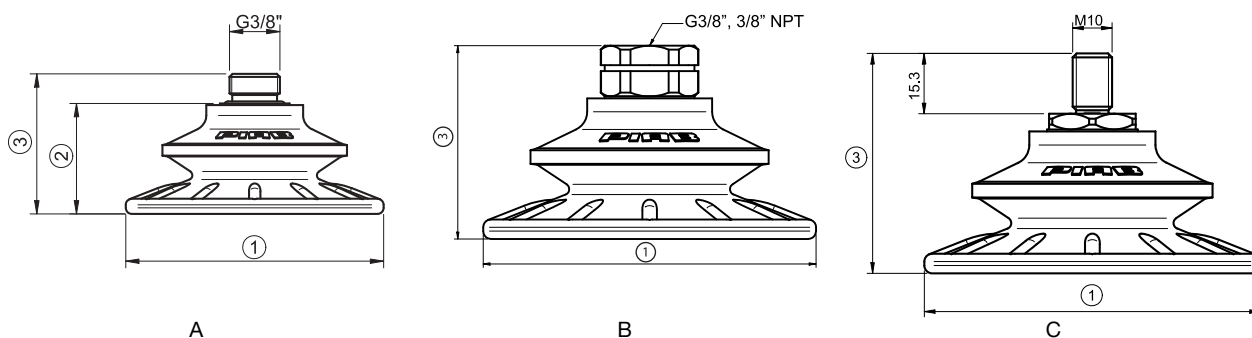
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Code	Art. No.
A	Suction cup BFF40P Polyurethane 55/60, G3/8" male, with mesh filter	BFF40P.4R.04UF	0118991
B	Suction cup BFF40P Polyurethane 55/60, G3/8" female	BFF40P.4R.04UA	0118992
B	Suction cup BFF40P Polyurethane 55/60, 3/8" NPT female	BFF40P.4R.04UN	0122278
C	Suction Cup BFF40P Polyurethane 55/60, M10x1.5 male	BFF40P.4R.M10M	0121427
A	Suction cup BFF60P Polyurethane 55/60, G3/8" male, with mesh filter	BFF60P.4R.06UF	0118994
B	Suction cup BFF60P Polyurethane 55/60, G3/8" female	BFF60P.4R.06UA	0118995
B	Suction cup BFF60P Polyurethane 55/60, 3/8" NPT female	BFF60P.4R.06UN	0122279
C	Suction cup BFF60P Polyurethane 55/60, M10x1.5 male	BFF60P.4R.M10M	0121428
A	Suction cup BFF80P Polyurethane 55/60, G3/8" male, with mesh filter	BFF80P.5R.G45M	0118997
B	Suction cup BFF80P Polyurethane 55/60, G3/8" female	BFF80P.5R.G45W	0118670
B	Suction cup BFF80P Polyurethane 55/60, 3/8" NPT female	BFF80P.5R.N47W	0122280
C	Suction cup BFF80P Polyurethane 55/60, M10x1.5 male	BFF80P.5R.M10M	0121384
A	Suction cup BFF110P Polyurethane 55/60, G3/8" male, with mesh filter	BFF110P.5R.G45M	0118671
B	Suction cup BFF110P Polyurethane 55/60, G3/8" female	BFF110P.5R.G45W	0118673
B	Suction cup BFF110P Polyurethane 55/60, 3/8" NPT female	BFF110P.5R.N47W	0122281
C	Suction cup BFF110P Polyurethane 55/60, M10x1.5 male	BFF110P.5R.M10M	0121430



Measures complete suction cups	BFF40P			BFF60P			BFF80P			BFF110P		
	A	B	C	A	B	C	A	B	C	A	B	C
1	45	45	—	61	61	—	85	85	—	115	115	—
2	22	—	—	26	—	—	37	—	—	53	—	—
3	32	32	51.5	36	36	55.3	46	50	55.8	63	66	72.3
Max. vertical movement, mm	7	7	7	10	10	10	14	14	14	21	21	21
Max. expanding lip, mm	46	46	46	62	62	62	87	87	87	118	118	118

## FCF35P, FCF50P, FCF75P, FCF100P, FCF125P



### Features

- ▶ Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- ▶ Normal wear on friction cup will not affect the long term shear force performance.
- ▶ Best choice if  $> 0,1\text{g/m}^2$  press oil is used on the sheet.
- ▶ Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- ▶ The "FCF" design is suitable for slightly domed and flat surfaces, e.g., such as those encountered when handling metal sheets in press lines.
- ▶ The suction cups have support cleats that prevent thin objects from being disfigured.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Model	Material to be handled	Lifting forces vertical to the surface, N, at vacuum level		Friction/shear forces parallel to the surface, N, at vacuum level		Volume cm <sup>3</sup>	Min. curve radius mm	Weight g
		60 -kPa	90 -kPa	60 -kPa	90 -kPa			
FCF35P	Oily steel plate	34	50	26	32	5	40	19–42
FCF50P	Oily steel plate	72	101	52	70	10	50	31–67
FCF75P	Oily steel plate	163	228	104	139	30	100	60–78
FCF100P	Oily steel plate	236	298	139	205	70	150	92–113
FCF125P	Oily steel plate	405	442	194	236	100	150	151–170

Values valid for steel sheet with surface finish Ra 1 and 2-3g/m<sup>2</sup> of press oil.

### Material specifications

Material	Colour	Hardness, °Shore A	Temperature range, °C
Polyurethane, PU55	Orange	55	10–50
Polyurethane, PU60	Green transparent	60	10–50

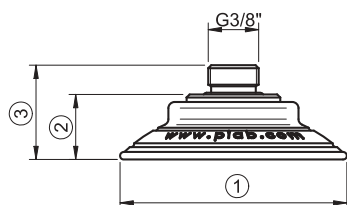
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

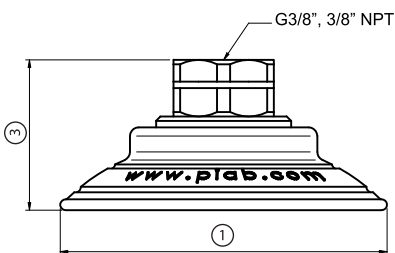
\*\*Please contact Piab.

## Ordering information

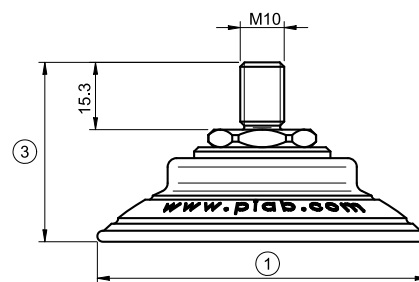
	Complete suction cups	Code	Art. No.
A	Suction cup FCF35P Polyurethane 55/60, G3/8" male, with mesh filter	FCF35P.4R.O4UF	0119913
B	Suction cup FCF35P Polyurethane 55/60, G3/8" female	FCF35P.4R.O4UA	0118981
B	Suction cup FCF35P Polyurethane 55/60, 3/8" NPT female	FCF35P.4R.O4UN	0122282
C	Suction cup FCF35P Polyurethane 55/60, M10x1.5 male	FCF35P.4R.M10M	0121431
A	Suction cup FCF50P Polyurethane 55/60, G3/8" male, with mesh filter	FCF50P.4R.O5UF	0118985
B	Suction cup FCF50P Polyurethane 55/60, G3/8" female	FCF50P.4R.O5UA	0118986
B	Suction cup FCF50P Polyurethane 55/60, 3/8" NPT female	FCF50P.4R.O5UN	0122283
C	Suction cup FCF50P Polyurethane 55/60, M10x1.5 male	FCF50P.4R.M10M	0121432
A	Suction cup FCF75P Polyurethane 55/60, G3/8" male, with mesh filter	FCF75P.5R.G45M	0118423
B	Suction cup FCF75P Polyurethane 55/60, G3/8" female	FCF75P.5R.G45W	0118429
B	Suction cup FCF75P Polyurethane 55/60, 3/8" NPT female	FCF75P.5R.N47W	0122284
C	Suction cup FCF75P Polyurethane 55/60, M10x1.5 male	FCF75P.5R.M10M	0121433
A	Suction cup FCF100P Polyurethane 55/60 G3/8" male, with mesh filter	FCF100P.5R.G40M	0118430
B	Suction cup FCF100P Polyurethane 55/60, G3/8" female	FCF100P.5R.G46W	0118432
B	Suction cup FCF100P Polyurethane 55/60, 3/8" NPT female	FCF100P.5R.N48W	0122285
C	Suction cup FCF100 Polyurethane 55/60, M10x1.5 male	FCF100P.5R.M10M	0121385
A	Suction cup FCF125P Polyurethane 55/60, G3/8" male, with mesh filter	FCF125P.5R.G40M	0118435
B	Suction cup FCF125P Polyurethane 55/60, G3/8" female	FCF125P.5R.G46W	0118437
B	Suction cup FCF125P Polyurethane 55/60, 3/8" NPT female	FCF125P.5R.N48W	0122286
C	Suction cup FCF125P Polyurethane 55/60, M10x1.5 male	FCF125P.5R.M10M	0121435



A



B



C

Measures complete suction cups															
	FCF35P			FCF50P			FCF75P			FCF100P			FCF125P		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1	35	35	35	50	50	50	75	75	75	100	100	100	126	126	126
2	19	—	—	24	—	—	22	—	—	26	—	—	32	—	—
3	29	29	47.8	34	31	49.9	31	34	40.8	36	39	44.8	42	45	50.8
Max. vertical movement, mm	2	2	2	3	3	3	4	4	4	6	6	6	8	8	8
Max. expanding lip, mm	38	38	38	54	54	54	79	79	79	105	105	105	132	132	132

## OBF35x90P, OBF50x140P, OBF65x170P



### Features

- ▶ Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- ▶ Normal wear on friction cup will not affect the long term shear force performance.
- ▶ Best choice if  $> 0,1\text{g/m}^2$  press oil is used on the sheet.
- ▶ Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- ▶ The "OBF" design is suitable for oblong objects with domed and flat surfaces, such as those encountered with body parts in the automotive industry.
- ▶ Can handle objects with height differences.
- ▶ Fitting option, male G3/8", with a swivel function prior to the locking operation, for easy positioning of the oval cup.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & Technical data

Model	Material to be handled	Lifting forces vertical to the surface, N, at vacuum level		Friction/shear forces parallel to the surface, N, at vacuum level		Volume cm <sup>3</sup>	Min. curve radius mm	Weight g
		60 -kPa	90 -kPa	60 -kPa	90 -kPa			
OBF35x90P	Oily steel plate	108	157	105	151	36	30	77-97
OBF50x140P	Oily steel plate	246	372	271	347	95	50	172-190
OBF65x170P	Oily steel plate	403	502	538	665	200	50	289-310

Values valid for steel sheet with surface finish Ra 1 and 2-3g/m<sup>2</sup> of press oil.

### Material specifications

Material	Colour	Hardness, °Shore A	Temperature range, °C
Polyurethane, PU55	Orange	55	10-50
Polyurethane, PU60	Green transparent	60	10-50

### Material resistance

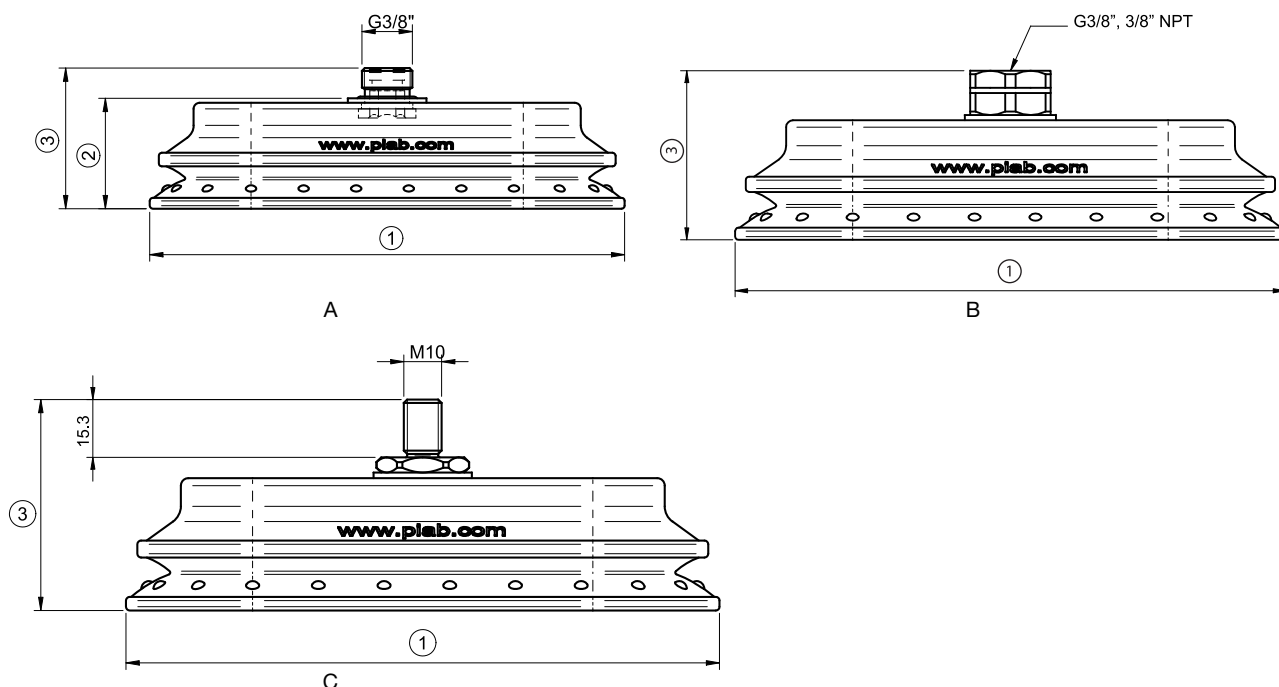
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.



## Ordering information

	Complete suction cups	Code	Art. No.
A	Suction cup OBF35x90P Polyurethane 55/60, G3/8" male, with mesh filter	OBF35x90P.5R.G40M	0119121
B	Suction cup OBF35x90P Polyurethane 55/60, G3/8" female	OBF35x90P.5R.G46W	0119123
B	Suction cup OBF35x90P Polyurethane 55/60, 3/8" NPT female	OBF35x90P.5R.N48W	0122287
C	Suction cup OBF35x90P Polyurethane 55/60, M10x1.5 male	OBF35x90P.5R.M10M	0121436
A	Suction cup OBF50x140P Polyurethane 55/60, G3/8" male, with mesh filter	OBF50x140P.5R.G40M	0119125
B	Suction cup OBF50x140P Polyurethane 55/60, G3/8" female	OBF50x140P.5R.G46W	0119127
B	Suction cup OBF50x140P Polyurethane 55/60, 3/8" NPT female	OBF50x140P.5R.N48W	0122288
C	Suction cup OBF50x140P Polyurethane 55/60, M10x1.5 male	OBF50x140P.5R.M10M	0121437
A	Suction cup OBF65x170P Polyurethane 55/60, G3/8" male, with mesh filter	OBF65x170P.5R.G40M	0119129
B	Suction cup OBF65x170P Polyurethane 55/60, G3/8" female	OBF65x170P.5R.G46W	0119131
B	Suction cup OBF65x170P Polyurethane 55/60, 3/8" NPT female	OBF65x170P.5R.N48W	0122289
C	Suction cup OBF65x170P Polyurethane 55/60, M10x1.5 male	OBF65x170P.5R.M10M	0121438



Measures complete suction cups	OBF35x90P			OBF50x140P			OBF65x170P		
	A	B	C	A	B	C	A	B	C
1	50x105	50x105	50x105	67x157	67x157	67x157	82x187	82x187	82x187
2	29	—	—	37	—	—	44	—	—
3	39	42	47.8	47	50	55.8	54	57	62.8
Max. vertical movement, mm	11	11	11	13	13	13	15	15	15
Max. expanding lip, mm	50x109	50x109	50x109	67x162	67x162	67x162	83x191	83x191	83x191

## OCF20x80P, OCF30x90P, OCF40x110P



- ▶ Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- ▶ Normal wear on friction cup will not affect the long term shear force performance.
- ▶ Best choice if  $> 0,1\text{g/m}^2$  press oil is used on the sheet.
- ▶ Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- ▶ The "OCF" design is suitable for oblong objects with slightly curved or flat surfaces, such as those encountered with body parts in the automotive industry.
- ▶ Fitting option, male G3/8", with a swivel function prior to the locking operation, for easy positioning of the oval cup.
- ▶ DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

### Lifting forces & technical data

Model	Material to be handled	Lifting force vertical to the surface, N, at vacuum level		Friction/Shear forces parallel to the surface, N, at vacuum level		Volume cm <sup>3</sup>	Min. curve radius mm	Weight g
		60 -kPa	90 -kPa	60 -kPa	90 -kPa			
OCF20x80P	Oily steel plate	82	90	35	48	15	20	24
OCF30x90P	Oily steel plate	115	159	51	74	17	25	24
OCF40x110P	Oily steel plate	185	246	54	78	34	42	55

Values valid for steel sheet with surface finish Ra 1 and 2-3g/m<sup>2</sup> of press oil.

### Material specifications

Material	Colour	Hardness, °Shore A	Temperature range, °C
Polyurethane, PU55	Orange	55	10–50
Polyurethane, PU60	Green transparent	60	10–50

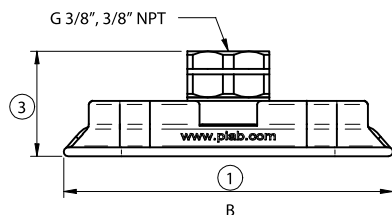
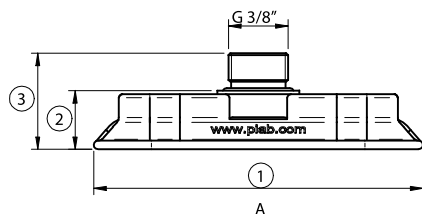
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

## Ordering information

	Complete suction cups	Code	Art. No.
A	Suction cup OCF20x80P Polyurethane 55/60, G3/8" male	OCF20x80P.5R.G41M	0121847
B	Suction cup OCF20x80P Polyurethane 55/60, 3/8" NPT female	OCF20x80P.5R.N47W	0121859
B	Suction cup OCF20x80P Polyurethane 55/60, G3/8" female	OCF20x80P.5R.G45W	0122455
A	Suction cup OCF30x90P Polyurethane 55/60, G3/8" male	OCF30x90P.5R.G41M	0122456
B	Suction cup OCF30x90P Polyurethane 55/60, 3/8" NPT female	OCF30x90P.5R.N47W	0122459
B	Suction cup OCF30x90P Polyurethane 55/60, G3/8" female	OCF30x90P.5R.G45W	0121786
A	Suction cup OCF40x110P Polyurethane 55/60, G3/8" male	OCF40x110P.5R.G40M	0122457
B	Suction cup OCF40x110P Polyurethane 55/60, 3/8" NPT female	OCF40x110P.5R.N48W	0121865
B	Suction cup OCF40x110P Polyurethane 55/60, G3/8" female	OCF40x110P.5R.G46W	0122860



	OCF20x80P		OCF30x90P		OCF40x110P	
	A	B	A	B	A	B
1	24x84	24x84	32.5x92.5	32.5x92.5	43x113	43x113
2	15.5	15.5	16.5	16.5	22.5	22.5
3	27.6	30.1	27.0	29.5	32.5	35.5
Max. vertical movement, mm	3	3	4	4	5	5
Max. expanding lip, mm	27x86.2	27x86.2	36x95	36x95	49x118	49x118

## BL30-3P



### Suction cup specially designed for plastic bag handling

- ▶ High-flow fitting allowing high initial vacuum flow needed for plastic bag handling.
- ▶ Suitable for level adjustment and uneven surfaces.
- ▶ Dual hardness allowing strength and stability in conjunction with softness and flexibility.
- ▶ DURAFLEX® material features the elasticity of rubber in combination with the wear resistance of polyurethane.
- ▶ The DURAFLEX® material is mark-free.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
10	22	28	9*	10*	16*	14	6	14	6

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10-50
Polyurethane, PU70	Black	70	10-50

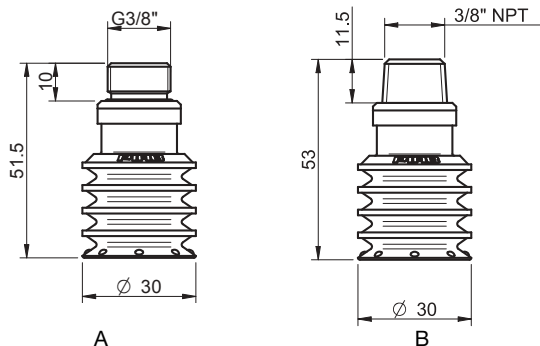
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

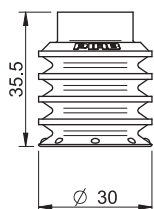
\*\*Please contact Piab.

## Ordering information

	Complete suction cup	Art. No.
A	Suction cup BL30-3P Polyurethane 30/70, G3/8" male	0113743
B	Suction cup BL30-3P Polyurethane 30/70, 3/8" NPT male	0113744



	Rubber part	Art. No.
	Suction cup BL30-3P Polyurethane 30/70	0110545



	Fitting	Art. No.
	Fitting G3/8" male, bag	0112662
	Fitting 3/8" NPT male, bag	0112692

## BL40-3P



### Suction cup specially designed for plastic bag handling

- ▶ High-flow fitting allowing high initial vacuum flow needed for plastic bag handling.
- ▶ Suitable for level adjustment and uneven surfaces.
- ▶ Dual hardness allowing strength and stability in conjunction with softness and flexibility.
- ▶ DURAFLEX® material features the elasticity of rubber in combination with the wear resistance of polyurethane.
- ▶ The DURAFLEX® material is mark-free.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
20	43	55	13*	24*	36*	27	13	21	12

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10–50
Polyurethane, PU70	Black	70	10–50

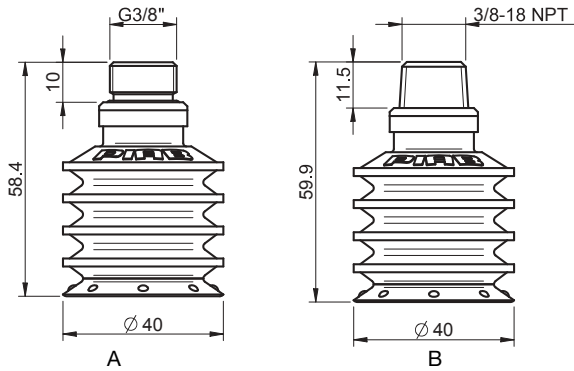
### Material resistance

Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

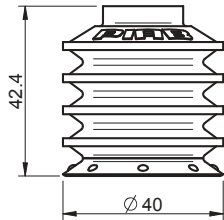
\*\*Please contact Piab.

## Ordering information

	Complete suction cup	Art. No.
A	Suction cup BL40-3P Polyurethane 30/70, G3/8" male	0111791
B	Suction cup BL40-3P Polyurethane 30/70, 3/8" NPT male	0112693



	Rubber part	Art. No.
	Suction cup BL40-3P Polyurethane 30/70	0112667



	Fittings	Art. No.
	Fitting G3/8" male, bag	0112662
	Fitting 3/8" NPT male, bag	0112692

## BL50-3P



### Suction cup specially designed for plastic bag handling

- ▶ High-flow fitting allowing high initial vacuum flow needed for plastic bag handling.
- ▶ Suitable for level adjustment and uneven surfaces.
- ▶ Dual hardness allowing strength and stability in conjunction with softness and flexibility.
- ▶ DURAFLEX® material features the elasticity of rubber in combination with the wear resistance of polyurethane.
- ▶ The DURAFLEX® material is mark-free.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
24	60	75	22*	49*	60*	54	16	26	24

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PU30	Yellow	30	10–50
Polyurethane, PU70	Black	70	10–50

### Material resistance

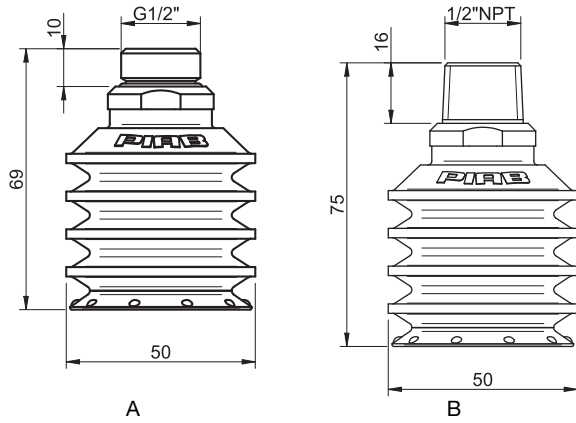
Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Ethanol	Methanol	Oxidation
Excellent	Excellent	Excellent	Fair**	Fair	Fair**	Fair	Poor	Poor

\*\*Please contact Piab.

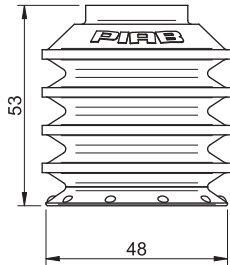


## Ordering information

	Complete suction cup	Art. No.
A	Suction cup BL50-3P Polyurethane 30/70, G1/2" male	0113745
B	Suction cup BL50-3P Polyurethane 30/70, 1/2" NPT male	0113746



	Rubber part	Art. No.
	Suction cup BL50-3P Polyurethane 30/70	0112641



	Fitting	Art. No.
	Fitting G1/2" male, bag	0113117
	Fitting 1/2" NPT male, bag	0113140

## BL20-2



### Suction cup with long bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Less suitable when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.32/3.2*	0.62/6.2*	—	—	—	—	4.0	4.0	13	3

\*Lifting force with reinforcement rings.

### Material specifications

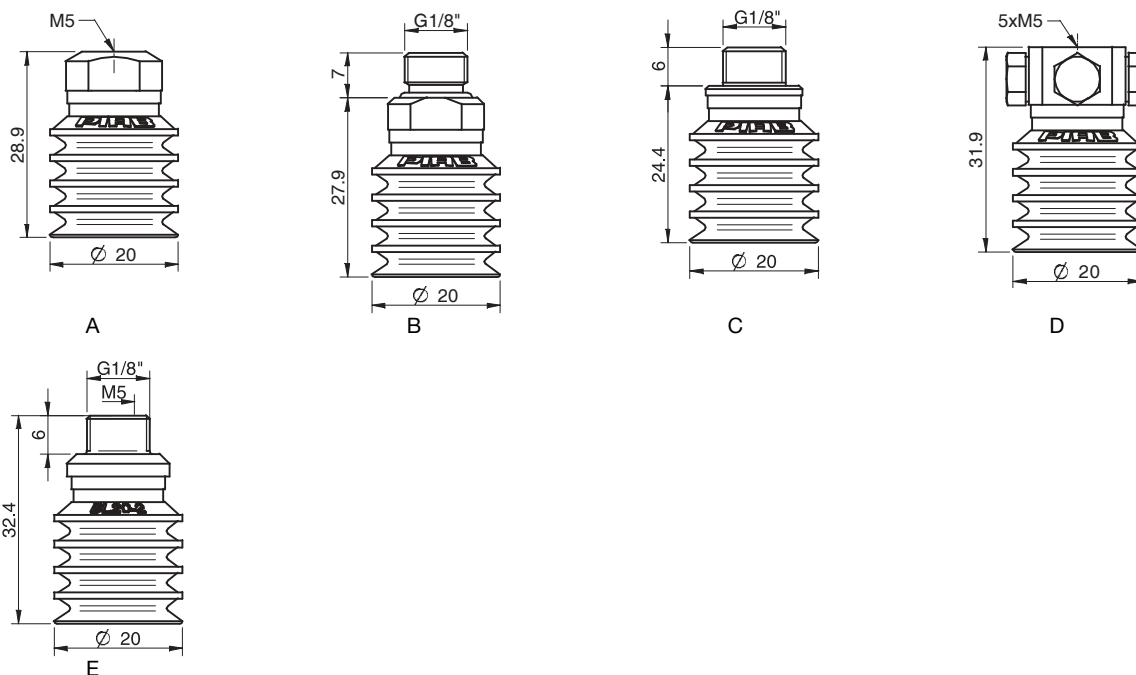
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

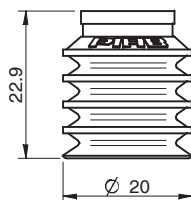
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL20-2 Chloroprene, M5 female	0101193
B	Suction cup BL20-2 Chloroprene, G1/8" male, with mesh filter	0101194
B	Suction cup BL20-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101200
C	Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101198
C	Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101202
D	Suction cup BL20-2 Chloroprene, 5xM5 female	0101197
A	Suction cup BL20-2 Silicone, M5 female	0101204
A	Suction cup BL20-2 Silicone, M5 female, with dual flow control valve	0101210
B	Suction cup BL20-2 Silicone, G1/8" male, with mesh filter	0101205
B	Suction cup BL20-2 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101211
C	Suction cup BL20-2 Silicone, G1/8" male/M5 female, with mesh filter	0101209
D	Suction cup BL20-2 Silicone, 5xM5 female	0101208
E	Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, PA	0109844
E	Suction cup BL20-2 Silicone, G1/8" male/M5 female, PA	0110339



Rubber parts	Art. No.
Suction cup BL20-2 Chloroprene	0101115
Suction cup BL20-2 Silicone	0101116



Fittings	Art. No.
Fitting M5 female	3250003
Fitting M5 female, with dual flow control valve	3251001
Fitting G1/8" male, with mesh filter	3250085
Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
Fitting G1/8" male/M5 female, with mesh filter	0101152
Fitting G1/8" male/M5 female, with dual flow control valve	3251004
Fitting 5xM5 female	0100260
Fitting 5xM5 female, with dual flow control valve	3251005
Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL20-2, 4x	Polyamide, PA	-40-110	3150071

## BL30-2



### Suction cup with long bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Less suitable when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.64/6.4*	1.6/16.0*	—	—	—	—	10	8	20	7

\*Lifting force with reinforcement rings.

### Material specifications

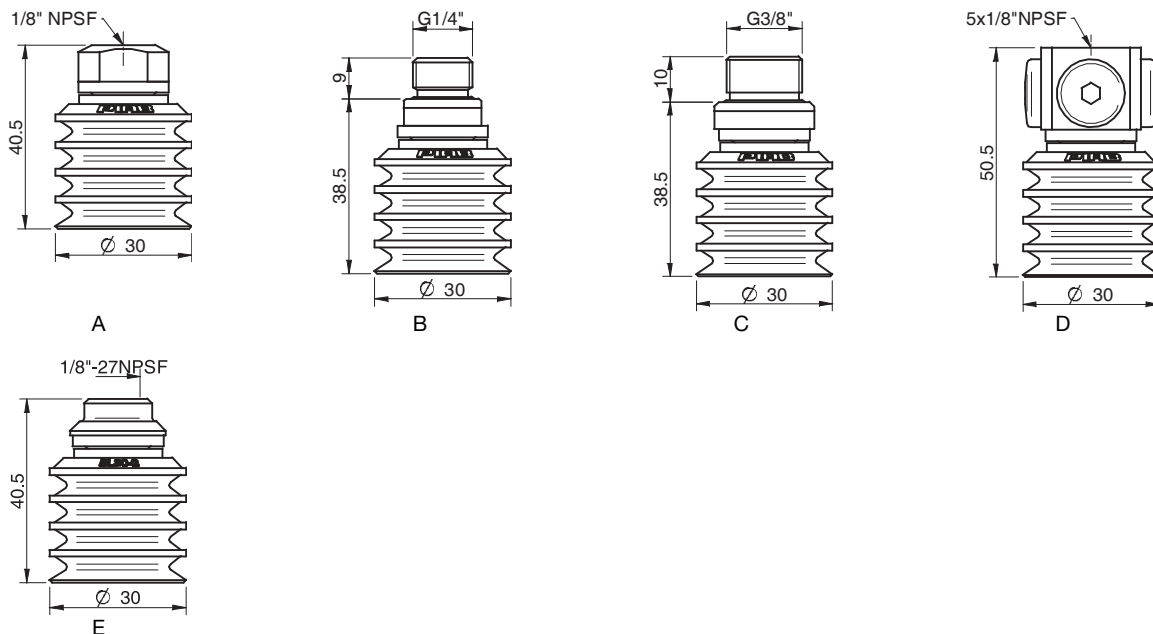
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

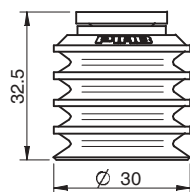
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL30-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101501
A	Suction cup BL30-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101502
B	Suction cup BL30-2 Chloroprene, G1/4" male, with mesh filter	0101496
B	Suction cup BL30-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101503
C	Suction cup BL30-2 Chloroprene, G3/8" male, with mesh filter	0101498
A	Suction cup BL30-2 Silicone, 1/8" NPSF female, with mesh filter	0101514
A	Suction cup BL30-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101515
B	Suction cup BL30-2 Silicone, G1/4" male, with mesh filter	0101509
B	Suction cup BL30-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101516
C	Suction cup BL30-2 Silicone, G3/8" male, with mesh filter	0101511
D	Suction cup BL30-2 Silicone, 5x1/8" NPSF female	0101513
E	Suction cup BL30-2 Chloroprene, 1/8" NPSF female, PA	0110951
E	Suction cup BL30-2 Silicone, 1/8" NPSF female, PA	0110340



Rubber parts	Art. No.
Suction cup BL30-2 Chloroprene	0101117
Suction cup BL30-2 Silicone	0101118



Fittings	Art. No
Fitting 1/8" NPSF female, 30–40, with mesh filter	0101153
Fitting 1/8" NPSF female, 30–40, with dual flow control valve	3251006
Fitting G1/4" male, 30–40, with mesh filter	3250091
Fitting G1/4" male, 30–40, with mesh filter and dual flow control valve	3251007
Fitting G3/8" male, 30–40, with mesh filter	3250086
Fitting G3/8" male, 30–40, with mesh and dual flow control valve	3251009
Fitting 5x1/8" NPSF female, 30–40	0100261
Fitting 5x1/8" NPSF female, 30–40, with dual flow control valve	3251011
Fitting 1/8" NPSF female, 30–40, PA	3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL30-2, 4x	Polyamide, PA	-40-110	3150072

## BL40-2



### Suction cup with long bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Less suitable when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
1.1/11.0*	2.2/22.0*	—	—	—	—	27	11	33	10

\*Lifting force with reinforcement rings.

### Material specifications

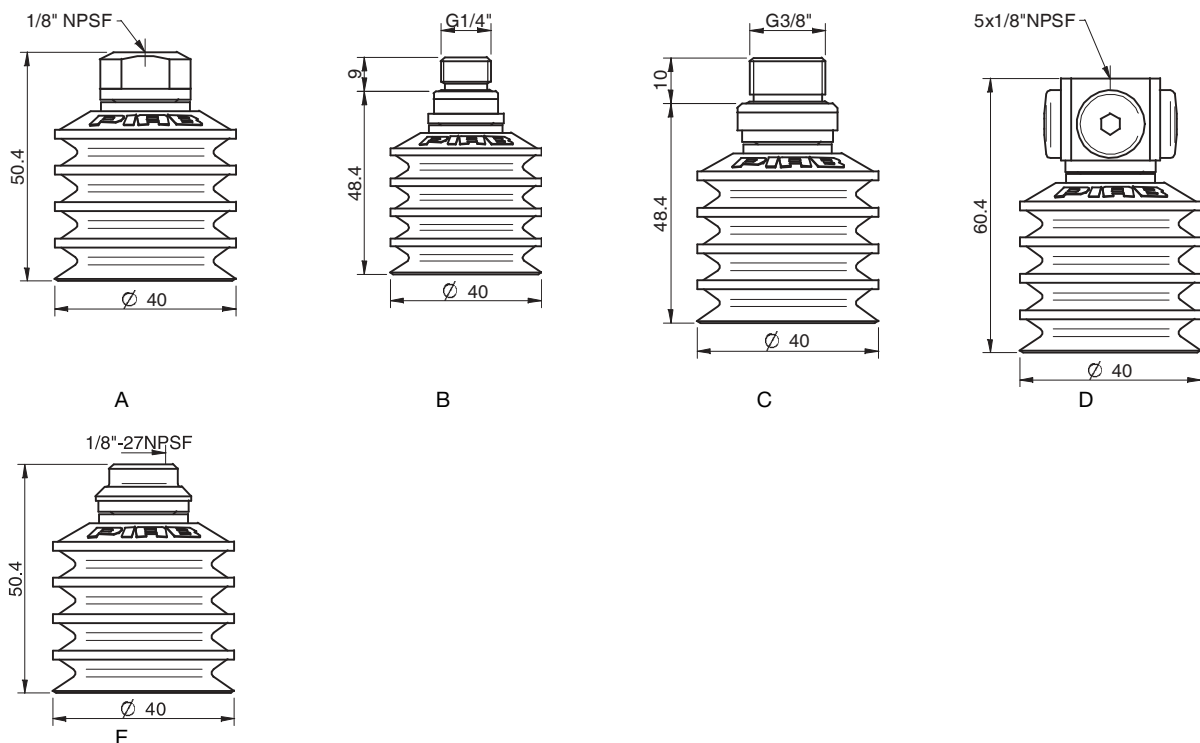
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

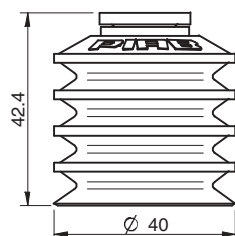
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL40-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101527
B	Suction cup BL40-2 Chloroprene, G1/4" male, with mesh filter	0101522
B	Suction cup BL40-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101529
C	Suction cup BL40-2 Chloroprene, G3/8" male, with mesh filter	0101524
D	Suction cup BL40-2 Chloroprene, 5x1/8" NPSF female	0101526
D	Suction cup BL40-2 Chloroprene, 5x1/8" NPSF female, with dual flow control valve	0101533
A	Suction cup BL40-2 Silicone, 1/8" NPSF female, with mesh filter	0101540
B	Suction cup BL40-2 Silicone, G1/4" male, with mesh filter	0101535
B	Suction cup BL40-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101542
C	Suction cup BL40-2 Silicone, G3/8" male, with mesh filter	0101537
D	Suction cup BL40-2 Silicone, 5x1/8" NPSF female	0101539
E	Suction cup BL40-2 Chloroprene, 1/8" NPSF female, PA	0110946
E	Suction cup BL40-2 Silicone, 1/8" NPSF female, PA	0110341



Rubber parts	Art. No.
Suction cup BL40-2 Chloroprene	0101119
Suction cup BL40-2 Silicone	0101120



Fittings	Art. No
Fitting 1/8" NPSF female, 30–40, with mesh filter	0101153
Fitting 1/8" NPSF female, 30–40, with dual flow control valve	3251006
Fitting G1/4" male, 30–40, with mesh filter	3250091
Fitting G1/4" male, 30–40, with mesh filter and dual flow control valve	3251007
Fitting G3/8" male, 30–40, with mesh filter	3250086
Fitting G3/8" male, 30–40, with mesh and dual flow control valve	3251009
Fitting 5x1/8" NPSF female, 30–40	0100261
Fitting 5x1/8" NPSF female, 30–40, with dual flow control valve	3251011
Fitting 1/8" NPSF female, 30–40, PA	3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL40-2 & B-BL40-2, 4x	Polyamide, PA	-40–110	3150073

## BL50-2



### Suction cup with long bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Less suitable when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
1.7/17.0*	4.3/43*	—	—	—	—	53	13	34	20.0

\*Lifting force with reinforcement rings.

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

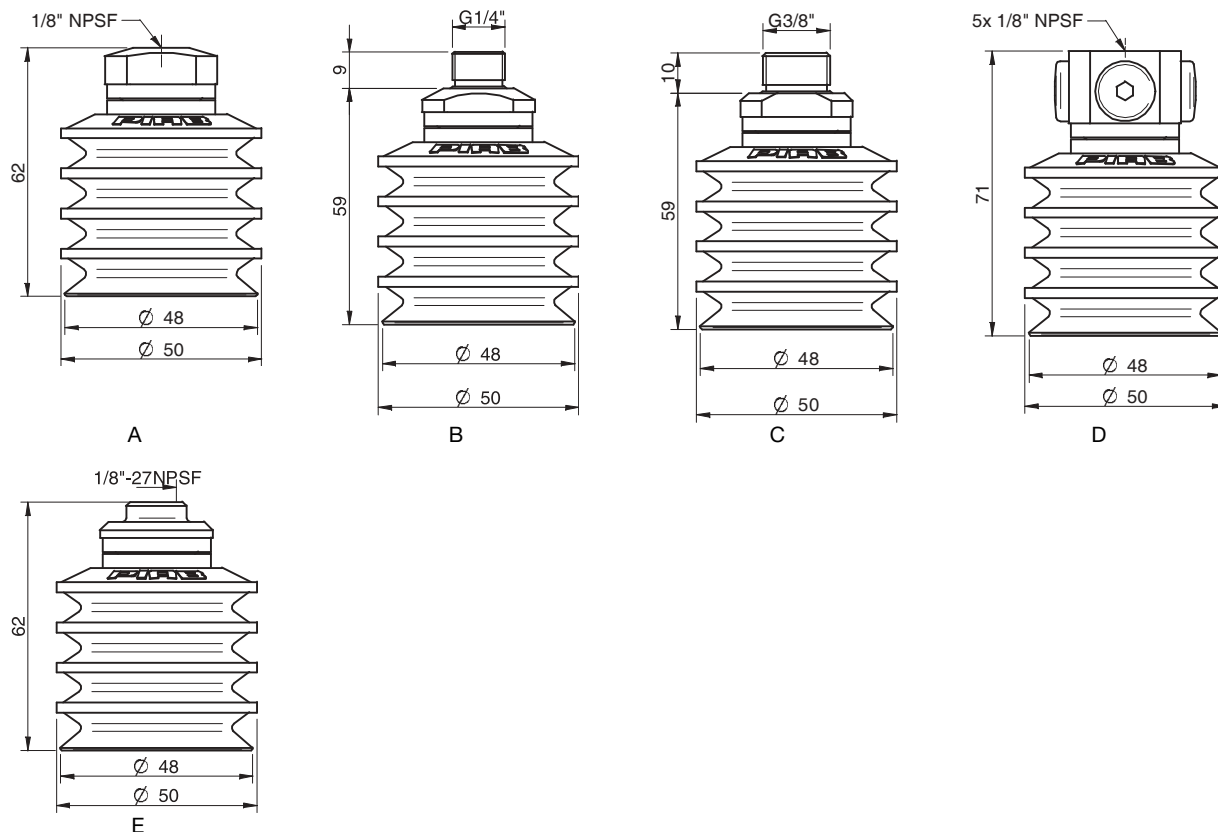
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

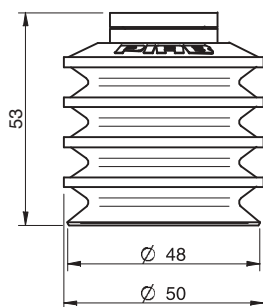
### Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL50-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101701
A	Suction cup BL50-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101702
B	Suction cup BL50-2 Chloroprene, G1/4" male, with mesh filter	0101696
B	Suction cup BL50-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101703
C	Suction cup BL50-2 Chloroprene, G3/8" male, with mesh filter	0101698
C	Suction cup BL50-2 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101705
D	Suction cup BL50-2 Chloroprene, 5x1/8" NPSF female	0101700
A	Suction cup BL50-2 Silicone, 1/8" NPSF female, with mesh filter	0101714
A	Suction cup BL50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101715
B	Suction cup BL50-2 Silicone, G1/4" male, with mesh filter	0101709
C	Suction cup BL50-2 Silicone, G3/8" male, with mesh filter	0101711
E	Suction cup BL50-2 Chloroprene, 1/8" NPSF female, PA	0110958
E	Suction cup BL50-2 Silicone, 1/8" NPSF female, PA	0110342





Rubber parts	Art. No.
Suction cup BL50-2 Chloroprene	0101121
Suction cup BL50-2 Silicone	0101122



Fittings	Art. No
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017
Fitting 1/8" NPSF female, 50, PA	3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL50-2, 4x	Polamide, PA	-40-110	3150074

## BL30-4



### Suction cup with long bellows and long lip

- ▶ Long and flexible bellow
- ▶ Long and thin lip
- ▶ High flow fitting
- ▶ Working area = lip diameter
- ▶ Wide temperature range (-40°C to +200°C)
- ▶ The silicone material complies with FDA 21 CFR 177.2600

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
8.0	—	—	—	—	—	4.1	20	19	5

*The suction cup is not intended for deeper vacuum levels than 20 -kPa.*

### Material specifications

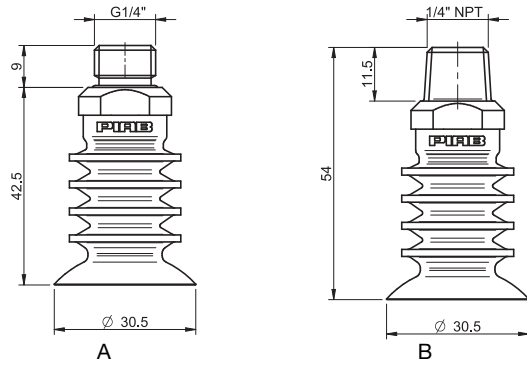
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40-200

### Material resistance

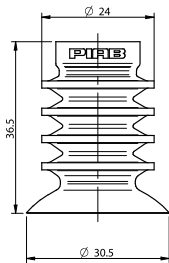
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL30-4 Silicone, G1/4" male	0118369
B	Suction cup BL30-4 Silicone, 1/4" NPT male	0118371



Rubber parts		Art. No.
Suction cup BL30-4 Silicone		0116971



Fittings		Art. No.
Fitting G1/4" male, bag		0118793
Fitting 1/4" NPT male, bag		0118794

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL20-2, 4x	Polyamide, PA	-40-110	3150071

## BL40-4



### Suction cup with long bellows and long lip

- ▶ Long and flexible bellow
- ▶ Long and thin lip
- ▶ High flow fitting
- ▶ Working area = lip diameter
- ▶ Wide temperature range (-40°C to +200°C)
- ▶ The silicone material complies with FDA 21 CFR 177.2600

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
10	15	22	9*	16*	26*	15	15	18	8

\*The suction cup is not intended for handling shear lifts. The values are given as a dimensioning guide to be used when, e.g., the acceleration/retardation causes shear forces.

### Material specifications

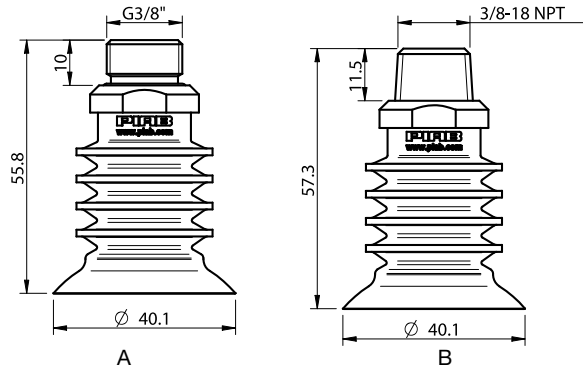
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40-200

### Material resistance

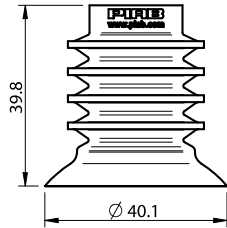
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cup	Art. No.
A	Suction cup BL40-4 Silicone, G3/8" male	0116993
B	Suction cup BL40-4 Silicone, 3/8" NPT male	0116996



	Rubber part	Art. No.
	Suction cup BL40-4 Silicone	0114848



	Fittings	Art. No.
	Fitting G3/8" male, bag	0112662
	Fitting 3/8" NPT male, bag	0112692

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Reinforcement ring for BL30-2, 4x	Polyamide, PA	-40-110	3150072

## BL50-4



### Features

- ▶ Good sealing properties
- ▶ Suitable for bags with fragile content e.g. snacks and cookies and lifting frozen food
- ▶ Suitable for level compensation
- ▶ The silicone material complies with FDA 21 CFR 177.2600
- ▶ High flow fitting

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
8	25	—	—	—	—	35	30	22	25

### Material specifications

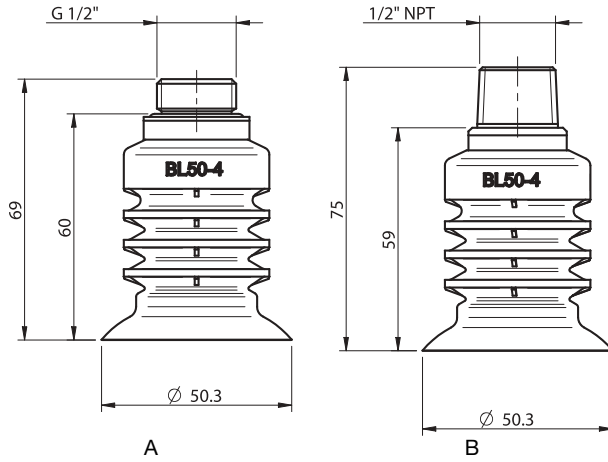
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40-200

### Material resistance

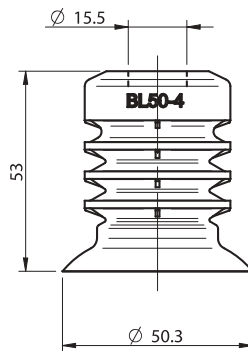
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cup	Art. No.
A	Suction cup BL50-4 Silicone, G1/2" male	0120543
B	Suction cup BL50-4 Silicone, 1/2" NPT male	0120544



	Rubber parts	Art. No.
	Suction cup BL50-4 Silicone	0117612



Description	Art. No.
Fitting G1/2" male, bag	0113117
Fitting 1/2" NPT male, bag	0113140

## BL30-5



### Suction cup specially optimised for difficult bag handling

- ▶ High initial flow, with re-enforced bellows and long, thin lip
- ▶ Suitable for handling difficult-to-handle bags, e.g., bags filled with liquid, frozen food, and for heavy bags
- ▶ Suitable working temperature is -40–200 °C
- ▶ Suitable for level compensation
- ▶ Made of silicone material that complies with FDA 21 CFR 177.2600

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level		Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	cm	mm	mm	g
8	9	8.55	17	11	14.5

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40–200

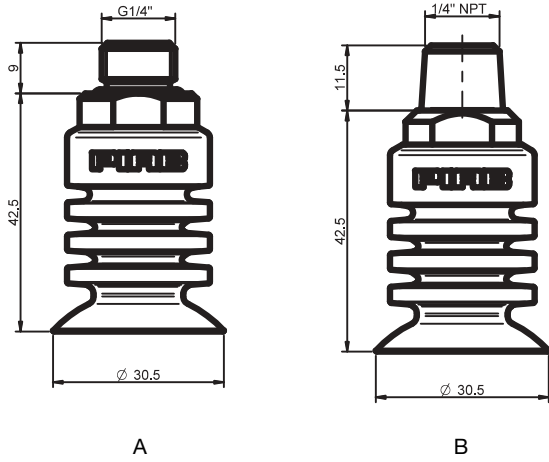
### Material resistance

Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

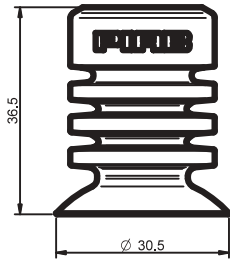


## Ordering information

Complete suction cups		Art. No.
A	Suction cup BL30-5 Silicone, G1/4" male	0124515
B	Suction cup BL30-5 Silicone, 1/4" NPT male	0124516



Rubber part		Art. No.
Suction cup BL30-5 Silicone		0121519



Fittings		Art. No.
Fitting G1/4" male, bag		0118793
Fitting 1/4" NPT male, bag		0118794

## BL40-5



### Suction cup specially optimised for difficult bag handling

- ▶ High initial flow, with re-enforced bellows and long, thin lip
- ▶ Suitable for handling difficult-to-handle bags, e.g., bags filled with liquid, frozen food, and for heavy bags
- ▶ Suitable working temperature is -40–200 °C
- ▶ Suitable for level compensation
- ▶ Made of silicone material that complies with FDA 21 CFR 177.2600

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level		Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	cm <sup>3</sup>	mm	mm	g
13	15	14	22	20	10

### Material specifications

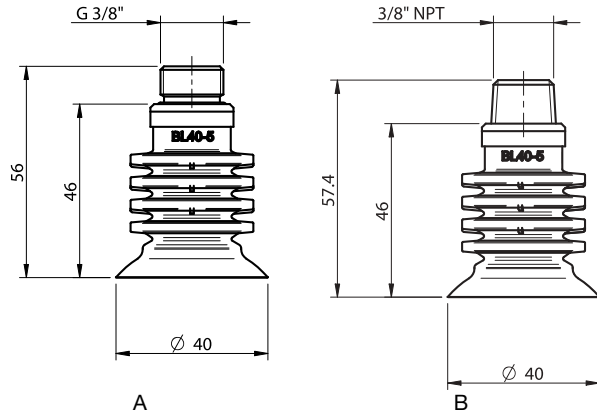
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40–200

### Material resistance

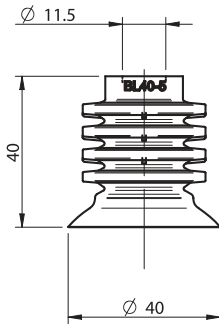
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups		Art. No.
A	Suction cup BL40-5 Silicone, G3/8" male	0120576
B	Suction cup BL40-5 Silicone, 3/8" NPT male	0120577



Rubber part		Art. No.
Suction cup BL40-5 Silicone		0117611



Fittings		Art. No.
Fitting G3/8" male, bag		0112662
Fitting 3/8" NPT male, bag		0112692

## BL50-5



### Suction cup specially optimised for difficult bag handling

- ▶ High initial flow, with re-enforced bellows and long, thin lip.
- ▶ Suitable for handling difficult-to-handle bags, e.g., bags filled with liquid, frozen food, and for heavy bags.
- ▶ Suitable working temperature is -40–200 °C.
- ▶ Suitable for level compensation.
- ▶ Made of silicone material that complies with FDA 21 CFR 177.2600.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
8	25	—	—	—	—	26	30	18	29

### Material specifications

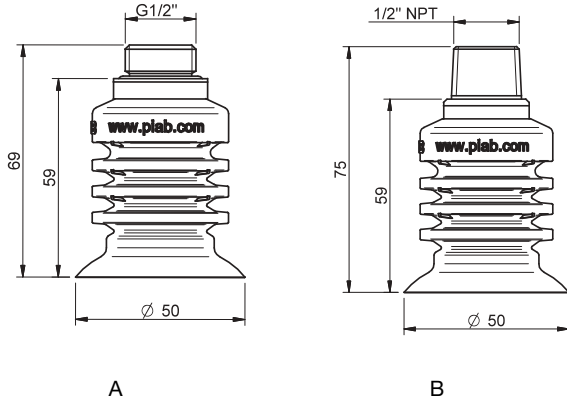
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40–200

### Material resistance

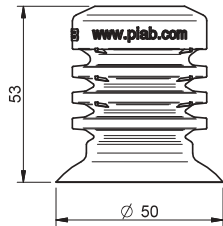
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup BL50-5 Silicone, G1/2" male	0122961
B	Suction cup BL50-5 Silicone, 1/2" NPT male	0122962



Rubber part	Art. No.
Suction cup BL50-5 Silicone	0121520



Description	Art. No.
Fitting G1/2" male, bag	0113117
Fitting 1/2" NPT male, bag	0113140

## B15MF



### Suction cup with short bellows, mark free

- ▶ Suction cup of TPU, a mark free material that leaves no trace on the object being handled.
- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
4.0	8.0	12.0	4.5	7.0	10.0	1.1	11	2.0	1.3

### Material specifications

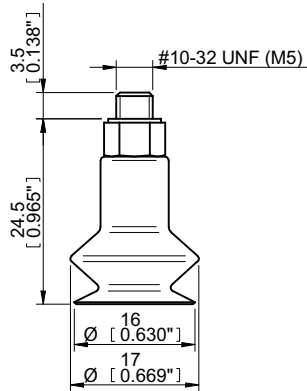
Material	Colour	Hardness °Shore A	Temperature range °C
Thermoelastic polyurethane, TPU	Transparent white	81	-20-80

### Material resistance

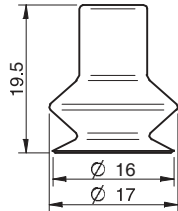
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Poor	Poor	Good	Good

## Ordering information

Complete suction cups	Art. No.
Suction cup B15MF Thermoelastic polyurethane, M5 male	3250069



Rubber parts	Art. No.
Suction cup B15MF Thermoelastic polyurethane	3150264



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B20MF



### Suction cup with short bellows, mark free

- ▶ Suction cup of TPU, a mark free material that leaves no trace on the object being handled.
- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
4.5	15.5	21.0	6.3	11.0	19.0	2.7	11	8.0	2.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Thermoelastic polyurethane, TPU	Transparent white	81	-20-80

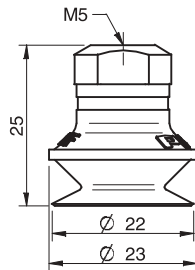
### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Poor	Poor	Good	Good

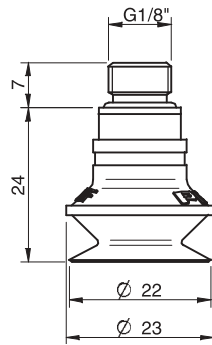


## Ordering information

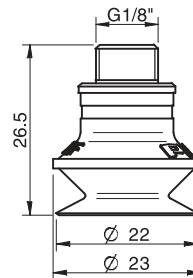
	Complete suction cups	Art. No.
A	Suction cup B20MF Thermoelastic polyurethane, M5 female	0101182
A	Suction cup B20MF Thermoelastic polyurethane, M5 female, with dual flow control valve	0101188
B	Suction cup B20MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101183
B	Suction cup B20MF Thermoelastic polyurethane, G1/8" male, with dual flow control valve and mesh filter	0101189
C	Suction cup B20MF Thermoelastic polyurethane, G1/8" male/M5 female, with mesh filter	0101187
C	Suction cup B20MF Thermoelastic polyurethane, G1/8" male/M5 fem., with dual flow control valve	0101191
D	Suction cup B20MF Thermoelastic polyurethane, 5xM5 female	0101186
D	Suction cup B20MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101192



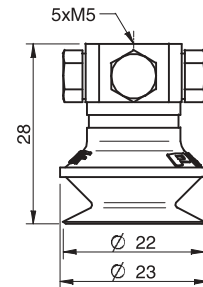
A



B

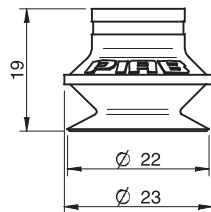


C



D

	Rubber parts	Art. No.
	Suction cup B20MF Thermoelastic polyurethane	0101111



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F15MF



### Flat suction cup with cleats, mark free

- ▶ Suction cup of TPU, a mark free material that leaves no trace on the object being handled.
- ▶ Suitable for flat surfaces.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm	mm	mm	g
4.0	8.0	12.0	4.5	9.0	14.5	0.37	17	1.0	0.8

### Material specifications

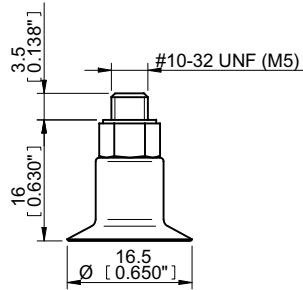
Material	Colour	Hardness °Shore A	Temperature range °C
Thermoelastic polyurethane, TPU	Transparent white	81	-20-80

### Material resistance

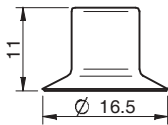
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Poor	Poor	Good	Good

## Ordering information

Complete suction cups	Art. No.
Suction cup F15MF Thermoelastic polyurethane, M5 male	3250074



Rubber parts	Art. No.
Suction cup F15MF Thermoelastic polyurethane	3150269



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F20MF



### Flat suction cup with cleats, mark free

- ▶ Suction cup of TPU, a mark free material that leaves no trace on the object being handled.
- ▶ Suitable for flat surfaces.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
3.6	14.5	22.0	8.0	14.5	21.0	1.0	18	2.0	1.2

### Material specifications

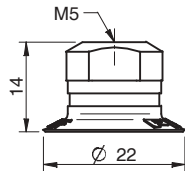
Material	Colour	Hardness °Shore A	Temperature range °C
Thermoelastic polyurethane, TPU	Transparent white	81	-20-80

### Material resistance

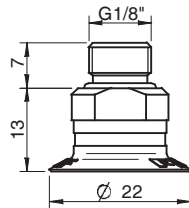
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Poor	Poor	Good	Good

## Ordering information

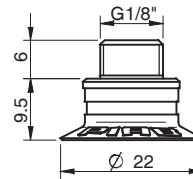
	Complete suction cups	Art. No.
A	Suction cup F20MF Thermoelastic polyurethane, M5 female	0101281
B	Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101282
B	Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101288
C	Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 female, with mesh filter	0101286
C	Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 fem., with dual flow control valve	0101290
D	Suction cup F20MF Thermoelastic polyurethane, 5xM5 female	0101285
D	Suction cup F20MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101291



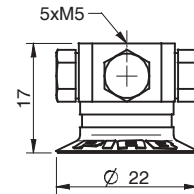
A



B

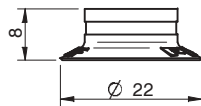


C



D

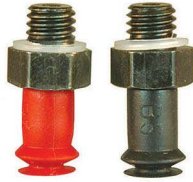
	Rubber parts	Art. No.
	Suction cup F20MF Thermoelastic polyurethane	0101139



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005
	Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B5



### Suction cup with short bellows

- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.
- ▶ Suitable for level adjustment.
- ▶ Suction cups of conductive silicone are suitable for objects with sensitivity to static electricity.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.30	0.80	1.0	—	—	—	0.05	1.5	1.5	0.11

### Material specifications

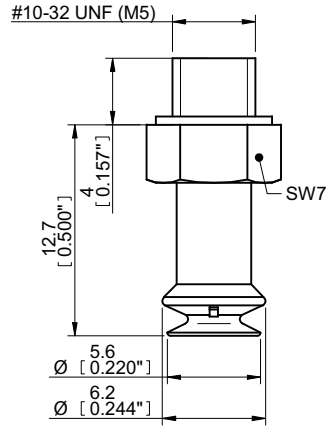
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40–110
Silicone, SIL	Red	50	-40–200
Conductive silicone, CSIL	Black	50	-55–230

### Material resistance

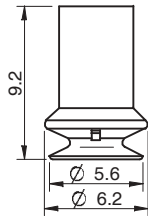
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
Conductive silicone, CSIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B5 Chloroprene, M5 male	3250082
Suction cup B5 Silicone, M5 male	3250082S
Suction cup B5 Conductive silicone, M5 male	3250082SC



Rubber parts	Art. No.
Suction cup B5 Chloroprene	3150286
Suction cup B5 Silicone	3150286S
Suction cup B5 Conductive silicone	3150286SC



Fittings	Art. No.
Fitting M5 male, 5-8	3107031

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B8



### Suction cup with short bellows

- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.
- ▶ Suitable for level adjustment.
- ▶ Suction cups of conductive silicone are suitable for objects with sensitivity to static electricity.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.80	1.6	2.5	—	—	—	0.15	1.9	3.5	0.3

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40–110
Silicone, SIL	Red	50	-40–200
Conductive silicone, CSIL	Black	50	-55–230

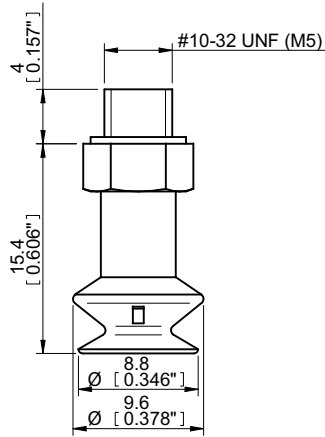
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
Conductive silicone, CSIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

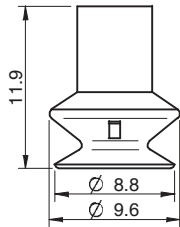


## Ordering information

Complete suction cups	Art. No.
Suction cup B8 Chloroprene, M5 male	3250083
Suction cup B8 Silicone, M5 male	3250083S
Suction cup B8 Conductive silicone, M5 male	3250083SC



Rubber parts	Art. No.
Suction cup B8 Chloroprene	3150287
Suction cup B8 Silicone	3150287S
Suction cup B8 Conductive silicone	3150287SC



Fittings	Art. No.
Fitting M5 male, 5-8	3107031

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B10-2



### Suction cup with short bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
1.5	3.4	4.9	—	—	—	0.48	4.0	4.5	1.0

### Material specifications

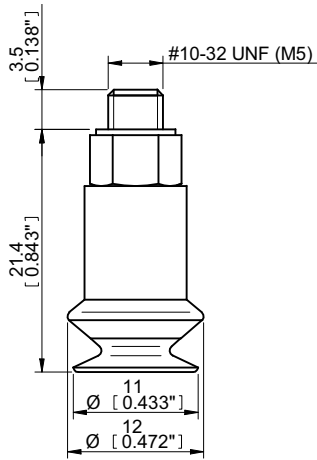
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

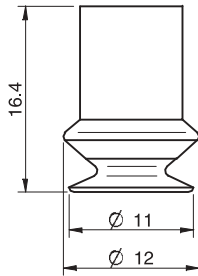
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B10-2 Chloroprene, M5 male	3150023
Suction cup B10-2 Silicone, M5 male	3150023S



Rubber parts	Art. No.
Suction cup B10-2 Chloroprene	3150101
Suction cup B10-2 Silicone	3150101S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B15-2



### Suction cup with short bellows

- ▶ Suitable for level adjustment.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
2.9	5.9	8.9	—	—	—	1.1	5.0	6.5	1.5

### Material specifications

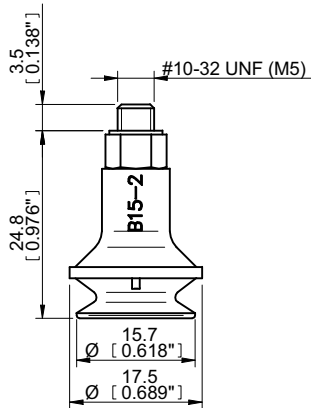
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

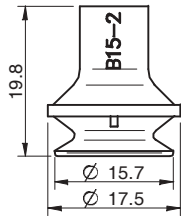
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B15-2 Chloroprene, M5 male	3250037
Suction cup B15-2 Silicone, M5 male	3250037S



Rubber parts	Art. No.
Suction cup B15-2 Chloroprene	3150230
Suction cup B15-2 Silicone	3150230S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B20



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
5.9	9.8	14	—	—	—	2.7	10	10	3.2

### Material specifications

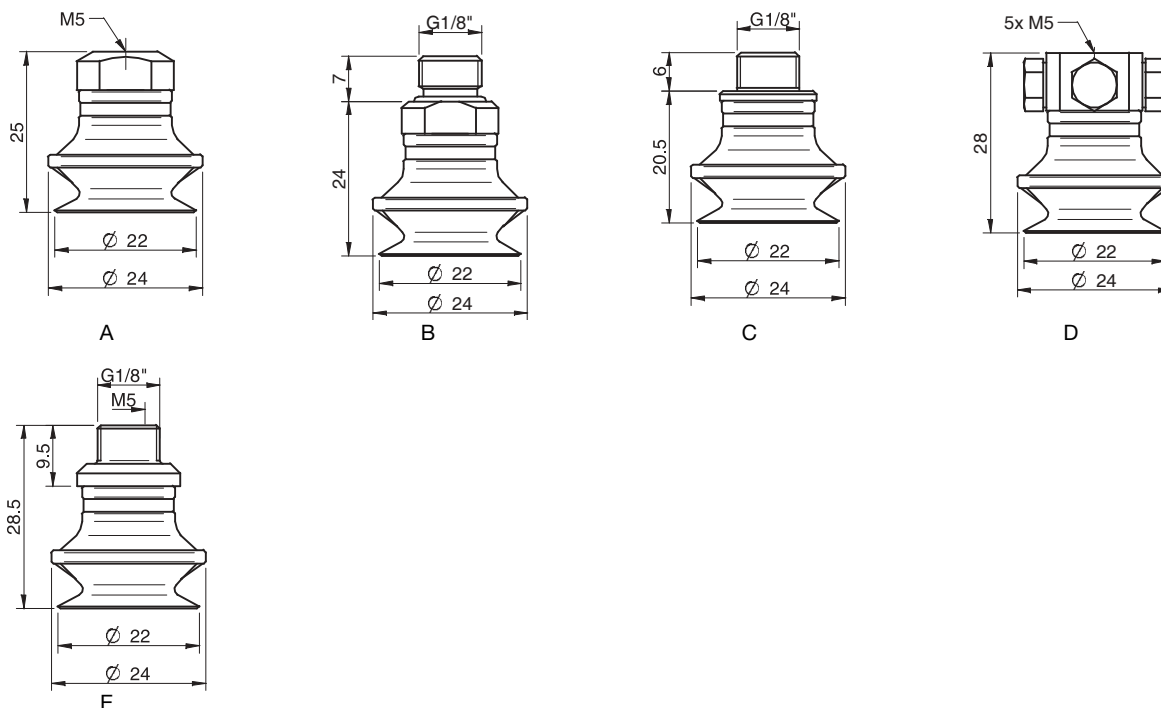
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

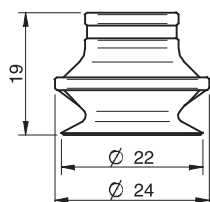
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup B20 Chloroprene, M5 female	0101160
A	Suction cup B20 Chloroprene, M5 female, with dual flow control valve	0101166
B	Suction cup B20 Chloroprene, G1/8" male, with mesh filter	0101161
B	Suction cup B20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101167
C	Suction cup B20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101165
C	Suction cup B20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101169
D	Suction cup B20 Chloroprene, 5xM5 female	0101164
A	Suction cup B20 Silicone, M5 female	0101171
A	Suction cup B20 Silicone, M5 female, with dual flow control valve	0101177
B	Suction cup B20 Silicone, G1/8" male, with mesh filter	0101172
B	Suction cup B20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101178
C	Suction cup B20 Silicone, G1/8" male/M5 female, with mesh filter	0101176
C	Suction cup B20 Silicone, G1/8" male/M5 female, with dual flow control valve	0101180
D	Suction cup B20 Silicone, 5xM5 female	0101175
D	Suction cup B20 Silicone, 5xM5 female, with dual flow control valve	0101181
E	Suction cup B20 Chloroprene, G1/8" male/M5 female, PA	0110949
E	Suction cup B20 Silicone, G1/8" male/M5 female, PA	0110336



Rubber parts	Art. No.
Suction cup B20 Chloroprene	0101101
Suction cup B20 Silicone	0101102



Fittings	Art. No.
Fitting M5 female	3250003
Fitting M5 female, with dual flow control valve	3251001
Fitting G1/8" male, with mesh filter	3250085
Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
Fitting G1/8" male/M5 female, with mesh filter	0101152
Fitting G1/8" male/M5 female, with dual flow control valve	3251004
Fitting 5xM5 female	0100260
Fitting 5xM5 female, with dual flow control valve	3251005
Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B30-2



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
12.0	22.0	27	—	—	—	10	15	15	7.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40–110
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

\*For a shorter period of time up to 160 °C.

### Material resistance

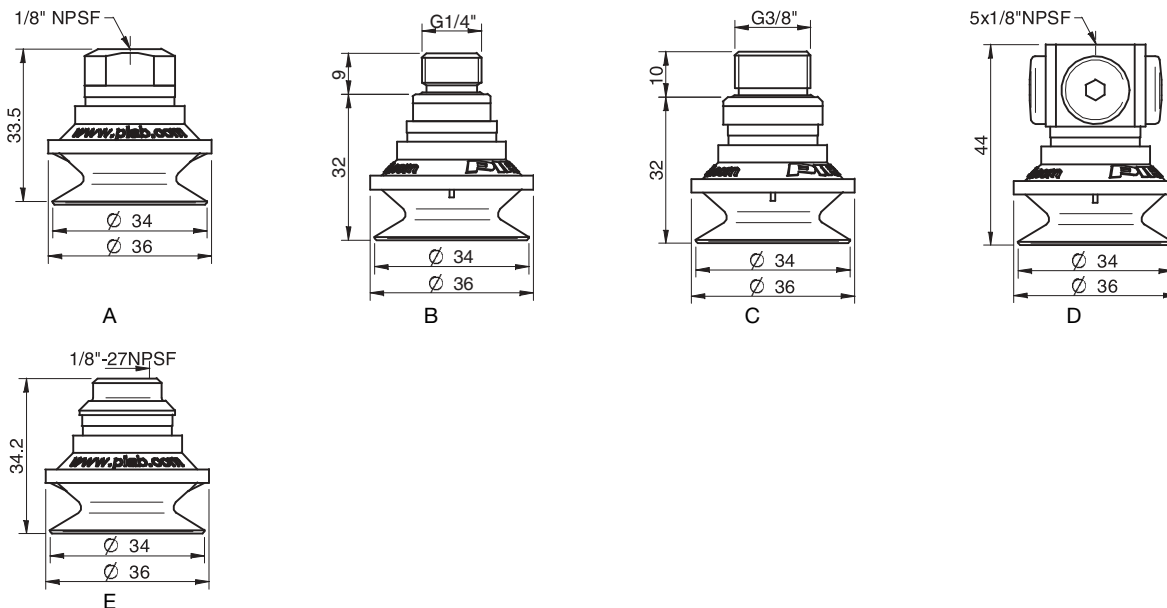
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

### Ordering information

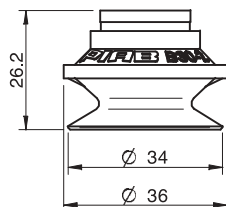
	Complete suction cups	Art. No.
A	Suction cup B30-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101423
A	Suction cup B30-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101424
B	Suction cup B30-2 Chloroprene, G1/4" male, with mesh filter	0101418
B	Suction cup B30-2 Chloroprene, G1/4" male, with mesh filter dual flow control valve	0101425
C	Suction cup B30-2 Chloroprene, G3/8" male, with mesh filter	0101420
C	Suction cup B30-2 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101427
D	Suction cup B30-2 Chloroprene, 5x1/8" NPSF female	0101422
A	Suction cup B30-2 Silicone, 1/8" NPSF female, with mesh filter	0101436
A	Suction cup B30-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101437
B	Suction cup B30-2 Silicone, G1/4" male, with mesh filter	0101431
B	Suction cup B30-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101438
C	Suction cup B30-2 Silicone, G3/8" male, with mesh filter	0101433
C	Suction cup B30-2 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101440
D	Suction cup B30-2 Silicone, 5x1/8" NPSF female	0101435
D	Suction cup B30-2 Silicone, 5x1/8" NPSF female, with dual flow control valve	0101442



Complete suction cups		Art. No.
A	Suction cup B30-2 HNBR, 1/8" NPSF female, with mesh filter	0108078
B	Suction cup B30-2 HNBR, G1/4" male, with mesh filter	0108167
C	Suction cup B30-2 HNBR, G3/8" male, with mesh filter	0108168
E	Suction cup B30-2 Chloroprene, 1/8" NPSF female, PA	0109845
E	Suction cup B30-2 Silicone, 1/8" NPSF female, PA	0110343



Rubber parts	Art. No.
Suction cup B30-2 Chloroprene	0101103
Suction cup B30-2 Silicone	0101104
Suction cup B30-2 HNBR	0108077



Fittings	Art. No
Fitting 1/8" NPSF female, 30-40, with mesh filter	0101153
Fitting 1/8" NPSF female, 30-40, with dual flow control valve	3251006
Fitting G1/4" male, 30-40, with mesh filter	3250091
Fitting G1/4" male, 30-40, with mesh filter and dual flow control valve	3251007
Fitting G3/8" male, 30-40, with mesh filter	3250086
Fitting G3/8" male, 30-40, with mesh and dual flow control valve	3251009
Fitting 5x1/8" NPSF female, 30-40	0100261
Fitting 5x1/8" NPSF female, 30-40, with dual flow control valve	3251011
Fitting 1/8" NPSF female, 30-40, PA	3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B40



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
22.0	39	49	—	—	—	15	20	12	10.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	60	-40-110
Silicone, SIL	Red	50	-40-200
HNBR	Grey-blue	75	-30-140*

\*For a shorter period of time up to 160 °C.

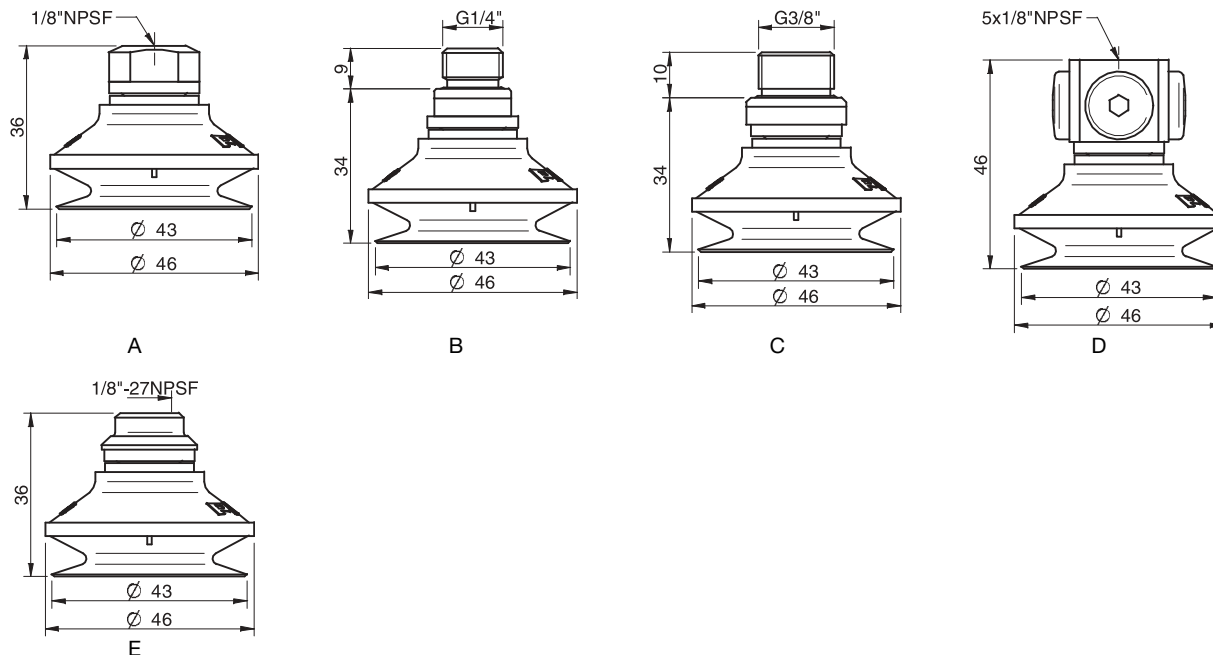
### Material resistance

Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

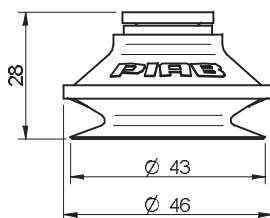
### Ordering information

	Complete suction cups	Art. No.
A	Suction cup B40 Chloroprene, 1/8" NPSF female, with mesh filter	0101462
A	Suction cup B40 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101463
B	Suction cup B40 Chloroprene, G1/4" male, with mesh filter	0101457
B	Suction cup B40 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101464
C	Suction cup B40 Chloroprene, G3/8" male, with mesh filter	0101459
C	Suction cup B40 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101466
D	Suction cup B40 Chloroprene, 5x1/8" NPSF female	0101461
A	Suction cup B40 Silicone, 1/8" NPSF female, with mesh filter	0101475
A	Suction cup B40 Silicone, 1/8" NPSF female, with dual flow control valve	0101476
B	Suction cup B40 Silicone, G1/4" male, with mesh filter	0101470
B	Suction cup B40 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101477
C	Suction cup B40 Silicone, G3/8" male, with mesh filter	0101472
D	Suction cup B40 Silicone, 5x1/8" NPSF female	0101474
A	Suction cup B40 HNBR, 1/8" NPSF female, with mesh filter	0108082
B	Suction cup B40 HNBR, G1/4" male, with mesh filter	0108169

Complete suction cups		Art. No.
C	Suction cup B40 HNBR, G3/8" male, with mesh filter	0108170
E	Suction cup B40 Chloroprene, 1/8" NPSF female, PA	0109843
E	Suction cup B40 Silicone, 1/8" NPSF female PA	0110337



Rubber parts		Art. No.
Suction cup B40 Chloroprene		0101105
Suction cup B40 Silicone		0101106
Suction cup B40 HNBR		0108081



Fittings		Art. No
Fitting 1/8" NPSF female, 30–40, with mesh filter		0101153
Fitting 1/8" NPSF female, 30–40, with dual flow control valve		3251006
Fitting G1/4" male, 30–40, with mesh filter		3250091
Fitting G1/4" male, 30–40, with mesh filter and dual flow control valve		3251007
Fitting G3/8" male, 30–40, with mesh filter		3250086
Fitting G3/8" male, 30–40, with mesh and dual flow control valve		3251009
Fitting 5x1/8" NPSF female, 30–40		0100261
Fitting 5x1/8" NPSF female, 30–40, with dual flow control valve		3251011
Fitting 1/8" NPSF female, 30–40, PA		3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B50



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
33	65	82	—	—	—	32	30	19	20.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

\* For a shorter period of time up to +160 °C

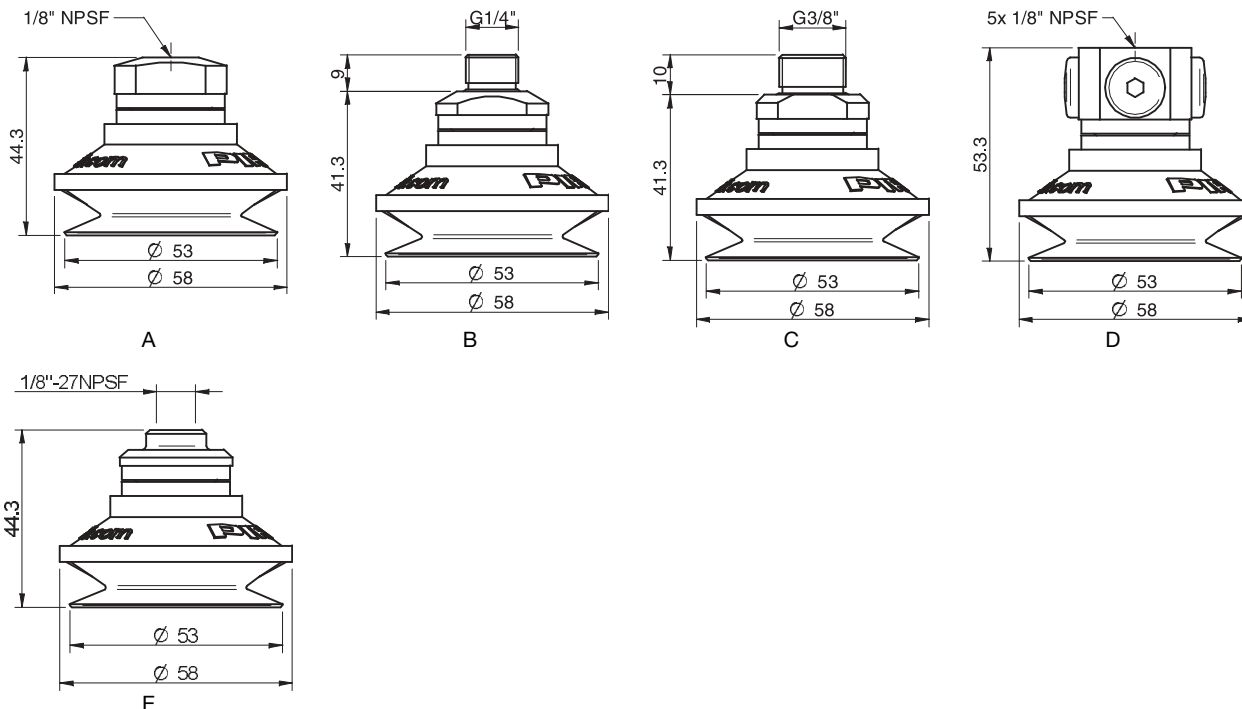
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

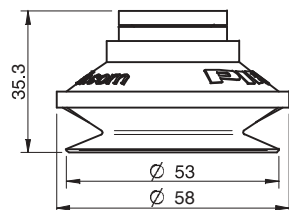
### Ordering information

	Complete suction cups	Art. No.
A	Suction cup B50 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101649
A	Suction cup B50 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101650
B	Suction cup B50 Nitrile-PVC, G1/4" male, with mesh filter	0101644
B	Suction cup B50 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101651
C	Suction cup B50 Nitrile-PVC, G3/8" male, with mesh filter	0101646
C	Suction cup B50 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101653
D	Suction cup B50 Nitrile-PVC, 5x1/8" NPSF female	0101648
A	Suction cup B50 Silicone, 1/8" NPSF female, with mesh filter	0101636
A	Suction cup B50 Silicone, 1/8" NPSF female, with dual flow control valve	0101637
B	Suction cup B50 Silicone, G1/4" male, with mesh filter	0101631
B	Suction cup B50 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101638
C	Suction cup B50 Silicone, G3/8" male, with mesh filter	0101633
C	Suction cup B50 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101640
D	Suction cup B50 Silicone, 5x1/8" NPSF female	0101635
A	Suction cup B50 HNBR, 1/8" NPSF female, with mesh filter	0108171

Complete suction cups		Art. No.
B	Suction cup B50 HNBR, G1/4" male, with mesh filter	0108172
C	Suction cup B50 HNBR, G3/8" male, with mesh filter	0108173
E	Suction cup B50 Nitrile-PVC, 1/8" NPSF female, PA	0111063



Rubber parts		Art. No.
Suction cup B50 Silicone		0101108
Suction cup B50 Nitrile-PVC		0101107
Suction cup B50 HNBR		0108165



Fittings		Art. No.
Fitting 1/8" NPSF female, 50, with mesh filter		0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve		3251012
Fitting G1/4" male, 50, with mesh filter		3250092
Fitting G1/4" male, with mesh filter and dual flow control valve		3251013
Fitting G3/8" male, 50, with mesh filter		3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve		3251015
Fitting 5x1/8" NPSF female, 50		0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve		3251017
Fitting 1/8" NPSF female, 50, PA		3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B50-2



### Suction cup with short bellows and filter

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
33	65	82	—	—	—	32	30	19	20.0

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90*
Silicone, SIL	Red	50	-40–200*

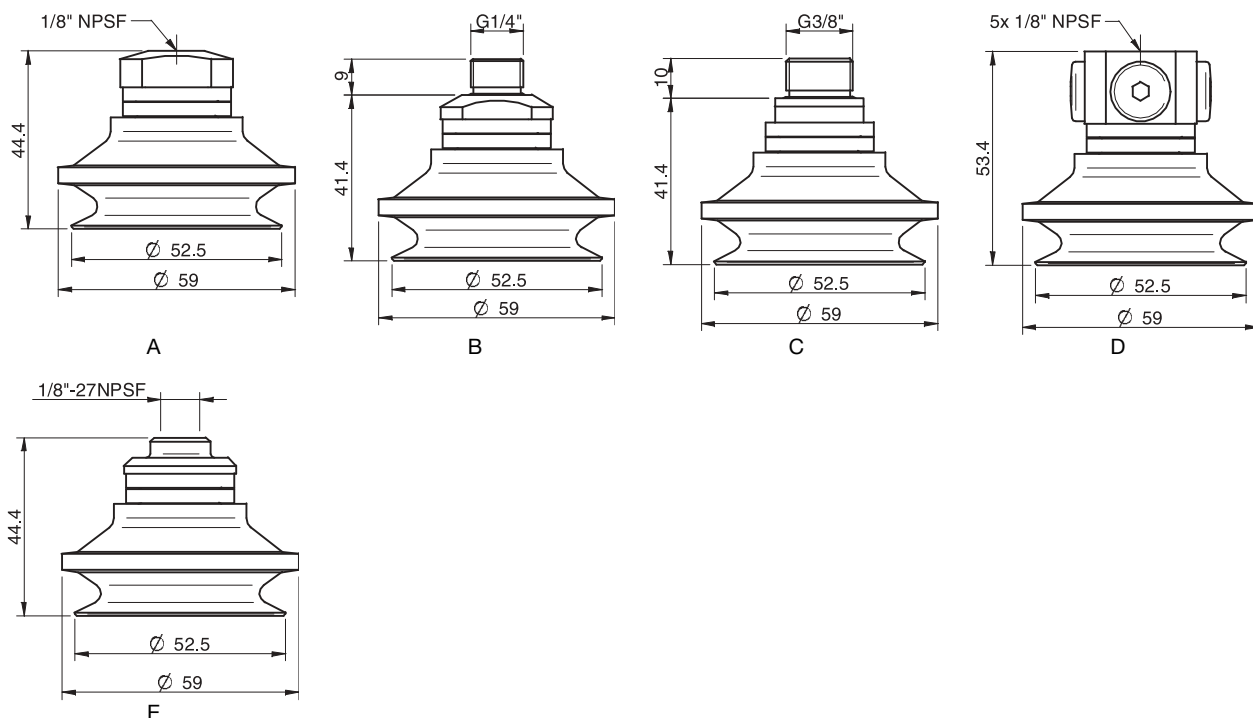
\* Filter disc max. 80 °C

### Material resistance

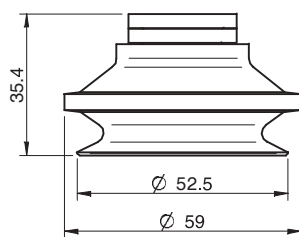
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

	Complete suction cups	Art. No
A	Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, with mesh filter	0101675
A	Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, with dual flow control valve	0101676
B	Suction cup B50-2 Nitrile-PVC with filter, G1/4" male, with mesh filter	0101670
B	Suction cup B50-2 Nitrile-PVC with filter, G1/4" male, with dual flow control valve and mesh filter	0101677
C	Suction cup B50-2 Nitrile-PVC with filter, G3/8" male, with mesh filter	0101672
D	Suction cup B50-2 Nitrile-PVC with filter, 5x1/8" NPSF female	0101674
A	Suction cup B50-2 Silicone with filter, 1/8" NPSF female, with mesh filter	0101662
A	Suction cup B50-2 Silicone with filter, 1/8" NPSF female, with dual flow control valve	0101663
B	Suction cup B50-2 Silicone with filter, G1/4" male, with mesh filter	0101657
C	Suction cup B50-2 Silicone with filter, G3/8" male, with mesh filter	0101659
D	Suction cup B50-2 Silicone with filter, 5x1/8" NPSF female	0101661
E	Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, PA	0110957
E	Suction cup B50-2 Silicone with filter, 1/8" NPSF female, PA	0110347



Rubber parts	Art. No.
Suction cup B50-2 Nitrile-PVC with filter	0101109
Suction cup B50-2 Silicone with filter	0101110



Fittings	Art. No
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017
Fitting 1/8" NPSF female, 50, PA	3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Filter for B50-2	Polyethylene, PE	-40-80	3150243

## B75



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min.curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
74	167	226	—	—	—	110	40	24	35

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

\* For a shorter period of time up to +160 °C

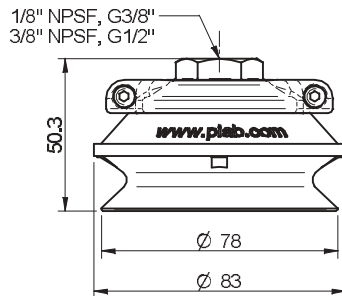
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

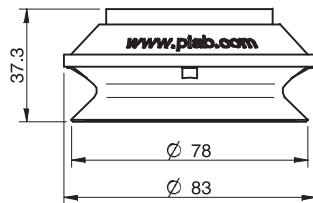


## Ordering information

Complete suction cups	Art. No.
Suction cup B75 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101854
Suction cup B75 Nitrile-PVC, G3/8" female, with mesh filter	0101855
Suction cup B75 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101856
Suction cup B75 Nitrile-PVC, G1/2" female, with mesh filter	0101857
Suction cup B75 Silicone, 1/8" NPSF female, with mesh filter	0101850
Suction cup B75 Silicone, G3/8" female, with mesh filter	0101851
Suction cup B75 Silicone, 3/8" NPSF female, with mesh filter	0101852
Suction cup B75 Silicone, G1/2" female, with mesh filter	0101853
Suction cup B75 HNBR, 1/8" NPSF female, with mesh filter	0108174
Suction cup B75 HNBR, G3/8" female, with mesh filter	0108175
Suction cup B75 HNBR, 3/8" NPSF female, with mesh filter	0108176
Suction cup B75 HNBR, G1/2" female, with mesh filter	0108177



Rubber parts	Art. No.
Suction cup B75 Nitrile-PVC	3150107P
Suction cup B75 Silicone	3150107S
Suction cup B75 HNBR	3150107T



Fittings	Art. No.
Fitting 75, 1/8" NPSF female, with mesh filter	0100548
Fitting 75, G3/8" female, with mesh filter	0100551
Fitting 75, 3/8" NPSF female, with mesh filter	0100553
Fitting 75, G1/2" female, with mesh filter	0100555

For further information and dimensioned drawings, see section *Suction cups/grippers Fittings*.

## B75-2



### Suction cup with short bellows and filter

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min.curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
74	167	226	—	—	—	110	40	24	35

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90*
Silicone, SIL	Red	50	-40-200*

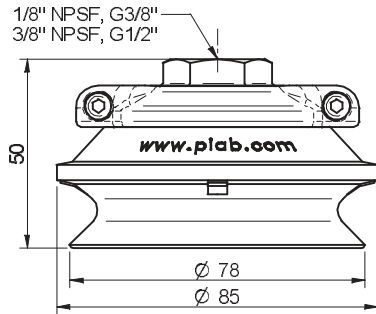
\* Filter disc max. 80 °C

### Material resistance

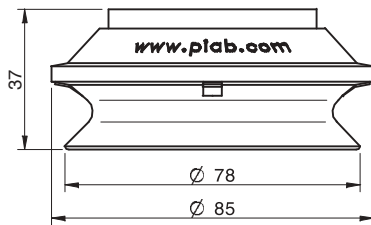
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B75-2 Nitrile-PVC with filter, 1/8" NPSF female, with mesh filter	0101862
Suction cup B75-2 Nitrile-PVC with filter, G3/8" female, with mesh filter	0101863
Suction cup B75-2 Nitrile-PVC with filter, 3/8" NPSF female, with mesh filter	0101864
Suction cup B75-2 Nitrile-PVC with filter, G1/2" female, with mesh filter	0101865
Suction cup B75-2 Silicone with filter, 1/8" NPSF female, with mesh filter	0101858
Suction cup B75-2 Silicone with filter, G3/8" female, with mesh filter	0101859
Suction cup B75-2 Silicone with filter, 3/8" NPSF female, with mesh filter	0101860
Suction cup B75-2 Silicone, G1/2" female, with mesh filter	0101861



Rubber parts	Art. No.
Suction cup B75-2 Nitrile-PVC with filter	0101942
Suction cup B75-2 Silicone with filter	0101943



Fittings	Art. No.
Fitting 75, 1/8" NPSF female, with mesh filter	0100548
Fitting 75, G3/8" female, with mesh filter	0100551
Fitting 75, 3/8" NPSF female, with mesh filter	0100553
Fitting 75, G1/2" female, with mesh filter	0100555

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare part	Material	Temperature range °C	Art. No.
Filter for B75-2	Polyethylene, PE	-40-80	3150244

## B110



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
137	343	461	—	—	—	310	60	35	120

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

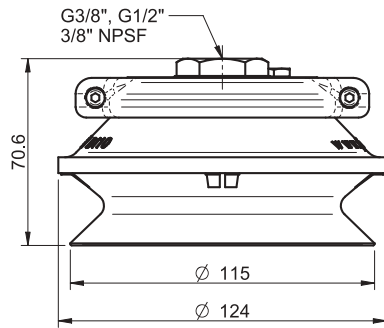
\* For a shorter period of time up to +160 °C

### Material resistance

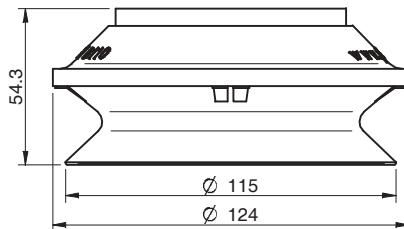
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B110 Nitrile-PVC, G3/8" female, with mesh filter	0101890
Suction cup B110 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101891
Suction cup B110 Nitrile-PVC, G1/2" female, with mesh filter	0101892
Suction cup B110 Silicone, G3/8" female, with mesh filter	0101884
Suction cup B110 Silicone, 3/8" NPSF female, with mesh filter	0101885
Suction cup B110 Silicone, G1/2" female, with mesh filter	0101886
Suction cup B110 HNBR, G3/8" female, with mesh filter	0108178
Suction cup B110 HNBR, G1/2" female, with mesh filter	0108180
Suction cup B110 HNBR, 3/8" NPSF female, with mesh filter	0108179



Rubber parts	Art. No.
Suction cup B110 Nitrile-PVC	3150108P
Suction cup B110 Silicone	3150108S
Suction cup B110 HNBR	3150108T



Fittings	Art. No.
Fitting 110 G3/8" female, with mesh filter	0100557
Fitting 110, G1/2" female, with mesh filter	0100561
Fitting 110, 3/8" NPSF female, with mesh filter	0100559

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B110-2



### Suction cup with short bellows and filter

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ Lifting movement to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
137	343	461	—	—	—	310	60	35	120

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90*
Silicone, SIL	Red	50	-40–200*

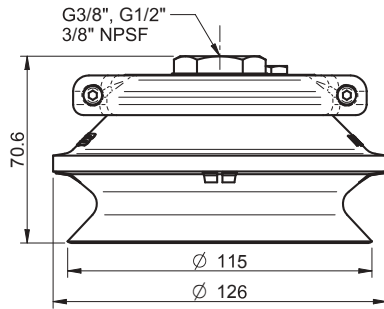
\* Filter disc max. 80 °C

### Material resistance

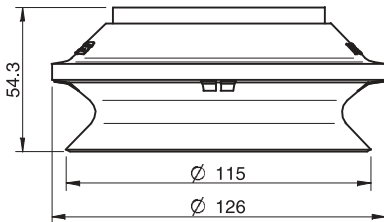
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup B110-2 Nitrile-PVC with filter, G3/8" female, with mesh filter	0101902
Suction cup B110-2 Nitrile-PVC with filter, 3/8" NPSF female, with mesh filter	0101903
Suction cup B110-2 Nitrile-PVC with filter, G1/2" female, with mesh filter	0101904
Suction cup B110-2 Silicone with filter, G3/8" female, with mesh filter	0101896
Suction cup B110-2 Silicone with filter, 3/8" NPSF female, with mesh filter	0101897
Suction cup B110-2 Silicone with filter, G1/2" female, with mesh filter	0101898



Rubber parts	Art. No.
Suction cup B110-2 Nitrile-PVC with filter	0101944
Suction cup B110-2 Silicone with filter	0101945



Fittings	Art. No.
Fitting 110 G3/8" female, with mesh filter	0100557
Fitting 110, G1/2" female, with mesh filter	0100561
Fitting 110, 3/8" NPSF female, with mesh filter	0100559

For further information and dimensioned drawings, see section *Suction cups/grippers Fittings*.

Spare Part	Material	Temperature range °C	Art. No.
Filter for B110-2	Polyethylene, PE	-40-80	3150249

## B150



### Suction cup with short bellows

- ▶ Suitable for level adjustment. Several short bellows in one lifting device can handle objects with height differences and varying shapes, for example embossed or corrugated plates.
- ▶ The lifting movement can be used to separate small and thin objects.
- ▶ Only lightweight objects should be handled when the lifting force is parallel to the surface of the object, in order to achieve good precision and safe lifting movement.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
294	686	883	—	—	—	650	75	45	265

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200

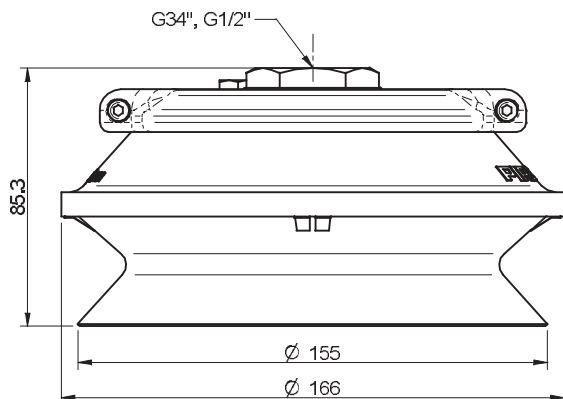
### Material resistance

Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

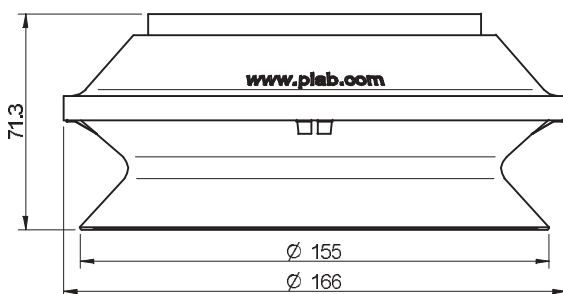


## Ordering information

Complete suction cups	Art. No.
Suction cup B150 Nitrile-PVC, G1/2" female, with mesh filter	0101931
Suction cup B150 Nitrile-PVC, G3/4" female, with mesh filter	0101932
Suction cup B150 Silicone, G1/2" female, with mesh filter	0101928
Suction cup B150 Silicone, G3/4" female, with mesh filter	0101929



Rubber parts	Art. No.
Suction cup B150 Nitrile-PVC	3150109P
Suction cup B150 Silicone	3150109S



Fittings	Art. No.
Fitting 150, G1/2" female, with mesh filter	0100564
Fitting 150, G3/4" female, with mesh filter	0100567

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## B-BL40-2, detectable



### Suction cup with long bellows

- ▶ Suitable for bakeries for use with handling seeded product.
- ▶ A low percentage metal additive is mixed with the rubber material to make it detectable.
- ▶ FDA-grade silicone material.
- ▶ Suitable for level adjustment.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
1.1	2.2	—	—	—	—	27	11	33	10

### Material specifications

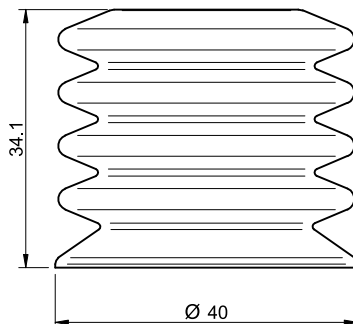
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	30	-40-200

### Material resistance

Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Description	Art. No.
Suction cup B-BL40-2, detectable	0121630
Retainer clip B-BL40-2, detectable	0121660



## D15-2



### Deep suction cup

- ▶ Suitable for objects with curved or irregular surfaces.
- ▶ Grips around corners and edges.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm	mm	mm	g
2.9	7.8	11.0	—	—	—	0.9	6.0	3.0	1.2

### Material specifications

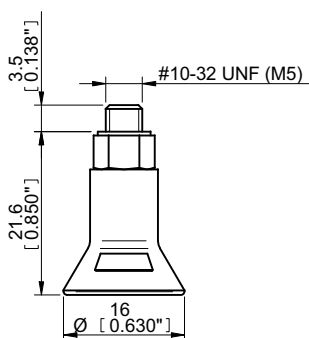
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

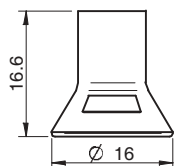
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup D15-2 Chloroprene, M5 male	3150010
Suction cup D15-2 Silicone, M5 male	3150010S



Rubber parts	Art. No.
Suction cup D15-2 Chloroprene	3150135
Suction cup D15-2 Silicone	3150135S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## D20-2



### Deep suction cup

- ▶ Suitable for objects with curved or irregular surfaces.
- ▶ Grips around corners and edges.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
5.9	15.0	18.0	—	—	—	2.5	8.0	4.5	2.2

### Material specifications

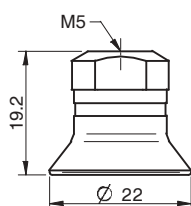
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

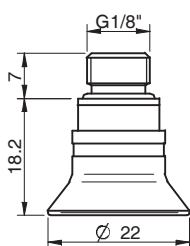
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

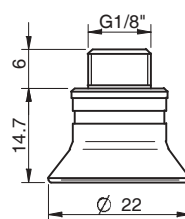
	Complete suction cups	Art. No.
A	Suction cup D20-2 Chloroprene, M5 female	0101215
B	Suction cup D20-2 Chloroprene, G1/8" male, with mesh filter	0101216
C	Suction cup D20-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101220
A	Suction cup D20-2 Silicone, M5 female	0101226
A	Suction cup D20-2 Silicone, M5 female, with dual flow control valve	0101232
B	Suction cup D20-2 Silicone, G1/8" male, with mesh filter	0101227
C	Suction cup D20-2 Silicone, G1/8" male/M5 female, with mesh filter	0101231
E	Suction cup D20-2 Silicone, G1/8" male/M5 female, PA	0110331



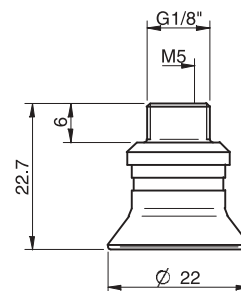
A



B

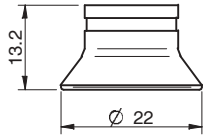


C



E

Rubber parts	Art. No.
Suction cup D20-2 Chloroprene	0101123
Suction cup D20-2 Silicone	0101124



Fittings	Art. No.
Fitting M5 female	3250003
Fitting M5 female, with dual flow control valve	3251001
Fitting G1/8" male, with mesh filter	3250085
Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
Fitting G1/8" male/M5 female, with mesh filter	0101152
Fitting G1/8" male/M5 female, with dual flow control valve	3251004
Fitting 5xM5 female	0100260
Fitting 5xM5 female, with dual flow control valve	3251005
Fitting G1/8" male/M5 female, PA	3150196

*For further information and dimensioned drawings, see section Suction cups/grippers Fittings.*

## D30-2



### Deep suction cup

- ▶ Suitable for objects with curved or irregular surfaces.
- ▶ Grips around corners and edges.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
14.0	26	31	—	—	—	5.0	13	5.0	4.0

### Material specifications

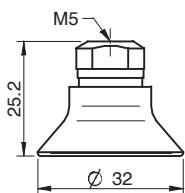
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

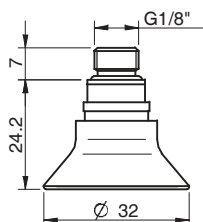
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

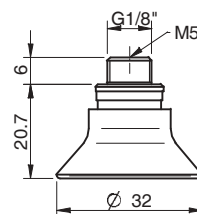
Complete suction cups		Art. No.
A	Suction cup D30-2 Chloroprene, M5 female	0101237
B	Suction cup D30-2 Chloroprene, G1/8" male, with mesh filter	0101238
B	Suction cup D30-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101244
C	Suction cup D30-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101242
C	Suction cup D30-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101246
A	Suction cup D30-2 Silicone, M5 female	0101248
B	Suction cup D30-2 Silicone, G1/8" male, with mesh filter	0101249
C	Suction cup D30-2 Silicone, G1/8" male/M5 female, with mesh filter	0101253
D	Suction cup D30-2 Silicone, 5xM5 female	0101252
E	Suction cup D30-2 Silicone, G1/8" male/M5 female, PA	0110332



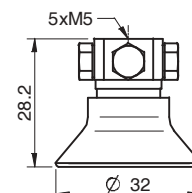
A



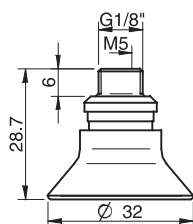
B



C

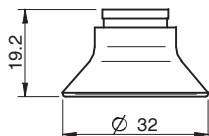


D



E

Rubber parts		Art. No.
Suction cup D30-2 Chloroprene		0101125
Suction cup D30-2 Silicone		0101126



Fittings		Art. No.
Fitting M5 female		3250003
Fitting M5 female, with dual flow control valve		3251001
Fitting G1/8" male, with mesh filter		3250085
Fitting G1/8" male, with mesh filter and dual flow control valve		3251002
Fitting G1/8" male/M5 female, with mesh filter		0101152
Fitting G1/8" male/M5 female, with dual flow control valve		3251004
Fitting 5xM5 female		0100260
Fitting 5xM5 female, with dual flow control valve		3251005
Fitting G1/8" male/M5 female, PA		3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## D50



### Deep suction cup

- ▶ Suitable for objects with curved or irregular surfaces.
- ▶ Grips around corners and edges.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
36	78	98	—	—	—	15	25	10	18

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

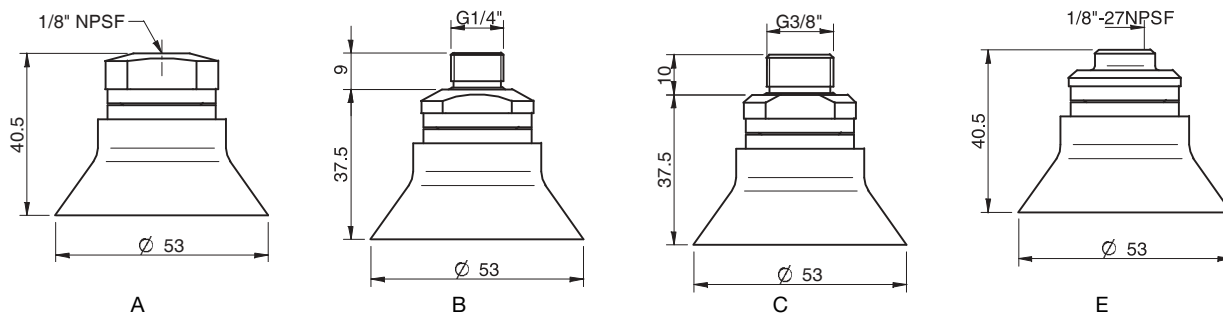
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

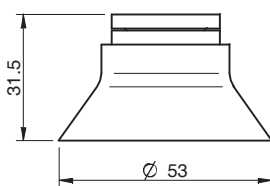


## Ordering information

Complete suction cups		Art. No.
A	Suction cup D50 Chloroprene, 1/8" NPSF female, with mesh filter	0101727
B	Suction cup D50 Chloroprene, G1/4" male, with mesh filter	0101722
C	Suction cup D50 Chloroprene, G3/8" male, with mesh filter	0101724
A	Suction cup D50 Silicone, 1/8" NPSF female, with mesh filter	0101740
B	Suction cup D50 Silicone, G1/4" male, with mesh filter	0101735
C	Suction cup D50 Silicone, G3/8" male, with mesh filter	0101737
E	Suction cup D50 Chloroprene, 1/8" NPSF female, PA	0109841



Rubber parts		Art. No.
Suction cup D50 Chloroprene		0101127
Suction cup D50 Silicone		0101128



Fittings	Art. No
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017
Fitting 1/8" NPSF female, 50, PA	3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F15



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
3.5	8.5	11.0	3.5	6.5	7.5	0.37	13	1.0	0.9

### Material specifications

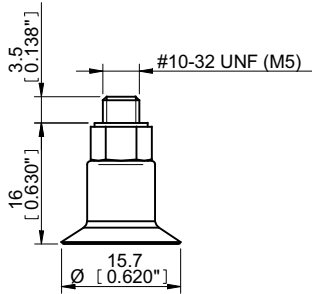
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

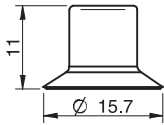
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

Complete suction cups	Art. No.
Suction cup F15 Chloroprene, M5 male	3150014
Suction cup F15 Silicone, M5 male	3150014S



Rubber parts	Art. No.
Suction cup F15 Chloroprene	3150125
Suction cup F15 Silicone	3150125S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F20



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
6.0	14.5	19.0	5.0	8.0	8.5	1.0	18	1.5	1.2

### Material specifications

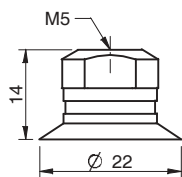
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

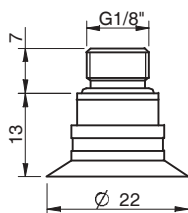
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

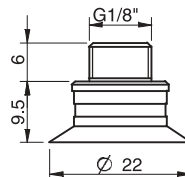
	Complete suction cups	Art. No.
A	Suction cup F20 Chloroprene, M5 female	0101259
A	Suction cup F20 Chloroprene, M5 female, with dual flow control valve	0101265
B	Suction cup F20 Chloroprene, G1/8" male, with mesh filter	0101260
B	Suction cup F20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101266
C	Suction cup F20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101264
C	Suction cup F20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101268
D	Suction cup F20 Chloroprene, 5xM5 female	0101263
A	Suction cup F20 Silicone, M5 female	0101270
B	Suction cup F20 Silicone, G1/8" male, with mesh filter	0101271
B	Suction cup F20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101277
C	Suction cup F20 Silicone, G1/8" male/M5 female, with mesh filter	0101275
D	Suction cup F20 Silicone, 5xM5 female	0101274
E	Suction cup F20 Chloroprene, G1/8" male/M5 female, PA	0110950
E	Suction cup F20 Silicone, G1/8" male/M5 female, PA	0110334



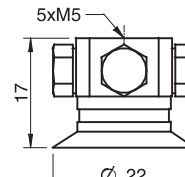
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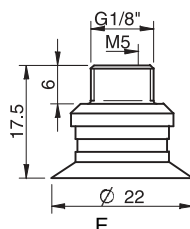
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C

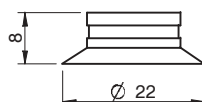


D



E

	Rubber parts	Art. No.
	Suction cup F20 Chloroprene	0101129
	Suction cup F20 Silicone	0101130



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005
	Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F25



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
9.0	19.5	25	8.0	9.0	10.0	1.1	22	1.5	1.8

### Material specifications

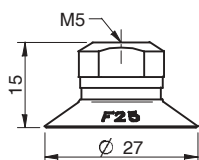
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40–110
Silicone, SIL	Red	50	-40–200

### Material resistance

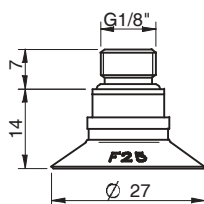
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

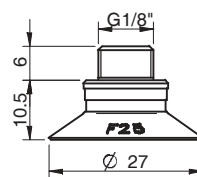
	Complete suction cups	Art. No.
A	Suction cup F25 Chloroprene, M5 female	0101292
B	Suction cup F25 Chloroprene, G1/8" male, with mesh filter	0101293
B	Suction cup F25 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101299
C	Suction cup F25 Chloroprene, G1/8" male/M5 female, with mesh filter	0101297
C	Suction cup F25 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101301
D	Suction cup F25 Chloroprene, 5xM5 female	0101296
A	Suction cup F25 Silicone, M5 female	0101303
B	Suction cup F25 Silicone, G1/8" male, with mesh filter	0101304
C	Suction cup F25 Silicone, G1/8" male/M5 female, with mesh filter	0101308
C	Suction cup F25 Silicone, G1/8" male/M5 female, with dual flow control valve	0101312
D	Suction cup F25 Silicone, 5xM5 female	0101307
E	Suction cup F25 Chloroprene, G1/8" male/M5 female, PA	0109842
E	Suction cup F25 Silicone, G1/8" male/M5 female, PA	0110335



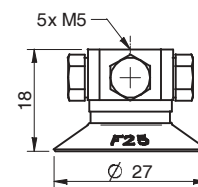
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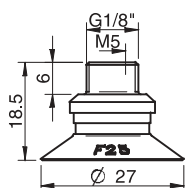
B



C

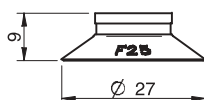


D



E

	Rubber parts	Art. No.
	Suction cup F25 Chloroprene	0101131
	Suction cup F25 Silicone	0101132



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005
	Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F30-2



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
12.0	25	31	11.0	16.0	20.0	2.0	25	2.0	2.2

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

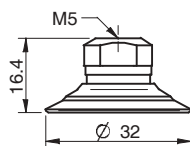
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

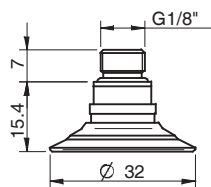


## Ordering information

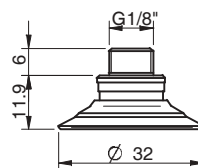
	Complete suction cups	Art. No.
A	Suction cup F30-2 Chloroprene, M5 female	0101325
A	Suction cup F30-2 Chloroprene, M5 female, with dual flow control valve	0101331
B	Suction cup F30-2 Chloroprene, G1/8" male, with mesh filter	0101326
B	Suction cup F30-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101332
C	Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101330
C	Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101334
E	Suction cup F30-2 Chloroprene, G1/8" male/M5 female PA	0109846
F	Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with cone valve	3250039
D	Suction cup F30-2 Chloroprene, 5xM5 female	0101329
A	Suction cup F30-2 Silicone, M5 female	0101341
B	Suction cup F30-2 Silicone, G1/8" male, with mesh filter	0101342
B	Suction cup F30-2 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101348
C	Suction cup F30-2 Silicone, G1/8" male/M5 female, with mesh filter	0101346
C	Suction cup F30-2 Silicone, G1/8" male/M5 female, with dual flow control valve	0101350
D	Suction cup F30-2 Silicone, 5xM5 female	0101345
E	Suction cup F30-2 Silicone, G1/8" male/M5 female PA	0110344
F	Suction cup F30-2 Silicone, G1/8" male/M5 female, with cone valve	3250039S



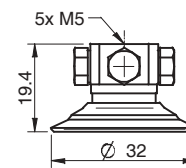
A



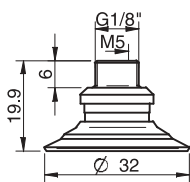
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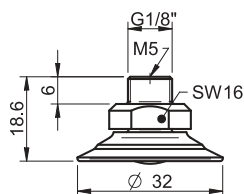
C



D

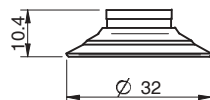


E



F

	Rubber parts	Art. No.
	Suction cup F30-2 Chloroprene	0101133
	Suction cup F30-2 Chloroprene, for fitting with cone valve	3150239
	Suction cup F30-2 Silicone	0101134
	Suction cup F30-2 Silicone, for fitting with cone valve	3150239S



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting G1/8" male/M5 female, with cone valve	0101155
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005
	Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Cone valve for F30-2	Al/SS/NBR	-40-110	3150055

## F40-2



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
20.0	40	50	15.0	25	30	4.8	52	2.5	5.5

### Material specifications

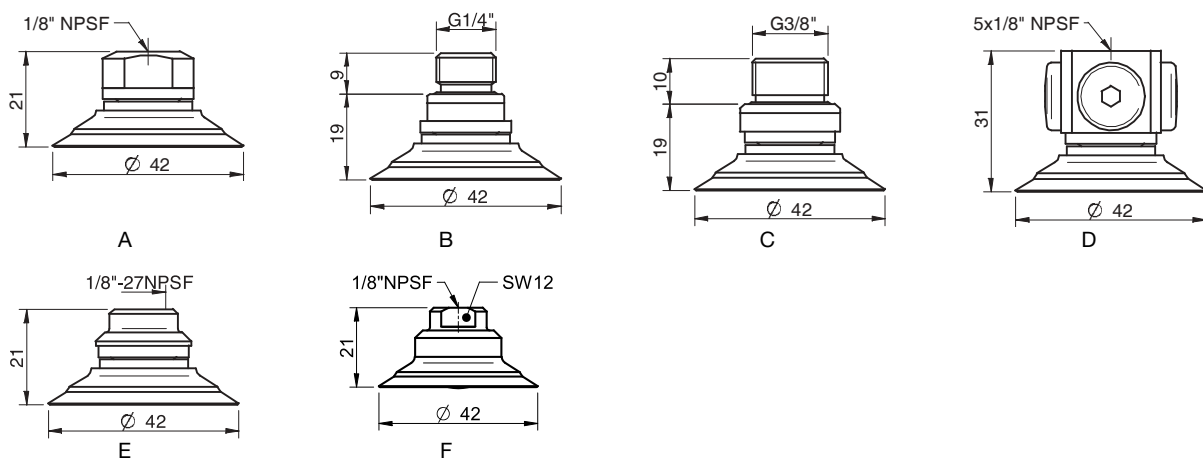
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200

### Material resistance

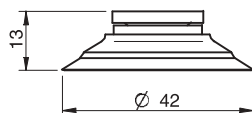
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101572
A	Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101573
B	Suction cup F40-2 Nitrile-PVC, G1/4" male, with mesh filter	0101567
B	Suction cup F40-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101574
C	Suction cup F40-2 Nitrile-PVC, G3/8" male, with mesh filter	0101569
C	Suction cup F40-2 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101576
D	Suction cup F40-2 Nitrile-PVC, 5x1/8" NPSF female	0101571
E	Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female PA	0109847
F	Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with cone valve	3150050P
A	Suction cup F40-2 Silicone, 1/8" NPSF female, with mesh filter	0101553
A	Suction cup F40-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101554
B	Suction cup F40-2 Silicone, G1/4" male, with mesh filter	0101548
C	Suction cup F40-2 Silicone, G3/8" male, with mesh filter	0101550
D	Suction cup F40-2 Silicone, 5x1/8" NPSF female	0101552
E	Suction cup F40-2 Silicone, 1/8" NPSF female PA	0110345
F	Suction cup F40-2 Silicone, 1/8" NPSF female, with cone valve	3150050S



Rubber parts	Art. No.
Suction cup F40-2 Nitrile-PVC	0101135
Suction cup F40-2 Nitrile-PVC, for fitting with cone valve	3150240P
Suction cup F40-2 Silicone	0101136
Suction cup F40-2 Silicone, for fitting with cone valve	3150240S



Fittings	Art. No
Fitting 1/8" NPSF female, 30-40, with mesh filter	0101153
Fitting 1/8" NPSF female, 30-40, with dual flow control valve	3251006
Fitting 1/8" NPSF female, 30-40, with cone valve	0101156
Fitting G1/4" male, 30-40, with mesh filter	3250091
Fitting G1/4" male, 30-40, with mesh filter and dual flow control valve	3251007
Fitting G3/8" male, 30-40, with mesh filter	3250086
Fitting G3/8" male, 30-40, with mesh and dual flow control valve	3251009
Fitting 5x1/8" NPSF female, 30-40	0100261
Fitting 5x1/8" NPSF female, 30-40, with dual flow control valve	3251011
Fitting 1/8" NPSF female, 30-40, PA	3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Cone valve for F40-2	Al/SS/NBR	-40-110	3150056

## F50-2



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
36	74	96	24.0	40	50	10	55	3.0	14

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

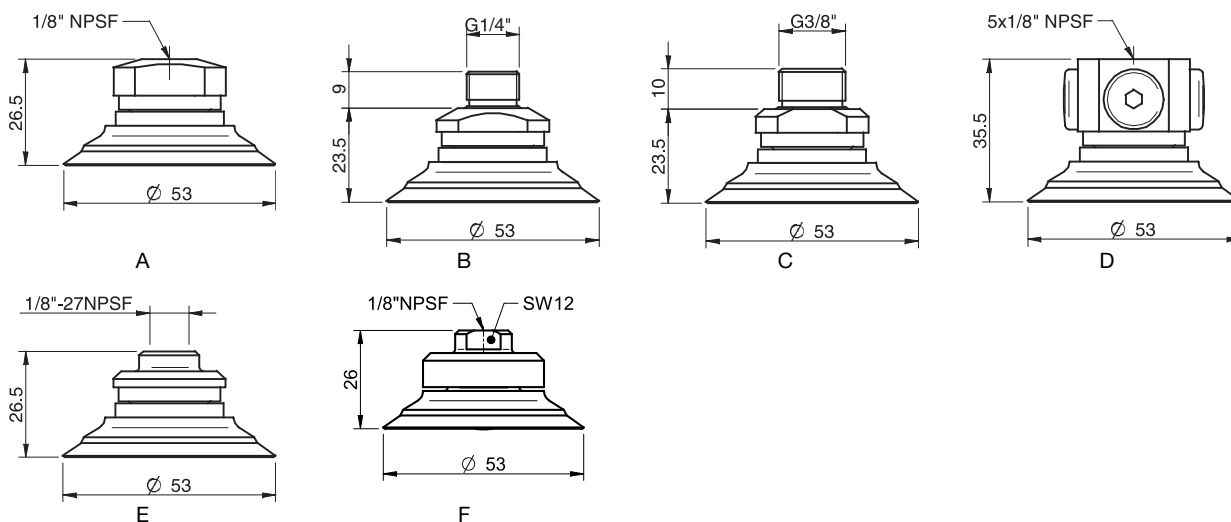
\* For a shorter period of time up to +160 °C

### Material resistance

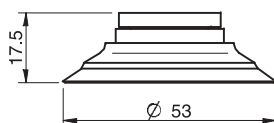
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101772
A	Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101773
B	Suction cup F50-2 Nitrile-PVC, G1/4" male, with mesh filter	0101767
B	Suction cup F50-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101774
C	Suction cup F50-2 Nitrile-PVC, G3/8" male, with mesh filter	0101769
C	Suction cup F50-2 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101776
D	Suction cup F50-2 Nitrile-PVC, 5x1/8" NPSF female	0101771
D	Suction cup F50-2 Nitrile-PVC, 5x1/8" NPSF female, with dual flow control valve	0101778
E	Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, PA	0110952
F	Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with cone valve	3150051P
A	Suction cup F50-2 Silicone, 1/8" NPSF female, with mesh filter	0101753
A	Suction cup F50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101754
B	Suction cup F50-2 Silicone, G1/4" male, with mesh filter	0101748
C	Suction cup F50-2 Silicone, G3/8" male, with mesh filter	0101750
D	Suction cup F50-2 Silicone, 5x1/8" NPSF female	0101752
E	Suction cup F50-2 Silicone, 1/8" NPSF female, PA	0110346
F	Suction cup F50-2 Silicone, 1/8" NPSF female, with cone valve	3150051S
A	Suction cup F50-2 HNBR, 1/8" NPSF female	0108181
B	Suction cup F50-2 HNBR, G1/4" male, with mesh filter	0108182
C	Suction cup F50-2 HNBR, G3/8" male, with mesh filter	0108183



Rubber parts	Art. No.
Suction cup F50-2 Nitrile-PVC	0101137
Suction cup F50-2 Nitrile-PVC, for fitting with cone valve	3150241P
Suction cup F50-2 Silicone	0101138
Suction cup F50-2 Silicone, for fitting with cone valve	3150241S
Suction cup F50-2 HNBR	0108166



Fittings	Art. No
Fitting 1/8" NPSF female, 50	3250017
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting 1/8" NPSF female, 50, with cone valve	0101157
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017
Fitting 1/8" NPSF female, 50, PA	3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare Part	Material	Temperature range °C	Art. No.
Cone valve for F50-2	Al/SS/NBR	-40-110	3150057

## F75



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
80	200	270	60	110	140	20	150	3.0	23

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0–90
Silicone, SIL	Red	50	-40–200
HNBR	Grey-blue	75	-30–140*

\* For a shorter period of time up to +160 °C

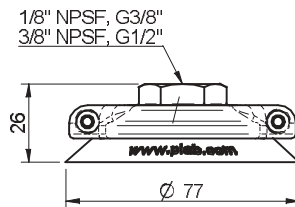
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

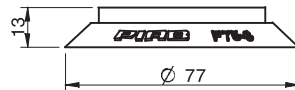
## Ordering information

Complete suction cups	Art. No.
Suction cup F75 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101873
Suction cup F75 Nitrile-PVC, G3/8" female, with mesh filter	0101874
Suction cup F75 Nitrile-PVC, G3/8" female, with cone valve	0101877
Suction cup F75 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101875
Suction cup F75 Nitrile-PVC, G1/2" female, with mesh filter	0101876
Suction cup F75 Nitrile-PVC, G1/2" female, with cone valve	0101879
Suction cup F75 Silicone, 1/8" NPSF female, with mesh filter	0101866
Suction cup F75 Silicone, G3/8" female, with mesh filter	0101867
Suction cup F75 Silicone, G3/8" female, with cone valve	0101870
Suction cup F75 Silicone, 3/8" NPSF female, with mesh filter	0101868
Suction cup F75 Silicone, G1/2" female, with mesh filter	0101869
Suction cup F75 Silicone, G1/2" female, with cone valve	0101872
Suction cup F75 HNBR, 1/8" NPSF female, with mesh filter	0108184
Suction cup F75 HNBR, G3/8" female, with mesh filter	0108185
Suction cup F75 HNBR, 3/8" NPSF female, with mesh filter	0108186
Suction cup F75 HNBR, G1/2" female, with mesh filter	0108187

When using F75 G1/2" female with cone valve (0101879 and 0101872) with Level compensator G1/2" (3350071 and 0114291) or Ball joint G1/2" (3350066), a Connector G1/2" (3107757) must be used.



Rubber parts	Art. No.
Suction cup F75 Nitrile-PVC	3150131P
Suction cup F75 Silicone	3150131S
Suction cup F75 HNBR	3150131T



Fittings	Art. No.
Fitting 75, 1/8" NPSF female, with mesh filter	0100548
Fitting 75, G3/8" female, with mesh filter	0100551
Fitting 75, G3/8" female, with cone valve	0100552
Fitting 75, 3/8" NPSF female, with mesh filter	0100553
Fitting 75, G1/2" female, with mesh filter	0100555
Fitting 75, G1/2" female, with cone valve	0100556

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## F110



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
140	420	560	140	250	300	70	250	4.0	66

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200
HNBR	Grey-blue	75	-30-140*

\* For a shorter period of time up to +160 °C

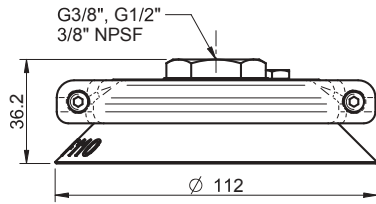
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent
HNBR	Excellent	Excellent	Excellent	Good	Excellent	Fair	Good	Excellent

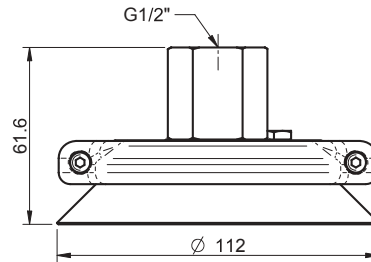


## Ordering information

	Complete suction cups	Art. No.
A	Suction cup F110 Nitrile-PVC, G3/8" female, with mesh filter	0101915
A	Suction cup F110 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101916
A	Suction cup F110 Nitrile-PVC, G1/2" female, with mesh filter	0101917
B	Suction cup F110 Nitrile-PVC, G1/2" female, with cone valve	0101921
A	Suction cup F110 Silicone, G3/8" female, with mesh filter	0101908
A	Suction cup F110 Silicone, 3/8" NPSF female, with mesh filter	0101909
A	Suction cup F110 Silicone, G1/2" female, with mesh filter	0101910
B	Suction cup F110 Silicone, G1/2" female, with cone valve	0101914
A	Suction cup F110 HNBR, G3/8" female, with mesh filter	0108188
A	Suction cup F110 HNBR, 3/8" NPSF female, with mesh filter	0108189
A	Suction cup F110 HNBR, G1/2" female, with mesh filter	0108190

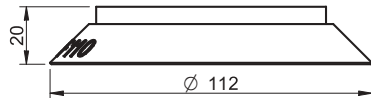


A



B

Rubber part	Art. No.
Suction cup F110 Nitrile-PVC	3150132P
Suction cup F110 Silicone	3150132S
Suction cup F110 HNBR	3150132T



Fittings	Art. No.
Fitting 110 G3/8" female, with mesh filter	0100557
Fitting 110, G1/2" female, with mesh filter	0100561
Fitting 110, 3/8" NPSF female, with mesh filter	0100559
Fitting 110, G1/2" female, with cone valve	0100563

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare part	Material	Temperature range °C	Art. No.
Cone valve for Fitting 110 & 150	Al/SS/NBR	-40-110	3350034

## F150



### Flat suction cup with cleats

- ▶ Suitable for flat objects.
- ▶ Good stability and little inherent movement.
- ▶ Recommended when the lifting force is parallel to the surface of the object.
- ▶ Cleats prevent thin, sensitive objects from being deformed and gives extra friction when the lifting force is parallel.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
300	850	1100	250	600	800	160	500	6.0	200

### Material specifications

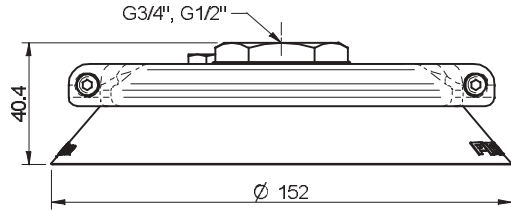
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200

### Material resistance

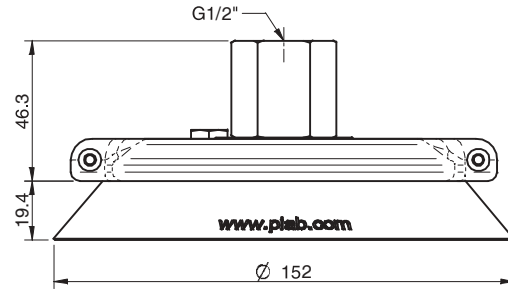
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cups	Art. No.
A	Suction cup F150 Nitrile-PVC, G3/4" female, with mesh filter	0101939
A	Suction cup F150 Nitrile-PVC, G1/2" female, with mesh filter	0101938
B	Suction cup F150 Nitrile-PVC, G1/2" female, with cone valve	0101941
A	Suction cup F150 Silicone, G3/4" female, with mesh filter	0101935
A	Suction cup F150 Silicone, G1/2" female, with mesh filter	0101934
B	Suction cup F150 Silicone, G1/2" female, with cone valve	0101937

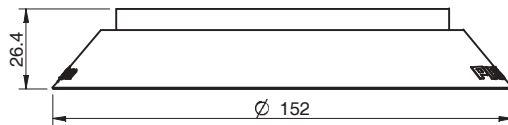


A



B

	Rubber parts	Art. No.
	Suction cup F150 Nitrile-PVC	3150133P
	Suction cup F150 Silicone	3150133S



	Fittings	Art. No.
	Fitting 150, G1/2" female, with mesh filter	0100564
	Fitting 150, G3/4" female, with mesh filter	0100567
	Fitting 150, G1/2" female, with cone valve	0100566

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

Spare part	Material	Temperature range °C	Art. No.
Cone valve for Fitting 110 & 150	Al/SS/NBR	-40-110	3350034

## FP200



### Flat suction cup

- Suitable for handling large, heavy objects with flat surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
750	1900	2700	—	—	—	540	—	7.0	1160

### Material specifications

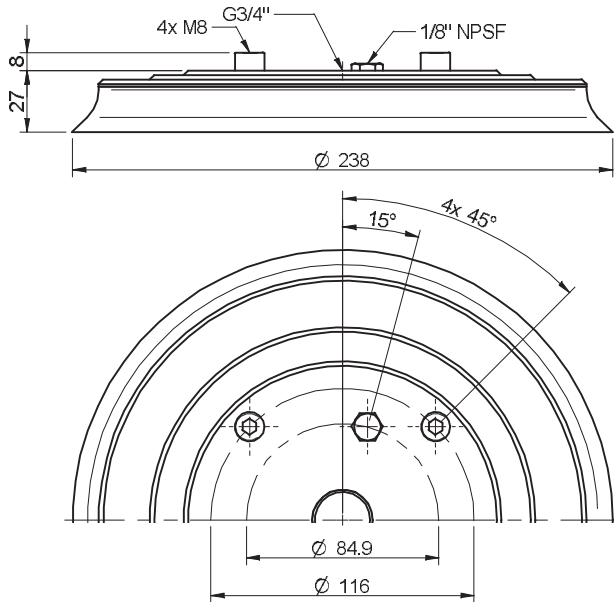
Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PUR	Yellow-white transparent	65	0–80

### Material resistance

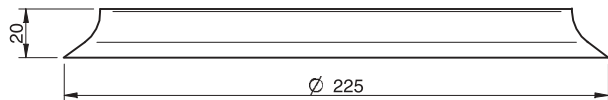
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Fair	Poor	Fair	Good

## Ordering information

Complete suction cups	Art. No.
Suction cup FP200 Polyurethane, G3/4" female	3350072



Rubber parts	Art. No.
Suction cup FP200 Polyurethane	3350148



Fittings & accessories	Art. No.
Fitting G3/4" female	3350059
Support kit for suction cup FP200, (2kits needed)	0106746

## FP300



### Flat suction cup

- Suitable for handling large, heavy objects with flat surface.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
1600	4300	6400	—	—	—	1280	—	7.0	2460

### Material specifications

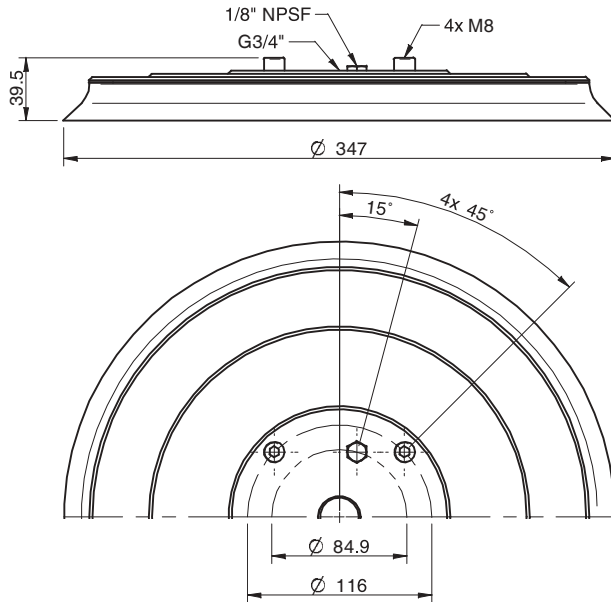
Material	Colour	Hardness °Shore A	Temperature range °C
Polyurethane, PUR	Yellow-white transparent	65	0–80

### Material resistance

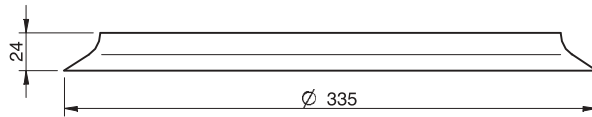
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Excellent	Poor	Fair	Poor	Fair	Good

## Ordering information

Complete suction cups	Art. No.
Suction cup FP300 Polyurethane, G3/4" female	3350073



Rubber parts	Art. No.
Suction cup FP300 Polyurethane	3350153



Fittings & accessories	Art. No.
Fitting G3/4" female	3350060
Support kit for suction cups P200 & FP300, (2 kits needed)	0106747

## OC60x140



### Oval, concave suction cup

- ▶ Suitable for handling oblong objects with flat or curved surface.
- ▶ Good stability and little inherent movement.
- ▶ Thick, durable lip.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
132	373	520	186	373	510	52	200	7.5	160

### Material specifications

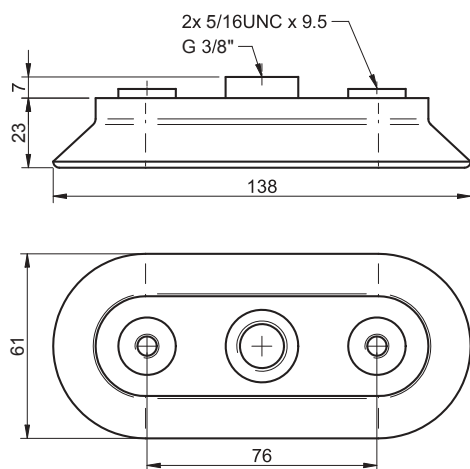
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile, NBR	Black	50	-20-100

### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Excellent	Excellent	Fair	Good	Good	Fair	Good	Good

### Ordering information

Complete suction cups	Art. No.
Suction cup OC60x140 Nitrile, G3/8" female	3350011





## OP20x100



### Oval suction cup with cellular rubber profile

- ▶ Suitable for handling oblong objects or thin pieces with uneven and rough surfaces.
- ▶ Use a ball joint fitting if prone to bending.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
25	80	110	—	—	—	14.0	—	1.5	87

### Material specifications

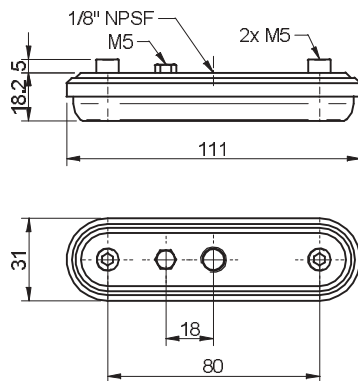
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

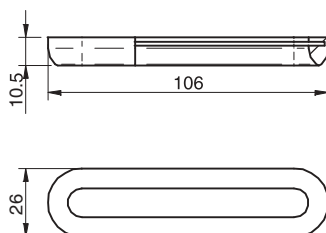
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup OP20x100 Ethylene propylene, 1/8" NPSF female	3350050



Rubber parts	Art. No.
Suction cup OP20x100 Ethylene propylene	3350028



Fittings	Art. No.
Fitting 1/8" NPSF female	3350061

## OP40x200



### Oval suction cup with cellular rubber profile

- ▶ Suitable for handling oblong objects or thin pieces with uneven and rough surfaces.
- ▶ Use a ball joint fitting if prone to bending.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight with fitting
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
100	320	440	—	—	—	56	—	2.5	326

### Material specifications

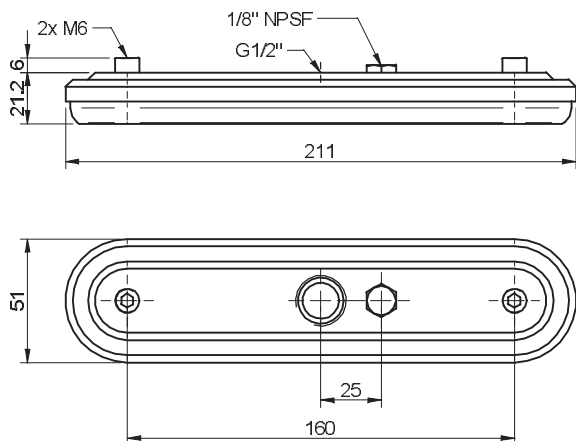
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

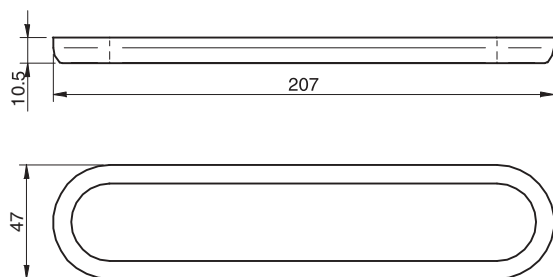
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup OP40x200 Ethylene propylene, G1/2" female	3350051



Rubber parts	Art. No.
Suction cup OP40x200 Ethylene propylene	3350029



Fittings	Art. No.
Fitting G1/2" female	3350062

## P35



### Suction cup with cellular rubber profile

- ▶ Suitable for irregular and rough surfaces.
- ▶ Use a ball joint if prone to bending.
- ▶ Available with adjustable support for handling thin material. Also suitable for applications requiring accurate positioning.
- ▶ Can also be equipped with a cone valve.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
20.0	50	70	—	—	—	6.0	—	3.0	22

### Material specifications

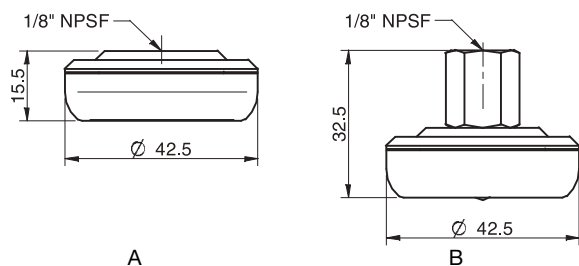
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

	Complete suction cups	Art. No.
A	Suction cup P35 Ethylene propylene, 1/8" NPSF female	3350045
B	Suction cup P35 Ethylene propylene, 1/8" NPSF female, with cone valve	3350038
B	Suction cup P35 Ethylene propylene, 1/8" NPSF female, adjustable support with filter	3350035



Rubber parts	Art. No.
Suction cup P35 Ethylene propylene	3350023

Fittings & accessories	Art. No.
Fitting 1/8" NPSF female	3350100
Adjustable support for P35, with filter	3350030
Cone valve for P35 & P60	3350033

## P60



### Suction cup with cellular rubber profile

- ▶ Suitable for irregular and rough surfaces.
- ▶ Use a ball joint if prone to bending.
- ▶ Available with adjustable support for handling thin material. Also suitable for applications requiring accurate positioning.
- ▶ Can also be equipped with a cone valve.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight with fitting g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
60	150	220	—	—	—	20.0	—	3.0	60

### Material specifications

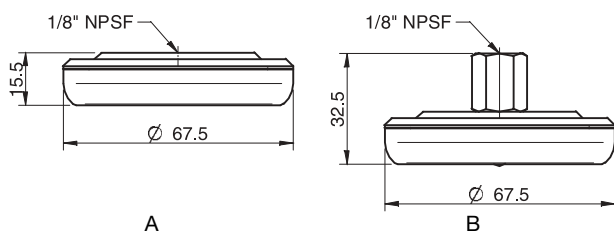
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

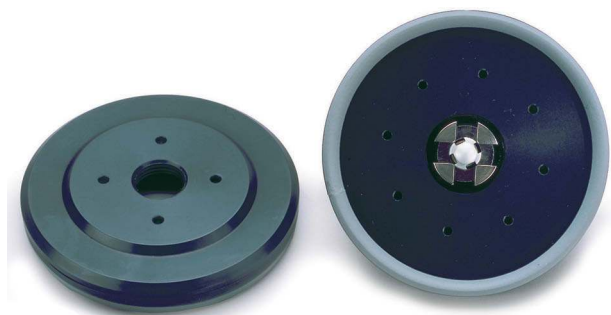
	Complete suction cups	Art. No.
A	Suction cup P60 Ethylene propylene, 1/8" NPSF female	3350046
B	Suction cup P60 Ethylene propylene, 1/8" NPSF female, with cone valve	3350039
B	Suction cup P60 Ethylene propylene, 1/8" NPSF female, adjustable support with filter	3350036



Rubber parts	Art. No.
Suction cup P60 Ethylene propylene	3350024

Fittings & accessories	Art. No.
1/8" NPSF female	3350110
Adjustable support	3350031
Cone valve	3350033

## P100



### Suction cup with cellular rubber profile

- ▶ Suitable for irregular and rough surfaces.
- ▶ Use a ball joint if prone to bending.
- ▶ Available with adjustable support for handling thin material. Also suitable for applications requiring accurate positioning.
- ▶ Can also be equipped with a cone valve.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight with fitting
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
180	450	660	—	—	—	55	—	3.0	236

### Material specifications

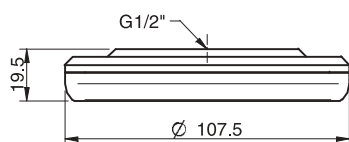
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

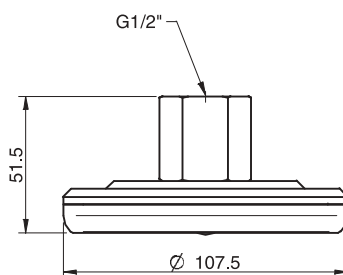
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

Complete suction cups		Art. No.
A	Suction cup P100 Ethylene propylene, G1/2" female	3350047
B	Suction cup P100 Ethylene propylene, G1/2" female, with cone valve	3350040
B	Suction cup P100 Ethylene propylene, G1/2" female, adjustable support with filter	3350037



A



B

Rubber parts	Art. No.
Suction cup P100 Ethylene propylene	3350025
Fittings & accessories	Art. No.
Fitting G1/2" female	3350115
Adjustable support for P100, with filter	3350032
Cone valve for P100	3350058

## P200



### Suction cup with cellular rubber profile

- ▶ Suitable for irregular and rough surfaces.
- ▶ Use a ball joint if prone to bending.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight with fitting
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
750	1900	2700	—	—	—	543	—	5.0	1245

### Material specifications

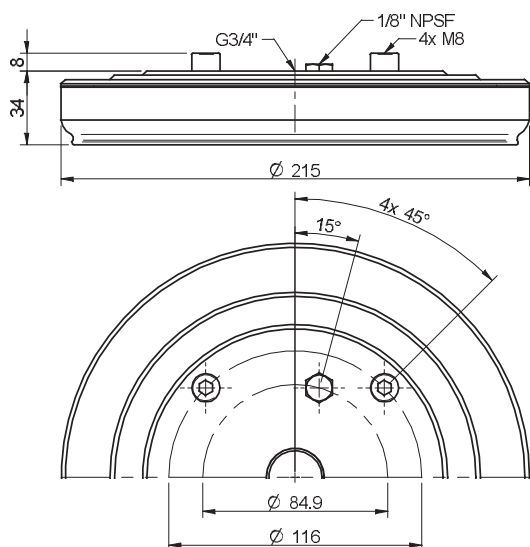
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup P200 Ethylene propylene, G3/4" female	3350048



Rubber parts	Art. No.
Suction cup P200 Ethylene propylene	3350026
Fittings & accessories	Art. No.
Fitting G3/4" female	3350059
Support kit for suction cups P200 & FP300, (2 kits needed)	0106747

## P300



### Suction cup with cellular rubber profile

- ▶ Suitable for irregular and rough surfaces.
- ▶ Use a ball joint if prone to bending.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight with fitting
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm <sup>3</sup>	mm	mm	g
1600	4300	6400	—	—	—	1285	—	5.0	2435

### Material specifications

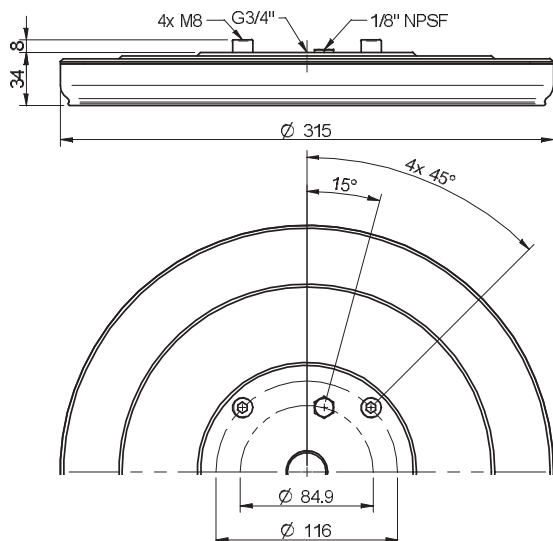
Material	Colour	Hardness °Shore A	Temperature range °C
Ethylene propylene, EPDM	Grey	—	-40–100

### Material resistance

Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Fair	Poor	Excellent	Good	Poor	Poor	Excellent	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup P300 Ethylene propylene, G3/4" female	3350049



Rubber parts	Art. No.
Suction cup P300 Ethylene propylene	3350027
Fittings & accessories	Art. No.
Fitting G3/4" female	3350060
Support kit for suction cup P300, (2 kits needed)	0106748

## U2



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.
- ▶ Suction cups of conductive silicone are suitable for objects with sensitivity to static electricity.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.03	0.10	0.15	—	—	—	0.003	4.0	0.10	0.012

### Material specifications

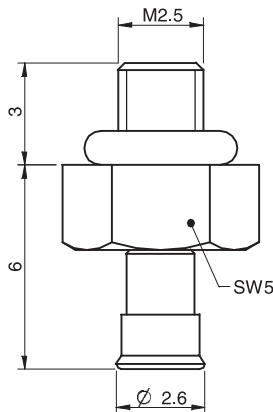
Material	Colour	Hardness °Shore A	Temperature range °C
Conductive silicone, CSIL	Black	50	-55–230

### Material resistance

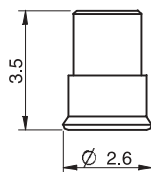
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U2 Conductive silicone, M2.5 male	3250080SC



Rubber parts	Art. No.
Suction cup U2 Conductive silicone	3150284SC



Fittings	Art. No.
Fitting M2.5 male	3250084

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.



## U3



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.
- ▶ Suction cups of conductive silicone are suitable for objects with sensitivity to static electricity.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.09	0.42	0.65	—	—	—	0.005	5.0	0.15	0.030

### Material specifications

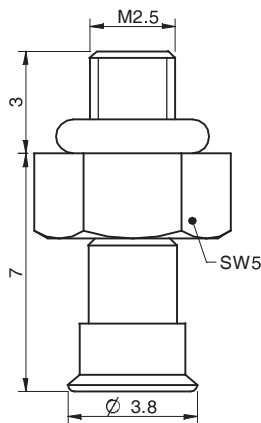
Material	Colour	Hardness °Shore A	Temperature range °C
Conductive silicone, CSIL	Black	50	-55–230

### Material resistance

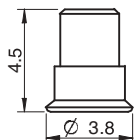
Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U3 Conductive silicone, M2.5 male	3250081SC



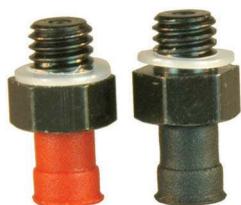
Rubber parts	Art. No.
Suction cup U3 Conductive silicone	3150285SC



Fittings	Art. No.
Fitting M2.5 male	3250084

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U4



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
0.20	0.90	1.3	0.20	0.80	1.0	0.03	3.0	0.20	0.08

### Material specifications

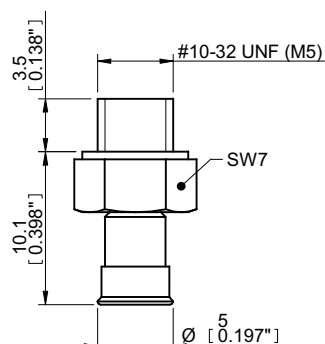
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

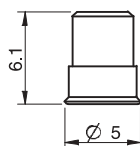
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U4 Chloroprene, M5 male	3150059
Suction cup U4 Silicone, M5 male	3150059S



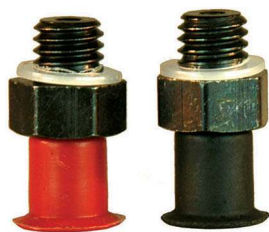
Rubber parts	Art. No.
Suction cup U4 Chloroprene	3150114
Suction cup U4 Silicone	3150114S



Fittings	Art. No.
Fitting M5 male, 5-8	3107031

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U6



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm	mm	mm	g
0.50	1.7	2.5	0.50	1.5	2.0	0.05	5.0	0.30	0.14

### Material specifications

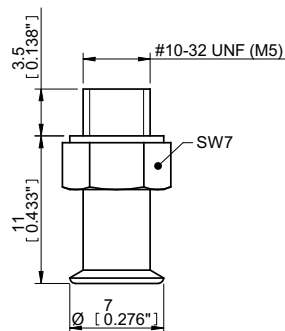
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

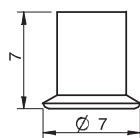
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U6 Chloroprene, M5 male	3150003
Suction cup U6 Silicone, M5 male	3150003S



Rubber parts	Art. No.
Suction cup U6 Chloroprene	3150115
Suction cup U6 Silicone	3150115S



Fittings	Art. No.
Fitting M5 male, 5-8	3107031

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U8



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm	mm	mm	g
1.0	2.9	3.9	1.0	2.9	3.4	0.10	6.0	0.50	0.16

### Material specifications

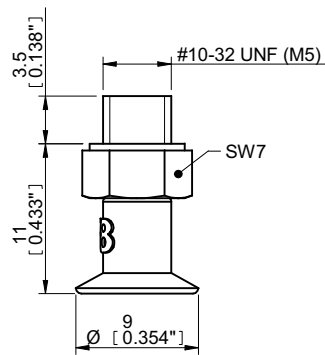
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

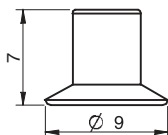
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U8 Chloroprene, M5 male	3150004
Suction cup U8 Silicone, M5 male	3150004S



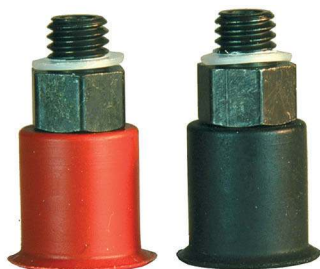
Rubber parts	Art. No.
Suction cup U8 Chloroprene	3150116
Suction cup U8 Silicone	3150116S



Fittings	Art. No.
Fitting M5 male, 5-8	3107031

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U10



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume	Min. curve radius	Max. vertical movement	Weight rubber part
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa	cm	mm	mm	g
1.5	4.4	6.9	1.5	4.4	4.9	0.18	8.0	0.50	0.65

### Material specifications

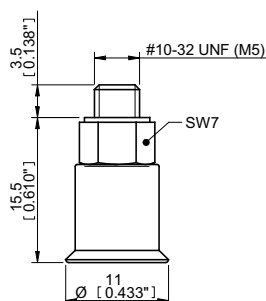
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

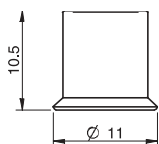
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U10 Chloroprene, M5 male	3150005
Suction cup U10 Silicone, M5 male	3150005S



Rubber parts	Art. No.
Suction cup U10 Chloroprene	3150117
Suction cup U10 Silicone	3150117S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U15



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
3.5	8.4	11.0	3.5	5.4	5.9	0.50	8.0	1.5	0.70

### Material specifications

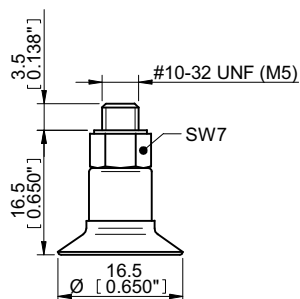
Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

### Material resistance

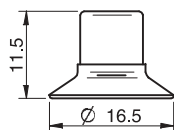
Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cups	Art. No.
Suction cup U15 Chloroprene, M5 male	3150006
Suction cup U15 Silicone, M5 male	3150006S



Rubber parts	Art. No.
Suction cup U15 Chloroprene	3150118
Suction cup U15 Silicone	3150118S



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U15-3



### Universal suction cup with reinforced lip

- ▶ Wide temperature range (-60°C to +200°C)
- ▶ The silicone material complies with FDA 21 CFR 177.2600
- ▶ Reinforced lip

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
3.5	8.4	11.0	3.5	5.4	5.9	0.50	8.0	1.5	0.70

### Material specifications

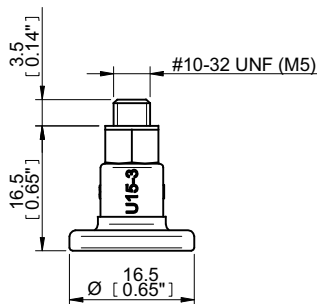
Material	Colour	Hardness °Shore A	Temperature range °C
Silicone, SIL	Red	40	-40-200

### Material resistance

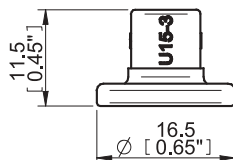
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

### Ordering information

Complete suction cup	Art. No.
Suction cup U15-3 Silicone, M5 male	0117947



Rubber part	Art. No.
Suction cup U15-3 Silicone	0114981



Fittings	Art. No.
Fitting M5 male, 10-15	3107030

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U20



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
5.9	12.0	16.0	5.9	8.8	9.8	1.0	13.0	2.5	1.2

### Material specifications

Material	Colour	Hardness °Shore A	Temperature range °C
Chloroprene, CR	Black	50	-40-110
Silicone, SIL	Red	50	-40-200

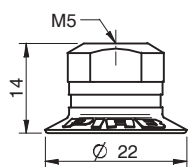
### Material resistance

Material	Wear resistance	Oil	Weather & ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Chloroprene, CR	Excellent	Fair	Good	Good	Fair	Poor	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

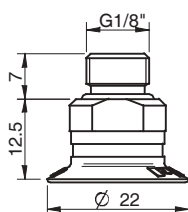


## Ordering information

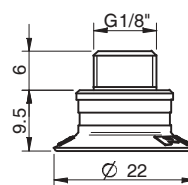
	Complete suction cups	Art. No.
A	Suction cup U20 Chloroprene, M5 female	0101373
A	Suction cup U20 Chloroprene, M5 female, with dual flow control valve	0101379
B	Suction cup U20 Chloroprene, G1/8" male, with mesh filter	0101374
B	Suction cup U20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101380
C	Suction cup U20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101378
C	Suction cup U20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101382
D	Suction cup U20 Chloroprene, 5xM5 female	0101377
A	Suction cup U20 Silicone, M5 female, with dual flow control valve	0101390
B	Suction cup U20 Silicone, G1/8" male, with mesh filter	0101385
B	Suction cup U20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101391
C	Suction cup U20 Silicone, G1/8" male/M5 female, with mesh filter	0101389
D	Suction cup U20 Silicone, 5xM5 female	0101388
D	Suction cup U20 Silicone, 5xM5 female, with dual flow control valve	0101394
E	Suction cup U20 Chloroprene, G1/8" male/M5 female, PA	0110956
E	Suction cup U20 Silicone, G1/8" male/M5 female, PA	0110328



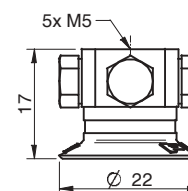
A



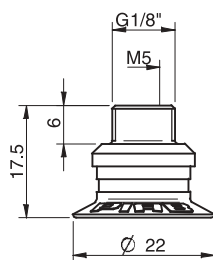
B



C

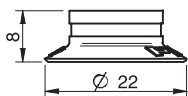


D



E

	Rubber parts	Art. No.
	Suction cup U20 Chloroprene	0101144
	Suction cup U20 Silicone	0101145



	Fittings	Art. No.
	Fitting M5 female	3250003
	Fitting M5 female, with dual flow control valve	3251001
	Fitting G1/8" male, with mesh filter	3250085
	Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
	Fitting G1/8" male/M5 female, with mesh filter	0101152
	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
	Fitting 5xM5 female	0100260
	Fitting 5xM5 female, with dual flow control valve	3251005
	Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U30



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
12.0	25.0	30	7.8	9.8	11.0	2.0	20.0	3.5	1.8

### Material specifications

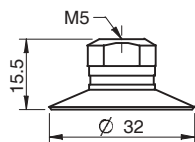
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200

### Material resistance

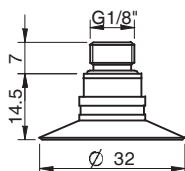
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

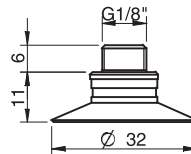
	Complete suction cups	Art. No.
A	Suction cup U30 Nitrile-PVC, M5 female	0101406
B	Suction cup U30 Nitrile-PVC, G1/8" male, with mesh filter	0101407
B	Suction cup U30 Nitrile-PVC, G1/8" male, with mesh filter and dual flow control valve	0101413
C	Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, with mesh filter	0101411
C	Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, with dual flow control valve	0101415
A	Suction cup U30 Silicone, M5 female, with mesh filter	0101395
B	Suction cup U30 Silicone, G1/8" male, with mesh filter	0101396
B	Suction cup U30 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101402
C	Suction cup U30 Silicone, G1/8" male / M5 female, with mesh filter	0101400
D	Suction cup U30 Silicone, 5xM5 female, with mesh filter	0101399
E	Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, PA	0109839



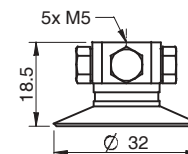
A



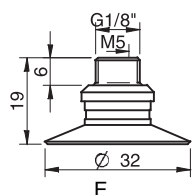
B



C

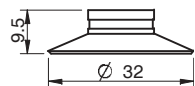


D



E

Rubber parts	Art. No.
Suction cup U30 Nitrile-PVC	0101146
Suction cup U30 Silicone	0101147



Fittings	Art. No.
Fitting M5 female	3250003
Fitting M5 female, with dual flow control valve	3251001
Fitting G1/8" male, with mesh filter	3250085
Fitting G1/8" male, with mesh filter and dual flow control valve	3251002
Fitting G1/8" male/M5 female, with mesh filter	0101152
Fitting G1/8" male/M5 female, with dual flow control valve	3251004
Fitting 5xM5 female	0100260
Fitting 5xM5 female, with dual flow control valve	3251005
Fitting G1/8" male/M5 female, PA	3150196

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U40-2



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
20.0	39	49	14.0	22.0	27	5.5	30	4.5	4.0

### Material specifications

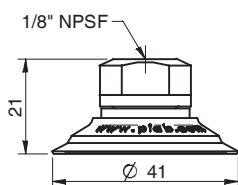
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200

### Material resistance

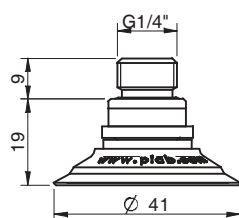
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

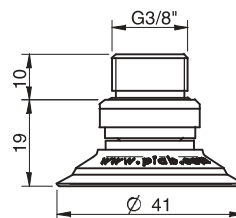
	Complete suction cups	Art. No.
A	Suction cup U40-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101623
B	Suction cup U40-2 Nitrile-PVC, G1/4" male, with mesh filter	0101618
B	Suction cup U40-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101625
C	Suction cup U40-2 Nitrile-PVC, G3/8" male, with dual flow control valve	0101627
A	Suction cup U40-2 Silicone, 1/8" NPSF female, with mesh filter	0101610
B	Suction cup U40-2 Silicone, G1/4" male, with mesh filter	0101605
C	Suction cup U40-2 Silicone, G3/8" male, with mesh filter	0101607
D	Suction cup U40-2 Silicone, 5x1/8" NPSF female	0101609
E	Suction cup U40-2 Silicone, 1/8" NPSF female, PA	0110338



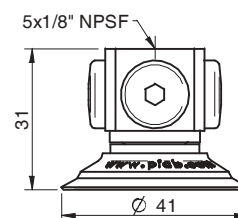
A



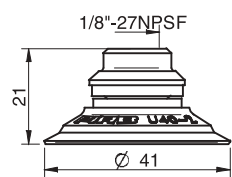
B



C

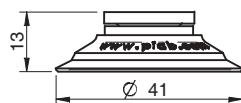


D



E

	Rubber parts	Art. No.
	Suction cup U40-2 Nitrile-PVC	0101148
	Suction cup U40-2 Silicone	0101149



	Fittings	Art. No.
	Fitting 1/8" NPSF female, 30–40, with mesh filter	0101153
	Fitting 1/8" NPSF female, 30–40, with dual flow control valve	3251006
	Fitting G1/4" male, 30–40, with mesh filter	3250091
	Fitting G1/4" male, 30–40, with mesh filter and dual flow control valve	3251007
	Fitting G3/8" male, 30–40, with mesh filter	3250086
	Fitting G3/8" male, 30–40, with mesh and dual flow control valve	3251009
	Fitting 5x1/8" NPSF female, 30–40	0100261
	Fitting 5x1/8" NPSF female, 30–40, with dual flow control valve	3251011
	Fitting 1/8" NPSF female, 30–40, PA	3150197

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## U50-2



### Universal suction cup

- ▶ Suitable for objects with flat or slightly curved surfaces.
- ▶ Also used for concave objects.

### Lifting forces & Technical data

Lifting force vertical to the surface, N, at vacuum level			Lifting force parallel to the surface, N, at vacuum level			Volume cm <sup>3</sup>	Min. curve radius mm	Max. vertical movement mm	Weight rubber part g
20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa				
35	73	92	20	37	44	12	35	6.0	10.0

### Material specifications

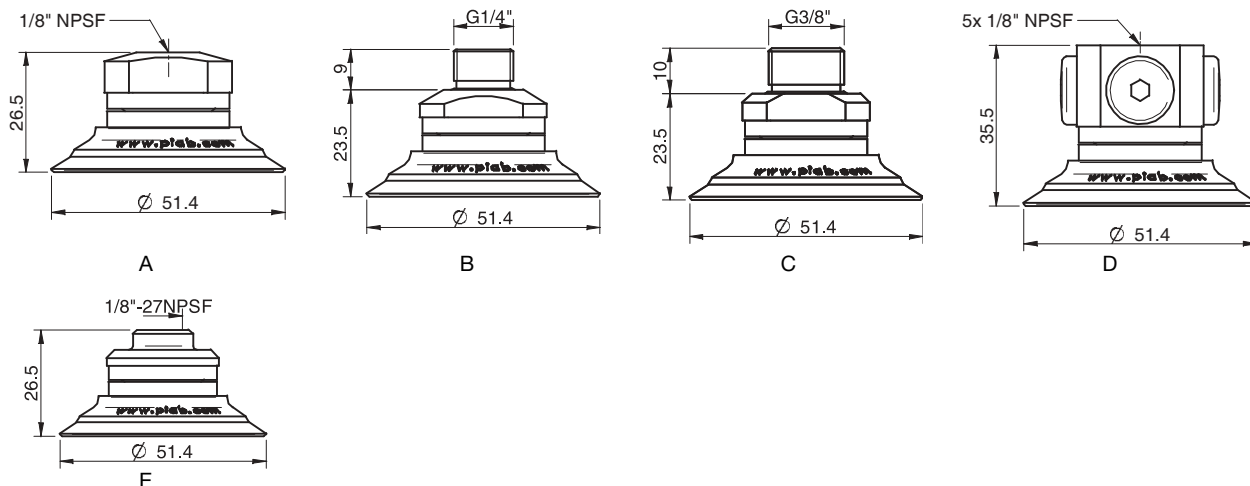
Material	Colour	Hardness °Shore A	Temperature range °C
Nitrile-PVC, NPV	Black	50	0-90
Silicone, SIL	Red	50	-40-200

### Material resistance

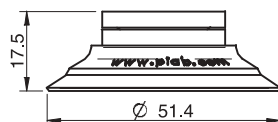
Material	Wear resistance	Oil	Weather & Ozone	Hydrolysis	Petrol	Concentrated acids	Alcohol	Oxidation
Nitrile-PVC, NPV	Excellent	Excellent	Good	Good	Excellent	Fair	Good	Good
Silicone, SIL	Good	Poor	Excellent	Fair	Poor	Poor	Good	Excellent

## Ordering information

	Complete suction cups	Art. No
A	Suction cup U50-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101823
B	Suction cup U50-2 Nitrile-PVC, G1/4" male, with mesh filter	0101818
C	Suction cup U50-2 Nitrile-PVC, G3/8" male, with mesh filter	0101820
D	Suction cup U50-2 Nitrile-PVC, 5x1/8" NPSF female	0101822
A	Suction cup U50-2 Silicone, 1/8" NPSF female, with mesh filter	0101810
A	Suction cup U50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101811
B	Suction cup U50-2 Silicone, G1/4" male, with mesh filter	0101805
C	Suction cup U50-2 Silicone, G3/8" male, with mesh filter	0101807
C	Suction cup U50-2 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101814
E	Suction cup U50-2 Silicone, 1/8" NPSF female, PA	0110330



Rubber parts	Art. No.
Suction cup U50-2 Silicone	0101151
Suction cup U50-2 Nitrile-PVC	0101150



Fittings	Art. No
Fitting 1/8" NPSF female, 50, with mesh filter	0101154
Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017
Fitting 1/8" NPSF female, 50, PA	3150198

For further information and dimensioned drawings, see section Suction cups/grippers Fittings.

## Level compensator LC



- ▶ Adjust differences in levels, for example on lifting devices with several suction cups.
- ▶ Less demand for exact positioning of vacuum handling device.
- ▶ Provides a certain degree of shock and vibration absorption.
- ▶ Allows for soft placement of cups on sensitive or thin objects.
- ▶ Non-rotational design, suitable for use with oval suction cups.
- ▶ Wide range of thread connections and stroke lengths.

### Technical data

Description	Unit	Value
Material		Al, SS, (FPM)*
Temperature range	°C	0-60

\* Valid for LC10 family (0124947 – 0124950).

### Technical data, specific

Art. No.	Spring force N/mm	Internal force N	End force N	Weight g	Volume cm	Connection	Action range/ Stroke mm	Max. recommended suction cup
0124947	0.21	1.5	3.6	10	0.22	M5	8.5	Ø25mm (Area: 500mm)
0124948	0.21	1.5	3.6	10	0.22	M5	8.5	Ø25mm (Area: 500mm)
0124949	0.085	1.6	3.7	14	0.22	M5	23.5	Ø25mm (Area: 500mm)
0124950	0.085	1.6	3.7	14	0.42	M5	23.5	Ø25mm (Area: 500mm)
0124951	0.27	3.6	9.0	36	1.14	G1/8"	20	Ø50mm (Area: 2000mm)
0124952	0.27	3.6	9.0	36	1.14	G1/8"	20	Ø50mm (Area: 2000mm)
0124953	0.15	4.3	9.5	46	1.63	G1/8"	35	Ø50mm (Area: 2000mm)
0124954	0.15	4.3	9.5	46	1.83	G1/8"	35	Ø50mm (Area: 2000mm)
0124955	0.27	4.1	11	64	2.47	G1/4"	25	Ø80mm (Area: 5000mm)
0124956	0.27	4.1	11	64	2.8	G1/4"	25	Ø80mm (Area: 5000mm)
0124957	0.14	4.3	11.4	90	4.1	G1/4"	50	Ø80mm (Area: 5000mm)
0124958	0.14	4.3	11.4	90	4.4	G1/4"	50	Ø80mm (Area: 5000mm)
0124959	0.27	5.6	16.5	164	6.6	G3/8"	40	Ø125mm (Area: 12000mm)
0124960	0.27	5.6	16.5	164	7.4	G3/8"	40	Ø125mm (Area: 12000mm)
0124961	0.14	6	17	231	11.16	G3/8"	80	Ø125mm (Area: 12000mm)
0124962	0.14	6	17	231	11.96	G3/8"	80	Ø125mm (Area: 12000mm)

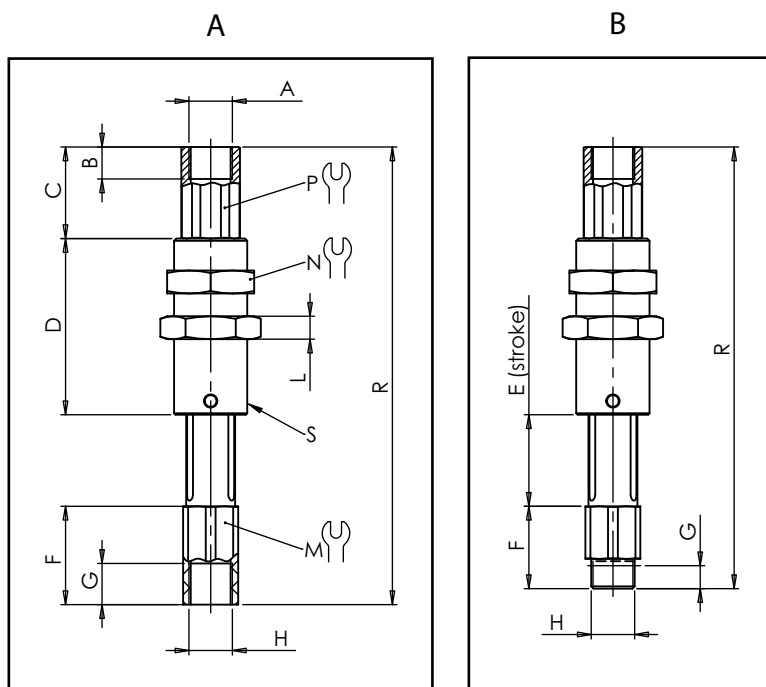


## Ordering information

Description	Art. No.
Level compensator LC10-F0510	0124947
Level compensator LC10-M0510	0124948
Level compensator LC10-F0525	0124949
Level compensator LC10-M0525	0124950
Level compensator LC16-F1820	0124951
Level compensator LC16-M1820	0124952
Level compensator LC16-F1835	0124953
Level compensator LC16-M1835	0124954
Level compensator LC20-F1425	0124955
Level compensator LC20-M1425	0124956
Level compensator LC20-F1450	0124957
Level compensator LC20-M1450	0124958
Level compensator LC25-F3840	0124959
Level compensator LC25-M3840	0124960
Level compensator LC25-F3880	0124961
Level compensator LC25-M3880	0124962

## Dimensions mm

	Art. No.	A	B	C	D	E	F	G	H	L	M	N	P	R	S
A	0124947	M5	5.5	17	23	8.5	8	5.5	M5	3.5	8	13	8	58	M10x1
B	0124948	M5	5.5	17	23	8.5	9.5	4.5	M5	3.5	8	13	8	59.5	M10x1
A	0124949	M5	5.5	17	42.5	23.5	8	5.5	M5	3.5	8	13	8	92.5	M10x1
B	0124950	M5	5.5	17	42.5	23.5	9.5	4.5	M5	3.5	8	13	8	94	M10X1
A	0124951	G1/8"	7	20	38.5	20	21.5	9	G1/8"	5	12	19	12	100	M16x1
B	0124952	G1/8"	7	20	38.5	20	18	5	G1/8"	5	12	19	12	96.5	M16x1
A	0124953	G1/8"	7	20	58.5	35	21.5	9	G1/8"	5	12	19	12	135	M16x1
B	0124954	G1/8"	7	20	58.5	35	18	5	G1/8"	5	12	19	12	131.5	M16X1
A	0124955	G1/4"	10	23	50	25	15	10	G1/4"	6	16	24	16	113	M20x1.5
B	0124956	G1/4"	10	23	50	25	14	6.5	G1/4"	6	16	24	16	112	M20x1.5
A	0124957	G1/4"	10	23	82.5	50	15	10	G1/4"	6	16	24	16	170.5	M20X1.5
B	0124958	G1/4"	10	23	82.5	50	14	6.5	G1/4"	6	16	24	16	169.5	M20x1.5
A	0124959	G3/8"	11	33	71	40	15	11	G3/8"	8	22	32	22	159	M25x1.5
B	0124960	G3/8"	11	33	71	40	18	9.5	G3/8"	8	22	32	22	162	M25x1.5
A	0124961	G3/8"	11	33	121	80	15	11	G3/8"	8	22	32	22	249	M25x1.5
B	0124962	G3/8"	11	33	121	80	18	9.5	G3/8"	8	22	32	22	252	M25x1.5



## Level compensators



- ▶ Adjust differences in levels, for example on lifting devices with several suction cups on a frame.
- ▶ A level compensator is often advantageous since it places less demand on exact vertical positioning, for example on a handling robot.
- ▶ The level compensator provides a certain degree of shock absorption.
- ▶ Level Compensator G1/2" with stiffer spring is identical to standard level compensator G1/2" except for thicker spring material. Suits e.g. robot vision systems in applications such as auto-racking.

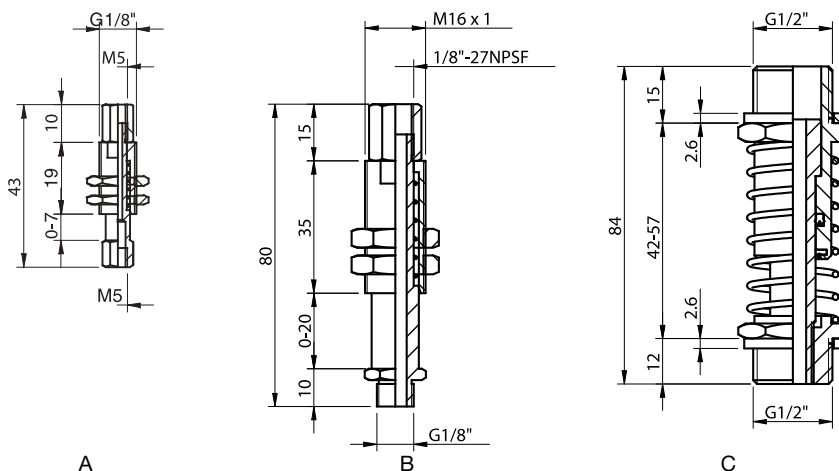
### Technical data

Description	Unit	Value			
		M5	G1/8"	G1/2"	G1/2" with stiffer spring
Weight	g	10	70	160	196
Temperature range	°C	-20-120	-20-120	-20-90	-20-90
Stroke	mm	0-7	0-20	0-15	0-15
Max. Load	kg	3.0	25	50	50
Material		SS/CuZn	SS/CuZn	SS	SS

### Ordering information

	Description	Art. No.
A	Level compensator M5	3350068
B	Level compensator G1/8"	3350069
C	Level compensator G1/2"	3350071
C	Level compensator G1/2" with stiffer spring	0114291

When using Level compensator G1/2" (3350071 and 0114291) with Suction cup F75 G1/2" female with cone valve (0101872 and 0101879), a Connector G1/2" (3107757) must be used.



### Ordering information, accessories

Description	Art. No.
Connector ext-int G1/2"	3107757

## Level compensator LC30



- ▶ Tailor made for the Vacuum Gripper System, VGS™, but can also be used together with other Piab products.
- ▶ Developed for use with standard profile systems.
- ▶ Easy installation with the option of fine adjustments and positioning of the suction cup.
- ▶ Non-rotational for use with, for example, oval suction cups. Can easily be made rotational.
- ▶ Quiet and reliable level compensation with load protection and shock absorption.

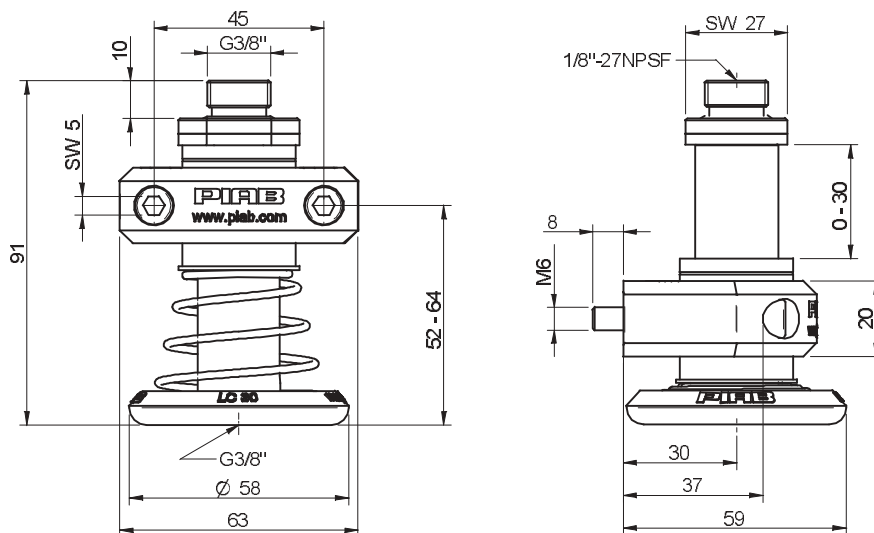
### Technical data

Description	Unit	Value
Spring force	N	5–42
Stroke	mm	30
Weight	g	220
Volume, internal	cm <sup>3</sup>	5
Maximum load, vertical	N	700
Temperature range	C°	10–50
Adjustable in height	mm	12
Adjustable in rotational direction	°	0–360
Material		Al, NBR, PA, POM, PUR, SS

### Ordering information

Description	Art. No.
Level compensator LC30	0111552

LC 30 is delivered with two MC6S M6x45 fzb screws.



## Ball joints



- ▶ Ball joint fittings could be used when lifting sheet metal with a device using several suction cups.
- ▶ To avoid bending stress a suction cup can be fitted with a balljoint.

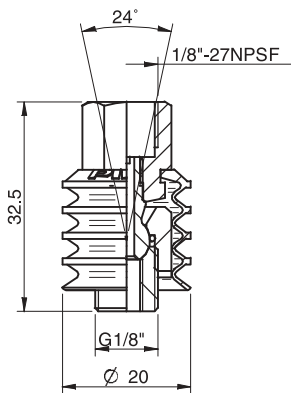
### Technical data

Description	Unit	Value		
		G1/8"	G1/2"	G3/4"
Weight	g	20	110	200
Temperature range	°C	-40-110	-40-110	-40-110
Angle	°	±12	±12	±12
Max. Load	kg	25	50	150
Material		SS/CR/PA/NBR	SS/CR/PA/NBR	SS/CR/PA/NBR

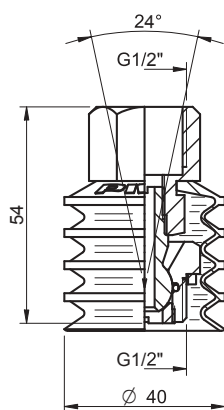
### Ordering information

	Description	Art. No.
A	Ball joint G1/8"	3350065
B	Ball joint G1/2"	3350066
C	Ball joint G3/4"	3350067

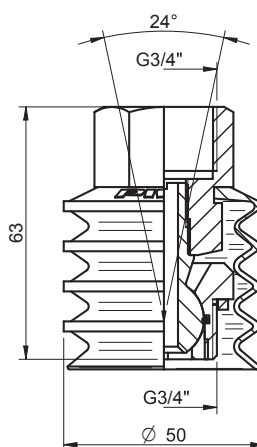
When using Ball joint G1/2" (3350066) with Suction cup F75 G1/2" with cone valve (0101872 and 0101879), a Connector G1/2" (3107757) must be used.



A



B



C

### Ordering information, accessories

Description	Art. No.
Connector ext-int G1/2"	3107757

## Angle adaptors



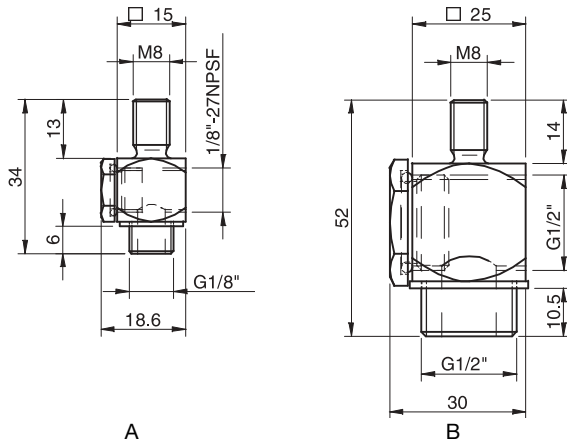
- ▶ Angle adaptors facilitate vacuum connections when space and headroom are limited.
- ▶ Can also be used as T-connectors.

### Technical data

Description	Unit	Value	
		G1/8" - M8	G1/2" -M8
Weight	g	20	120
Temperature range	°C	-40-110	-40-110
Material		CuZn/NBR/PA	SS/NBR/PA

### Ordering information

Description	Art. No.
A Angle adapter G1/8"-M8	3150053
B Angle adapter G1/2"-M8	3150054



## T-slot adapters



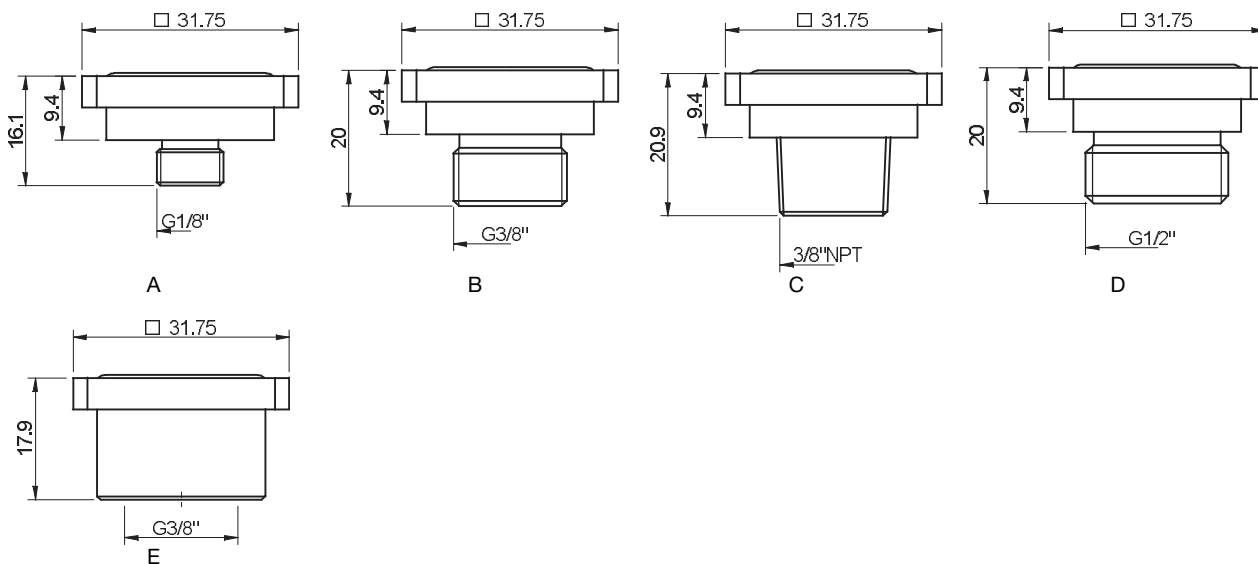
- ▶ The Piab T-slot adapter enables Piab suction cups to mount to existing boom assemblies and end-of-arm tooling used in the automotive industry. The T-slot adapter threads into the Piab cup fitting and can then be mounted accordingly.
- ▶ The suction cups can be changed quickly and with great ease.
- ▶ Non-rotating feature — good when using oval suction cups.

### Technical data

Description	Unit	Value
Weight	g	17–22
Working temperature	°C	-20–90
Material		Al/NBR

### Ordering information

	Description	Art. No.
A	T-slot adapter G1/8" male	0104108
B	T-slot adapter G3/8" male	0104110
C	T-slot adapter 3/8" NPT	0104111
D	T-slot adapter G1/2" male	0104112
E	T-slot adapter G3/8" female	0107942



## Ball joint fitting



- ▶ Fitted to a suction cup to avoid bending stress.
- ▶ Non-leaking design to work with Vacuum Check Valve and Vacustat.
- ▶ Available in a loose-fit, a locking version or one with 5° movement.

### Technical data

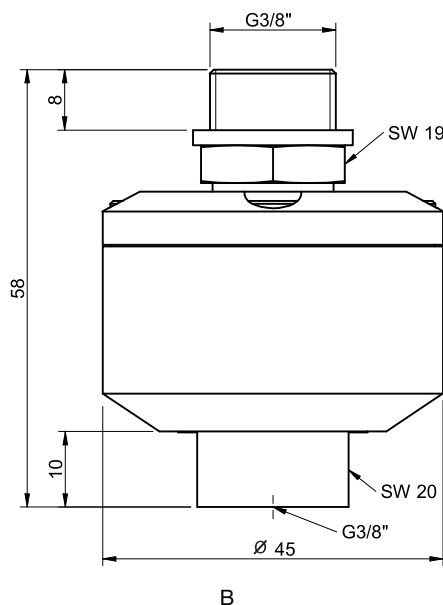
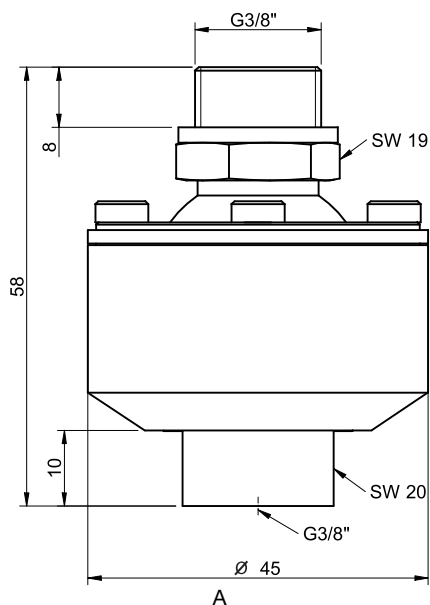
Description	Unit	Value
Material		SS, Zn, CuZn, NBR
Temperature range	°C	-30-70
Weight	g	348-393

### Technical data, specific

Description	Unit	Value		
		0110636	0121177	0110635
Angular movement	°	±20	±5	±20

### Ordering information

	Description	PMAT No.	Art. No.
A	Ball joint fitting G3/8"	X7016	0110635
A	Ball joint fitting G3/8", locking	X7018	0110636
B	Ball joint fitting G3/8", limited movement	X7026	0121177



### Ordering information, accessories

Description	Art. No.
Adapter fitting G3/8" male x 3/8" NPT male	0121240

## Height adjuster



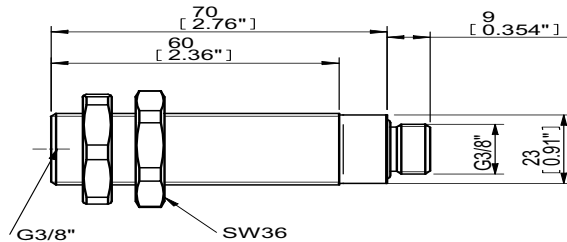
- ▶ Provides a height extension between the tooling and the suction cup.
- ▶ Adjustable in height.
- ▶ Can be used with Suction cup extension.

### Technical data

Description	Unit	Value
Material		Al, NBR, SS
Temperature range	°C	-30-70
Weight	g	130
Volume, internal	cm <sup>3</sup>	32
Action range, adjustable length	mm	48

### Ordering information

Description	Art. No.
Height adjuster G3/8" male x G3/8" female	0121122



### Ordering information, accessories

Description	Art. No.
Adapter fitting G3/8" male x 3/8" NPT male	0121240



## Suction cup extension



- ▶ Solid extension for mounting a suction cup.
- ▶ Several heights available.
- ▶ Can be used with Height adjuster.

### Technical data

Description	Unit	Value
Material		AL, NBR
Temperature range	°C	-30-70
Max. load, radial	N	400
Max. load, axial	N	700
Radial deflection at 400 N	mm	<1

Operational lifetime: 10,000,000 cycles at max. load

### Technical data, specific - G threads

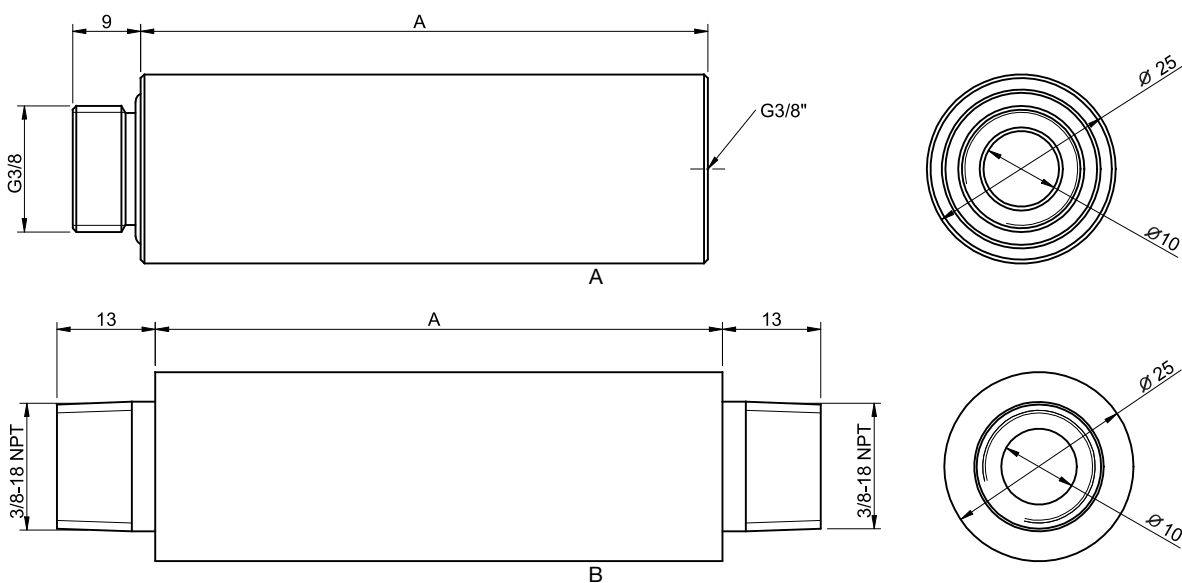
Description	Unit	Value					
		0110653	0110655	0110657	0110659	0110661	0110663
Weight	g	29	56	84	123	168	223
Volume, internal	cm <sup>3</sup>	3	5	7	9	12	16

### Technical data, specific - NPT threads

Description	Unit	Value					
		0121138	0121139	0121140	0121141	0121142	0121143
Weight	g	39	66	94	133	178	233
Volume, internal	cm <sup>3</sup>	3	5	7	9	12	16

## Ordering information

	Description	PMAT No.	Art. No.
A	Suction cup extension 25, G3/8" male x G3/8" female	X7044	0110653
A	Suction cup extension 50, G3/8" male x G3/8" female	X7046	0110655
A	Suction cup extension 75, G3/8" male x G3/8" female	X7051	0110657
A	Suction cup extension 110, G3/8" male x G3/8" female	X7054	0110659
A	Suction cup extension 150, G3/8" male x G3/8" female	X7058	0110661
A	Suction cup extension 200, G3/8" male x G3/8" female	X7062	0110663
B	Suction cup extension 25, 3/8" NPT male x 3/8" NPT male	--	0121138
B	Suction cup extension 50, 3/8" NPT male x 3/8" NPT male	--	0121139
B	Suction cup extension 75, 3/8" NPT male x 3/8" NPT male	--	0121140
B	Suction cup extension 110, 3/8" NPT male x 3/8" NPT male	--	0121141
B	Suction cup extension 150, 3/8" NPT male x 3/8" NPT male	--	0121142
B	Suction cup extension 200, 3/8" NPT male x 3/8" NPT male	--	0121143



## Dimensions

Description	A mm
Suction cup extension 25	25
Suction cup extension 50	50
Suction cup extension 75	75
Suction cup extension 110	110
Suction cup extension 150	150
Suction cup extension 200	200

## Ordering information, accessories

Description	Art. No.
Height adjuster G3/8" male x G3/8" female	0121122

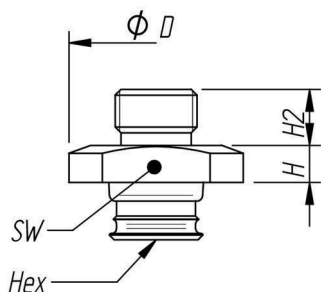
## piGRIP® fittings



- ▶ All fittings are possible to use for all piGRIP® configurations.
- ▶ All fittings are also suitable for suction cups B50, B50-2, B50MF, BL50-2, BX52P, D50, F50-2, F50MF, U50-2.
- ▶ Integrated mesh filter as an option, keeps particles away.
- ▶ O-ring seal on straight threads to avoid leakage.
- ▶ Internal and external key handle on most fittings.

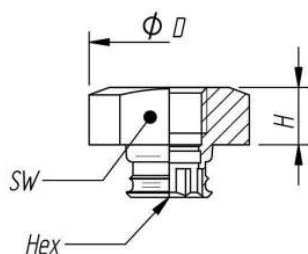
### Technical data male thread G and M

Art. No.	Code	Description	Material	Weight g	Volume cm <sup>3</sup>	Temp. range C°	Dimensions (mm)				
							H	H2	D	SW	HEX
9902441	G18M.00	piGRIP® Fitting G1/8" male	Al, NBR	5.0	1.2	-20-90	5	6	19	17	10
9902442	G18M.01	piGRIP® Fitting G1/8" male, with mesh filter	Al, SS, NBR	5.1	1.2		5	6	19	17	10
9902447	G14M.00	piGRIP® Fitting G1/4" male	Al, NBR	12.3	1.6		6	9	28	22	10
9902448	G14M.01	piGRIP® Fitting G1/4" male, with mesh filter	Al, SS, NBR	12.4	1.6		6	9	28	22	10
9902451	G38M.00	piGRIP® Fitting G3/8" male	Al, NBR	13.4	2.1		6	10	28	22	10
9902452	G38M.01	piGRIP® Fitting G3/8" male, with mesh filter	Al, SS, NBR	13.5	2.1		6	10	28	22	10
9902455	G12M.00	piGRIP® Fitting G1/2" male	Al, NBR	16.9	2.2		6	10	28	22	10
9902456	G12M.01	piGRIP® Fitting G1/2" male, with mesh filter	Al, SS, NBR	17.0	2.2		6	10	28	22	10
9902487	MM6M.00	piGRIP® Fitting M6 male	SS, NBR	14.1	0.9		5	6	19	17	10
9902488	MM6M.01	piGRIP® Fitting M6 male, with mesh filter	SS, NBR	14.2	0.9		5	6	19	17	10
9902493	MMF8M.00	piGRIP® Fitting M8 x 1 male	SS, NBR	14.1	1.1		5	6	19	17	10
9902494	MMF8M.01	piGRIP® Fitting M8 x 1 male, with mesh filter	SS, NBR	14.2	1.1		5	6	19	17	10
9902497	MM10M.00	piGRIP® Fitting M10 male	Al, NBR	6.1	1.4		6	10	19	17	10
9902498	MM10M.01	piGRIP® Fitting M10 male, with mesh filter	Al, SS, NBR	6.2	1.4		6	10	19	17	10
9902501	MMF14M.00	piGRIP® Fitting M14 x 1 male	Al, NBR	10.3	2.3		6	12	28	22	10
9902502	MMF14M.01	piGRIP® Fitting M14 x 1 male, with mesh filter	Al, SS, NBR	10.4	2.3		6	12	28	22	10
9902505	MMF16M.00	piGRIP® Fitting M16 x 1.5 male	Al, NBR	13.6	2.3		6	12	28	22	10
9902506	MMF16M.01	piGRIP® Fitting M16 x 1.5 male, with mesh filter	Al, SS, NBR	13.7	2.3		6	12	28	22	10



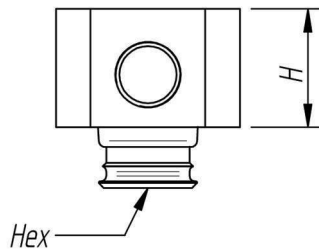
## Technical data female thread

Art. No.	Code	Description	Material	Weight g	Volume cm <sup>3</sup>	Temp. range C°	Dimensions (mm)			
							H	D	SW	HEX
9902445	G14F.00	piGRIP® Fitting G1/4" female	Al	11.7	1.9	-20- 120	10	28	22	10
9902446	G14F.01	piGRIP® Fitting G1/4" female, with mesh filter	Al, SS	11.8	1.9		10	28	22	10
9902449	G38F.00	piGRIP® Fitting G3/8" female	Al	13	3.1		13	28	22	10
9902450	G38F.01	piGRIP® Fitting G3/8" female, with mesh filter	Al, SS	13.1	3.1		13	28	22	10
9902453	G12F.00	piGRIP® Fitting G1/2" female	Al	13.6	4.6		14	28	22	10
9902454	G12F.01	piGRIP® Fitting G1/2" female, with mesh filter	Al, SS	13.7	4.6		14	28	22	10
9902485	MM5F.00	piGRIP® Fitting M5 female	Al	5.3	0.9		6	19	17	10
9902486	MM5F.01	piGRIP® Fitting M5 female, with mesh filter	Al, SS	5.4	0.9		6	19	17	10
9902489	MM6F.00	piGRIP® Fitting M6 female	Al	5.3	1.0		7	19	17	10
9902490	MM6F.01	piGRIP® Fitting M6 female, with mesh filter	Al, SS	5.4	1.0		7	19	17	10
9902491	MM8F.00	piGRIP® Fitting M8 female	Al	5.7	1.1		7	19	17	10
9902492	MM8F.01	piGRIP® Fitting M8 female, with mesh filter	Al, SS	5.8	1.1		7	19	17	10
9902495	MM10F.00	piGRIP® Fitting M10 female	Al	5.7	1.2		7	19	17	10
9902496	MM10F.01	piGRIP® Fitting M10 x 1 female, with mesh filter	Al, SS	5.8	1.2		7	19	17	10
9902499	MM12F.00	piGRIP® Fitting M12 female	Al	16.1	1.8		12	22	10	10
9902500	MM12F.01	piGRIP® Fitting M12 female, with mesh filter	Al, SS	16.2	1.8		12	22	10	10
9902503	MMF16F.00	piGRIP® Fitting M16 x 1.5 female	Al	13.6	2.9		13	22	10	10
9902504	MMF16F.01	piGRIP® Fitting M16 x 1.5 female, with mesh filter	Al, SS	13.7	2.9		13	22	10	10
9902439	NS18F.00	piGRIP® Fitting 1/8" NPSF female	Al	5.2	1.2		7	19	17	10
9902440	NS18F.01	piGRIP® Fitting 1/8" NPSF female, with mesh filter	Al, SS	5.3	1.2		7	19	17	10
9902479	NS14F.00	piGRIP® Fitting 1/4" NPSF female	Al	11.9	1.8		10	28	22	10
9902480	NS14F.01	piGRIP® Fitting 1/4" NPSF female, with mesh filter	Al, SS	12.0	1.8		10	28	22	10
9902481	NS38F.00	piGRIP® Fitting 3/8" NPSF female	Al	13.3	3.0		13	28	22	10
9902482	NS38F.01	piGRIP® Fitting 3/8" NPSF female, with mesh filter	Al, SS	13.4	3.0		13	28	22	10
9902483	NS12F.00	piGRIP® Fitting 1/2" NPSF female	Al	14.3	4.3		14	28	22	10
9902484	NS12F.01	piGRIP® Fitting 1/2" NPSF female, with mesh filter	Al, SS	14.4	4.3		14	28	22	10
9902463	NT14F.00	piGRIP® Fitting 1/4" NPT female	Al	15.6	2.0		12	28	22	10
9902464	NT14F.01	piGRIP® Fitting 1/4" NPT female, with mesh filter	Al, SS	15.7	2.0		12	28	22	10
9902467	NT38F.00	piGRIP® Fitting 3/8" NPT female	Al	13.4	3.0	13	28	22	10	
9902468	NT38F.01	piGRIP® Fitting 3/8" NPT female, with mesh filter	Al, SS	13.5	3.0	13	28	22	10	
9902507	U12F.00	piGRIP® Fitting 1/2" UNC female	Al	15.9	1.9	12	28	22	10	
9902508	U12F.01	piGRIP® Fitting 1/2" UNC female, with mesh filter	Al, SS	16.0	1.9	12	28	22	10	



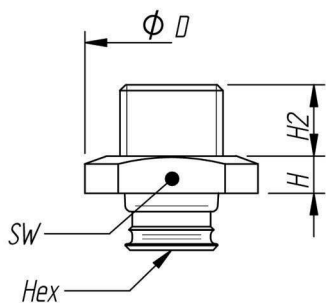
## Technical data female thread 5x

Art. No.	Code	Description	Material	Weight g	Volume cm <sup>3</sup>	Temp. range C°	Dimensions (mm)	
							H	HEX
9902443	NS518F.00	piGRIP® Fitting 5x1/8" NPSF female	Al	27.6	4.3	-20- 120	18	10
9902444	NS518F.01	piGRIP® Fitting 5x1/8" NPSF female, with mesh filter	Al, SS	27.7	4.3		18	10



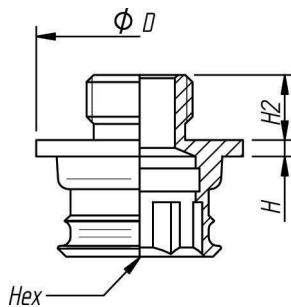
## Technical data male thread NPT

Art. No.	Code	Description	Material	Weight g	Volume cm <sup>3</sup>	Temp. range C°	Dimensions (mm)				
							H	H2	D	SW	HEX
9902465	NT18M.00	piGRIP® Fitting 1/8" NPT male	Al	5.2	1.2	-20- 120	5	7	19	17	10
9902513	NT18M.01	piGRIP® Fitting 1/8" NPT male, with mesh filter	Al, SS	5.3	1.2		5	7	19	17	10
9902512	NT14M.00	piGRIP® Fitting 1/4" NPT male	Al	11.6	1.7		6	11	28	22	10
9902466	NT14M.01	piGRIP® Fitting 1/4" NPT male, with mesh filter	Al, SS	11.7	1.7		6	11	28	22	10
9902469	NT38M.00	piGRIP® Fitting 3/8" NPT male	Al	12.7	2.3		6	11.5	28	22	10
9902470	NT38M.01	piGRIP® Fitting 3/8" NPT male, with mesh filter	Al, SS	12.8	2.3		6	11.5	28	22	10
9902471	NT12M.00	piGRIP® Fitting 1/2" NPT male	Al	19.3	2.6		6	15	28	22	10
9902472	NT12M.01	piGRIP® Fitting 1/2" NPT male, with mesh filter	Al, SS	19.4	2.6		6	15	28	22	10



## Technical data male thread low G and NPT

Art. No.	Code	Description	Material	Weight g	Volume cm <sup>3</sup>	Temp. range C°	Dimensions (mm)			
							H	H2	D	HEX
9902457	GL18M.00	piGRIP® Fitting G1/8" low male	Al	3	1.1	-20- 120	1.5	6	19	10
9902458	GL18M.01	piGRIP® Fitting G1/8" low male, with mesh filter	Al, SS	3.1	1.1		1.5	6	19	10
9902459	GL14M.00	piGRIP® Fitting G1/4" low male	Al	5.5	1.3		1.5	9	28	10
9902460	GL14M.01	piGRIP® Fitting G1/4" low male, with mesh filter	Al, SS	5.6	1.3		1.5	9	28	10
9902461	GL38M.00	piGRIP® Fitting G3/8" low male	Al	6.9	1.8		1.5	10	28	10
9902462	GL38M.01	piGRIP® Fitting G3/8" low male, with mesh filter	Al, SS	7.0	1.8		1.5	10	28	10
9902473	NTL18M.00	piGRIP® Fitting 1/8" NPT low male	Al	3.2	1.1		1.5	7	19	10
9902474	NTL18M.01	piGRIP® Fitting 1/8" NPT low male, with mesh filter	Al, SS	3.3	1.1		1.5	7	19	10
9902475	NTL14M.00	piGRIP® Fitting 1/4" NPT low male	Al	6.2	1.4		1.5	11	28	10
9902476	NTL14M.01	piGRIP® Fitting 1/4" NPT low male, with mesh filter	Al, SS	6.3	1.4		1.5	11	28	10
9902477	NTL38M.00	piGRIP® Fitting 3/8" NPT low male	Al	7.7	1.9		1.5	11.5	28	10
9902478	NTL38M.01	piGRIP® Fitting 3/8" NPT low male, with mesh filter	Al, SS	7.8	1.9		1.5	11.5	28	10



## Fitting 75



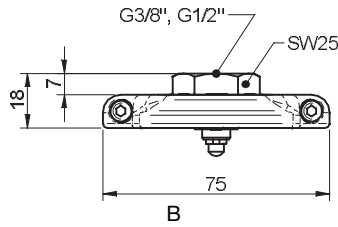
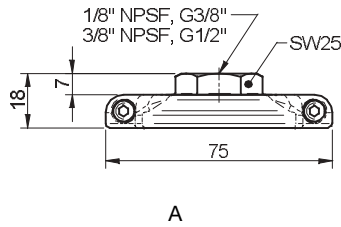
- ▶ **Suits suction cups:**  
B75, B75P, B75-2, F75, F75P, FC100P
- ▶ **With cone valve only for:**  
F75

### Technical data

Description	Unit	Value	
		With mesh filter	With cone valve
Weight	g	70	75
Working temperature	°C	-20-120	-20-90
Material		Al/SS	Al/SS/NBR

### Ordering information

	Description	Art. No.
A	Fitting 75, G3/8" female, with mesh filter	0100551
B	Fitting 75, G3/8" female, with cone valve	0100552
A	Fitting 75, G1/2" female, with mesh filter	0100555
B	Fitting 75, G1/2" female, with cone valve	0100556
A	Fitting 75, 3/8" NPSF female, with mesh filter	0100553
A	Fitting 75, 1/8" NPSF female, with mesh filter	0100548



## Fitting 110



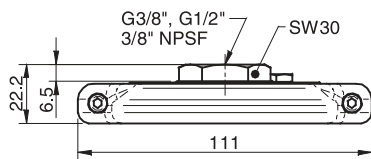
- ▶ **Suits suction cups:**  
B110, B110-2, F110P, F110, FC150P
- ▶ **With cone valve only for:**  
F110

### Technical data

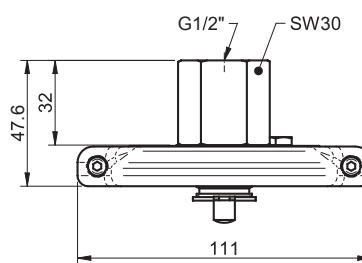
Description	Unit	Value	
		With mesh filter	With cone valve
Weight	g	240	290
Working temperature	°C	-20-90	-20-90
Material		Al/SS/CuZn/NBR	Al/SS/CuZn/NBR

### Ordering information

	Description	Art. No.
A	Fitting 110 G3/8" female, with mesh filter	0100557
A	Fitting 110, G1/2" female, with mesh filter	0100561
B	Fitting 110, G1/2" female, with cone valve	0100563
A	Fitting 110, 3/8" NPSF female, with mesh filter	0100559



A



B



## Fitting 150



### Features

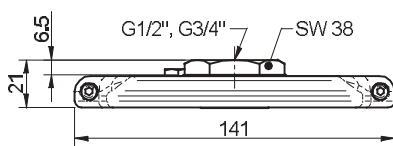
- ▶ Suits suction cups:  
B150, F150
- ▶ With cone valve only for:  
F150

### Technical data

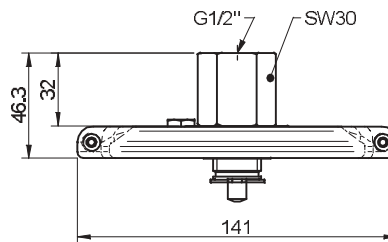
Description	Unit	Value	
		With mesh filter	With cone valve
Weight	g	355	415
Working temperature	°C	-20-90	-20-90
Material		Al/SS/CuZn/NBR	Al/SS/CuZn/NBR

### Ordering information

Description	Art. No.
A Fitting 150, G1/2" female, with mesh filter	0100564
B Fitting 150, G1/2" female, with cone valve	0100566
A Fitting 150, G3/4" female, with mesh filter	0100567



A



B

## M2.5 male



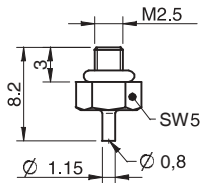
► Suits suction cups:  
U2, U3

### Technical data

Description	Unit	Value
Weight	g	0.5
Working temperature	°C	-20-90
Material		CuZn/NBR

### Ordering information

Description	Art. No.
Fitting M2.5 male	3250084



## M5 male



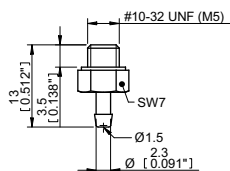
► Suits suction cups:  
B5, B8, U4, U6, U8

### Technical data

Description	Unit	Value
Weight	g	3
Working temperature	°C	-40-110
Material		CuZn/PA

### Ordering information

Description	Art. No.
Fitting M5 male, 5-8	3107031



## M5 male



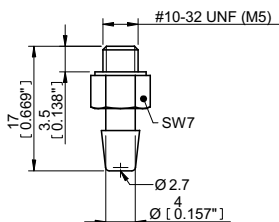
- **Suits suction cups:**  
 B10-2, B15-2, B15MF, D15-2, F15, F15MF,  
 U10, U15

### Technical data

Description	Unit	Value
Weight	g	4
Working temperature	°C	-40-110
Material		CuZn/PA

### Ordering information

Description	Art. No.
Fitting M5 male, 10-15	3107030



## M5 female



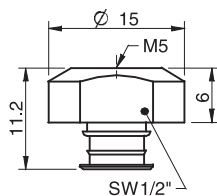
- **Suits suction cups:**  
 B20, B20MF, BL20-2, D20-2, F20,  
 F20MF, U20, F25, F25MF, FC20P,  
 FC25P, D30-2, F30-2, F30MF, U30

### Technical data

Description	Unit	Value	
		Without valve	With dual flow control valve
Weight	g	3	3
Working temperature	°C	-20-120	0-80
Material		Al	Al/PUR

### Ordering information

Description	Art. No.
Fitting M5 female	3250003
Fitting M5 female, with dual flow control valve	3251001



## G1/8" male



► **Suits suction cups:**

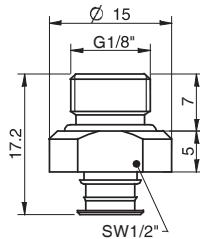
B20, B20MF, D20-2, F20, F20MF, U20, F25, F25MF, FC20P, FC25P, D30-2, F30-2, F30MF, U30

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	3	3
Working temperature	°C	-20-90	0-80
Material		Al/SS/NBR	Al/SS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting G1/8" male, with mesh filter	3250085
Fitting G1/8" male, with mesh filter and dual flow control valve	3251002



## G1/8" male / M5 female



► **Suits suction cups:**

B20, B20MF, BL20-2, D20-2, F20, F20MF, U20, F25, F25MF, FC20P, FC25P, D30-2, F30-2, F30MF, U30

► **With cone valve only for:**

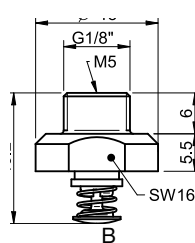
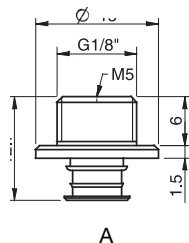
F30-2

### Technical data

Description	Unit	Value		
		With mesh filter	With dual flow control valve	With cone valve
Weight	g	2	2	4
Working temperature	°C	-20-120	0-80	-20-90
Material		Al/SS	Al/PUR	Al/SS/NBR

### Ordering information

	Description	Art. No.
A	Fitting G1/8" male/M5 female, with mesh filter	0101152
A	Fitting G1/8" male/M5 female, with dual flow control valve	3251004
B	Fitting G1/8" male/M5 female, with cone valve	0101155



## G1/8" male / M5 female – Composite



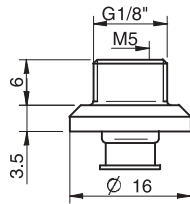
- ▶ Made of PA (Polyamide).
- ▶ Can be used on a number of Piab's suction cups in sizes from 20 to 50 mm.
- ▶ The weight of the composite fittings is approximately half the weight of corresponding fittings of aluminium.
- ▶ The fittings are durable and resistant to the most common acids and chemicals. They can be used in applications where aluminium cannot be used due to environmental issues, for example, in the chemical industry and the food industry.
- ▶ **Suits suction cups:** B20, BL20-2, D20-2, D30-2, F20, F25, F30-2, U20, U30

### Technical data

Description	Unit	Value
Weight	g	1.7
Working temperature	°C	-20-110
Material		PA composite

### Ordering information

Description	Art. No.
Fitting G1/8" male/M5 female, PA	3150196



## 1/8" NPSF female



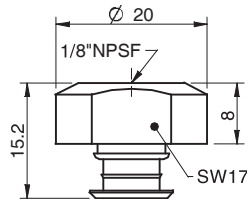
- ▶ **Suits suction cups:**  
B30-2, B30MF, BL30-2, B40, B40MF, BL40-2, F40-2, F40MF, U40-2, FC35P
- ▶ **With cone valve only for:**  
F40-2
- ▶ **Without mesh filter for:**  
BX35P

### Technical data

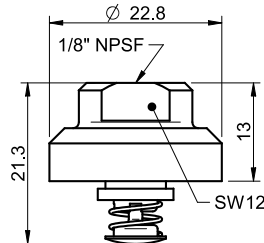
Description	Unit	Value			
		Without mesh filter	With mesh filter	With dual flow control valve	With cone valve
Weight	g	6	6	6	7
Working temperature	°C	-20-120	-20-120	0-80	-20-90
Material		Al	Al/SS	Al/PUR	Al/SS/NBR

### Ordering information

	Description	Art. No.
A	Fitting 1/8" NPSF female, 30-40	3250005
A	Fitting 1/8" NPSF female, 30-40, with mesh filter	0101153
A	Fitting 1/8" NPSF female, 30-40, with dual flow control valve	3251006
B	Fitting 1/8" NPSF female, 30-40, with cone valve	0101156



A



B

## 1/8" NPSF female



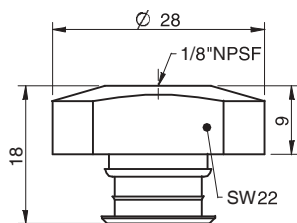
- ▶ **Suits suction cups:**  
B50, B50-2, BX52P, B50MF, BL50-2, D50, F50-2, F50MF, U50-2
- ▶ **With cone valve only for:**  
F50-2
- ▶ **Without mesh filter for:**  
BX52P

### Technical data

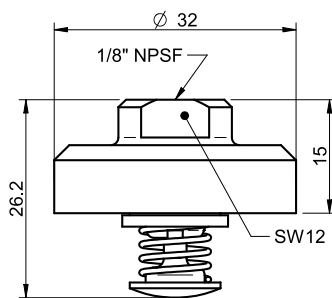
Description	Unit	Value			
		Without mesh filter	With mesh filter	With dual flow control valve	With cone valve
Weight	g	10	10	10	15
Working temperature	°C	-20-120	-20-120	0-80	-20-90
Material		Al	Al/SS	Al/PUR	Al/SS/NBR

### Ordering information

	Description	Art. No.
A	Fitting 1/8" NPSF female, 50	3250017
A	Fitting 1/8" NPSF female, 50, with mesh filter	0101154
A	Fitting 1/8" NPSF female, 50, with dual flow control valve	3251012
B	Fitting 1/8" NPSF female, 50, with cone valve	0101157



A



B

## 1/8" NPSF female – Composite



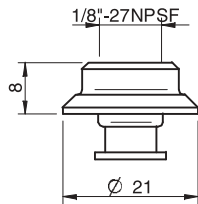
- ▶ Made of PA (Polyamide).
- ▶ Can be used on a number of Piab's suction cups in sizes from 20 to 50 mm.
- ▶ The weight of the composite fittings is approximately half the weight of corresponding fittings of aluminium.
- ▶ The fittings are durable and resistant to the most common acids and chemicals. They can be used in applications where aluminium cannot be used due to environmental issues, for example, in the chemical industry and the food industry.
- ▶ **Suits suction cups:** B30-2, B40, BL30-2, BL40-2, F40-2, U40-2

### Technical data

Description	Unit	Value
Weight	g	2.4
Working temperature	°C	-20–110
Material		PA composite

### Ordering information

Description	Art. No.
Fitting 1/8" NPSF female, 30–40, PA	3150197





## 1/8" NPSF female – Composite



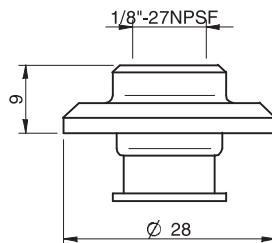
- ▶ Made of PA (Polyamide).
- ▶ Can be used on a number of Piab's suction cups in sizes from 20 to 50 mm.
- ▶ The weight of the composite fittings is approximately half the weight of corresponding fittings of aluminium.
- ▶ The fittings are durable and resistant to the most common acids and chemicals. They can be used in applications where aluminium cannot be used due to environmental issues, for example, in the chemical industry and the food industry.
- ▶ **Suits suction cups:** B50, B50-2, BL50-2, B50MF, D50, F50-2, U50-2

### Technical data

Description	Unit	Value
Weight	g	5.6
Working temperature	°C	-20–110
Material		PA composite

### Ordering information

Description	Art. No.
Fitting 1/8" NPSF female, 50, PA	3150198



## G1/4" male with mesh filter



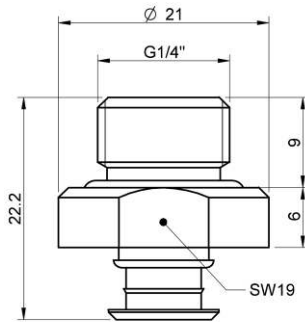
- **Suits suction cups:**  
 B30-2, B30MF, BL30-2, B40,  
 B40MF, BX35P, BL40-2, F40-2,  
 F40MF, U40-2, FC35P

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	7	7
Working temperature	°C	-20-90	0-80
Material		Al/SS/NBR	Al/SS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting G1/4" male, 30-40, with mesh filter	3250091
Fitting G1/4" male, 30-40, with mesh filter and dual flow control valve	3251007



## G1/4" male with mesh filter



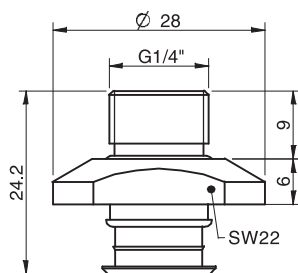
- ▶ Suits suction cups:  
B50, B50-2, BX52P, B50MF,  
BL50-2, D50, F50-2, F50MF, U50-2

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	10	10
Working temperature	°C	-20-90	0-80
Material		Al/SS/NBR	Al/SS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting G1/4" male, 50, with mesh filter	3250092
Fitting G1/4" male, with mesh filter and dual flow control valve	3251013



## G1/2" male



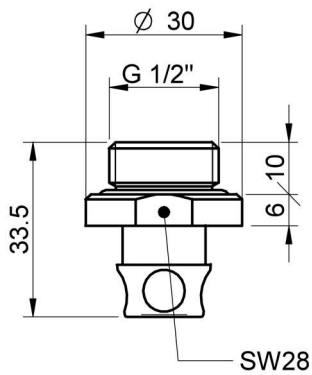
► Suits suction cup:  
BL50-3P

### Technical data

Description	Unit	Value
Weight	g	14
Working temperature	°C	-20-90
Material		Al/NBR

### Ordering information

Description	Art. No.
Fitting G1/2" male, bag	0113117



## 1/2" NPT male



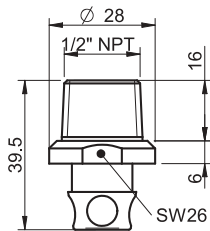
► Suits suction cup:  
BL50-3P

### Technical data

Description	Unit	Value
Weight	g	17
Working temperature	°C	-20-90
Material		Al

### Ordering information

Description	Art. No.
Fitting 1/2" NPT male, bag	0113140



## G3/8" male with mesh filter



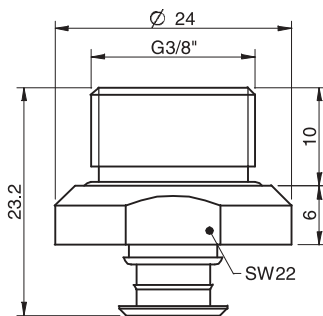
- Suits suction cups:  
 B30-2, B30MF, BL30-2, B40,  
 B40MF, BX35P, BL40-2, F40-2,  
 F40MF, U40-2, FC35P

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	10	10
Working temperature	°C	-20-90	0-80
Material		Al/SS/NBR	Al/SS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting G3/8" male, 30-40, with mesh filter	3250086
Fitting G3/8" male, 30-40, with mesh and dual flow control valve	3251009



## G3/8" male with mesh filter



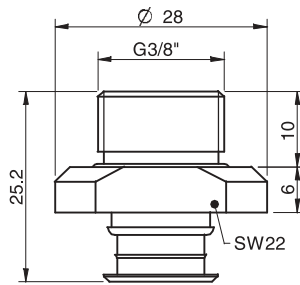
- **Suits suction cups:**  
B50, B50-2, B50MF, BL50-2, D50,  
F50-2, F50MF, U50-2

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	10	10
Working temperature	°C	-20-90	0-80
Material		Al/SS/NBR	Al/SS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting G3/8" male, 50, with mesh filter	3250087
Fitting G3/8" male, 50, with mesh filter and dual flow control valve	3251015



## G3/8" male



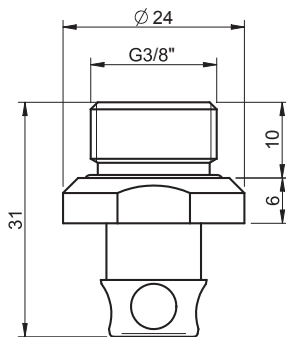
► Suits suction cup:  
BL30-3P, BL40-3P

### Technical data

Description	Unit	Value
Weight	g	12
Working temperature	°C	-20-90
Material		Al/NBR

### Ordering information

Description	Art. No.
Fitting G3/8" male, bag	0112662





## 3/8" NPT male



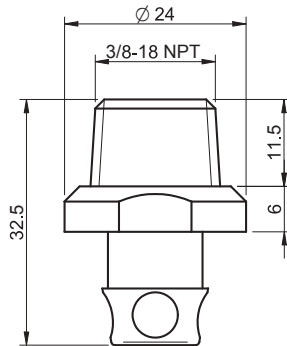
► Suits suction cup:  
BL30-3P, BL40-3P

### Technical data

Description	Unit	Value
Weight	g	12
Working temperature	°C	-20-120
Material		Al

### Ordering information

Description	Art. No.
Fitting 3/8" NPT male, bag	0112692



## 5xM5 female



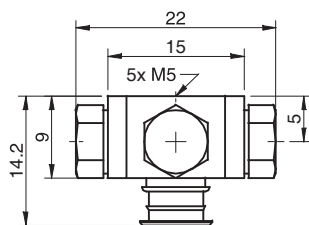
- **Suits suction cups:**  
 B20, B20MF, BL20-2, D20-2, F20, F20MF, U20, F25, F25MF, FC20P, FC25P, D30-2, F30-2, F30MF, U30

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	10	10
Working temperature	°C	-20-120	0-80
Material		Al/CuZn/PA	Al/CuZn/PA/PUR

### Ordering information

Description	Art. No.
Fitting 5xM5 female	0100260
Fitting 5xM5 female, with dual flow control valve	3251005



## 5x1/8" NPSF female



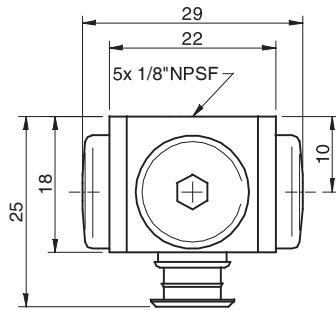
- **Suits suction cups:**  
 B30-2, B30MF, BL30-2, B40,  
 B40MF, BX35P, BL40-2, F40-2,  
 F40MF, U40-2, FC35P

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	20	20
Working temperature	°C	-20-90	0-80
Material		AI/PPS/NBR	AI/PPS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting 5x1/8" NPSF female, 30-40	0100261
Fitting 5x1/8" NPSF female, 30-40, with dual flow control valve	3251011



## 5x1/8" NPSF female



- **Suits suction cups:**  
 B50, B50-2, BX52P, B50MF ,  
 BL50-2, D50, F50-2, F50MF, U50-2

### Technical data

Description	Unit	Value	
		With mesh filter	With dual flow control valve
Weight	g	30	30
Working temperature	°C	-20-90	0-80
Material		AI/PPS/NBR	AI/PPS/NBR/PUR

### Ordering information

Description	Art. No.
Fitting 5x1/8" NPSF female, 50	0100262
Fitting 5x1/8" NPSF female, 50, with dual flow control valve	3251017





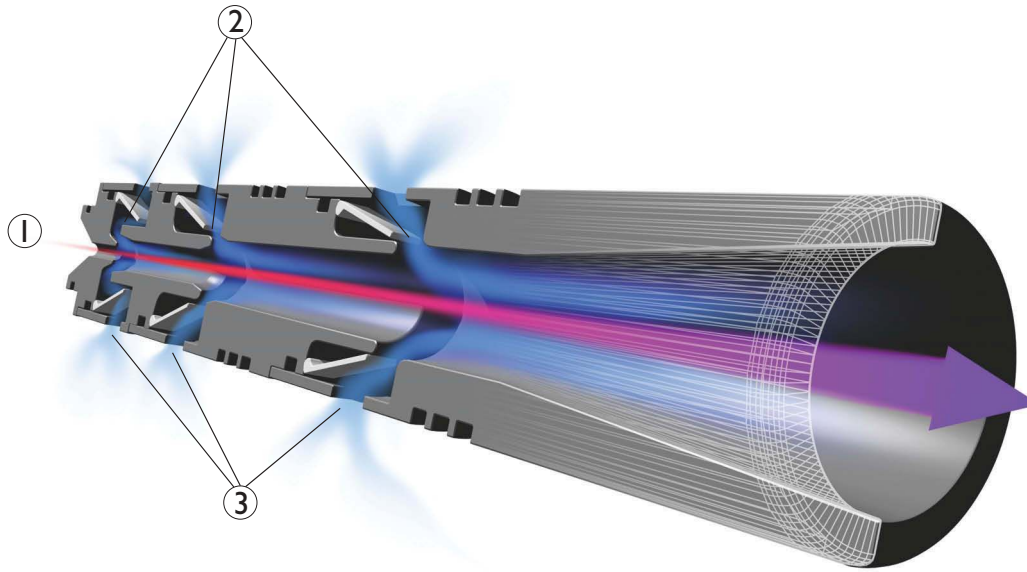
Introduction .....	264
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COAX® MINI .....	276
COAX® MIDI .....	294

## Introduction





Piab vacuum pumps are predominantly based on the patented COAX® technology



When compressed air (1) passes through the nozzles (2), air is pulled through with the stream of compressed air. "Suction" is thus created at the opening of each stage (3).

COAX® cartridges exist in several sizes (MICRO, MINI & MIDI) and models (Bi, Ti, Pi, Si, & Xi), making them suitable for every application. The technology ensures excellent performance at both low and high feed pressures – ideal for situations where compressed air lines deliver air at low or fluctuating pressures. Pumps based on COAX® technology can operate within the range of 0.17 to 0.60 MPa.

power exactly where needed, making maximum use of energy and increasing speed by eliminating line losses and inefficiencies. For more information visit [www.coaxtechnology.com](http://www.coaxtechnology.com).

Piab's decentralized vacuum gripper system (VGS™) is a product solution integrating high-quality DURAFLEX® suction cups with COAX®-based vacuum cartridges. The VGS™ makes selection, sizing and installation of a vacuum system easier. With a VGS™, you will enjoy the benefits of a more cost-efficient and reliable vacuum system.



Piab centralized pumps are also based on COAX® technology. These are modularized pumps with COAX® cartridges; how many cartridges depend on the vacuum flow needed.



Integrating COAX® technology directly into the machine body allows you to position vacuum

## Bi03-2



- ▶ Two-stage COAX® cartridge - MICRO - probably the world's smallest multistage vacuum ejector.
- ▶ Vacuum level to 83 -kPa at extremely low feed pressure.
- ▶ High operational reliability in case of fluctuating or low compressed-air pressure.
- ▶ The low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.
- ▶ Suitable for handling sealed objects.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	1.5-2.3
Material		Al, NBR, PA, SS, TPE

### Vacuum flow

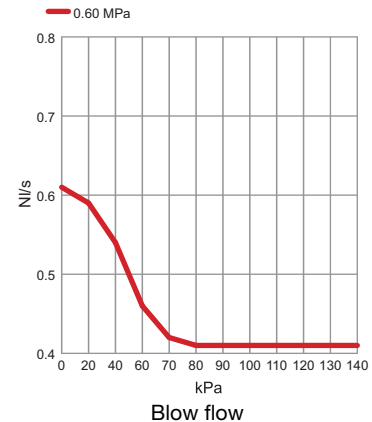
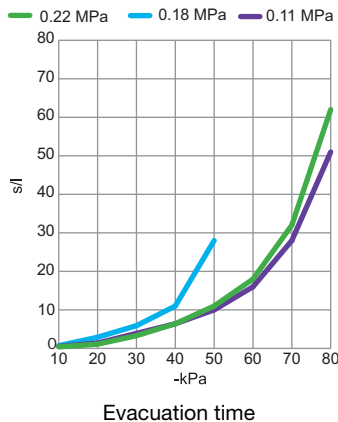
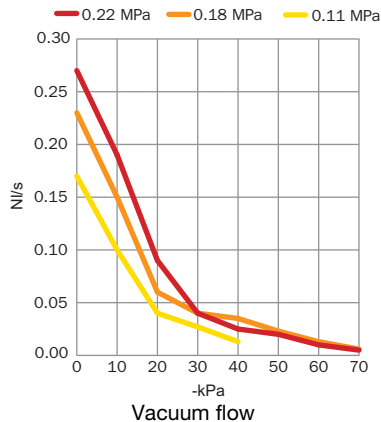
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.11	0.10	0.17	0.10	0.040	0.027	0.013	—	—	—	50
0.18	0.14	0.23	0.15	0.060	0.040	0.035	0.023	0.013	0.0060	83
0.22	0.17	0.27	0.19	0.090	0.040	0.025	0.020	0.010	0.0050	82

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.11	0.10	0.70	2.9	5.9	11.0	28.0	—	—	—	50
0.18	0.14	0.50	1.4	3.9	6.4	10.0	16.0	28.0	51.0	83
0.22	0.17	0.40	1.1	3.3	6.4	11.0	18.0	32.0	62.0	82

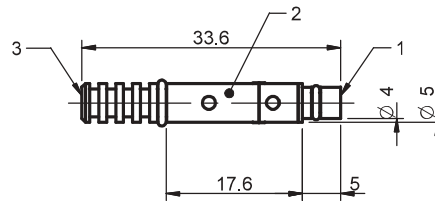
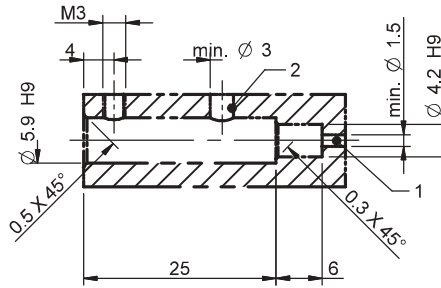
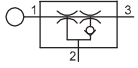
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
		0	20	40	60	70	80	90	100	110	120	130	140	
0.6	0.37	0.61	0.59	0.54	0.46	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.41	140

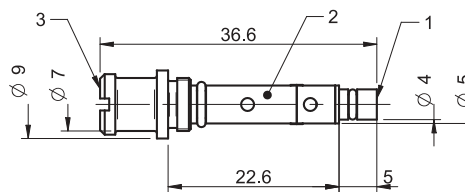
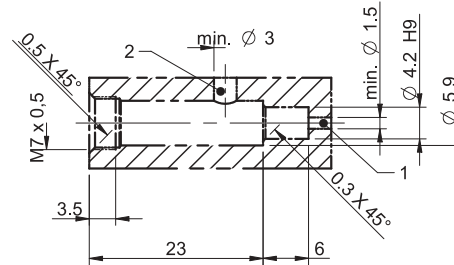
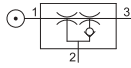


## Ordering information

	Description	Art. No.
A	COAX® cartridge MICRO Bi03-2	0106966
B	COAX® cartridge MICRO Bi03-2, holding cap	0106968



A



B

## Bi03-2 ozone resistant



- ▶ Two-stage COAX® cartridge - MICRO - probably the world's smallest multistage vacuum ejector.
- ▶ Vacuum level to 83 -kPa at extremely low feed pressure.
- ▶ High operational reliability in case of fluctuating or low compressed-air pressure.
- ▶ The low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.
- ▶ Suitable for handling sealed objects.
- ▶ Available with ozone resistant flap valve and sealing material, suitable for electronic and semiconductor applications

### Technical data

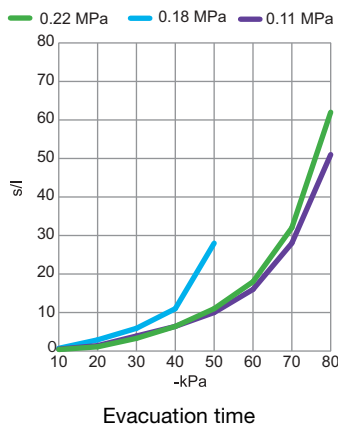
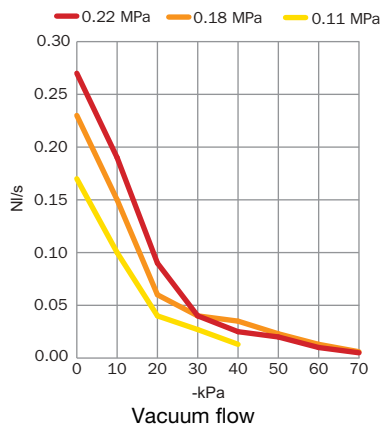
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	1.5-2.3
Material		Al, EPDM, PA, SS, TPE, Viton

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.11	0.10	0.17	0.10	0.040	0.027	0.013	—	—	—	50
0.18	0.14	0.23	0.15	0.060	0.040	0.035	0.023	0.013	0.0060	83
0.22	0.17	0.27	0.19	0.090	0.040	0.025	0.020	0.010	0.0050	82

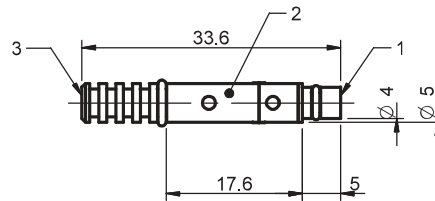
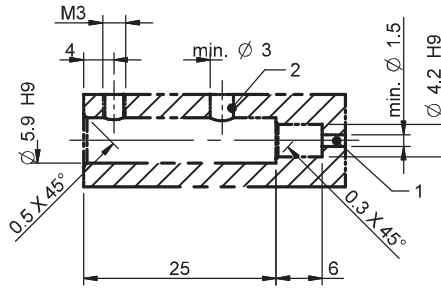
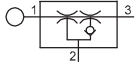
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.11	0.10	0.70	2.9	5.9	11.0	28.0	—	—	—	50
0.18	0.14	0.50	1.4	3.9	6.4	10.0	16.0	28.0	51.0	83
0.22	0.17	0.40	1.1	3.3	6.4	11.0	18.0	32.0	62.0	82

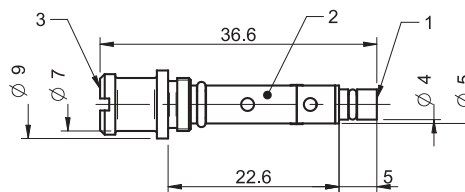
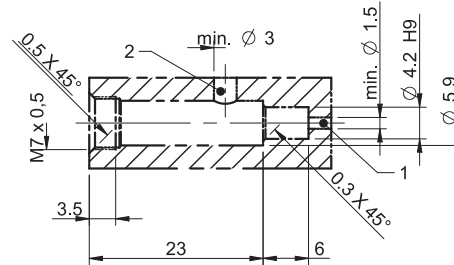
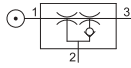


## Ordering information

	Description	Art. No.
A	COAX® cartridge MICRO Bi 03-2, ozone resistant	0110015
B	COAX® cartridge MICRO Bi 03-2, ozone resistant, holding cap	0125793



A



B

## Si02-2



- ▶ Two-stage COAX® cartridge - MICRO - probably the world's smallest multistage vacuum ejector.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Good for handling porous materials or if surface leakage is present.
- ▶ The low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	1.5-2.3
Material		Al, NBR, PA, SS, TPE

### Vacuum flow

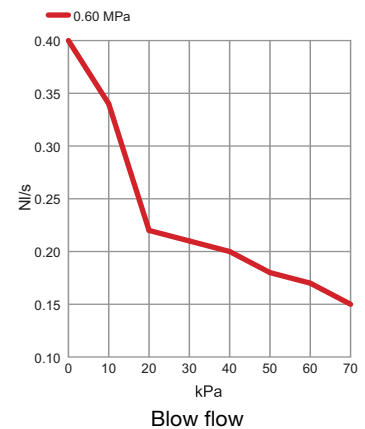
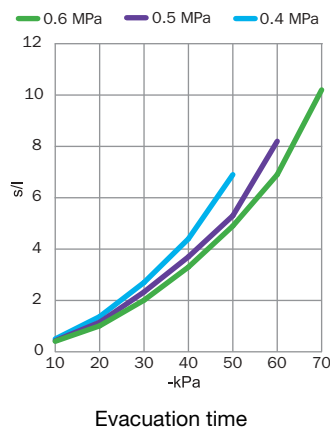
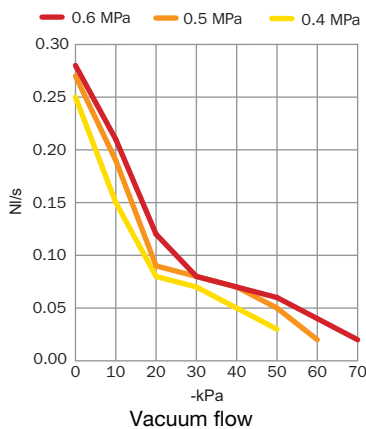
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.4	0.09	0.25	0.15	0.08	0.07	0.05	0.03	—	—	60
0.5	0.10	0.27	0.19	0.09	0.08	0.07	0.05	0.02	—	70
0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum -kPa
		10	20	30	40	50	60	70	
0.4	0.09	0.50	1.37	2.70	4.40	6.90	—	—	60
0.5	0.10	0.43	1.15	2.33	3.70	5.30	8.20	—	70
0.6	0.12	0.41	1.01	2.01	3.30	4.90	6.90	10.2	75

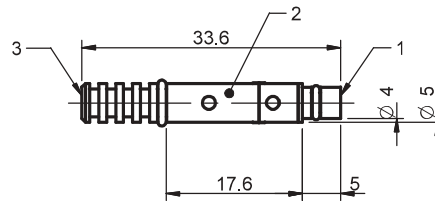
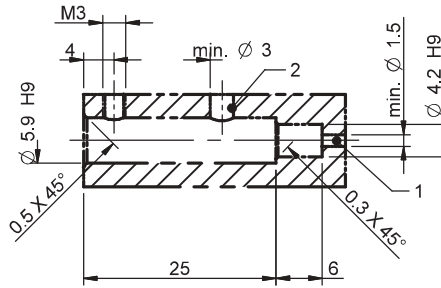
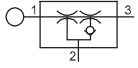
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)								Max pressure kPa
		0	10	20	30	40	50	60	70	
0.6	0.12	0.40	0.34	0.22	0.21	0.20	0.18	0.17	0.15	70

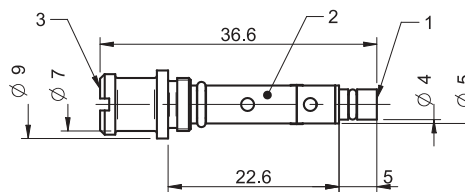
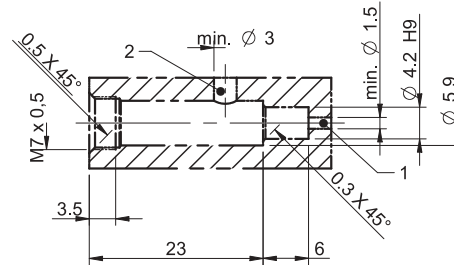
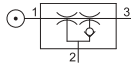


## Ordering information

	Description	Art. No.
A	COAX® cartridge MICRO SiO2-2	0113591
B	COAX® cartridge MICRO SiO2-2, holding cap	0113593



A



B

## Ti05-2



- ▶ Two-stage COAX® cartridge - MICRO - probably the world's smallest multistage vacuum ejector.
- ▶ Larger flow and evacuation capacity vs. the other MICRO cartridges.
- ▶ The low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.
- ▶ Dirt tolerant cartridge design .
- ▶ Suitable for leaking objects at 0.6MPa feed pressure and sealed objects at 0.4 MPa feed pressure.

### Technical data

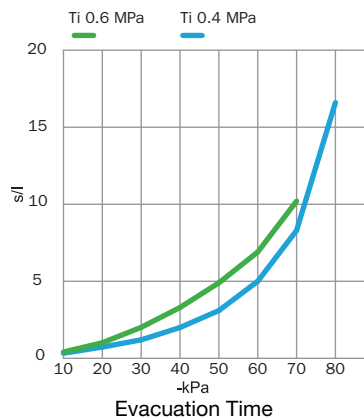
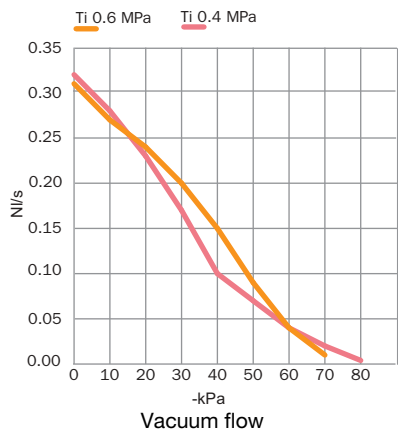
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	1.5-2.3
Material		AI, NBR, PA, SS, TPE

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.4	0.27	0.32	0.28	0.23	0.17	0.10	0.07	0.04	0.02	0.004	84	
0.6	0.37	0.31	0.27	0.24	0.20	0.15	0.09	0.04	0.01	-	75	

### Evacuation time

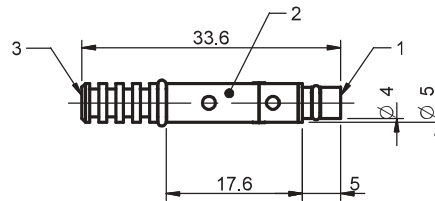
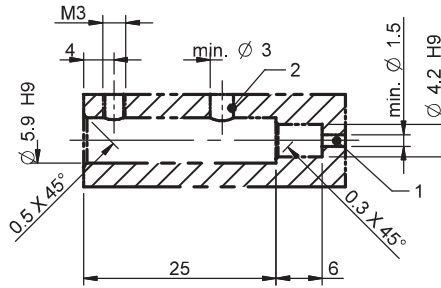
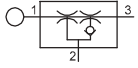
Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80		
0.4	0.27	0.33	0.73	1.20	2.00	3.10	5.00	8.30	16.6	84	
0.6	0.37	0.30	0.70	1.20	1.80	2.60	4.20	8.43	-	75	



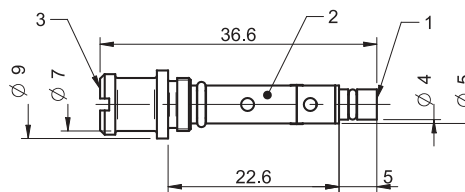
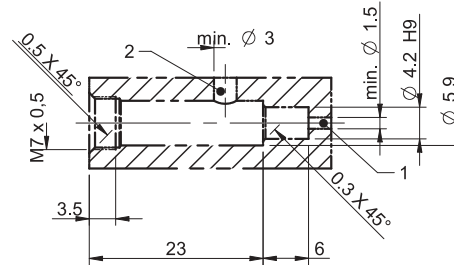
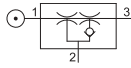


## Ordering information

	Description	Art. No.
A	COAX® cartridge MICRO Ti05-2	0123098
B	COAX® cartridge MICRO Ti05-2, holding cap	0125794



A



B

## Xi2.5-2



- ▶ Two-stage COAX® cartridge - MICRO - probably the world's smallest multistage vacuum ejector.
- ▶ High vacuum flow at deep vacuum levels, to 92 -kPa.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Quick response time when deep vacuum is needed.
- ▶ Good for handling sealed materials.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	1.5-2.3
Material		AI, NBR, PA, SS, TPE

### Vacuum flow

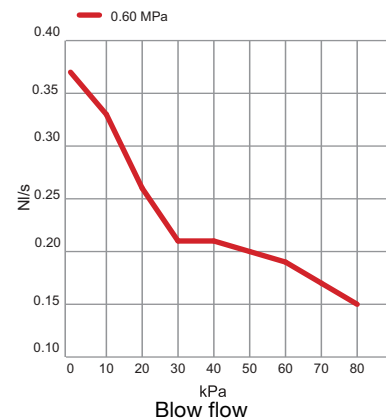
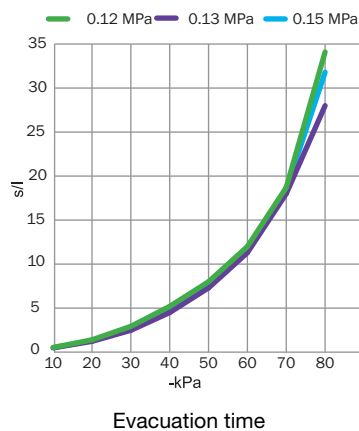
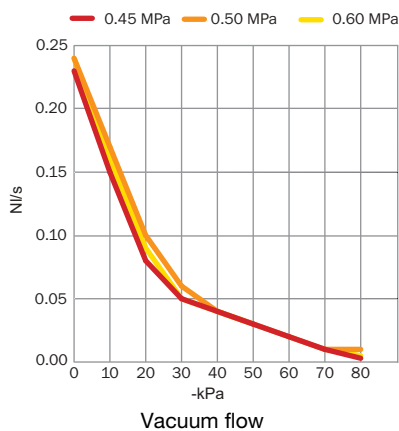
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.45	0.12	0.23	0.15	0.08	0.05	0.04	0.03	0.02	0.01	0.003	89	
0.50	0.13	0.24	0.17	0.10	0.06	0.04	0.03	0.02	0.01	0.010	92	
0.60	0.15	0.24	0.16	0.09	0.05	0.04	0.03	0.02	0.01	0.005	91	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.45	0.12	0.53	1.40	2.93	5.20	8.00	12.0	18.7	34.1	89
0.50	0.13	0.49	1.23	2.48	4.50	7.30	11.3	18.0	28.0	92
0.60	0.15	0.50	1.30	2.73	5.00	7.80	11.8	18.5	31.8	91

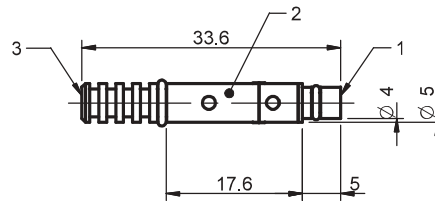
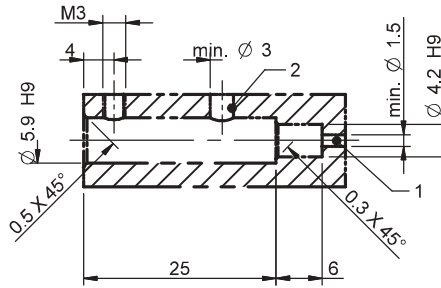
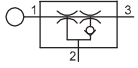
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80		
0.6	0.15	0.37	0.33	0.26	0.21	0.21	0.20	0.19	0.17	0.15	90	

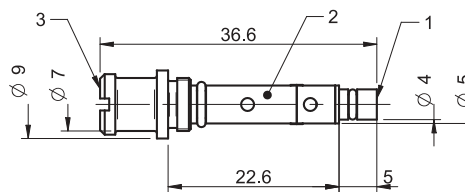
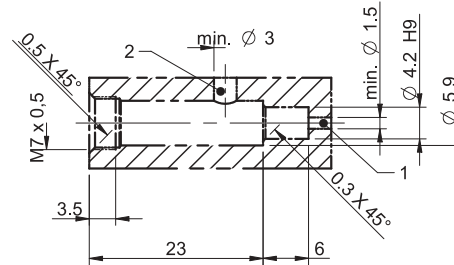
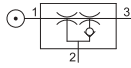


## Ordering information

	Description	Art. No.
A	COAX® cartridge MICRO Xi2.5-2	0120297
B	COAX® cartridge MICRO Xi2.5-2, holding cap	0120283



A



B

## Pi12-2



- ▶ Two-stage COAX® cartridge - MINI - with small mounting dimensions.
- ▶ Vacuum level to 90 -kPa at low feed pressures.
- ▶ High operational reliability in case of fluctuating or low compressed-air pressure.
- ▶ Suitable for handling sealed objects.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	2.6-9.7
Material		Al, NBR, PA, SS

### Vacuum flow

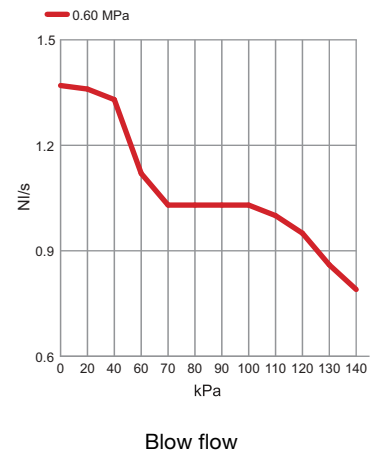
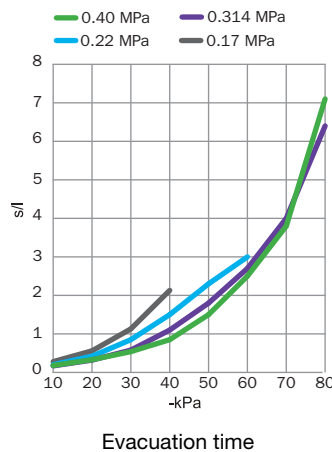
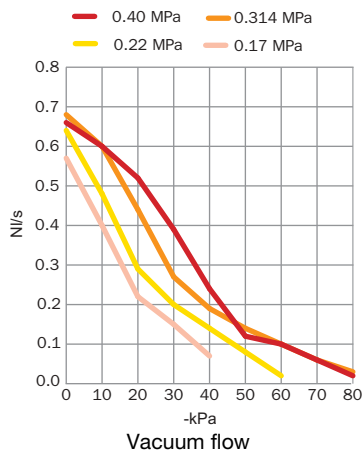
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.17	0.29	0.57	0.40	0.22	0.15	0.070	—	—	—	—	—	49
0.22	0.34	0.64	0.48	0.29	0.20	0.14	0.080	0.020	—	—	—	64
0.314	0.44	0.68	0.60	0.44	0.27	0.19	0.14	0.10	0.060	0.030	—	90
0.40	0.53	0.66	0.60	0.52	0.39	0.24	0.12	0.10	0.060	0.020	—	84

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80			
0.17	0.29	0.28	0.56	1.13	2.13	—	—	—	—	—	—	49
0.22	0.34	0.20	0.42	0.85	1.5	2.3	3.0	—	—	—	—	64
0.314	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4.0	6.4	—	—	90
0.40	0.53	0.18	0.33	0.54	0.85	1.5	2.5	3.8	7.1	—	—	84

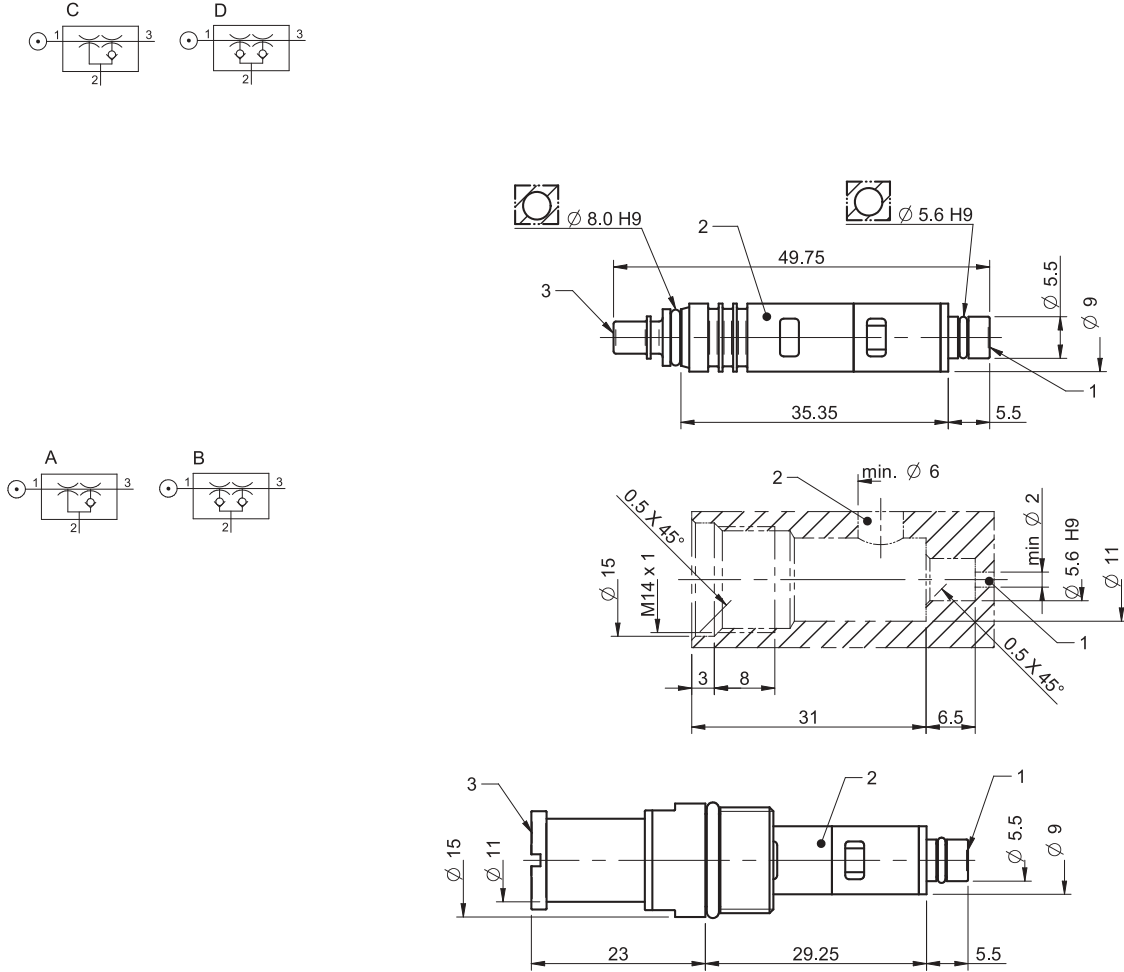
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)													Max pressure kPa
		0	20	40	60	70	80	90	100	110	120	130	140		
0.6	0.75	1.37	1.36	1.33	1.12	1.03	1.03	1.03	1.03	1.0	0.95	0.86	0.79	140	



## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Pi12-2	0106922
A	COAX® cartridge MINI Pi12-2, holding cap	0106924
D	COAX® cartridge MINI Pi12-2, extra non-return valve	0106963
B	COAX® cartridge MINI Pi12-2, holding cap, extra non-return valve	0106964



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977

## Pi12-3



- ▶ Three-stage COAX® cartridge - MINI - with high initial vacuum flow.
- ▶ Vacuum level to 90 -kPa at low feed pressure.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for handling sealed objects with high pick-up speed.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	4.7-12.5
Material		Al, NBR, PA, SS

### Vacuum flow

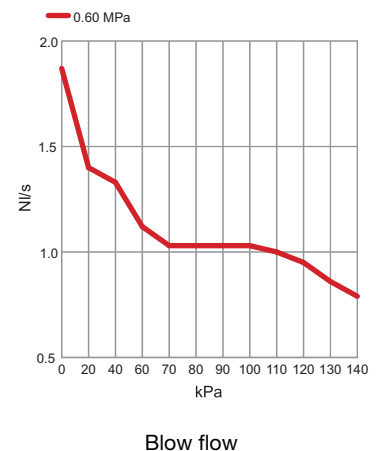
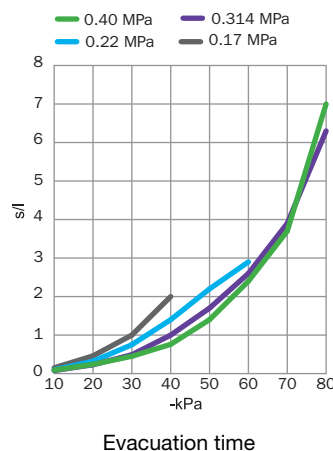
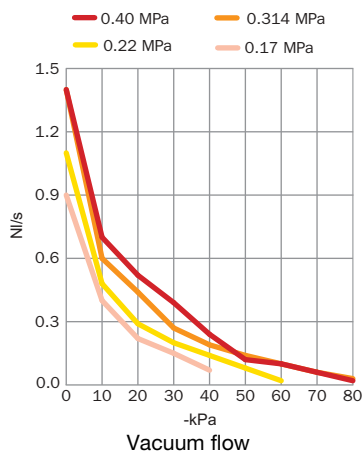
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.17	0.29	0.90	0.40	0.22	0.15	0.07	—	—	—	—	—	49
0.22	0.34	1.10	0.48	0.29	0.20	0.14	0.08	0.02	—	—	—	64
0.314	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.06	0.03	—	90
0.40	0.53	1.40	0.70	0.52	0.39	0.24	0.12	0.10	0.06	0.02	—	84

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.17	0.29	0.15	0.46	1.00	2.00	—	—	—	—	49
0.22	0.34	0.10	0.32	0.75	1.40	2.20	2.90	—	—	64
0.314	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	90
0.40	0.53	0.09	0.24	0.45	0.76	1.40	2.40	3.70	7.00	84

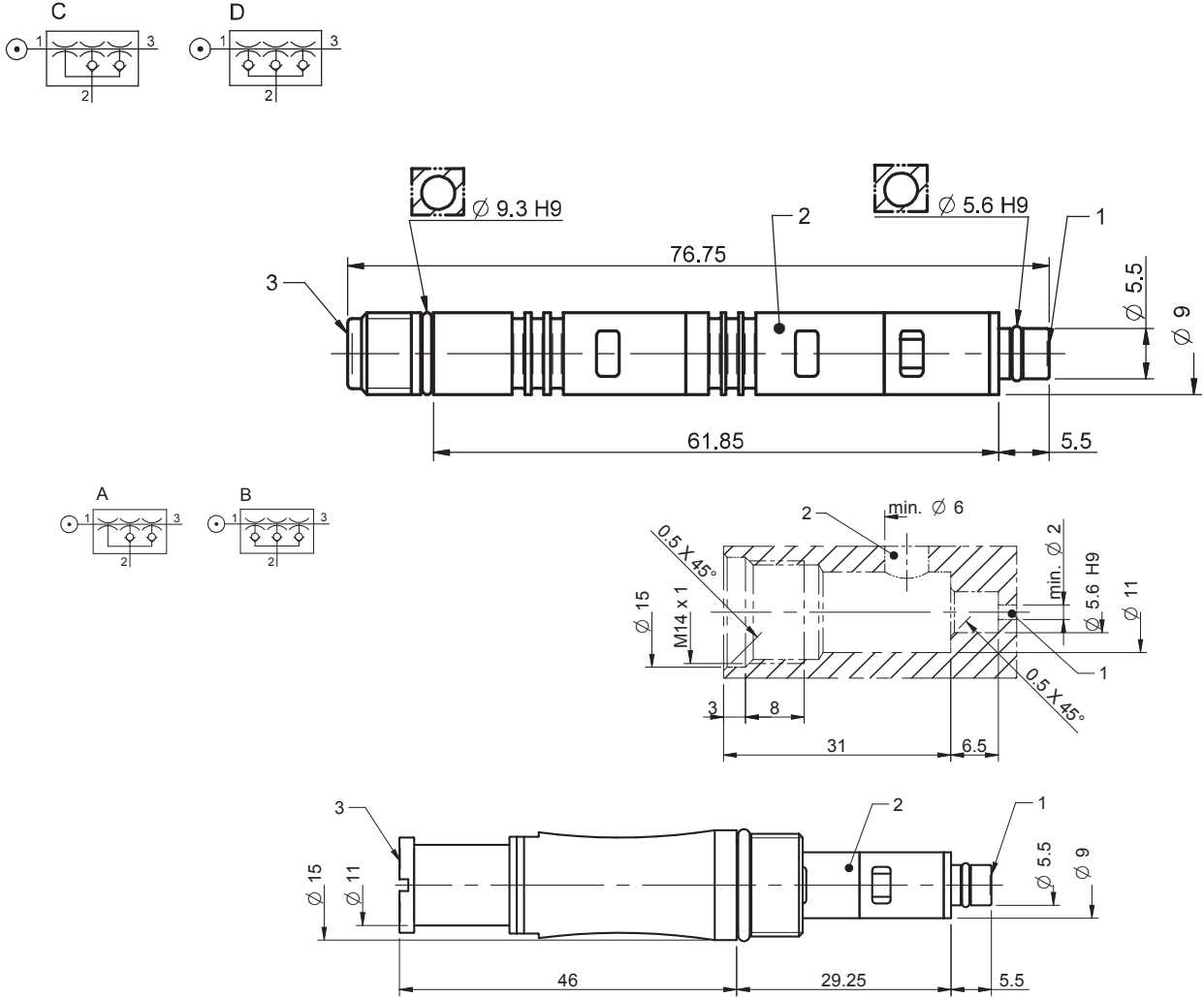
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
		0	20	40	60	70	80	90	100	110	120	130	140	
0.6	0.75	1.87	1.4	1.33	1.12	1.03	1.03	1.03	1.03	1.0	0.95	0.86	0.79	140



## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Pi12-3	0106895
A	COAX® cartridge MINI Pi12-3, holding cap	0106923
D	COAX® cartridge MINI Pi12-3, extra non-return valve	0106956
B	COAX® cartridge MINI Pi12-3, holding cap, extra non-return valve	0106957



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977
Exhaust adapter	0106344

## Pi12-3 FS



- ▶ Three-stage COAX® cartridge - MINI - with high initial vacuum flow.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ Vacuum level to 90 -kPa at low feed pressure.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for handling sealed objects with high pick-up speed.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	11.4
Material		NBR, PA, PP, SS

### Vacuum flow

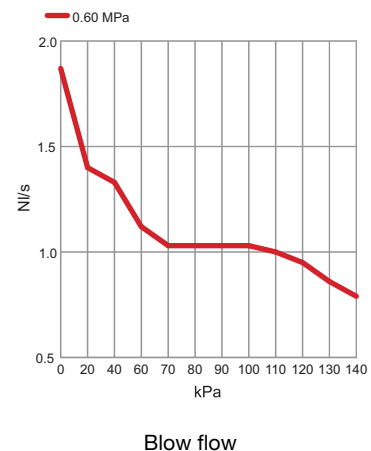
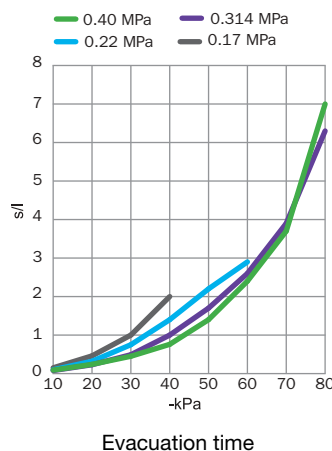
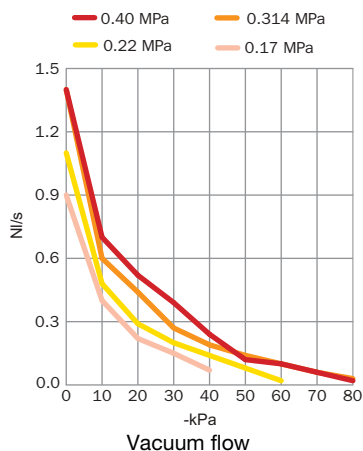
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.17	0.29	0.90	0.40	0.22	0.15	0.07	—	—	—	—	—	49
0.22	0.34	1.10	0.48	0.29	0.20	0.14	0.08	0.02	—	—	—	64
0.314	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.06	0.03	—	90
0.40	0.53	1.40	0.70	0.52	0.39	0.24	0.12	0.10	0.06	0.02	—	84

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.17	0.29	0.15	0.46	1.00	2.00	—	—	—	—	49
0.22	0.34	0.10	0.32	0.75	1.40	2.20	2.90	—	—	64
0.314	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	90
0.40	0.53	0.09	0.24	0.45	0.76	1.40	2.40	3.70	7.00	84

### Blow flow

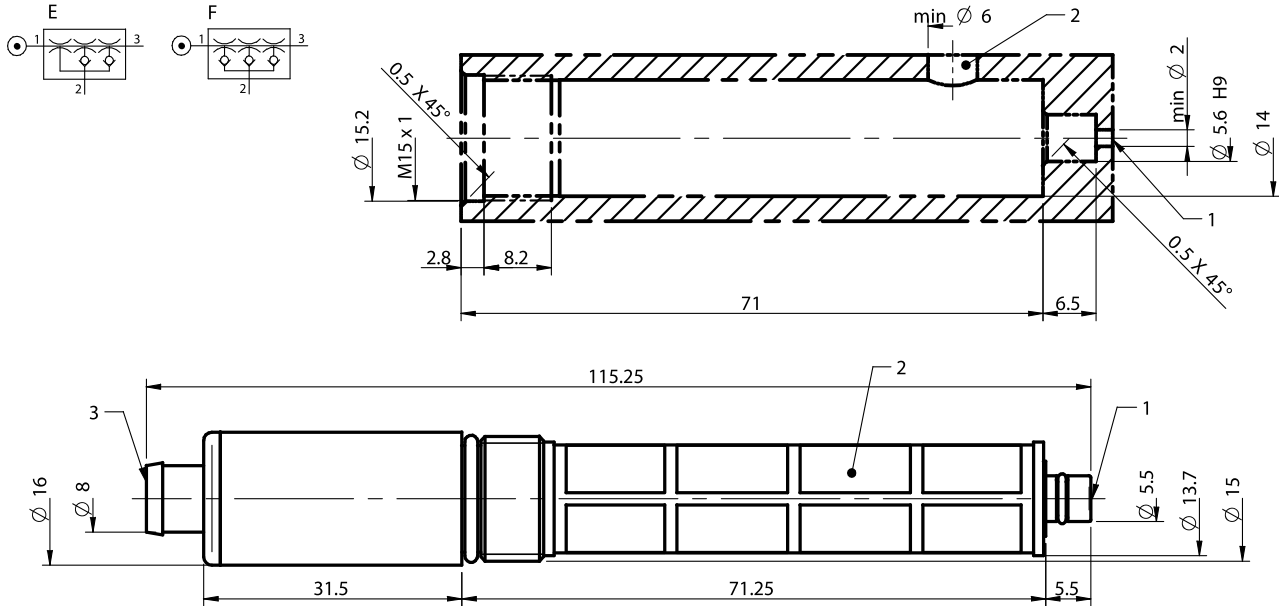
Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)											Max pressure kPa	
		0	20	40	60	70	80	90	100	110	120	130		140
0.6	0.75	1.87	1.4	1.33	1.12	1.03	1.03	1.03	1.03	1.0	0.95	0.86	0.79	140





## Ordering information

	Description	Art. No.
E	COAX® cartridge MINI Pi12-3, holding cap silencer, vacuum filter	0104265
F	COAX® cartridge MINI Pi12-3, extra non-return valve, holding cap silencer, vacuum filter	0106676



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977
Exhaust adapter	0106344

## Si08-2



- ▶ Two-stage COAX® cartridge - MINI - with small mounting dimensions.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Good for handling porous materials or if surface leakage is present.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10–80
Weight	g	2.8–9.9
Material		Al, NBR, PA, SS

### Vacuum flow

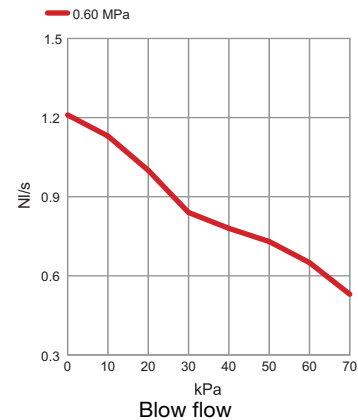
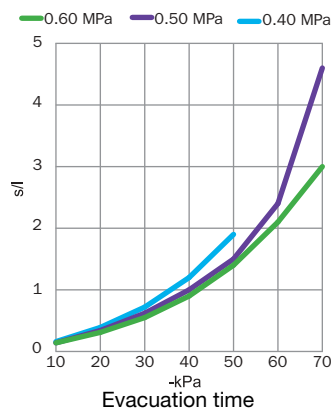
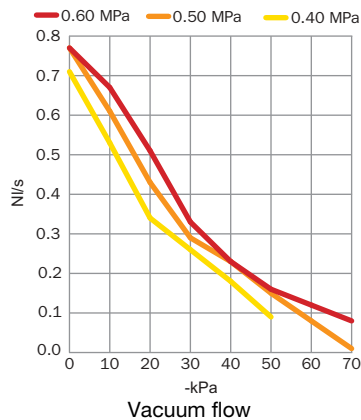
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.40	0.31	0.71	0.53	0.34	0.26	0.18	0.09	0.01	—	60
0.50	0.38	0.77	0.61	0.43	0.29	0.23	0.15	0.08	0.01	70
0.60	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70		
0.40	0.31	0.16	0.39	0.72	1.2	1.9	3.9	—	60	
0.50	0.38	0.14	0.34	0.62	1.0	1.5	2.4	4.6	70	
0.60	0.44	0.14	0.31	0.55	0.9	1.4	2.1	3.1	75	

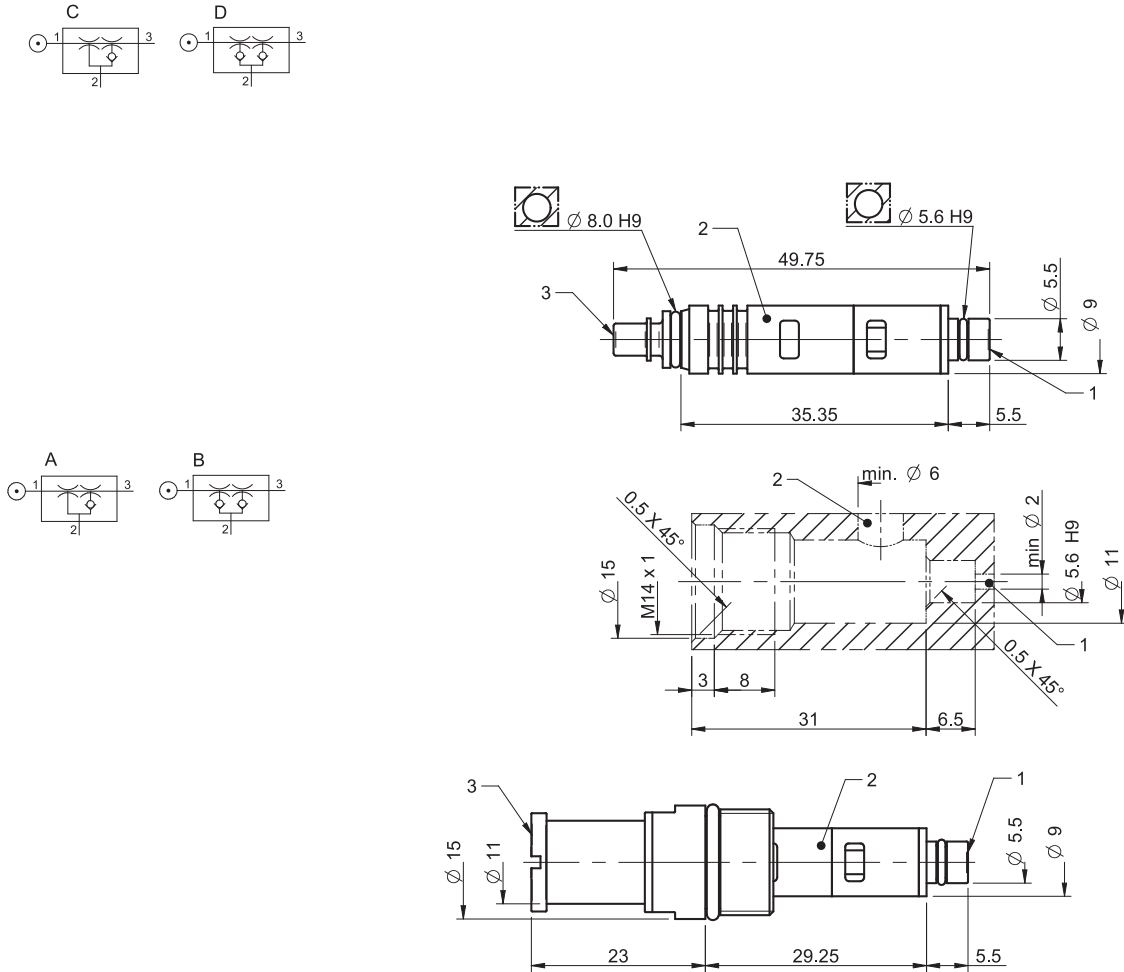
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)								Max pressure kPa
		0	10	20	30	40	50	60	70	
0.60	0.44	1.21	1.13	1.0	0.84	0.78	0.73	0.65	0.53	70



## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Si08-2	0113583
A	COAX® cartridge MINI Si08-2, holding cap	0113585
D	COAX® cartridge MINI Si08-2, extra non-return valve	0113587
B	COAX® cartridge MINI Si08-2, holding cap, extra non-return valve	0113589



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977

## Si08-3



- ▶ Three-stage COAX® cartridge - MINI - with extra high initial vacuum flow.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Good for handling porous materials or if surface leakage is present. Recommended for high speed applications.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	4.9-12.7
Material		Al, NBR, PA, SS

### Vacuum flow

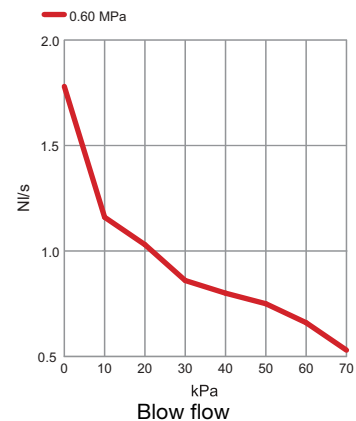
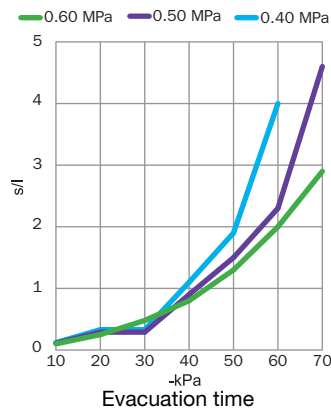
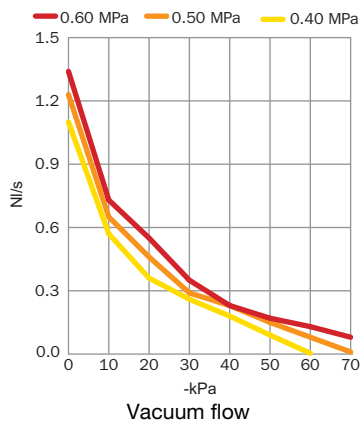
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.40	0.31	1.10	0.57	0.36	0.26	0.18	0.09	—	—	60
0.50	0.38	1.23	0.65	0.46	0.29	0.23	0.15	0.08	0.01	70
0.60	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum -kPa
		10	20	30	40	50	60	70	
0.40	0.31	0.12	0.33	0.66	1.10	1.90	—	—	60
0.50	0.38	0.11	0.29	0.55	0.90	1.50	2.30	4.60	70
0.60	0.44	0.10	0.25	0.48	0.80	1.30	2.00	2.90	75

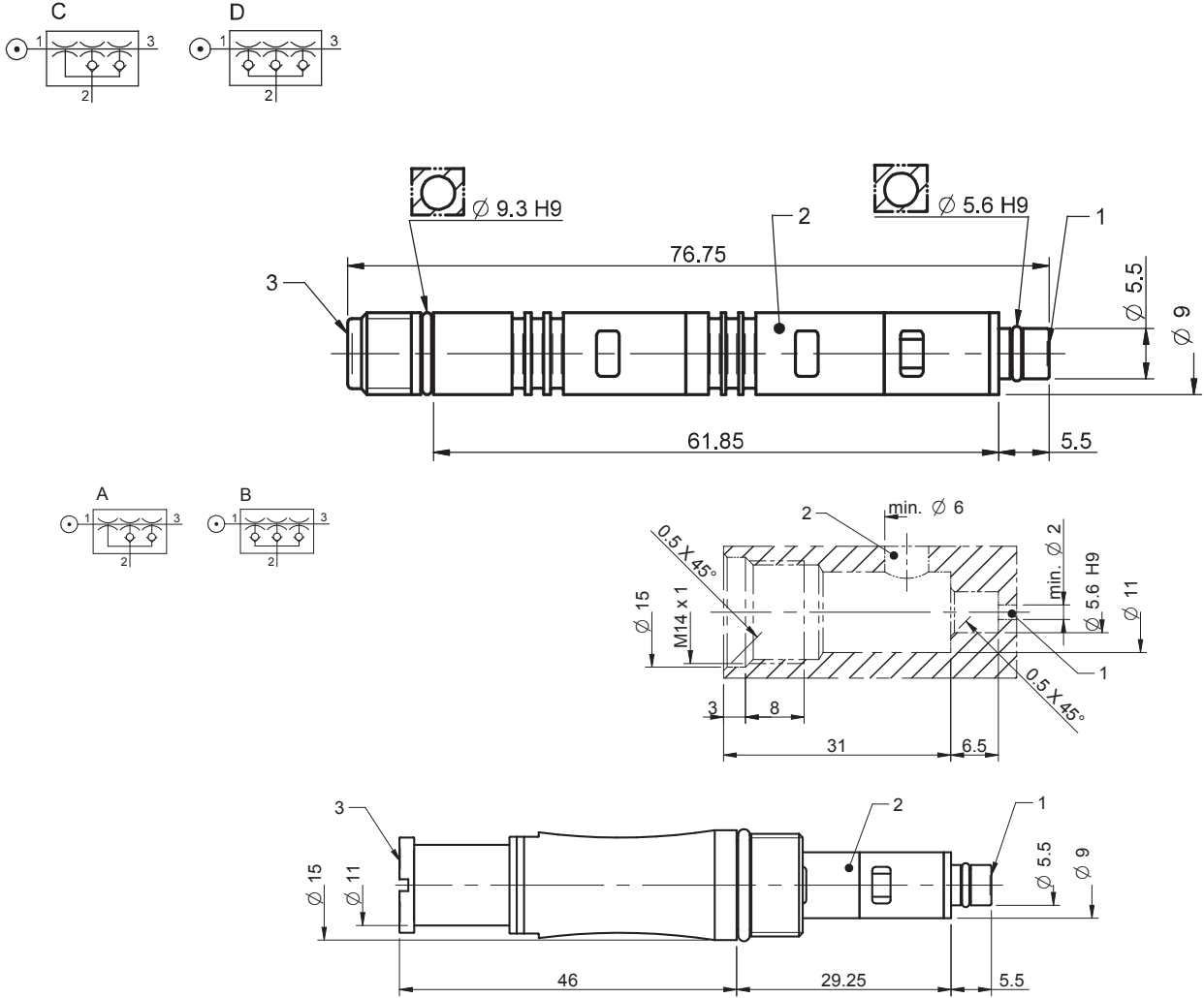
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)								Max pressure kPa
		0	10	20	30	40	50	60	70	
0.60	0.44	1.78	1.16	1.03	0.86	0.80	0.75	0.66	0.53	70



## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Si08-3	0113214
A	COAX® cartridge MINI Si08-3, holding cap	0113572
D	COAX® cartridge MINI Si08-3, extra non-return valve	0113575
B	COAX® cartridge MINI Si08-3, holding cap, extra non-return valve	0113577



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977
Exhaust adapter	0106344

## Si08-3 FS



- ▶ Three-stage COAX® cartridge - MINI - with extra high initial vacuum flow.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Good for handling porous materials or if leakage is present. Recommended for high speed applications.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	11.4
Material		NBR, PA, PP, SS

### Vacuum flow

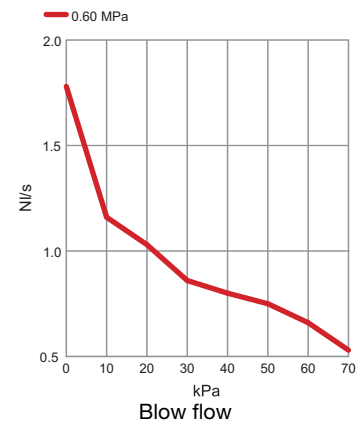
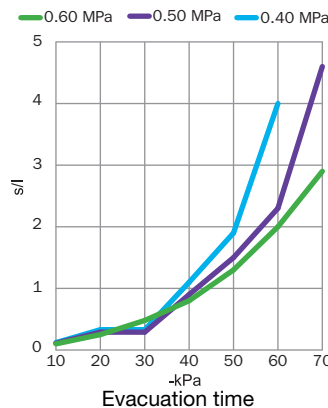
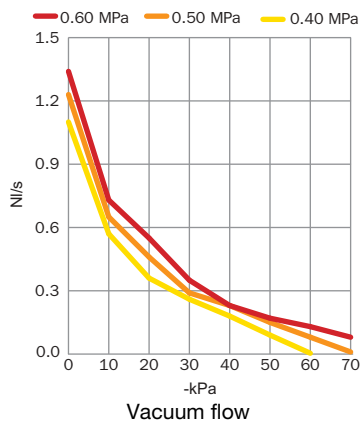
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.40	0.31	1.10	0.57	0.36	0.26	0.18	0.09	—	—	60
0.50	0.38	1.23	0.65	0.46	0.29	0.23	0.15	0.08	0.01	70
0.60	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum -kPa
		10	20	30	40	50	60	70	
0.40	0.31	0.12	0.33	0.66	1.10	1.90	—	—	60
0.50	0.38	0.11	0.29	0.55	0.90	1.50	2.30	4.60	70
0.60	0.44	0.10	0.25	0.48	0.80	1.30	2.00	2.90	75

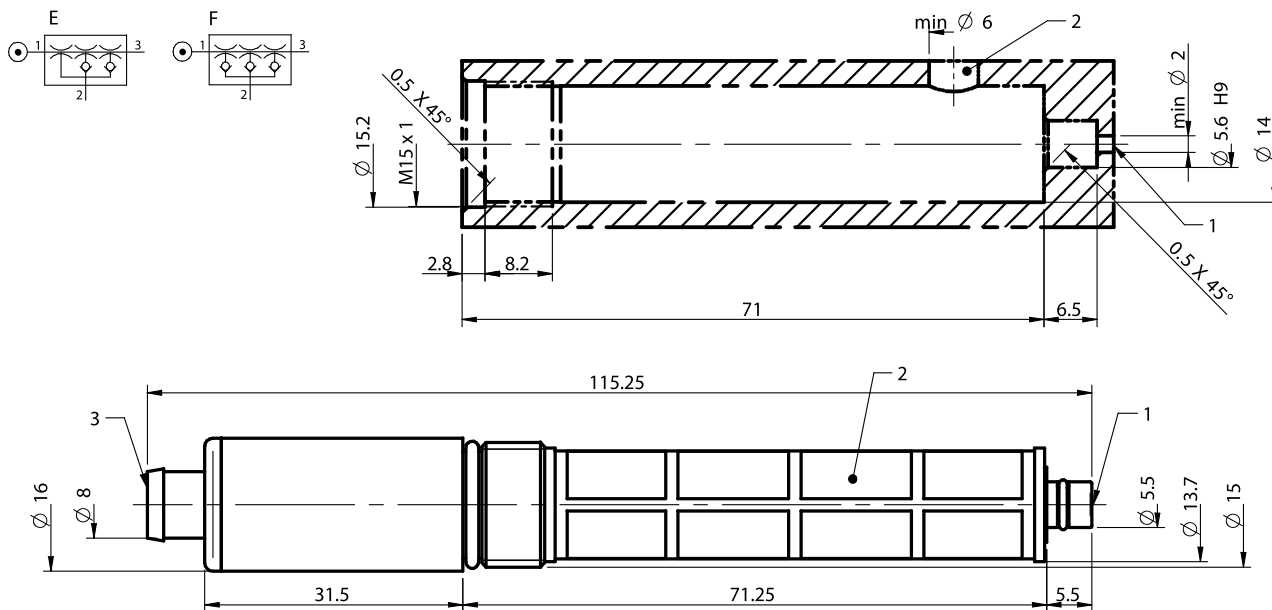
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)								Max pressure kPa
		0	10	20	30	40	50	60	70	
0.60	0.44	1.78	1.16	1.03	0.86	0.80	0.75	0.66	0.53	70



## Ordering information

	Description	Art. No.
E	COAX® cartridge MINI Si08-3, holding cap silencer, vacuum filter	0113579
F	COAX® cartridge MINI Si08-3, extra non-return valve, holding cap silencer, vacuum filter	0113581



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977
Exhaust adapter	0106344

## Xi10-2



- ▶ Two-stage COAX® cartridge - MINI - with small mounting dimensions.
- ▶ High vacuum flow at deep vacuum levels to 94 -kPa.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Quick response time when deep vacuum is needed.
- ▶ Good for handling sealed materials.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	2.6-9.7
Material		Al, NBR, PA, SS

### Vacuum flow

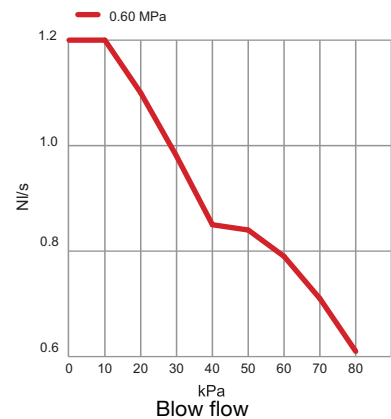
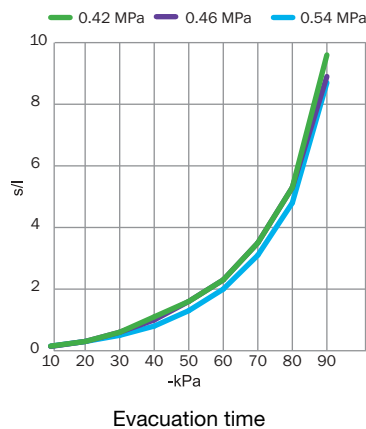
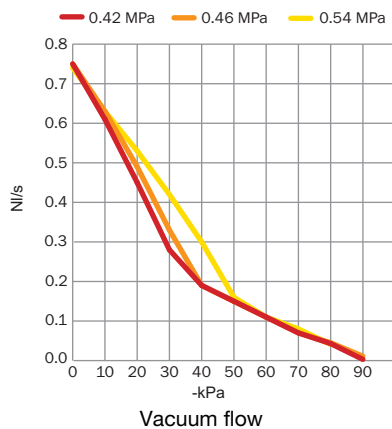
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.45	0.42	0.75	0.61	0.45	0.28	0.19	0.15	0.11	0.07	0.043	0.003	92
0.5	0.46	0.75	0.63	0.49	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
0.6	0.54	0.74	0.63	0.53	0.42	0.30	0.16	0.11	0.08	0.041	0.010	93

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.45	0.42	0.15	0.3	0.6	1.1	1.6	2.3	3.5	5.3	9.6	92	
0.5	0.46	0.14	0.3	0.6	1.0	1.6	2.3	3.5	5.3	8.9	94	
0.6	0.54	0.15	0.3	0.5	0.8	1.3	2.0	3.1	4.8	8.7	93	

### Blow flow

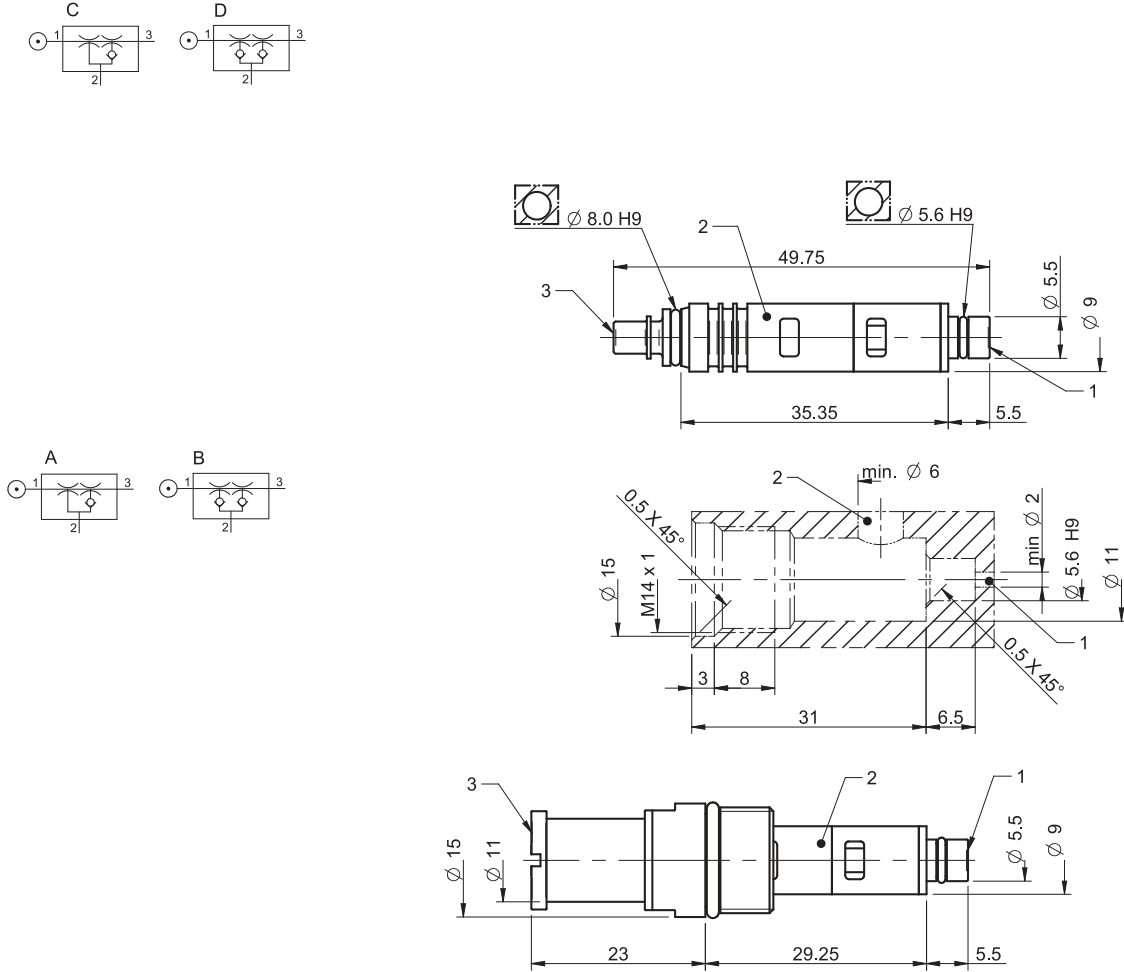
Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80		
0.6	0.54	1.2	1.2	1.1	0.98	0.85	0.84	0.79	0.71	0.61	90	





## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Xi10-2	0120284
A	COAX® cartridge MINI Xi10-2, holding cap	0120294
D	COAX® cartridge MINI Xi10-2, extra non-return valve	0120280
B	COAX® cartridge MINI Xi10-2, holding cap, extra non-return valve	0120300



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977

## Xi10-3



- ▶ Three-stage COAX® cartridge – MINI.
- ▶ High vacuum flow at deep vacuum levels to 94 -kPa.
- ▶ Quick response time when deep vacuum is needed.
- ▶ Suitable for handling sealed objects with high pick-up speed.
- ▶ Large vacuum flow in relation to energy consumption

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	4.7-12.5
Material		Al, NBR, PA, SS

### Vacuum flow

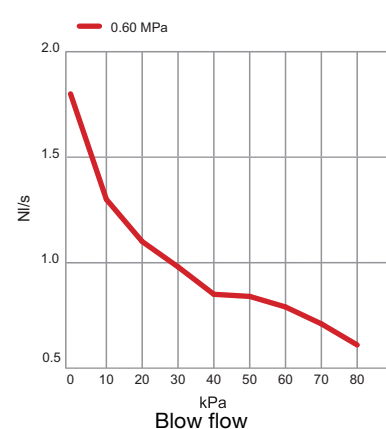
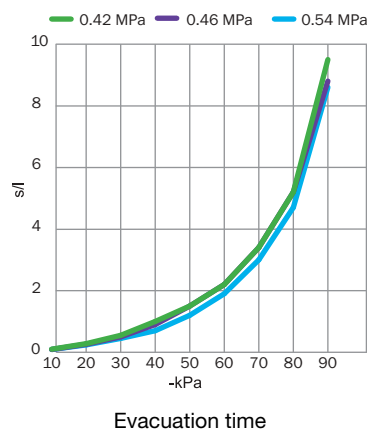
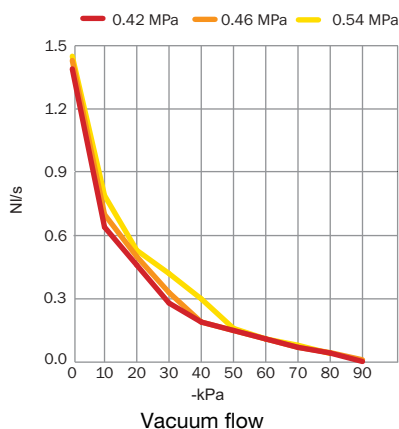
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.45	0.42	1.39	0.64	0.46	0.28	0.19	0.15	0.11	0.07	0.043	0.003	92	
0.5	0.46	1.43	0.70	0.50	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94	
0.6	0.54	1.45	0.79	0.53	0.42	0.30	0.16	0.11	0.08	0.041	0.010	93	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.45	0.42	0.1	0.28	0.55	1.0	1.5	2.2	3.4	5.2	9.5	92	
0.5	0.46	0.09	0.26	0.50	0.90	1.5	2.2	3.4	5.2	8.8	94	
0.6	0.54	0.09	0.24	0.45	0.70	1.2	1.9	3.0	4.7	8.6	93	

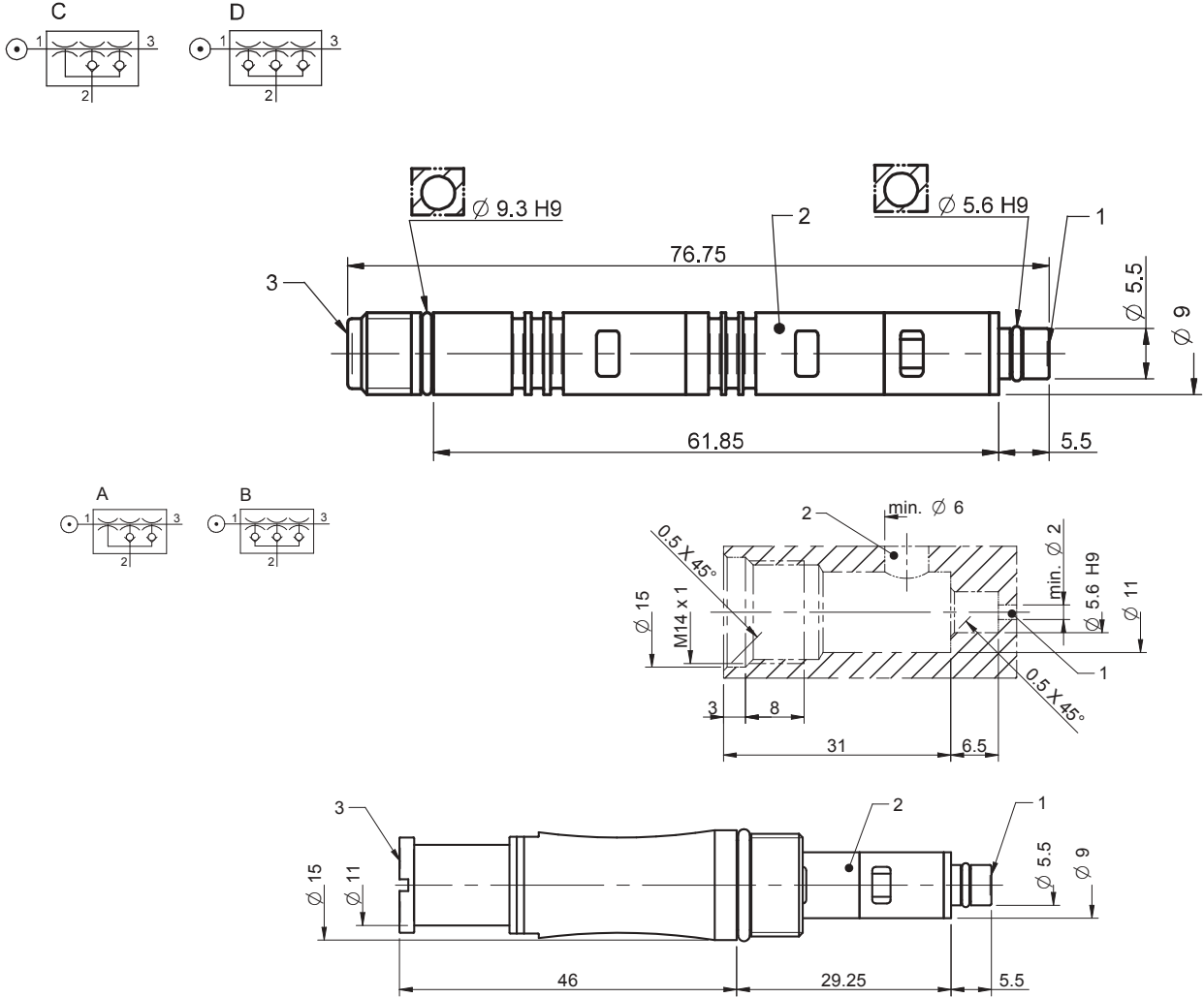
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80		
0.6	0.54	1.8	1.3	1.1	0.98	0.85	0.84	0.79	0.71	0.61	90	



## Ordering information

	Description	Art. No.
C	COAX® cartridge MINI Xi10-3	0120286
A	COAX® cartridge MINI Xi10-3, holding cap	0120299
D	COAX® cartridge MINI Xi10-3, extra non-return valve	0120289
B	COAX® cartridge MINI Xi10-3, holding cap, extra non-return valve	0120298



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MINI	0111977

## Xi10-3 FS



- ▶ Three-stage COAX® cartridge - MINI.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High vacuum flow at deep vacuum levels to 94 - kPa.
- ▶ Quick response time when deep vacuum is needed.
- ▶ Suitable for handling sealed objects with high pick-up speed.
- ▶ Large vacuum flow in relation to energy consumption.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	12.5
Material		NBR, PA, PP, SS

### Vacuum flow

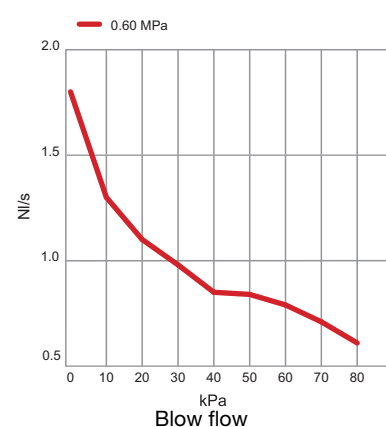
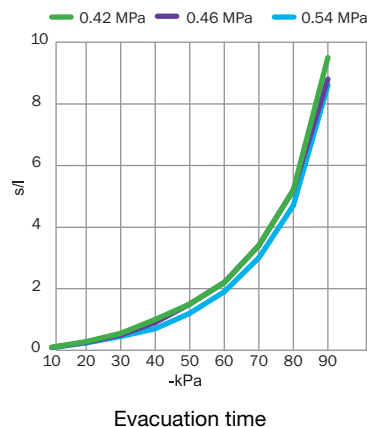
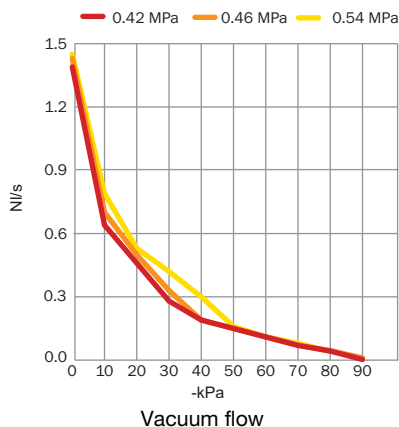
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.45	0.42	1.39	0.64	0.46	0.28	0.19	0.15	0.11	0.07	0.043	0.003	92
0.5	0.46	1.43	0.70	0.50	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
0.6	0.54	1.45	0.79	0.53	0.42	0.30	0.16	0.11	0.08	0.041	0.010	93

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.45	0.42	0.1	0.28	0.55	1.0	1.5	2.2	3.4	5.2	9.5	92	
0.5	0.46	0.09	0.26	0.50	0.90	1.5	2.2	3.4	5.2	8.8	94	
0.6	0.54	0.09	0.24	0.45	0.70	1.2	1.9	3.0	4.7	8.6	93	

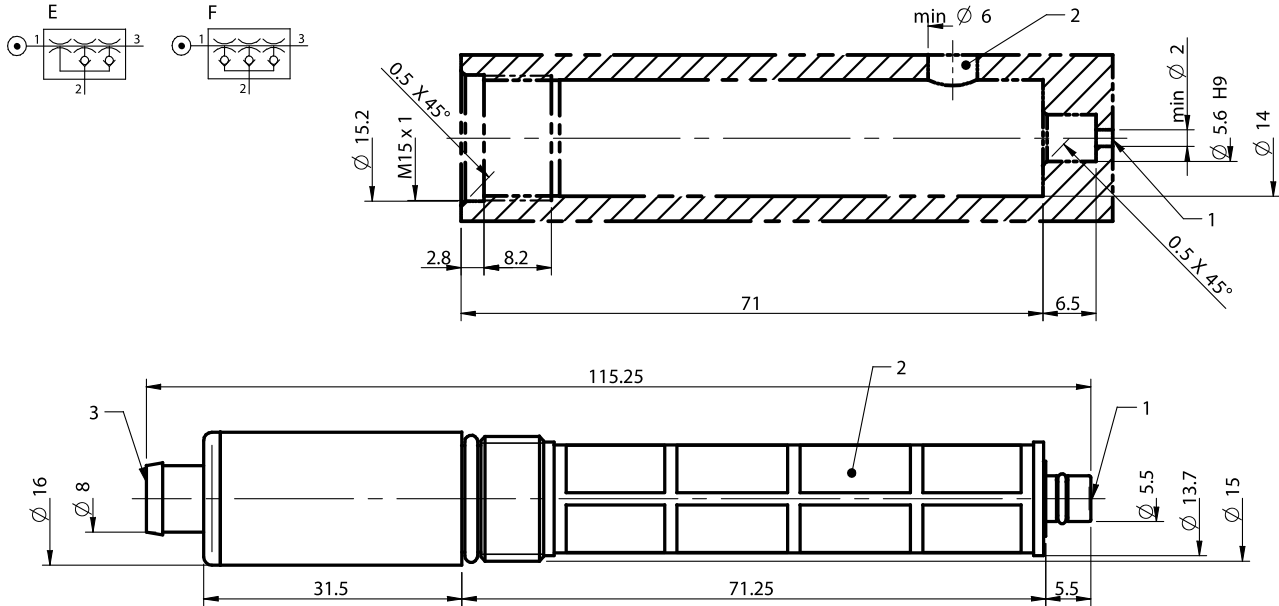
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80		
0.6	0.54	1.8	1.3	1.1	0.98	0.85	0.84	0.79	0.71	0.61	90	



## Ordering information

	Description	Art. No.
E	COAX® cartridge MINI Xi10-3, holding cap silencer, vacuum filter	0120775
F	COAX® cartridge MINI Xi10-3, extra non-return valve, holding cap silencer, vacuum filter	0120776



## Ordering information, accessories

	Description	Art. No.
	Silencer COAX® MINI	0111977
	Exhaust adapter	0106344

## Pi48-2



- ▶ Two-stage COAX® cartridge - MIDI - with small mounting dimension for limited spaces.
- ▶ Vacuum level to 90 -kPa at low feed pressure.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Efficient generator of blow-air, recommended for overpressures between 0.05 and 0.14 MPa.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	27-57
Material		Al, NBR, PA, SS

### Vacuum flow

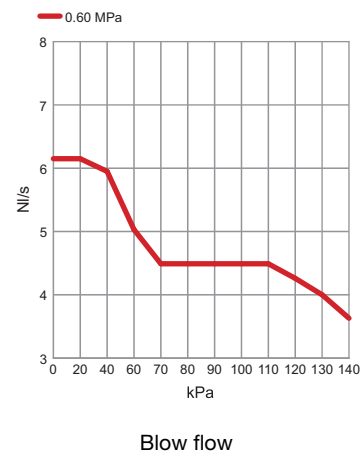
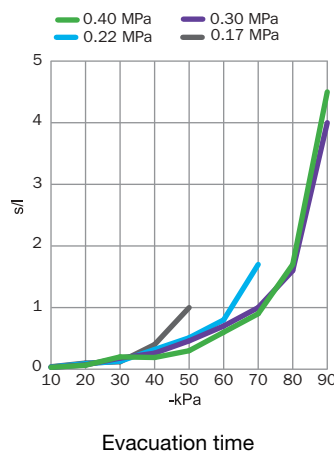
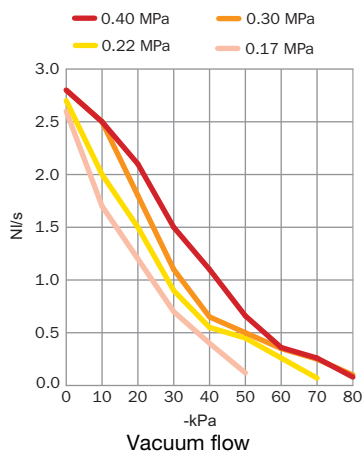
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.17	1.37	2.6	1.7	1.2	0.70	0.40	0.12	—	—	—	55	
0.22	1.62	2.7	2.0	1.5	0.90	0.55	0.45	0.26	0.07	—	73	
0.30	2.0	2.8	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.1	90	
0.40	2.54	2.8	2.5	2.1	1.5	1.1	0.66	0.36	0.26	0.08	86	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.17	1.37	0.040	0.10	0.20	0.40	1.0	—	—	—	55	
0.22	1.62	0.035	0.090	0.18	0.32	0.51	0.80	1.7	—	73	
0.30	2.0	0.030	0.070	0.13	0.26	0.46	0.70	1.0	1.6	4.0	
0.40	2.54	0.030	0.065	0.12	0.19	0.30	0.60	0.90	1.7	4.5	

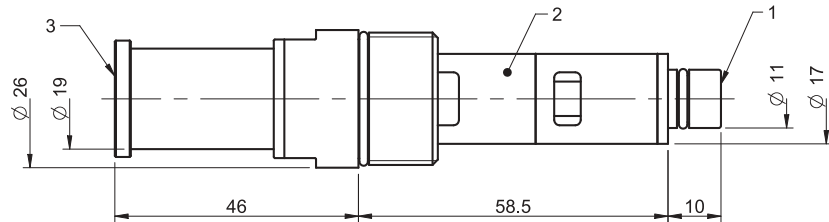
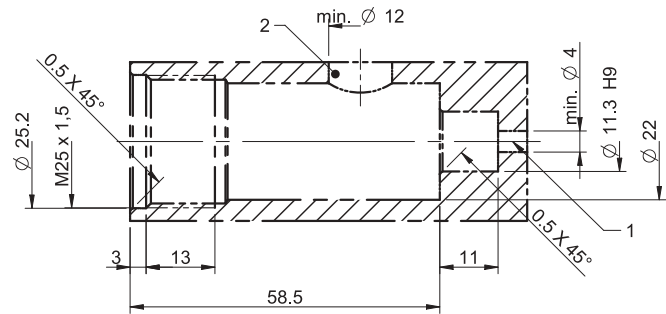
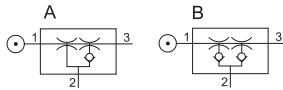
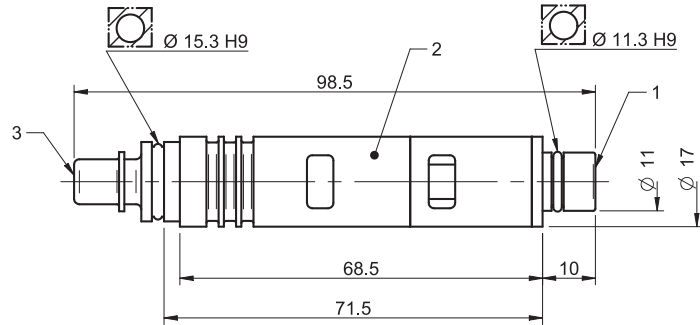
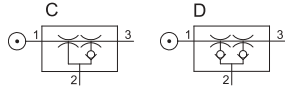
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
		0	20	40	60	70	80	90	100	110	120	130	140	
0.6	3.5	6.15	6.15	5.95	5.03	4.49	4.49	4.49	4.49	4.49	4.26	4.0	3.63	140



## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Pi48-2	0107125
A	COAX® cartridge MIDI Pi48-2, holding cap	0107127
D	COAX® cartridge MIDI Pi48-2, extra non-return valve	0107710
B	COAX® cartridge MIDI Pi48-2, holding cap, extra non-return valve	0107712



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976

## Pi48-3



- ▶ Three-stage COAX® cartridge - MIDI - with high initial vacuum flow.
- ▶ Vacuum level to 90 -kPa at low feed pressure.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast evacuation of large volumes in sealed systems.
- ▶ Efficient generator of blow-air. Recommended for overpressures between 0.05 and 0.14 MPa.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	33-70
Material		Al, NBR, PA, SS

### Vacuum flow

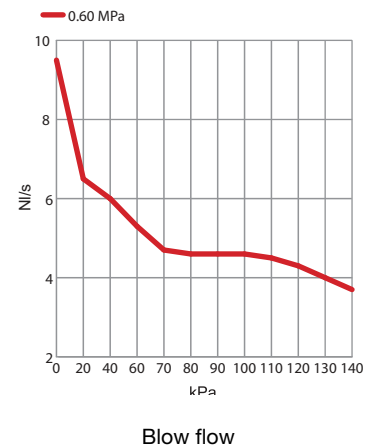
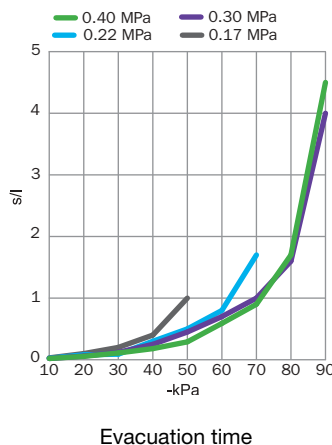
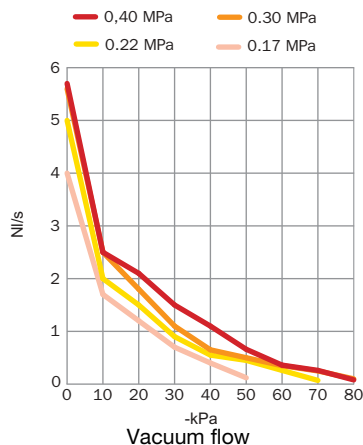
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.17	1.37	4.0	1.7	1.2	0.70	0.40	0.12	—	—	—	—	55
0.22	1.62	5.0	2.0	1.5	0.90	0.55	0.45	0.26	0.07	—	—	73
0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	—	90
0.40	2.54	5.7	2.5	2.1	1.5	1.1	0.66	0.36	0.26	0.08	—	86

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	90	
0.17	1.37	0.030	0.10	0.20	0.40	1.0	—	—	—	—	—	55
0.22	1.62	0.025	0.080	0.17	0.30	0.50	0.80	1.7	—	—	—	73
0.30	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0	—	90
0.40	2.54	0.020	0.055	0.11	0.18	0.29	0.59	0.90	1.7	4.5	—	86

### Blow flow

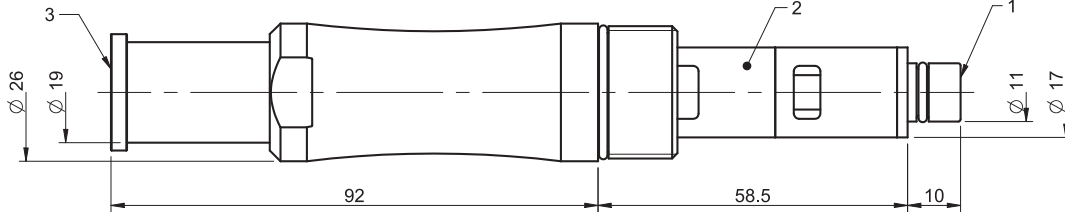
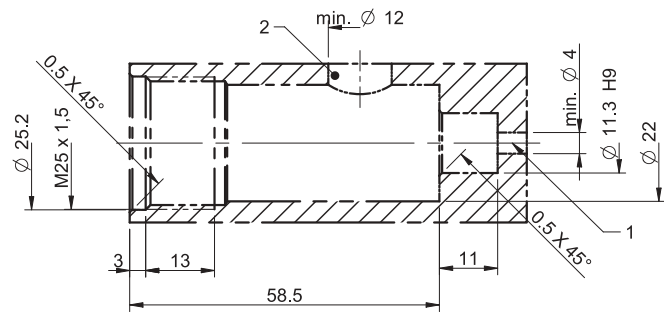
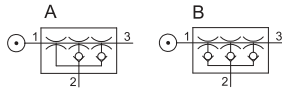
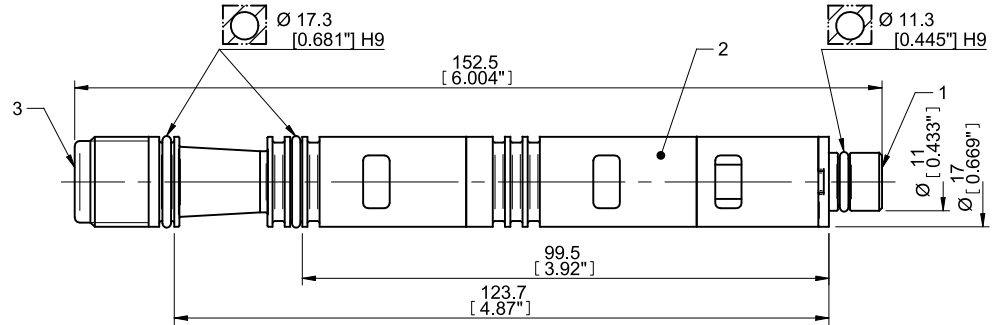
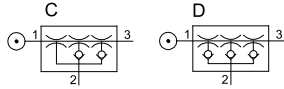
Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
		0	20	40	60	70	80	90	100	110	120	130	140	
0.60	3.5	9.5	6.5	6.0	5.3	4.7	4.6	4.6	4.6	4.5	4.3	4.0	3.7	140





## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Pi48-3	0106639
A	COAX® cartridge MIDI Pi48-3, holding cap	0107129
D	COAX® cartridge MIDI Pi48-3, extra non-return valve	0107714
B	COAX® cartridge MIDI Pi48-3, holding cap, extra non-return valve	0107716



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976

## Si32-2



- ▶ Two-stage COAX® cartridge - MIDI - with small mounting dimension for limited spaces.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Suitable for high-volume evacuation when handling porous materials or if surface leakage is present.
- ▶ Efficient generator of blow-air. Recommended for low overpressures (0 - 0.05 MPa).

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	27-57
Material		Al, NBR, PA, SS

### Vacuum flow

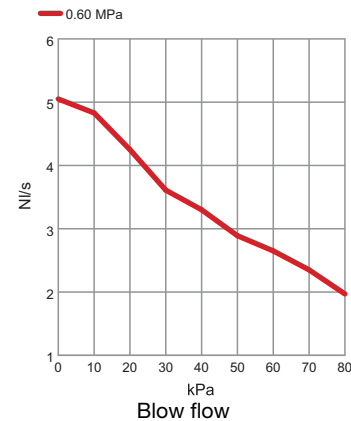
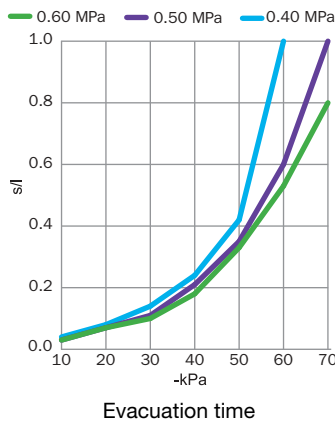
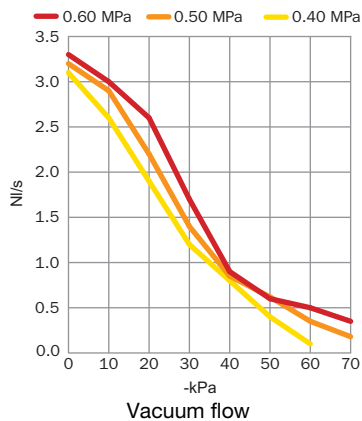
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)									Max vacuum -kPa
		0	10	20	30	40	50	60	70		
0.40	1.25	3.1	2.6	1.9	1.2	0.80	0.40	0.1	—	60	
0.50	1.50	3.2	2.9	2.2	1.4	0.85	0.62	0.35	0.18	70	
0.60	1.75	3.3	3.0	2.6	1.7	0.90	0.60	0.50	0.35	75	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70		
0.40	1.25	0.040	0.080	0.14	0.24	0.42	1.0	—	60	
0.50	1.50	0.030	0.070	0.11	0.21	0.35	0.60	1.0	70	
0.60	1.75	0.030	0.070	0.10	0.18	0.33	0.53	0.80	75	

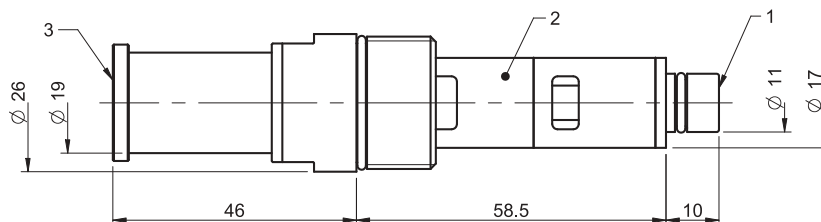
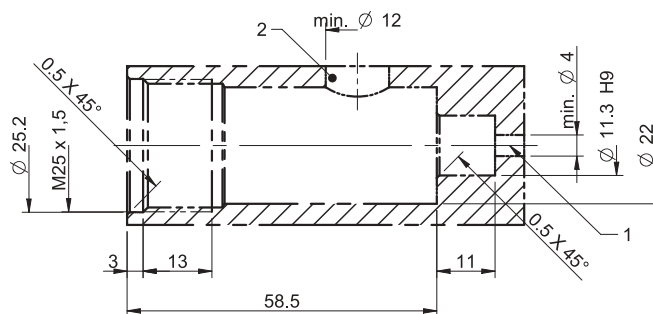
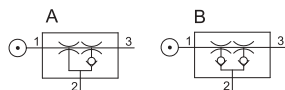
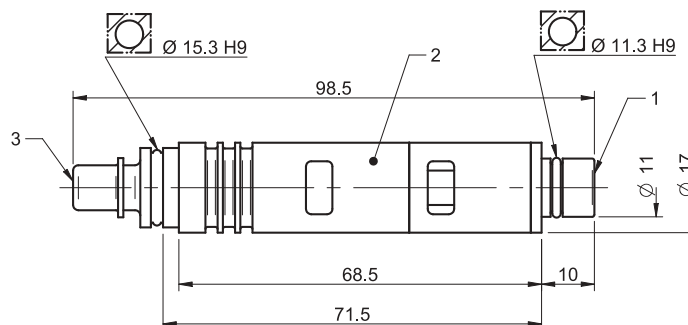
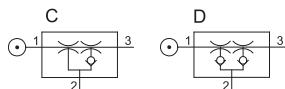
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80		
0.6	1.75	5.05	4.83	4.25	3.61	3.30	2.89	2.65	2.35	1.97	80	



## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Si32-2	0107124
A	COAX® cartridge MIDI Si32-2, holding cap	0107126
D	COAX® cartridge MIDI Si32-2, extra non-return valve	0107709
B	COAX® cartridge MIDI Si32-2, holding cap, extra non-return valve	0107711



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976

## Si32-3



- ▶ Three-stage COAX® cartridge - MIDI - with extra high initial vacuum flow.
- ▶ Large vacuum flow in relation to energy consumption.
- ▶ Suitable for fast evacuation of large volumes when handling porous materials or if surface leakage is present.
- ▶ Efficient generator of blow-air.  
Recommended for low overpressures (0 - 0.05 MPa).

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10-80
Weight	g	33-70
Material		Al, NBR, PA, SS

### Vacuum flow

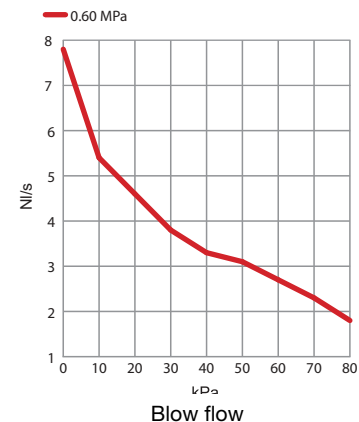
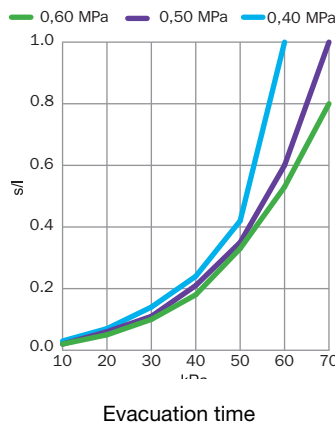
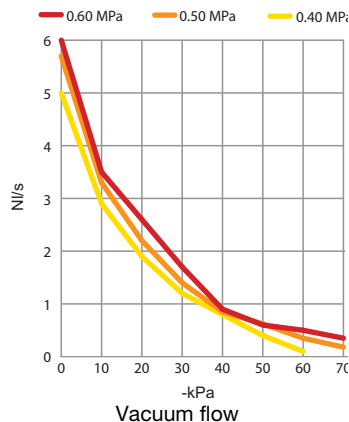
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.40	1.25	5.0	2.9	1.9	1.2	0.80	0.40	0.10	—	60
0.50	1.5	5.7	3.3	2.2	1.4	0.85	0.62	0.35	0.18	70
0.60	1.75	6.0	3.5	2.6	1.7	0.90	0.60	0.50	0.35	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70		
0.40	1.25	0.030	0.070	0.14	0.24	0.42	1.0	—	60	
0.50	1.5	0.020	0.060	0.11	0.21	0.35	0.60	1.0	70	
0.60	1.75	0.020	0.050	0.10	0.18	0.33	0.53	0.80	75	

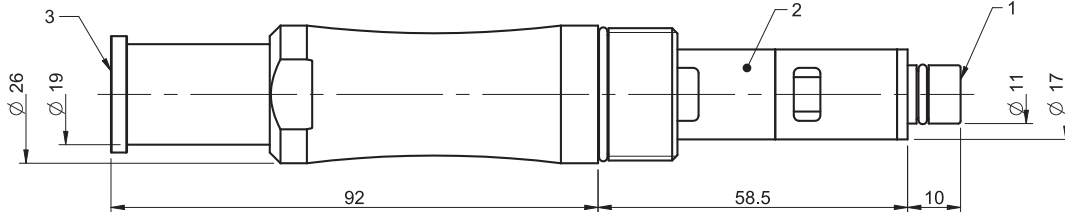
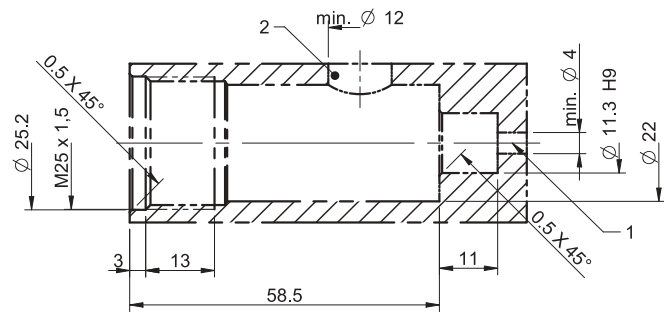
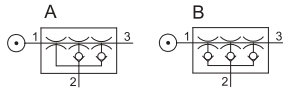
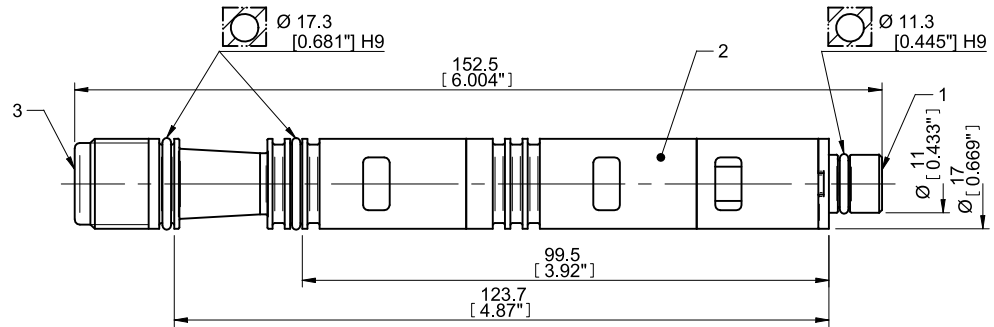
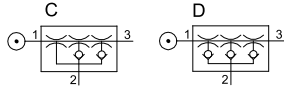
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)									Max pressure kPa
		0	10	20	30	40	50	60	70	80	
0.60	1.75	7.8	5.4	4.6	3.8	3.3	3.1	2.7	2.3	1.8	80



## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Si32-3	0107053
A	COAX® cartridge MIDI Si32-3, holding cap	0107128
D	COAX® cartridge MIDI Si32-3, extra non-return valve	0107713
B	COAX® cartridge MIDI Si32-3, holding cap, extra non-return valve	0107715



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976

## Xi40-2



- ▶ Two-stage COAX® cartridge – MIDI – with small mounting dimensions for limited spaces
- ▶ Deep end vacuum level, 95 -kPa
- ▶ High vacuum flow at deep vacuum levels, 75 to 95 -kPa
- ▶ Quick response time when deep vacuum is needed
- ▶ The all-round characteristics makes it suitable for several types of vacuum applications

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10–80
Weight	g	18.5-54.7
Material		Al, NBR, PA, SS

### Vacuum flow

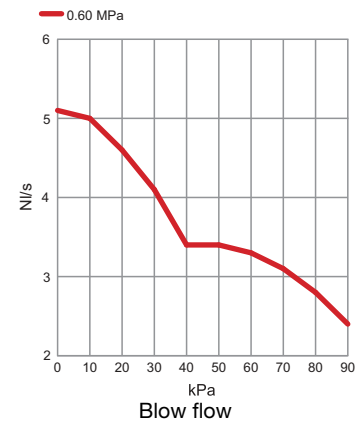
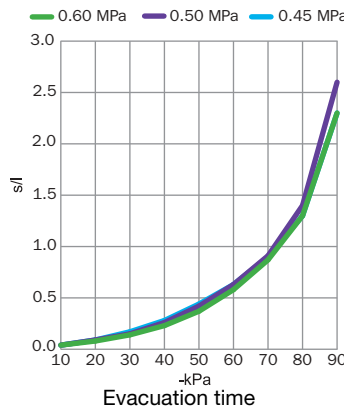
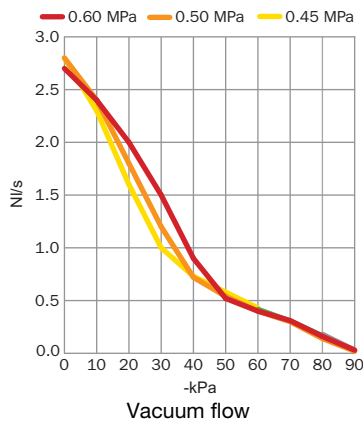
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.45	1.83	2.8	2.3	1.6	1.0	0.73	0.58	0.43	0.32	0.18	0.03	95	
0.50	2.0	2.8	2.4	1.8	1.2	0.72	0.54	0.40	0.30	0.14	0.02	94	
0.60	2.33	2.7	2.4	2.0	1.5	0.90	0.52	0.40	0.31	0.16	0.03	94	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.90	1.3	2.3	95	
0.50	2.0	0.04	0.09	0.15	0.26	0.42	0.63	0.91	1.4	2.6	94	
0.60	2.33	0.04	0.08	0.14	0.23	0.37	0.58	0.87	1.3	2.3	94	

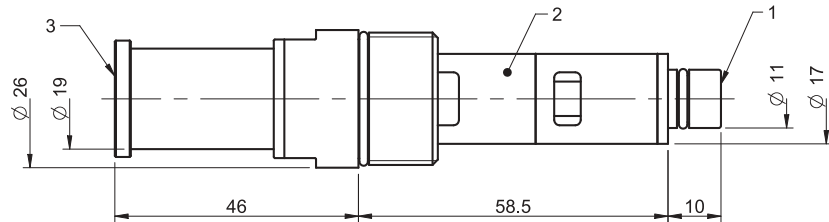
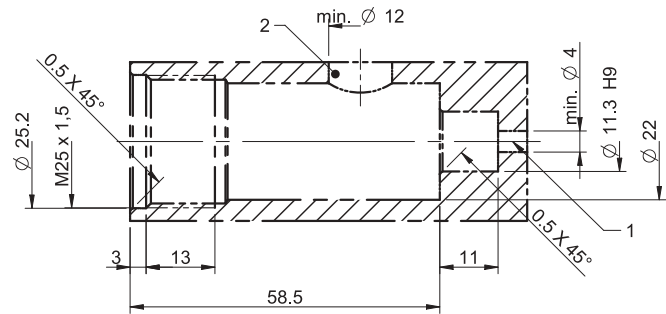
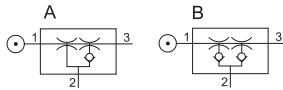
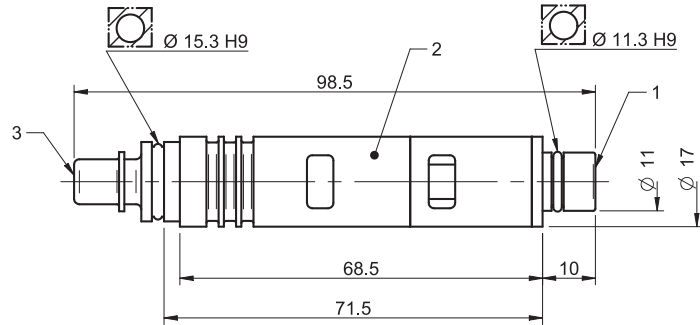
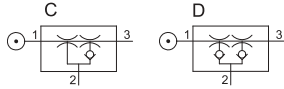
### Blow flow

Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)											Max pressure kPa
		0	10	20	30	40	50	60	70	80	90		
0.6	2.33	5.1	5.0	4.6	4.1	3.4	3.4	3.3	3.1	2.8	2.4	90	



## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Xi40-2	0118747
A	COAX® cartridge MIDI Xi40-2, holding cap	0118757
D	COAX® cartridge MIDI Xi40-2, extra non-return valve	0118748
B	COAX® cartridge MIDI Xi40-2, holding cap, extra non-return valve	0118758



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976

## Xi40-3



- ▶ Three-stage COAX® cartridge – MIDI – with high initial vacuum flow
- ▶ Deep end vacuum level, 95 -kPa
- ▶ High vacuum flow at deep vacuum levels, 75 to 95 -kPa
- ▶ Quick response time when deep vacuum is needed
- ▶ The all-round characteristics makes it suitable for several types of vacuum applications

### Technical data

Description	Unit	Value
Feed pressure, max.	Mpa	0.7
Temperature range	°C	-10-80
Weight	g	28.7-63.2
Material		Al, NBR, PA, SS

### Vacuum flow

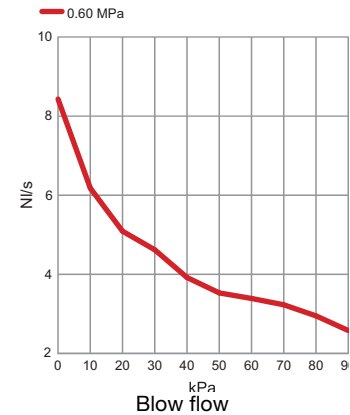
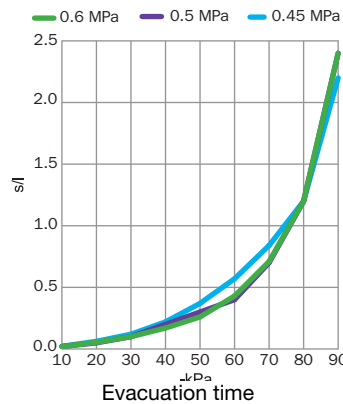
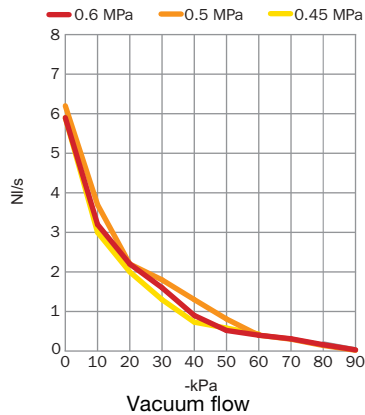
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.45	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95	
0.50	2.0	6.2	3.7	2.2	1.8	1.3	0.81	0.40	0.30	0.14	0.02	94	
0.60	2.33	5.9	3.2	2.2	1.6	0.90	0.52	0.40	0.31	0.16	0.03	94	

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	95	
0.50	2.0	0.02	0.05	0.10	0.20	0.30	0.40	0.70	1.2	2.4	94	
0.60	2.33	0.02	0.054	0.10	0.17	0.26	0.43	0.71	1.2	2.4	94	

### Blow flow

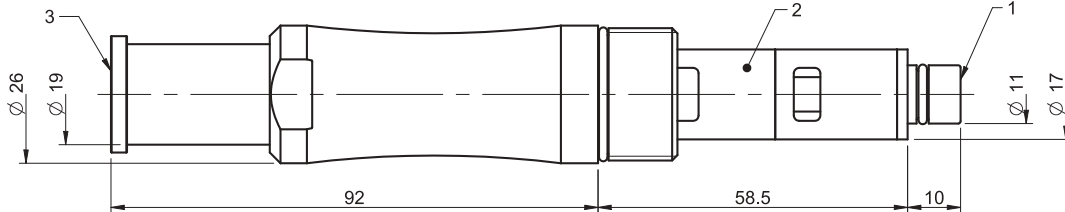
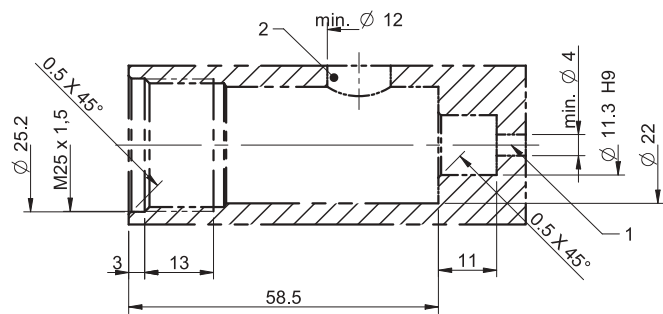
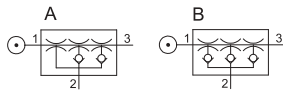
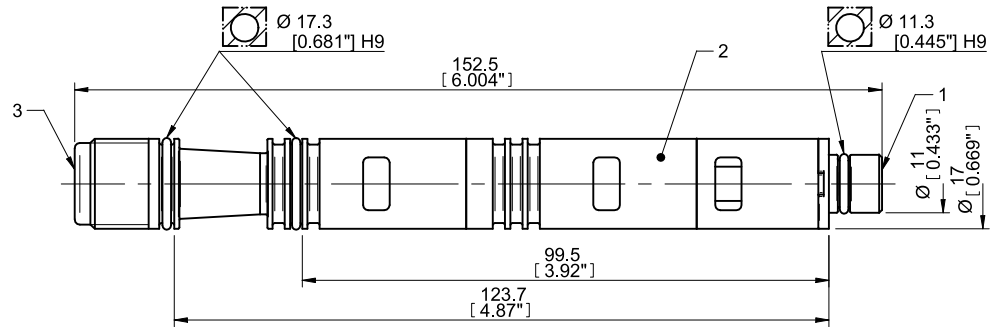
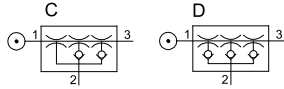
Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)										Max pressure kPa
		0	10	20	30	40	50	60	70	80	90	
0.60	2.33	8.43	6.18	5.09	4.62	3.92	3.53	3.39	3.23	2.95	2.58	90





## Ordering information

	Description	Art. No.
C	COAX® cartridge MIDI Xi40-3	0118724
A	COAX® cartridge MIDI Xi40-3, holding cap	0118759
D	COAX® cartridge MIDI Xi40-3, extra non-return valve	0118725
B	COAX® cartridge MIDI Xi40-3, holding cap, extra non-return valve	0118760



## Ordering information, accessories

Description	Art. No.
Silencer COAX® MIDI	0111976



Introduction .....	308
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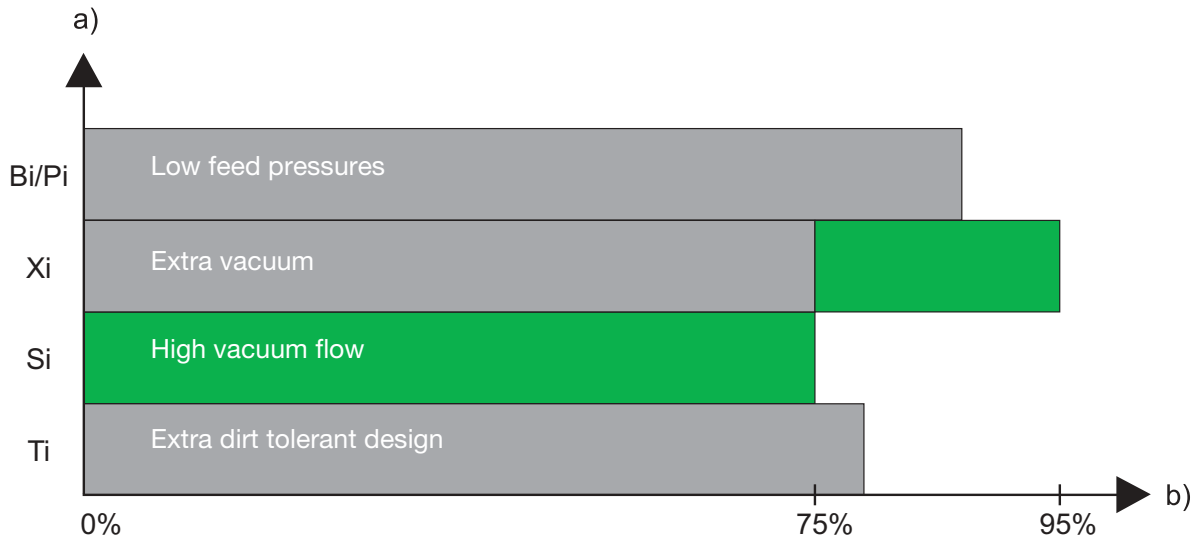
## Selection guide

### Which pump should I select?

Piab vacuum pumps are divided into series with different characteristics: Bi, Ti, Pi, Si, Xi. When you know what these letters mean and the applications for which they were developed, it will be easier to select the right pump.

COAX® cartridge	2-stage	3-stage	MICRO	MINI	MIDI	Vacuum level -kPa	Optimal usage				Applications
							Low feed pressure	Extra vacuum	High vacuum flow	Extra dirt tolerant	
<b>Bi</b>	x		x			83	x				Electronics, semiconductors
<b>Ti</b>	x		x			84				x	Leaking objects, pick and place small objects
<b>Pi</b>	x	x		x	x	90	x			x	Fluctuating compressed air pressure
<b>Si</b>	x	x	x	x	x	75			x	x*	High speed applications
<b>Xi</b>	x	x	x	x	x	95		x		x*	Sealed applications

\*) Not recommended for the Si and Xi COAX® MICRO cartridge.



a) Characteristics, b) Vacuum level

Green = most energy efficient choice.




## Vacuum flow at optimal feed pressure

COAX® cartridge	Optimal feed pressure Mpa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max Vacuum -kPa
			0	10	20	30	40	50	60	70	80	90	
Bi03-2	0.18	0.14	0.23	0.15	0.060	0.040	0.035	0.023	0.013	0.0060	-	-	83
Xi2.5-2	0.50	0.13	0.24	0.17	0.10	0.06	0.04	0.03	0.02	0.01	0.010	-	92
Si02-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	-	-	75
Ti05-2	0.4	0.27	0.32	0.28	0.23	0.17	0.10	0.07	0.04	0.02	0.004	-	84
Ti05-2	0.6	0.37	0.31	0.27	0.24	0.20	0.15	0.09	0.04	0.01	-	-	75
Pi12-2	0.314	0.44	0.68	0.60	0.44	0.27	0.19	0.14	0.10	0.060	0.030	-	90
Pi12-3	0.314	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.06	0.03	-	90
Si08-2	0.60	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	-	-	75
Si08-3	0.60	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	-	-	75
Xi10-2	0.5	0.46	0.75	0.63	0.49	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
Xi10-3	0.5	0.46	1.43	0.70	0.50	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
Pi48-2	0.30	2.0	2.8	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.1	-	90
Pi48-3	0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	-	90
Si32-2	0.60	1.75	3.3	3.0	2.6	1.7	0.90	0.60	0.50	0.35	-	-	75
Si32-3	0.60	1.75	6.0	3.5	2.6	1.7	0.90	0.60	0.50	0.35	-	-	75
Xi40-2	0.45	1.83	2.8	2.3	1.6	1.0	0.73	0.58	0.43	0.32	0.18	0.03	95
Xi40-3	0.45	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95

## Evacuation time at optimal feed pressure

COAX® cartridge	Optimal feed pressure Mpa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max Vacuum -kPa
			10	20	30	40	50	60	70	80	90		
Bi03-2	0.18	0.14	0.50	1.4	3.9	6.4	10.0	16.0	28.0	51.0	-	-	83
Xi2.5-2	0.50	0.13	0.49	1.23	2.48	4.50	7.30	11.3	18.0	28.0	-	-	92
Si02-2	0.6	0.12	0.41	1.01	2.01	3.30	4.90	6.90	10.2	-	-	-	75
Ti05-2	0.4	0.27	0.33	0.73	1.20	2.00	3.10	5.00	8.30	16.6	-	-	84
Ti05-2	0.6	0.37	0.30	0.70	1.20	1.80	2.60	4.20	8.43	-	-	-	75
Pi12-2	0.314	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4.0	6.4	-	-	90
Pi12-3	0.314	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	-	-	90
Si08-2	0.60	0.44	0.14	0.31	0.55	0.9	1.4	2.1	3.1	-	-	-	75
Si08-3	0.60	0.44	0.10	0.25	0.48	0.80	1.30	2.00	2.90	-	-	-	75
Xi10-2	0.5	0.46	0.14	0.3	0.6	1.0	1.6	2.3	3.5	5.3	8.9	-	94
Xi10-3	0.5	0.46	0.09	0.26	0.50	0.90	1.5	2.2	3.4	5.2	8.8	-	94
Pi48-2	0.30	2.0	0.030	0.070	0.13	0.26	0.46	0.70	1.0	1.6	4.0	-	90
Pi48-3	0.30	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0	-	90
Si32-2	0.60	1.75	0.030	0.070	0.10	0.18	0.33	0.53	0.80	-	-	-	75
Si32-3	0.60	1.75	0.020	0.050	0.10	0.18	0.33	0.53	0.80	-	-	-	75
Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.90	1.3	2.3	-	95
Xi40-3	0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	-	95

The vacuum pumps/generators are classified according to their initial vacuum flow rate. There are Small with 10-180 NI/min; Medium with 180-1700 NI/min and Large with 101-918 m<sup>3</sup>/h.



Group	Initial flow	Vacuum pump/generator	
Small	10-180 NI/min	piINLINE® MICRO & MINI	
		piCOMPACT10	
		P3010	

Features	Typical applications
<ul style="list-style-type: none"> <li>▶ Basic design.</li> <li>▶ Available with a two-stage COAX® cartridge MICRO or MINI.</li> <li>▶ Installs directly on a vacuum hose near the suction point.</li> <li>▶ Dirt tolerant and durable with generic “plug-and-play” design.</li> <li>▶ Easy and simple installation with push-in connections.</li> <li>▶ Generic plug-and-play design makes it easy to retrofit other.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Injection moulding automation equipment.</li> <li>▶ Sheet metal handling equipment, such as laser cutting, bending and punching machines.</li> <li>▶ Pick-and-place, such as labelling machines.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Available with one or up to six two-stage COAX® cartridge MICRO or MINI.</li> <li>▶ Reduces air-consumption with 30–50% compared to other ejector technologies.</li> <li>▶ Control valves for on/off and blow-off.</li> <li>▶ Vacuum switches, vacuum display and energy saving features.</li> <li>▶ Slim design.</li> <li>▶ Can be mounted in a manifold for several units with a common compressed air port.</li> <li>▶ Suitable when designing multi channel vacuum circuits.</li> <li>▶ Large variety of electrical interfaces and cables.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Electronic and semiconductor machine equipment.</li> <li>▶ Small parts handling in plastic, consumer and sheet metal industries.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Available with a three-stage COAX® cartridge MINI.</li> <li>▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.</li> <li>▶ Slim, compact, configurable and modular design.</li> <li>▶ Low weight.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Robot handling equipment in plastic, consumer, furniture and automotive industries.</li> <li>▶ Suitable for fast and reliable evacuation in sealed systems.</li> </ul>

Group	Initial flow	Vacuum pump/generator	
Medium	180-1700 NI/min	piINLINE® MIDI	
		P5010	
		P6010	
		piCLASSIC	



Features	Typical applications
<ul style="list-style-type: none"> <li>▶ Basic design.</li> <li>▶ Available with a two-stage COAX® cartridge MIDI.</li> <li>▶ Installs directly on a vacuum hose near the suction point.</li> <li>▶ Dirt tolerant and durable with generic “plug-and-play” design.</li> <li>▶ Easy and simple installation with push-in connections.</li> <li>▶ Generic plug-and-play design makes it easy to retrofit other.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Injection moulding automation equipment.</li> <li>▶ Sheet metal handling equipment, such as laser cutting, bending and punching machines.</li> <li>▶ Pick-and-place, such as labelling machines.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Available with a two- or three-stage COAX® cartridge MIDI.</li> <li>▶ Integrated flow-through silencer that is unaffected by dust and dirt.</li> <li>▶ Substantially lower air-consumption as compared to conventional ejectors of similar sizes.</li> <li>▶ Slim, compact, configurable and modular design.</li> <li>▶ Low weight.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Designed mainly for automated vacuum handling applications with robots or dedicated machines (for example packaging machines).</li> <li>▶ Developed for requirements found in industries such as the plastic, automotive, consumer goods, graphic and glass.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Available with one up to four three-stage COAX® cartridge MIDI.</li> <li>▶ Provides up to 40% more flow than conventional vacuum pumps, while still reducing overall energy consumption.</li> <li>▶ Durable and maintenance free.</li> <li>▶ Provides powerful, whisper-quiet, and non-heat generating suction at extremely low feed pressures.</li> <li>▶ Compact size.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Automated material handling and other manufacturing processes in the automotive, robotic, graphics and packaging.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Piab’s classical vacuum pump design – now with upgraded design and COAX® technology.</li> <li>▶ Available with one or up to six three-stage COAX® cartridge MIDI.</li> <li>▶ New modular design makes for easy cleaning of ejector cartridges and gives an opportunity to upgrade the performance if needed.</li> <li>▶ Large vacuum capacity in relation to size, suitable to replace larger electromechanical pumps, can be placed much closer to point of use and therefore reduce the flow losses for vacuum lines.</li> <li>▶ Additional energy saving features available as options.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Robot handling equipment in plastic, consumer, furniture and automotive industries.</li> <li>▶ Packaging machines.</li> </ul>

Group	Initial flow	Vacuum pump/generator	
Large	101-918 m <sup>3</sup> /h	Round pump	
		P6040	

Features	Typical applications
<ul style="list-style-type: none"> <li>▶ Available in one configuration with 6x Si32-3 COAX® cartridge MIDI.</li> <li>▶ Round pump is a large capacity pump in a very compact package – suitable for cramped areas.</li> <li>▶ Vacuum and exhaust ports are in-line.</li> <li>▶ Easy to install the pump into existing hose or pipe lines.</li> <li>▶ Made of resistant materials.</li> <li>▶ For environments with tough chemical conditions.</li> <li>▶ COAX® cartridges are equipped with Viton® flap valves.</li> </ul>	<ul style="list-style-type: none"> <li>▶ For environments with tough chemical conditions.</li> <li>▶ Vacuum forming, evacuation and filling of liquids, leak testing.</li> </ul>
<ul style="list-style-type: none"> <li>▶ Available with five to 16 three-stage COAX® cartridge MIDI.</li> <li>▶ Same flow capacity as electromechanical pumps up to 4 kW.</li> <li>▶ Modular, durable and virtually maintenance free design.</li> <li>▶ Suitable as a blow pump in applications with up to 0.15 MPa over/ back pressure.</li> <li>▶ Option with control valves, vacuum switches and energy saving functions are available.</li> <li>▶ Whisper-quiet and non-heat generating.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Machine equipment for the graphic industry, e.g. off set press, post press machines.</li> <li>▶ Liquid filling applications.</li> <li>▶ Packaging machines.</li> </ul>

## Resistance of various materials

Resistance	PA	POM	ABS	AL	NBR	Viton® fluoroelastomers*
Weather, ozone	—	+	++	++	+	+++
Heat, aging	++	++	+	+++	++	+++
Oil, petrol	++	++	+	+	+++	+++
Hydrolysis	—	++	+	+++	++	++
Acid and alkali	+	+	—	—	++	++
Acetone	+++	+++	—	+++	—	—
Ammonia	+	—	—	++	+	—
Amyl alcohol	+++	+++	—	++	++	++
Benzene	+++	+++	—	++	—	+++
Butanol	—	+++	+++	++	++	+++
Cyclohexane	+++	+++	—	+++	++	+++
Ethanol	+++	+++	++	++	+	+++
Ethyl acetate	+++	+++	—	++	—	—
Hexane	++	+++	—	+++	+++	+++
Carbon tetrachloride	—	++	—	—	—	+++
Chlorobenzene	—	—	—	+++	—	+++
Chloroform	+++	+++	—	+	—	+++
Methanol	++	+++	—	++	+++	+
Methylene chloride	+	++	—	+	—	+++
Methyl ethyl ketone, MEK	+++	+	—	++	—	—
NaOH	+++	+	+	—	++	++
Propanol	—	+++	++	++	+++	+++
Sulphuric acid	—	—	++	—	+	+++
Tetrahydrofuran	+++	+++	—	—	—	—
Tetrachlorethylene	+++	+++	—	—	—	+++
Toulene	+++	+	—	+++	—	+++
Trichlorethane	+	+++	—	—	—	+++
Trichlorethylene	+	—	—	—	—	+++
Xylene	+++	+++	—	++	—	+++
Acetic acid	—	—	—	+	+	++

+++ Recommended

++ Good, minor chemical attack

+ Limited, moderate chemical attack, limited service

— Not recommended

\*) Viton® is a registered trademark of DuPont Performance Elastomers.

## Materials

PA	Polyamide, Nylon®, for example
POM	Acetal plastic, Polyoxymethylene, Delrin®, and Hostaform®, for example
ABS	Thermoplastic
AL	Aluminium
NBR	Nitrile
Viton®	Fluor rubber FPM (FKM)



## piINLINE® MICRO



piINLINE® Patent Pending

- ▶ Patented COAX® cartridge technology.
- ▶ High vacuum flow capacity in relation to energy consumption.
- ▶ Low weight inline design with push-in fittings.
- ▶ Quick and easy installation directly on the hose.
- ▶ Si/Ti cartridge at 0.6 MPa for extra vacuum flow.
- ▶ Bi cartridge for reliability at low feed pressures.
- ▶ Ti/Xi cartridge at 0.4/0.5 MPa when high flow and deep vacuum is needed.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		PA, NBR, SS, TPE, CuZn, Al*
Temperature range	°C	-10-80

\*) Only on 4-4 mm.

### Technical data, specific

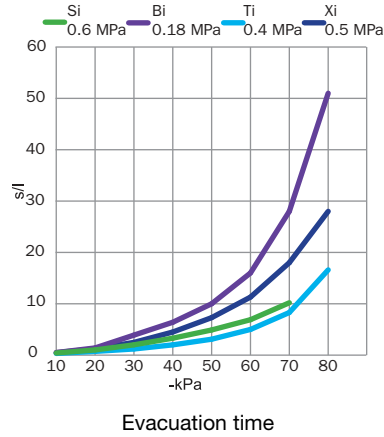
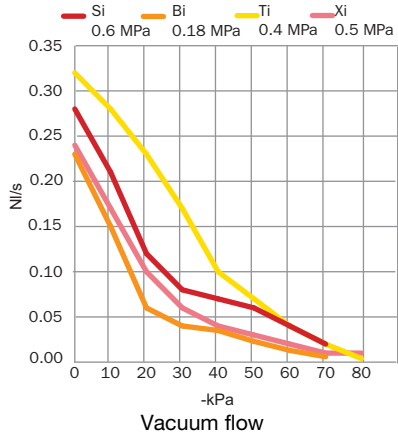
Description	Unit	Value					
		Bi4-4	Xi4-4	Si6-6	Bi6-6	Ti6-6	Xi6-6
Noise level, min-max	dBA	64-73	70-76	67-73	67-73	74-85	70-76
Weight	g	10	10	9.8	9.8	9.8	9.8
Connection, vacuum	mm	4	4	6	6	6	6
Connection, compressed air	mm	4	4	6	6	6	6

## Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)									Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	
Si	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75
Ti	0.6	0.37	0.31	0.27	0.24	0.20	0.15	0.09	0.04	0.01	—	75
Bi	0.18	0.14	0.23	0.15	0.060	0.040	0.035	0.023	0.013	0.006	—	83
Ti	0.4	0.27	0.32	0.28	0.23	0.17	0.10	0.07	0.04	0.02	0.004	84
Xi	0.5	0.13	0.24	0.17	0.10	0.06	0.04	0.03	0.02	0.01	0.01	92

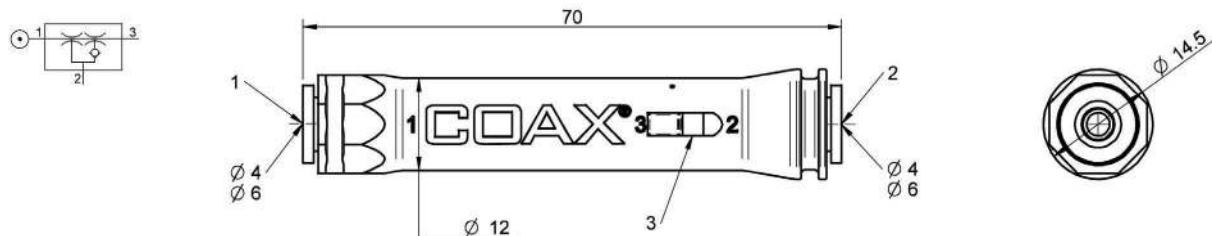
## Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum -kPa	
			10	20	30	40	50	60	70		80
Si	0.6	0.12	0.41	1.01	2.01	3.30	4.90	6.90	10.2	—	75
Ti	0.6	0.37	0.30	0.70	1.20	1.80	2.60	4.20	8.43	—	75
Bi	0.18	0.14	0.50	1.40	3.90	6.40	10.0	16.0	28.0	51.0	83
Ti	0.4	0.27	0.33	0.73	1.20	2.00	3.10	5.00	8.30	16.6	84
Xi	0.5	0.13	0.49	1.23	2.48	4.50	7.30	11.3	18.0	28.0	92



## Ordering information

Description	Art. No.
piINLINE® vacuum generator MICRO Bi, 4-4 mm	0122880
piINLINE® vacuum generator MICRO Xi, 4-4 mm	0122881
piINLINE® vacuum generator MICRO Si, 6-6 mm	0122882
piINLINE® vacuum generator MICRO Bi, 6-6 mm	0122883
piINLINE® vacuum generator MICRO Ti, 6-6 mm	0122022
piINLINE® vacuum generator MICRO Xi, 6-6 mm	0122884



## Ordering information, accessories

Description	Art. No.
Snap-in piINLINE® 5x MICRO mounting bracket	0123093

## piINLINE® MINI



piINLINE® Patent Pending

- ▶ Patented COAX® cartridge technology.
- ▶ High vacuum flow capacity in relation to energy consumption.
- ▶ Low weight inline design with push-in fittings for vacuum and compressed air.
- ▶ Quick and easy installation directly on the hose.
- ▶ Si cartridge for extra vacuum flow.
- ▶ Pi cartridge for high performance at low feed pressures.
- ▶ Xi cartridge when high flow and deep vacuum is needed.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		PA, NBR, SS, CuZn, Al*
Temperature range	°C	-10-80

\*) Only on 6-6 mm.

### Technical data, specific

Description	Unit	Value					
		Si6-6	Pi6-6	Xi6-6	Si8-8	Pi8-8	Xi8-8
Noise level, min-max	dBA	68-84	69-85	81-85	68-84	69-85	81-85
Weight	g	23	23	23	21.8	21.8	21.8
Connection, vacuum	mm	6	6	6	8	8	8
Connection, compressed air	mm	6	6	6	8	8	8

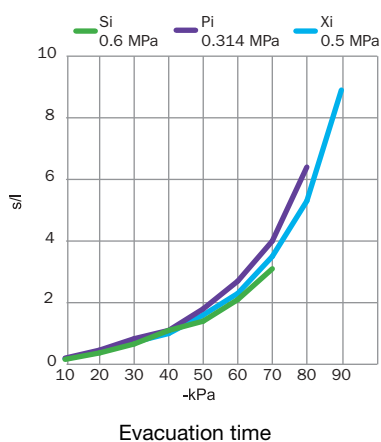
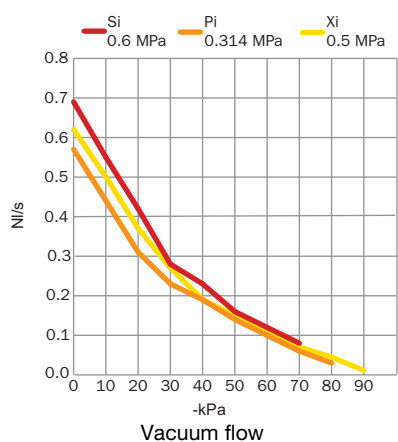


## Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90	
Si	0.6	0.44	0.69	0.55	0.42	0.28	0.23	0.16	0.12	0.08	—	—	75
Pi	0.314	0.44	0.57	0.44	0.31	0.23	0.19	0.14	0.10	0.06	0.03	—	90
Xi	0.5	0.46	0.62	0.50	0.37	0.27	0.19	0.15	0.11	0.07	0.045	0.011	94

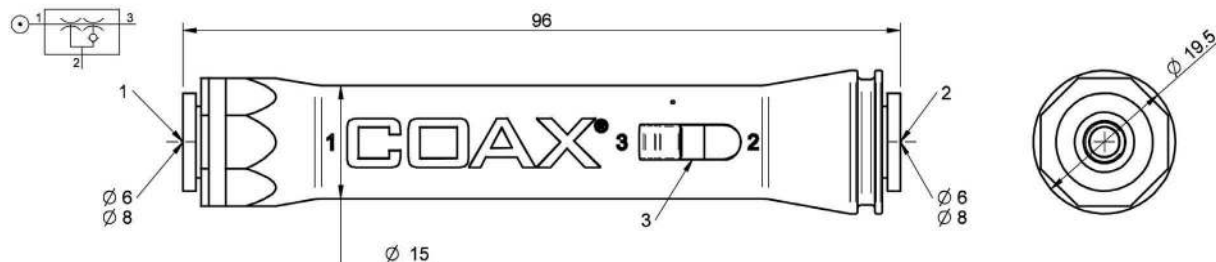
## Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
			10	20	30	40	50	60	70	80	90	
Si	0.6	0.44	0.16	0.37	0.66	1.10	1.40	2.10	3.10	—	—	75
Pi	0.314	0.44	0.20	0.46	0.83	1.10	1.80	2.70	4.00	6.40	—	90
Xi	0.5	0.46	0.18	0.41	0.72	1.00	1.60	2.30	3.50	5.30	8.90	94



## Ordering information

Description	Art. No.
piINLINE® vacuum generator MINI Si, 6-6 mm	0122025
piINLINE® vacuum generator MINI Pi, 6-6 mm	0122894
piINLINE® vacuum generator MINI Xi, 6-6 mm	0122895
piINLINE® vacuum generator MINI Si, 8-8 mm	0122896
piINLINE® vacuum generator MINI Pi, 8-8 mm	0122897
piINLINE® vacuum generator MINI Xi, 8-8 mm	0122898



## Ordering information, accessories

Description	Art. No.
Snap-in piINLINE® 4x MINI mounting bracket	0123094

## piCOMPACT10



- ▶ Ejector with COAX® patented technology.
- ▶ Reduced air-consumption with 30-50% compared to other ejector technologies.
- ▶ Easy to optimize vacuum performance with a varied selection of micro multi-stage ejectors.
- ▶ Unique low feed pressure version available, full performance from 0.18 MPa.
- ▶ Very low weight, 70g, and small footprint. The width is 10mm.
- ▶ Integrated supply and release valves, vacuum sensor/switch optional.
- ▶ Suitable for small objects in high-speed handling, such as surface mount machines in the electronic and semi-conductor industry.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	0-55
Weight (single piCOMPACT10 unit)	g	70
Weight (single piCOMPACT10 unit w/ vacuum sensor 1A Analog)	g	102
Weight (single piCOMPACT10 unit w/ vacuum sensor 1D, 2D Digital/Analog)	g	127
Material		PA, AI, NBR, SS, TPE

### Technical data, noise level

COAX® cartridge	Feed pressure MPa	Noise level dBA
Bi	0.18	60-65
Si	0.6	63-68
Xi	0.5	63-66
Ti*	0.4	69-71
Ti*	0.6	69-75

\*Ti cartridge is suited for sealed applications at 0.4 MPa and for leaking applications at 0.6 MPa.

### Technical data, valves

Description	Unit	Value
		Vacuum on/off valve, V1, Blow-off/Release valve, V2
Supply voltage	VDC	24 (21.6-26.4)
Feed pressure	MPa	0.1-0.7
Power consumption	W	1
Manual override		Yes, non-locking push style
Status indicator		LED
Function		NC
Wiring		Two lead wires (300 mm), open end

### Vacuum flow

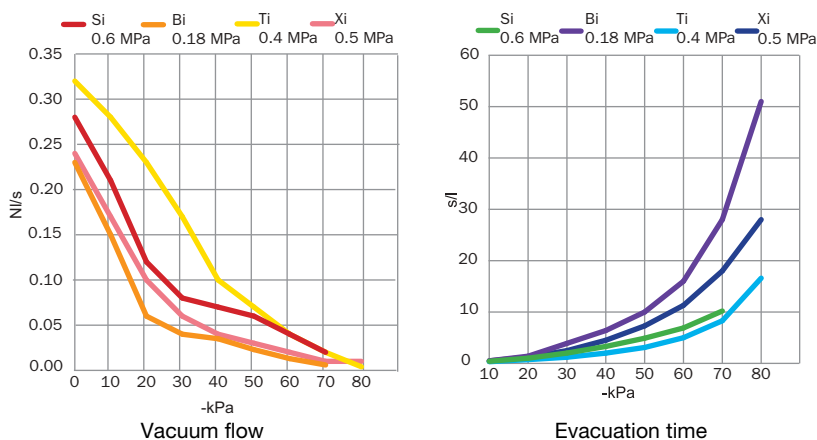
COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
			0	10	20	30	40	50	60	70	80		
Bi	0.18	0.14	0.23	0.15	0.060	0.040	0.035	0.023	0.013	0.006	—	83	
Si	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75	
Xi	0.5	0.13	0.24	0.17	0.10	0.06	0.04	0.03	0.02	0.01	0.01	92	
Ti	0.4	0.27	0.32	0.28	0.23	0.17	0.10	0.07	0.04	0.02	0.004	84	
Ti	0.6	0.37	0.31	0.27	0.24	0.20	0.15	0.09	0.04	0.01	—	75	

For vacuum flows at other feed pressure, see COAX® cartridge data sheets.

## Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
			10	20	30	40	50	60	70	80	
Bi	0.18	0.14	0.50	1.40	3.90	6.40	10.0	16.0	28.0	51.0	83
Si	0.6	0.12	0.41	1.01	2.01	3.30	4.90	6.90	10.2	—	75
Xi	0.5	0.13	0.49	1.23	2.48	4.50	7.30	11.3	18.0	28.0	92
Ti	0.4	0.27	0.33	0.73	1.20	2.00	3.10	5.00	8.30	16.6	84
Ti	0.6	0.37	0.30	0.70	1.20	1.80	2.60	4.20	8.43	—	75

For evacuation times at other feed pressures, see COAX® cartridge data sheets.



## Ordering information

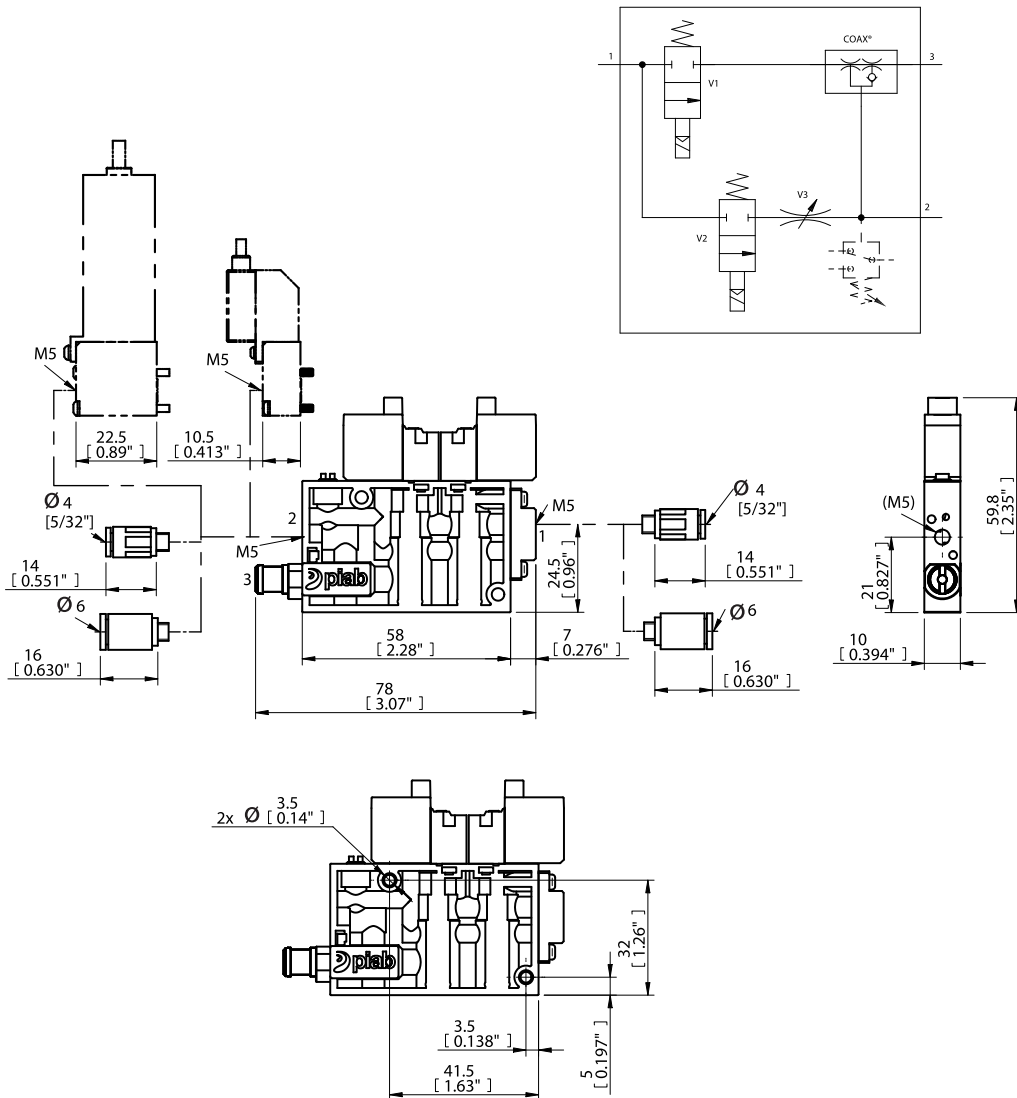
<b>1. COAX® cartridge module</b>	<b>PC10 Code</b>
COAX® cartridge Bi03-2, low feed pressure	B
COAX® cartridge Si02-2, high vacuum flow	S
COAX® cartridge Xi2.5-2, extra vacuum	X
COAX® cartridge Ti05-2, dirt tolerant design	T
COAX® cartridge Bi03-2, ozone resistant	BO
<b>2. Supply and release valve</b>	<b>PC10 Code</b>
Solenoid valve NC	01
<b>3. Vacuum sensing</b>	<b>PC10 Code</b>
No vacuum sensing	AA
No display, analog output	1A
Display, analog & digital output PNP	1D
Display, analog & digital output NPN	2D
<b>4. Vacuum connection</b>	<b>PC10 Code</b>
M5 female threaded connection	M5
4mm (5/32") push-in connector	D4
6mm push-in connector	D6
<b>5. Accessories (under development)</b>	<b>PC10 Code</b>
No accessory	AA
<b>6. Number of units</b>	<b>PC10 Code</b>
Single unit	1
2 units	2
3 units	3
4 units	4
5 units	5
6 units	6

7. Manifold mount	PC10 Code
No manifold, stand-alone unit	01
Manifold mount, 2 units	02
Manifold mount, 3 units	03
Manifold mount, 4 units	04
Manifold mount, 5 units	05
Manifold mount, 6 units	06

All units must be of same configuration.

8. Compressed air connection	PC10 Code
M5 female threaded connection	M5
4mm (5/32") push-in connector	D4
6mm push-in connector	D6
6mm angle push-in connector	D6A
8mm (5/16") push-in connector	D8
8mm (5/16") angle push-in connector	D8A
BSPT/Rc1/8" female threaded connection	T18

Example	Ordering number
COAX® Bi03-2, NC supply & release valve, no vacuum sensing, M5 female threaded vacuum connection, no accessory, single unit, no manifold, M5 female threaded compressed air connection	PC10.B.01.AA.M5.AA.1.01.M5



## Ordering information, Accessories

Description	Art. No.
Cable 2-pin female, L=2m	0110157

If longer length cables are needed for valves, please note that (2) cables are needed for each piCOMPACT10, one for each valve.

## piCOMPACT10 Manifold mount



- ▶ Manifold mounted compact ejectors with COAX® patented technology.
- ▶ Reduced air-consumption with 30-50% compared to other ejector technologies.
- ▶ Easy to optimize vacuum performance with a varied selection of micro multi-stage ejectors.
- ▶ Unique low feed pressure version available, full performance from 0.18 MPa.
- ▶ Common feed port(s) for compressed air.
- ▶ Integrated supply and release valves, vacuum sensor/switch optional
- ▶ Suitable for small objects in high-speed handling, such as surface mount machines in the electronic and semi-conductor industry.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	0-55
Material		PA, AL, NBR, SS, TPE

### Technical data, weight

Description	Weight (g)*		
	No vacuum switch	with vacuum switch 1A Analog	with vacuum switch 1D, 2D Digital
Manifold mount, 2 units	170-178	234-242	284-292
Manifold mount, 3 units	242-252	341-348	416-423
Manifold mount, 4 units	319-327	447-455	547-555
Manifold mount, 5 units	394-401	554-561	679-686
Manifold mount, 6 units	468-476	660-668	810-818

\*Weights vary depending on size of compressed air connector.

### Technical data, noise level

COAX® cartridge	Feed pressure	Noise level**
	MPa	dBA
Bi	0.18	60-65
Si	0.6	63-68
Xi	0.5	63-66
Ti*	0.4	69-71
Ti*	0.6	69-75

\*Ti cartridge is suited for sealed applications at 0.4 MPa and for leaking applications at 0.6 MPa.

\*\*Noise level values are for a single unit.

### Technical data, valves

Description	Unit	Value
		Vacuum on/off valve, V1, Blow-off/Release valve, V2
Supply voltage	VDC	24 (21.6-26.4)
Feed pressure	MPa	0.1-0.7
Power consumption	W	1
Manual override		Yes, non-locking push style
Status indicator		LED
Function		NC
Wiring		Two lead wires (300 mm), open end

## Performance tables

Depending upon choice of COAX® cartridge, performance data of the piCOMPACT10 can be found in the tables for vacuum flow and evacuation time on the piCOMPACT10 or Vacuum cartridges/integration datasheets.

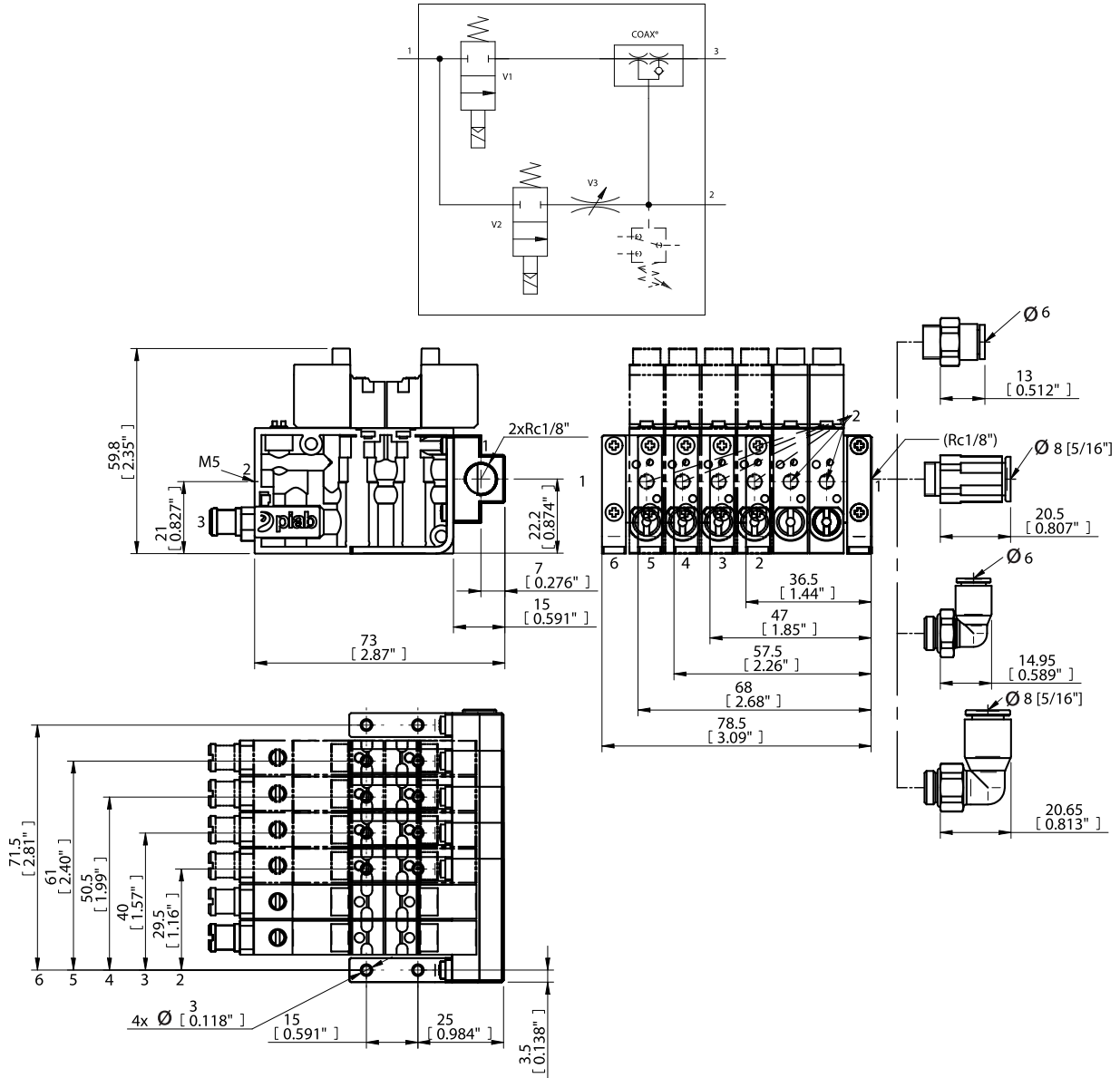
## Ordering information

1. COAX® cartridge module	PC10 Code
COAX® cartridge Bi03-2, low feed pressure	B
COAX® cartridge Si02-2, high vacuum flow	S
COAX® cartridge Xi2.5-2, extra vacuum	X
COAX® cartridge Ti05-2, dirt tolerant design	T
COAX® cartridge Bi03-2, ozone resistant	BO
2. Supply and release valve	PC10 Code
Solenoid valve NC	01
3. Vacuum sensing	PC10 Code
No vacuum sensing	AA
No display, analog output	1A
Display, analog & digital output PNP	1D
Display, analog & digital output NPN	2D
4. Vacuum connection	PC10 Code
M5 female threaded connection	M5
4mm (5/32") push-in connector	D4
6mm push-in connector	D6
5. Accessories (under development)	PC10 Code
No accessory	AA
6. Number of units	PC10 Code
2 units	2
3 units	3
4 units	4
5 units	5
6 units	6
7. Manifold mount	PC10 Code
Manifold mount, 2 units	02
Manifold mount, 3 units	03
Manifold mount, 4 units	04
Manifold mount, 5 units	05
Manifold mount, 6 units	06

*All units must be of same configuration.*

8. Compressed air connection	PC10 Code
6mm push-in connector	D6
6mm angle push-in connector	D6A
8mm (5/16") push-in connector	D8
8mm (5/16") angle push-in connector	D8A
BSPT/Rc1/8" female threaded connection	T18

<b>Example</b>	<b>Ordering number</b>
COAX® Bi03-2, NC supply & release valve, analog vacuum sensor, M5 female threaded vacuum connection, no accessory, 2 units, manifold mount, 2 units, 8mm (5/16") push-in compressed air connection	PC10.B.01.1A.M5.AA.2.02.D8



For more information about fitting options on the vacuum side, please refer to piCOMPACT10 single unit dimensional drawing.

## Ordering information, Accessories

Description	Art. No.
Cable 2-pin female, L=2m	0110157

If longer length cables are needed for valves, please note that (2) cables are needed for each piCOMPACT10, one for each valve.

## piCOMPACT10 Vacuum sensor/switch



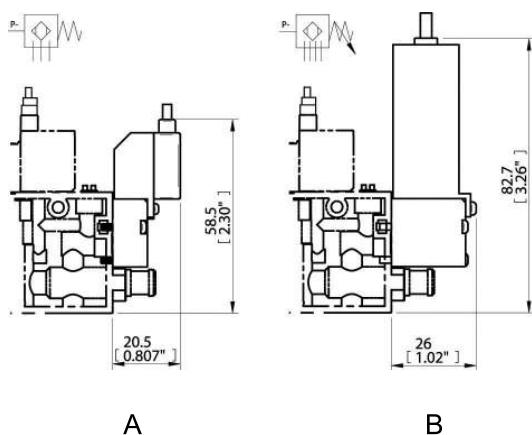
- ▶ Vacuum sensor/switch options for piCOMPACT10.
- ▶ Sensor with analog output 1-5 VDC.
- ▶ Digital switch with LED Display, PNP or NPN output + analog output (1-5 VDC).
- ▶ Easy to set vacuum level, hysteresis and change display units (bar, kPa, inHg, mmHg)
- ▶ 2m cable included, open ends.

### Technical data

Description	Unit	Value	
		Vacuum sensor 1A Analog	Vacuum sensor/switch 1D, 2D Digital/ Analog
Vacuum range	-kPa	0-101	0-101
Overpressure, max.	MPa	0.5	0.5
Material		PC, Al	PC, Al
Temperature range	°C	0-50	0-50
Weight	g	32	57
Vacuum connection		M5 threaded female	M5 threaded female
Humidity	%RH	35-85	35-85
Safety classification		IP40	IP40
Voltage supply	VDC	10.8-30, Ripple (Vp-p) 10% max	10.8-30, Ripple (Vp-p) 10% max
Response time	ms	2	2
Dielectric strength, 1 min	VAC	100	100
Accuracy		±1% of F.S.	±2% of F.S.
Repeatability		-	±0.2% of F.S.
Analog output	VDC	1-5 (±0.1), linearity ±0.5% F.S. Output impedance 500 Ω	1-5 (±0.1), linearity ±0.5% F.S. Output impedance 500 Ω
Switch/digital output		-	PNP or NPN open collector Max 125mA (load current)
Display		-	3 1/2 digit 7 segment
Current consumption	mA	20 or less	60 or less
Vibration resistance	Hz	0-55, amplitude 1.5mm XYZ 2h	0-150, amplitude 1.5mm XYZ 2h

### Ordering information, spare parts

	Description	Code	Art. No.
A	No display, analog output vacuum sensor	1A	0125645
B	Display, analog & digital output vacuum sensor PNP	1D	0125648
B	Display, analog & digital output vacuum sensor NPN	2D	0125647





## P3010



- ▶ Patented COAX® technology.
- ▶ Available with three-stage COAX® cartridge MINI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ Suitable for fast and reliable evacuation in sealed systems.
- ▶ Slim, compact, configurable and modular design.
- ▶ Low weight.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	66-68
Temperature range	°C	-10-50
Weight	g	110-330
Material		PP, PA, NBR, AI, SS

### Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90	
Pi12-3	0.314	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.060	0.030	—	90
Si08-3	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
Xi10-3	0.5	0.46	1.43	0.70	0.50	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94

For vacuum flows at other feed pressures, see section Vacuum cartridges/integration.

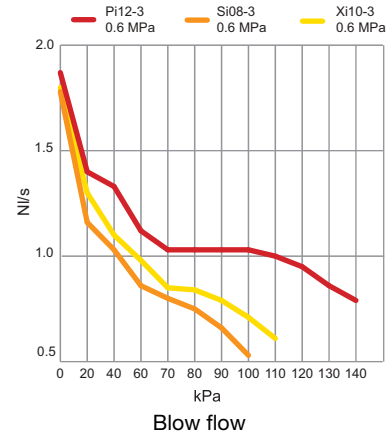
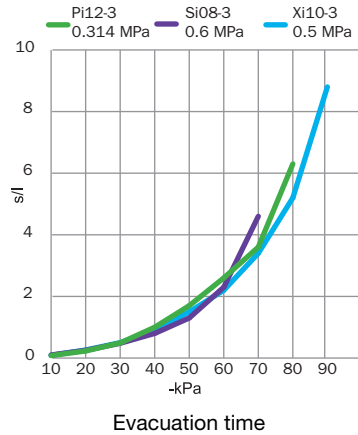
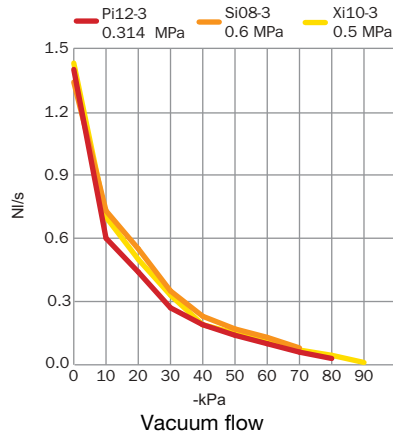
### Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
			10	20	30	40	50	60	70	80	90	
Pi12-3	0.314	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	—	90
Si08-3	0.6	0.44	0.10	0.25	0.48	0.80	1.30	2.30	4.60	—	—	75
Xi10-3	0.5	0.46	0.09	0.26	0.50	0.90	1.5	2.2	3.4	5.2	8.8	94

For evacuation times at other feed pressures, see section Vacuum cartridges/integration.

## Blow flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
			0	20	40	60	70	80	90	100	110	120	130	140	
Pi12-3	0.6	0.75	1.87	1.4	1.33	1.12	1.03	1.03	1.03	1.03	1.0	0.95	0.86	0.79	140
Si08-3	0.6	0.44	1.78	1.16	1.03	0.86	0.80	0.75	0.66	0.53	—	—	—	—	70
Xi10-3	0.6	0.54	1.8	1.3	1.1	0.98	0.85	0.84	0.79	0.71	0.61	—	—	—	90



## Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

3. Select connection and function module	P3010 Code
B Connection module high 6x1/8"	01
A Connection module low 3x1/8"	02
Function Quick-release connection, 10 and 6 mm, 3 cm³	04
Function Quick-release connection, 8 and 6 mm, 30 cm³	05
Function Quick-release connection, 8 and 6 mm, 60 cm³	06
Function Quick-release connection, 10 and 6 mm, 30 cm³	07
Function Quick-release connection, 10 and 6 mm, 60 cm³	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm³	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm³	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm³	11
Function Quick-release connection, 8 and 6 mm, 3 cm³	12
Function AVM™2 NO G connection	27
Function AVM™2 NC G connection	28
Function CU NC G connection	29

For detailed information on Quick-release, AVM™2 and CU, see separate datasheets.

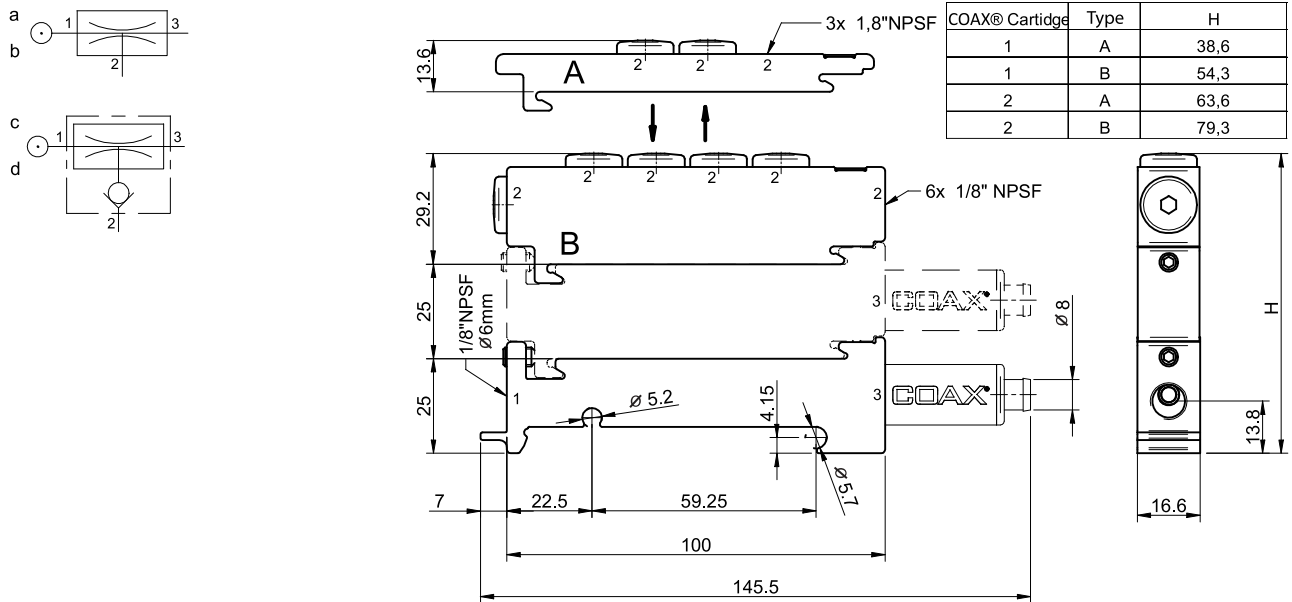
4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB
ES Vacustat 2/2 NO, large hysteresis	AC
ES Vacustat 2/2 NO, small hysteresis	AD

For detailed information on Valve DS 23 and Vacustat, see separate datasheets.

5. Select vacuum sensing	P3010 Code
No vacuum sensing	00
Vacuum switch, adjustable, PNP NO MM8	01
Vacuum switch, adjustable, NPN NO MM8	02
Vacuum switch, adjustable, PNP NO LM8	05
Vacuum switch, adjustable, PNP NO DM8	09
Vacuum switch, adjustable, NPN NO DM8	10
Vacuum switch inductive, adjustable with knob	11
Vacuum switch VS4015 Ø6, 30 -kPa	18
Vacuum switch VS4015 Ø6, 50 -kPa	19
Vacuum switch VS4015 Ø6, 70 -kPa	20
Vacuum switch VS4016 G1/8" male, 30 -kPa	21
Vacuum switch VS4016 G1/8" male, 50 -kPa	22
Vacuum switch VS4016 G1/8" male, 70 -kPa	23

For detailed information on vacuum switches, see separate datasheets.

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Connection module high 6x1/8", no energy saving, no vacuum sensing	P3010.00.AE.01.AA.00



### Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Quick Release Module



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Quick release volume from 3-60 cm<sup>3</sup>
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ Slim, compact, configurable and modular design.
- ▶ Low weight.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	66-68
Temperature range	°C	-10-50
Weight	g	168-320
Material		PP, PA, NBR, AI, SS

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

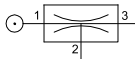
1. Select housing		P3010 Code
Housing, connection Ø=6 mm		00
Housing, connection 1/8" NPSF		01
2. COAX® cartridge modules		P3010 Code
COAX® cartridge module Pi12-3FSx1		AE
COAX® cartridge module Pi12-3FSx1, non-return valve		AF
COAX® cartridge module Pi12-3FSx2		AG
COAX® cartridge module Pi12-3FSx2, non-return valve		AH
COAX® cartridge module Si08-3FSx1		AA
COAX® cartridge module Si08-3FSx1, non-return valve		AB
COAX® cartridge module Si08-3FSx2		AC
COAX® cartridge module Si08-3FSx2, non-return valve		AD
COAX® cartridge module Xi10-3FSx1		AI
COAX® cartridge module Xi10-3FSx1, non-return valve		AJ
COAX® cartridge module Xi10-3FSx2		AK
COAX® cartridge module Xi10-3FSx2, non-return valve		AL
3. Select connection and function module		P3010 Code
A	Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
B	Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
C	Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
B	Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
C	Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
A	Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
B	Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
C	Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
A	Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12
4. Select ES		P3010 Code
No energy saving		AA
Valve DS23		AB

For detailed information on Valve DS 23, see separate datasheet.

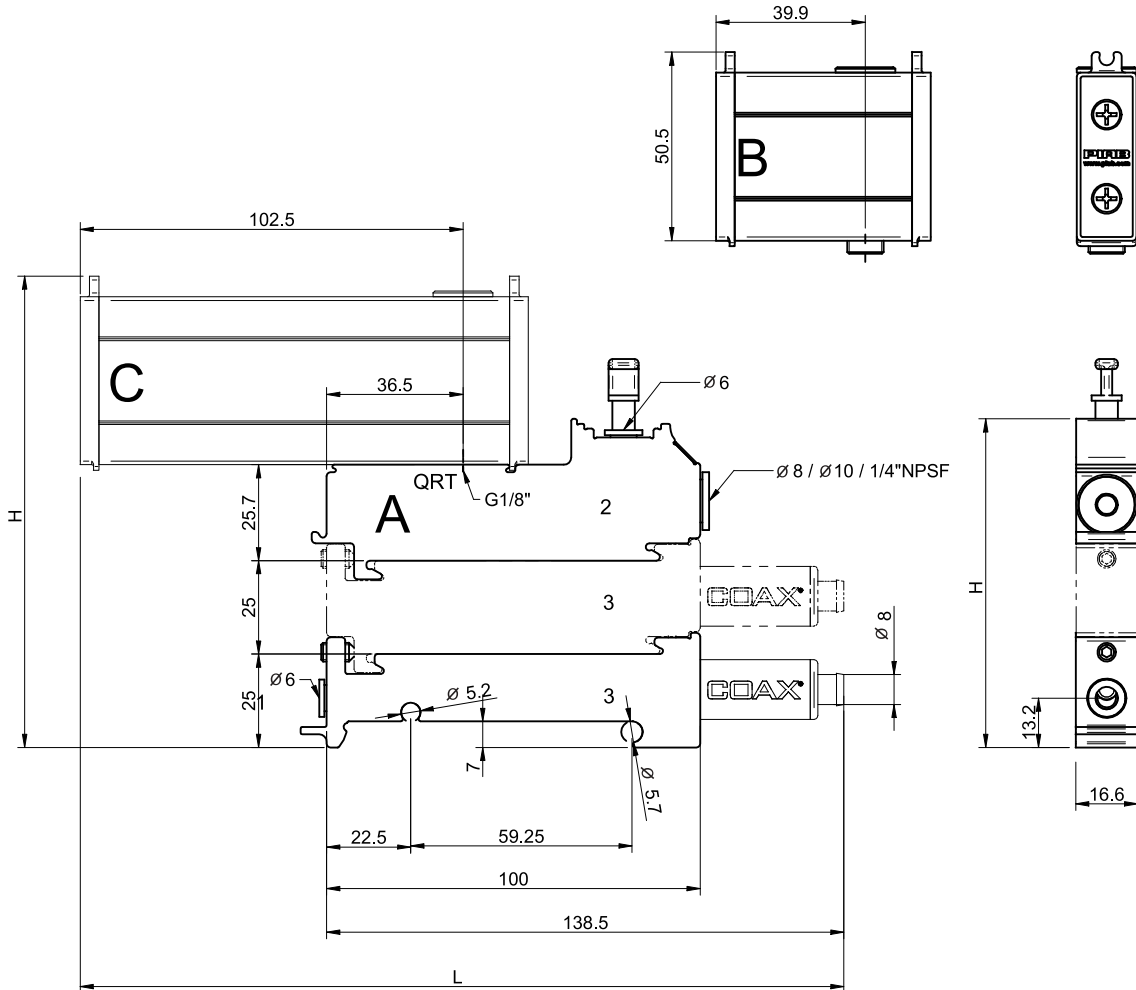
5. Select vacuum sensing	P3010 Code
No vacuum sensing	00
Vacuum switch, adjustable, PNP NO MM8	01
Vacuum switch, adjustable, NPN NO MM8	02
Vacuum switch, adjustable, PNP NO LM8	05
Vacuum switch, adjustable, PNP NO DM8	09
Vacuum switch, adjustable, NPN NO DM8	10
Vacuum switch inductive, adjustable with knob	11
Vacuum switch VS4015 Ø6, 30 -kPa	18
Vacuum switch VS4015 Ø6, 50 -kPa	19
Vacuum switch VS4015 Ø6, 70 -kPa	20

For detailed information on vacuum switches, see separate datasheets.

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, no vacuum sensing	P3010.00.AE.04.AA.00



	A	B	C
1x COAX® Cartridge	H=63	H=102	H=102
2x COAX® Cartridge	H=88	H=127	H=127
Length (L)	L=139	L=142	L=205



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Energy saving



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Integrated air-saving function (ES Vacustat) that minimizes the air consumption by controlling the incoming air flow to the pump.
- ▶ Large hysteresis is recommended for sealed vacuum handling applications such as metal sheet, glass or plastic handling.
- ▶ Small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process.
- ▶ Adjustable ES switch level.
- ▶ Pneumatic function.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dB(A)	66-68
Temperature range	°C	-10-50
Weight	g	197-349
Material		PP, PA, NBR, Al, SS
Signal range	-kPa	15-99
Function		2/2 NO
Flow at P1=6 bar and Δp=0.5 bar	NI/s	7.3
kv		10
Life span	cycles	>10,000,000

### Performance tables

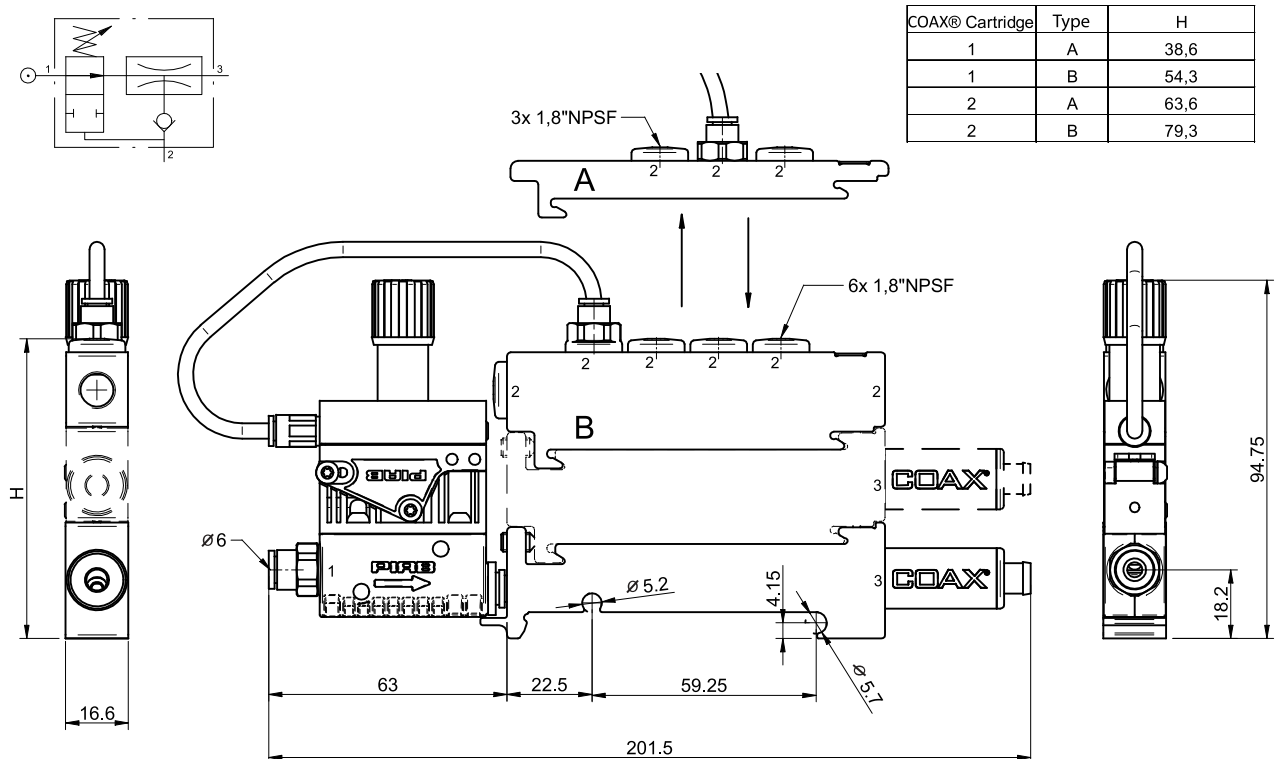
Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

## Ordering information

<b>1. Select housing</b>		<b>P3010 Code</b>
Housing, connection $\varnothing=6$ mm		00
<b>2. COAX® cartridge modules</b>		<b>P3010 Code</b>
COAX® cartridge module Pi12-3FSx1, non-return valve		AF
COAX® cartridge module Pi12-3FSx2, non-return valve		AH
COAX® cartridge module Si08-3FSx1, non-return valve		AB
COAX® cartridge module Si08-3FSx2, non-return valve		AD
COAX® cartridge module Xi10-3FSx1, non-return valve		AJ
COAX® cartridge module Xi10-3FSx2, non-return valve		AL
<b>3. Select connection and function module</b>		<b>P3010 Code</b>
B	Connection module high 6x1/8"	01
A	Connection module low 3x1/8"	02
<b>4. Select ES</b>		<b>P3010 Code</b>
ES Vacustat 2/2 NO, large hysteresis		AC
ES Vacustat 2/2 NO, small hysteresis		AD
<b>5. Select vacuum sensing</b>		<b>P3010 Code</b>
No vacuum sensing		00
Vacuum switch VS4016 G1/8" male, 30 -kPa		21
Vacuum switch VS4016 G1/8" male, 50 -kPa		22
Vacuum switch VS4016 G1/8" male, 70 -kPa		23

For detailed information on VS4016, see separate datasheet.

<b>Example</b>	<b>Ordering number</b>
Housing, connection $\varnothing$ 6 mm Pi12-3FSx1, non-return valve, Connection module high 6x1/8", ES Vacustat 2/2 NO, large hysteresis, no vacuum sensing	P3010.00.AF.01.AC.00



COAX® Cartridge	Type	H
1	A	38,6
1	B	54,3
2	A	63,6
2	B	79,3

## Ordering information, accessories

<b>Description</b>	<b>Art. No.</b>
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Solenoid Valve



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ DS 23 3/2 valve suitable for compressed air, filtration 40µ
- ▶ 2.5 W solenoid
- ▶ Manual override
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ Slim, compact, configurable and modular design.
- ▶ Low weight.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Feed pressure	MPa	0.2-0.6
Material		PP, PA, NBR, Al, SS, Ni, POM, CuZn
Working temperature	°C	-10-50
Weight	g	210-485
Connection compressed air		D=6
Connection exhaust		D=6
Supply voltage	VDC	24
Safety classification, DIN (c) socket		IP65
Display		LED
Flow, nominal	NI/s	1.3
kv		1.2
Lifespan, mechanical	cycles	100,000,000
Power consumption	W	2.5
Load time rating	%	100
Electrical connection		DIN (c) socket

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL



3. Select connection and function module		P3010 Code
B	Connection module high 6x1/8"	01
A	Connection module low 3x1/8"	02
	Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
	Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
	Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
	Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
	Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
	Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

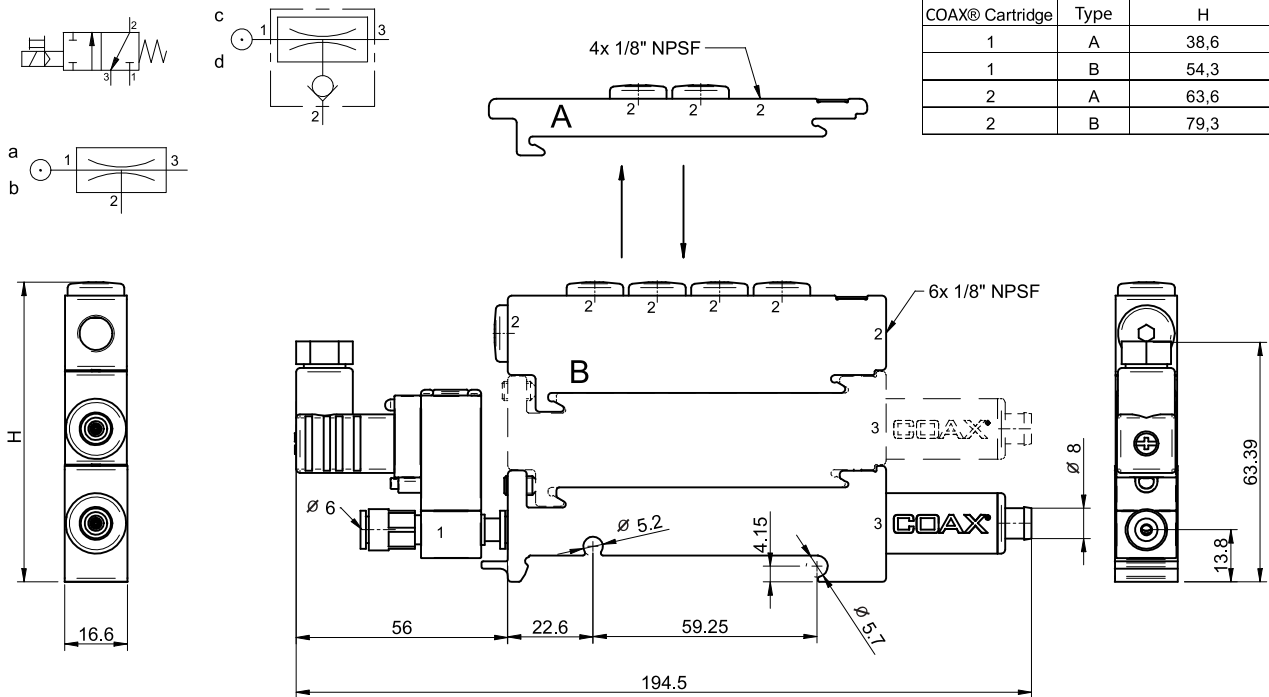
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
Valve DS23	AB

5. Select vacuum sensing	P3010 Code
No vacuum sensing	00
Vacuum switch, adjustable, PNP NO MM8	01
Vacuum switch, adjustable, NPN NO MM8	02
Vacuum switch, adjustable, PNP NO LM8	05
Vacuum switch, adjustable, PNP NO DM8	09
Vacuum switch, adjustable, NPN NO DM8	10
Vacuum switch inductive, adjustable with knob	11
Vacuum switch VS4015 Ø6, 30 -kPa	18
Vacuum switch VS4015 Ø6, 50 -kPa	19
Vacuum switch VS4015 Ø6, 70 -kPa	20
Vacuum switch VS4016 G1/8" male, 30 -kPa	21
Vacuum switch VS4016 G1/8" male, 50 -kPa	22
Vacuum switch VS4016 G1/8" male, 70 -kPa	23

For detailed information on vacuum switches, see separate datasheets.

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Connection module high 6 x 1/8", Solenoid valve DS23, no vacuum sensing	P3010.00.AE.01.AB.00



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, adjustable with analogue output



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ 1 output NO and 1 analogue output.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max (switch)	MPa	0.2
Vacuum range	-kPa	0-100
Material		PP, PA, AI, PC, POM, NBR, SS
Temperature range	°C	-10-50
Weight	g	218-470
Function		NO, NPN/PNP
Hysteresis	%	1-15
Supply voltage	VDC	10.8-30
Voltage output	VDC	1-5
Safety classification		IP40
Analogue output, current max. (load resistance min. 5kΩ)	mA	1
Humidity	% RH	35-85
Response time	ms	2
Accuracy at 25°C		±3% F.S.
Current consumption, max	mA	17
High-voltage resistant	VAC	500
Insulation at 500 VDC	MOhm	100
Vibration resistance, 1,5 mm, XYZ, 2 h	Hz	10-500
Electric connection		M8 4 pin male
Current output, max	mA	80

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

3. Select connection and function module	P3010 Code
Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

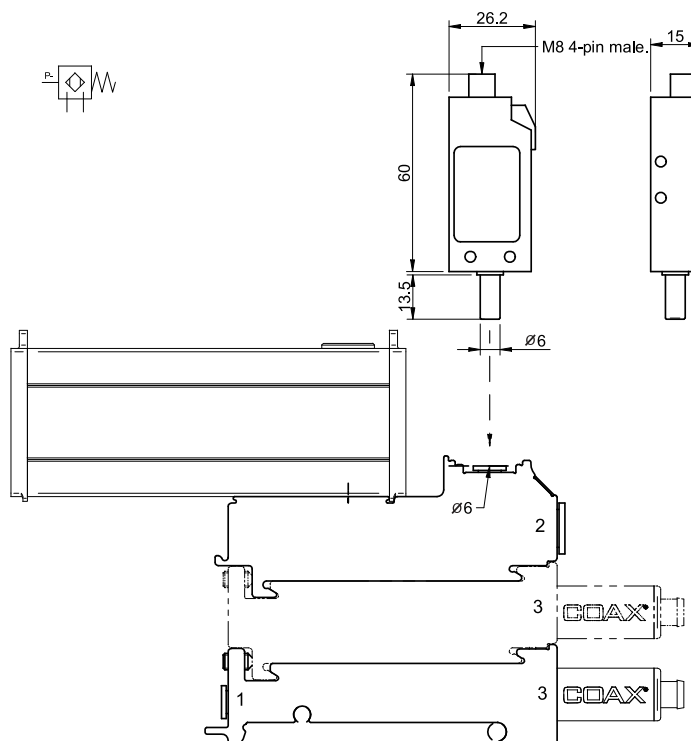
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch, adjustable, PNP NO MM8	01
Vacuum switch, adjustable, NPN NO MM8	02

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, Vacuum switch PNP NO MM8	P3010.00.AE.04.AA.01



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, adjustable with 1 output



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max. (switch)	MPa	0.2
Vacuum range	-kPa	0-100
Material		PP, PA, PC, Al, NBR, SS
Temperature range	°C	-10-50
Weight	g	174-426
Function		NO
Hysteresis		±2% F.S.
Voltage supply	VDC	10.8-30
Safety classification		IP40
Humidity	%RH	35-85
Response time, approx.	ms	1
Accuracy, at 25°C		±3% F.S.
Current consumption, max	mA	20
High-voltage resistance	VDC	500
Insulation at 500 VDC	MOhm	100
Vibration resistance, 1.5 mm, XYZ, 2 h	Hz	10-55
Current output, max	mA	80

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

3. Select connection and function module	P3010 Code
Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

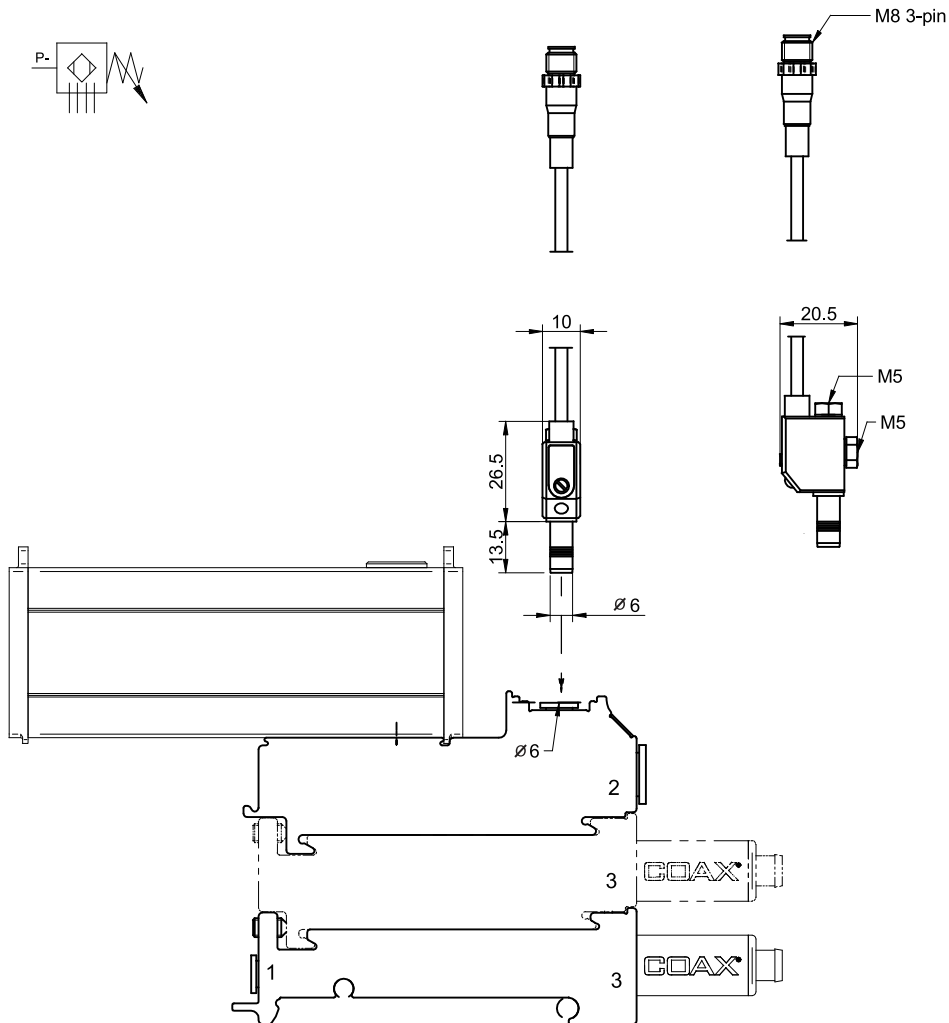
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch, adjustable, PNP NO LM8	05

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, Vacuum switch PNP NO LM8	P3010.00.AE.04.AA.05



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, adjustable with LED-Display



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max. (switch)	MPa	0.2
Vacuum range	-kPa	0-100
Material		PP, PA, PC, POM, NBR, Al, SS
Temperature range	°C	-10-50
Weight	g	220-472
Function		2 NO, NPN/PNP
Hysteresis	kPa	2
Voltage supply	VDC	12-24
Dielectric strength, 1 min	VAC	500
Safety classification		IP40
Humidity	%RH	35-85
Response time	ms	2
Accuracy at 25°C		±3% F.S
Current consumption, maximum	mA	35
Insulation resistance, at 500 VDC	MO/MW	100
Display		2-digits LED
Current output, max.	mA	80

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

3. Select connection and function module	P3010 Code
Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

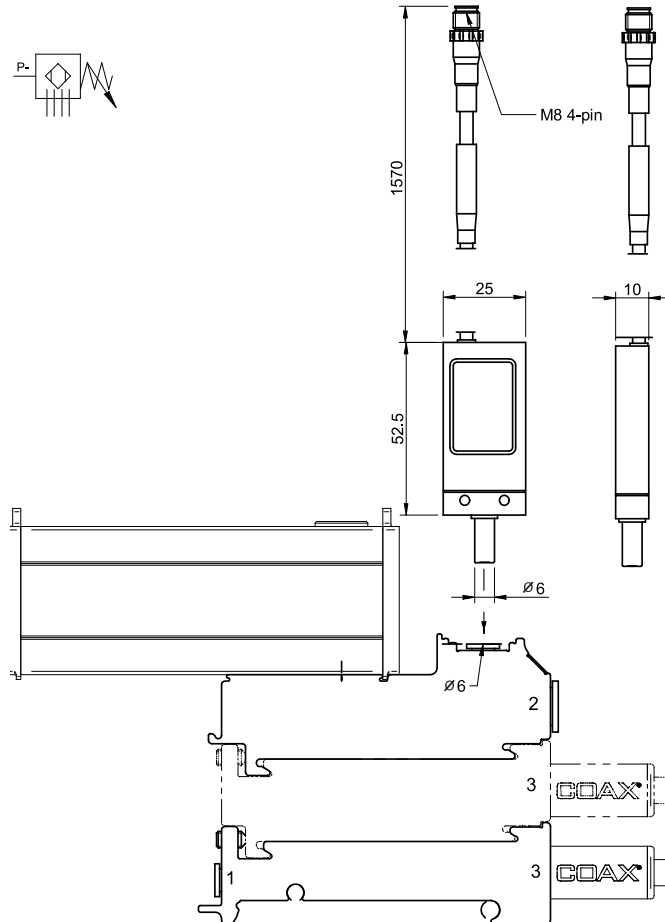
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch, adjustable, PNP NO DM8	09
Vacuum switch, adjustable, NPN NO DM8	10

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, Vacuum switch PNP NO DM8	P3010.00.AE.04.AA.09



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, inductive universal



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Adjustable vacuum switch is actuated at a set vacuum level and set by a knob.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max (switch)	MPa	0.6
Material		PP, PBTP, PVC, PA, SS, NBR, POM, AI, CuZn
Temperature range	°C	-10-50
Weight	g	233-485
Function		PNP NO, PNP NC, NPN NO and NPN NC
Hysteresis	kPa	2
Cable		2 x 0.14 mm <sup>2</sup> x 2m
Supply voltage	VDC	24 (5-36)
Safety classification		IP67
Current Output, max	mA	200
Voltage drop, max	VDC	4.6

The switch must be connected in series with the load.

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL



3. Select connection and function module	P3010 Code
Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

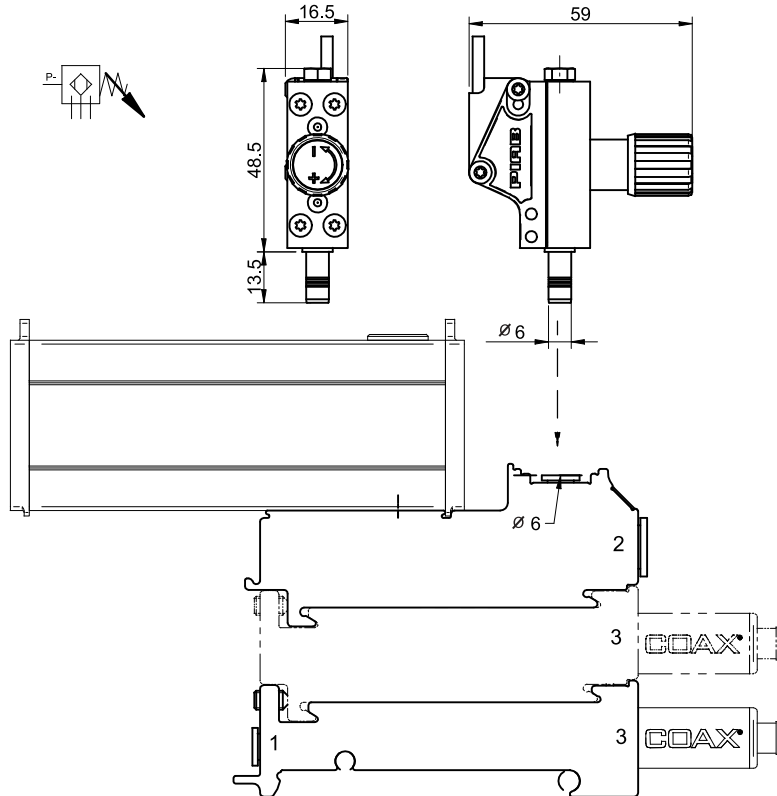
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch inductive, adjustable with knob	11

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, Vacuum switch inductive, adj. knob	P3010.00.AE.04.AA.11



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, mini, pre-set, push-in



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Electromechanical vacuum switch with digital output.
- ▶ Built-in red LED that indicates status.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max (switch)	MPa	0.2
Material		PP, PA, Al, , NBR, TPU, SS, CuZn(Au)
Temperature range	°C	-10-50
Weight	g	173-425
Signal range	-kPa	30, 50 or 70 +5/-3
Function		PNP NO/NC, NPN NO/NC
Hysteresis	kPa	6 ± 1
Voltage	VDC	24 (12-30)
Safety classification		IP40
Current max	mA	100 inductive/400 resistive
Voltage drop, max (100mA/24V inductive load)	VDC	0.055
Response time	ms	4
Display		Red LED
Electric connection		M8 3-pin male

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® artridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

3. Select connection and function module	P3010 Code
Function Quick-release connection, 10 and 6 mm, 3 cm <sup>3</sup>	04
Function Quick-release connection, 8 and 6 mm, 30 cm <sup>3</sup>	05
Function Quick-release connection, 8 and 6 mm, 60 cm <sup>3</sup>	06
Function Quick-release connection, 10 and 6 mm, 30 cm <sup>3</sup>	07
Function Quick-release connection, 10 and 6 mm, 60 cm <sup>3</sup>	08
Function Quick-release connection, 1/4" NPSF and 6 mm, 3 cm <sup>3</sup>	09
Function Quick-release connection, 1/4" NPSF and 6 mm, 30 cm <sup>3</sup>	10
Function Quick-release connection, 1/4" NPSF and 6 mm, 60 cm <sup>3</sup>	11
Function Quick-release connection, 8 and 6 mm, 3 cm <sup>3</sup>	12

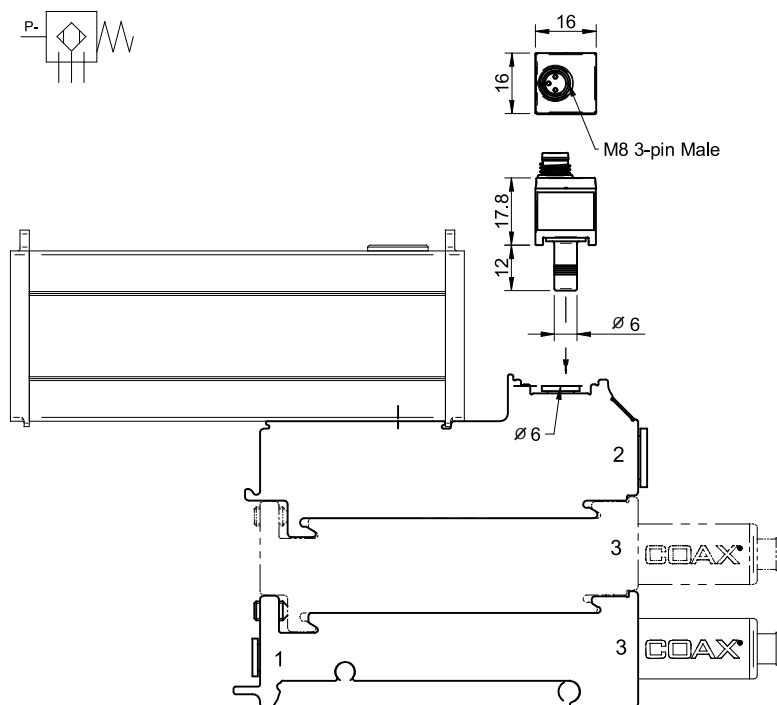
For detailed information on Quick-release, see separate datasheet.

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch VS4015 Ø6, 30 -kPa	18
Vacuum switch VS4015 Ø6, 50 -kPa	19
Vacuum switch VS4015 Ø6, 70 -kPa	20

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Function Quick-release module 10/6 3cm <sup>3</sup> , no energy saving, Vacuum switch VS4015 30 -kPa	P3010.00.AE.04.AA.18



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 Vacuum switch, mini, pre-set, threaded



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Electromechanical vacuum switch with digital output.
- ▶ Built-in red LED that indicates status.
- ▶ Includes a flow-through silencer and a built-in vacuum filter for harsh environments.
- ▶ High system reliability in case of fluctuating or low feed pressure.
- ▶ Suitable for fast and reliable evacuation in sealed systems.

### Technical data

Description	Unit	Value
Feed pressure, max. (pump)	MPa	0.7
Noise level	dBA	66-68
Pressure, max (switch)	MPa	0.2
Material		PP, PA, Al, , NBR, TPU, SS, CuZn(Au)
Temperature range	°C	-10-50
Weight	g	115-362
Signal range	-kPa	30, 50 or 70 +5/-3
Function		PNP NO/NC, NPN NO/NC
Hysteresis	kPa	6 ± 1
Voltage	VDC	24 (12-30)
Safety classification		IP40
Current max	mA	100 inductive/400 resistive
Voltage drop, max (100mA/24V inductive load)	VDC	0.055
Response time	ms	4
Display		Red LED
Electric connection		M8 3-pin male

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01

2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL

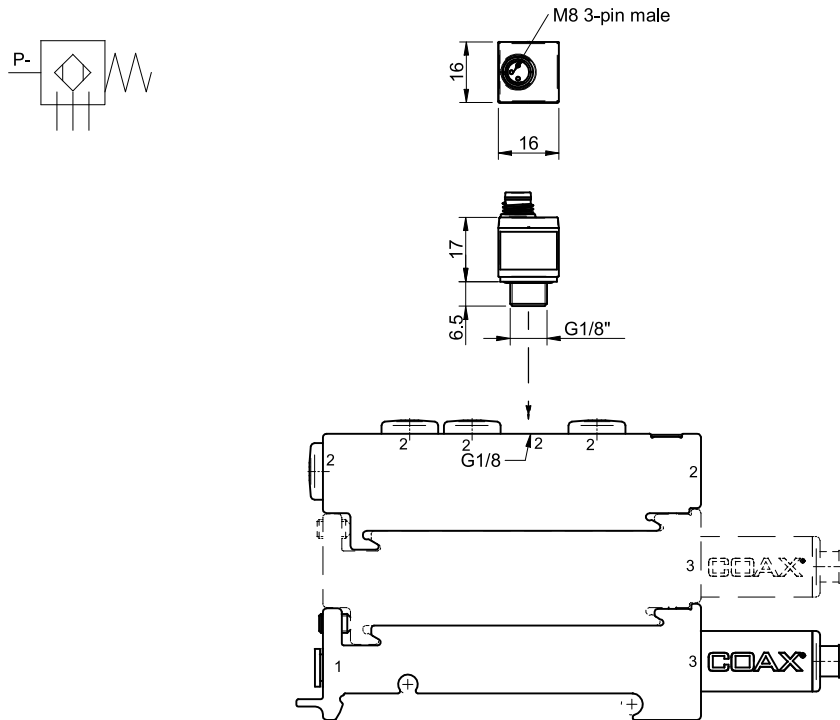
3. Select connection and function module	P3010 Code
Connection module high 6x1/8"	01
Connection module low 3x1/8"	02

4. Select ES	P3010 Code
No energy saving	AA
Valve DS23	AB

For detailed information on Valve DS 23, see separate datasheet.

5. Select vacuum sensing	P3010 Code
Vacuum switch VS4016 G1/8" male, 30 -kPa	21
Vacuum switch VS4016 G1/8" male, 50 -kPa	22
Vacuum switch VS4016 G1/8" male, 70 -kPa	23

Example	Ordering number
Housing, connection Ø 6 mm Pi12-3FSx1, Connection module high 6x1/8", no energy saving, Vacuum switch VS4016 30 -kPa	P3010.00.AE.01.AA.21



## Ordering information, accessories

Description	Art. No.
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 AVM™2



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ AVM™2, Automatic Vacuum Management, unit with built-in control and monitoring functions.
- ▶ Valves for vacuum on/off and blow-off.
- ▶ Special safety feature for the version with normally closed on/off valve. (E-stop).
- ▶ Analogue vacuum sensor with two digital outputs.
- ▶ Digital display with “-kPa” or “-inHg” as unit options.
- ▶ Integrated energy saving function (ES) that minimizes the air consumption in sealed systems. The ES function can be activated manually or via a signal (signal override).
- ▶ Three-colour LED status indicators for valves, signal outputs and ES.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	66-68
Material		PA, NBR, AI, SS, PMMA
Temperature range	°C	0-50
Weight	g	250-330
Signal range, adjustable	-kPa	20-80
Hysteresis	kPa	7±1
Voltage	VDC	24 (22-28)
Ripple, max.	V <sub>p</sub>	1V <sub>rms</sub>
Current consumption, nominal	mA	110
Safety classification		IP65 [NEMA 4]
Current, max. output load		100
Display		LED indicators, numeric
Flow. blow-off	NI/s	0-7.5

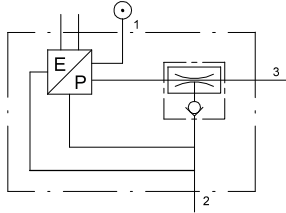
### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

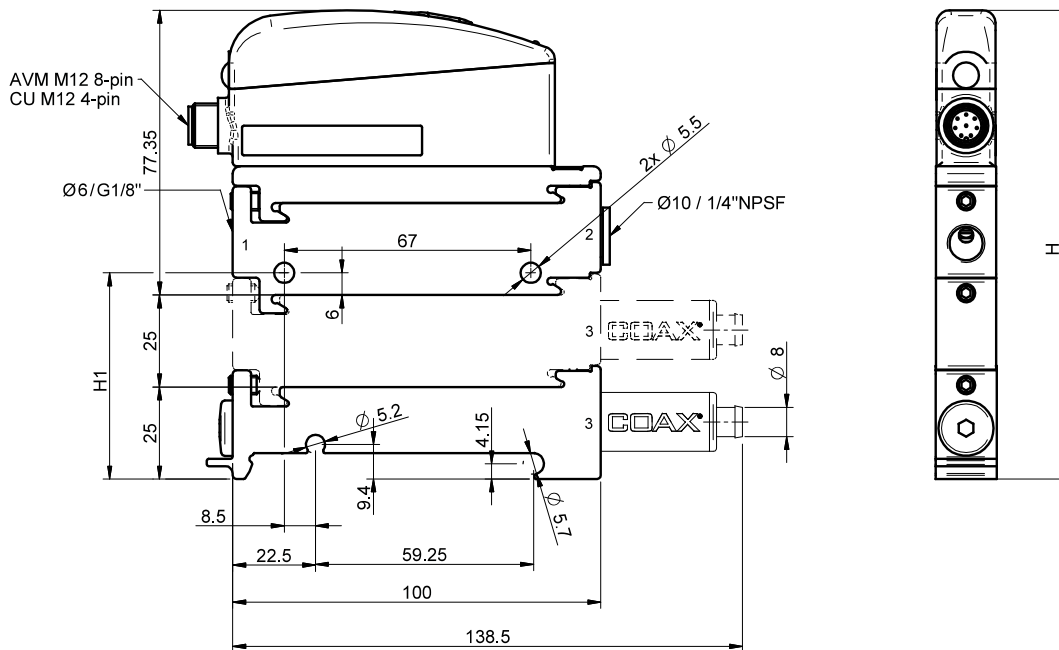
### Ordering information

1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01
2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2, non-return valve	AL
3. Select connection and function module	P3010 Code
Function AVM™2 NO G connection	27
Function AVM™2 NC G connection	28
4. Select ES	P3010 Code
No energy saving	AA

<b>5. Select vacuum sensing</b>	<b>P3010 Code</b>
No vacuum sensing	00
<b>Example</b>	<b>Ordering number</b>
Housing, connection 1/8" NPSF Pi12-3FSx1, non-return valve, Function AVM2 NO, no energy saving function, no vacuum sensing	P3010.01.AF.27.AA.00



COAX® Cartridge	H	H1
1	102,4	31
2	127,4	56



## Ordering information, accessories

Description	Art. No.
Cable M12 8-pin female, PUR, L=2m	0110238
Cable M12 8-pin female, PUR, L=5m	0117746
Y-cable M12 8-pin female, 2xM12 4-pin male, PNP, PUR, L=2m	0118407
Y-cable M12 8-pin female, 2xM12 5-pin male, NPN, PUR, L=2m	0120229
Y-cable MIL 18-pin male, 2xM12 8-pin female, PNP, L=0.3m	0113248
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## P3010 CU



- ▶ Patented multistage COAX® cartridge - MINI - with Pi, Si, Xi cartridge.
- ▶ Integrated Control Unit (CU) with electric valves for vacuum on-off and blow-off control.
- ▶ Mechanical valve for blow-off flow adjustment.
- ▶ Slim, compact, configurable and modular design.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	66-68
Material		PA, NBR, AI, SS, PMMA
Temperature range	°C	0-50
Weight	g	236-316
Voltage	VDC	24 (22-28)
Safety classification		IP65 [NEMA 4]
Humidity	%RH	90
Current consumption, nominal	mA	60
Ripple, max.	V <sub>p</sub>	1 V <sub>rms</sub>
Flow, blow-off	NI/s	0-7.5
Function, on/off		NC

### Performance tables

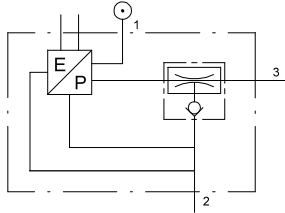
Depending upon choice of COAX® cartridge, performance data of the P3010 can be found in the tables for vacuum flow, evacuation time and blow flow on the P3010 or Vacuum cartridges/integration datasheets.

### Ordering information

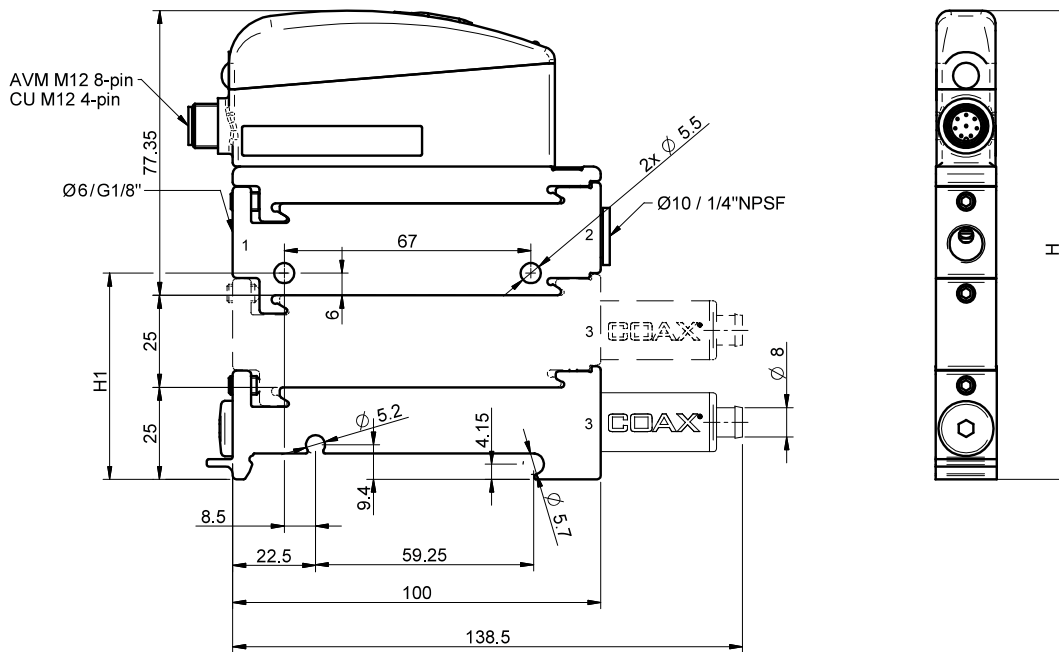
1. Select housing	P3010 Code
Housing, connection Ø=6 mm	00
Housing, connection 1/8" NPSF	01
2. COAX® cartridge modules	P3010 Code
COAX® cartridge module Pi12-3FSx1	AE
COAX® cartridge module Pi12-3FSx1, non-return valve	AF
COAX® cartridge module Pi12-3FSx2	AG
COAX® cartridge module Pi12-3FSx2, non-return valve	AH
COAX® cartridge module Si08-3FSx1	AA
COAX® cartridge module Si08-3FSx1, non-return valve	AB
COAX® cartridge module Si08-3FSx2	AC
COAX® cartridge module Si08-3FSx2, non-return valve	AD
COAX® cartridge module Xi10-3FSx1	AI
COAX® cartridge module Xi10-3FSx1, non-return valve	AJ
COAX® cartridge module Xi10-3FSx2	AK
COAX® cartridge module Xi10-3FSx2, non-return valve	AL
3. Select connection and function module	P3010 Code
Function CU NC G connection	29
4. Select ES	P3010 Code
No energy saving	AA



<b>5. Select vacuum sensing</b>	<b>P3010 Code</b>
No vacuum sensing	00
<b>Example</b>	<b>Ordering number</b>
Housing, connection 1/8" NPSF Pi12-3FSx1, Function CU NC, no energy saving function, no vacuum sensing	P3010.01.AE.29.AA.00



COAX® Cartridge	H	H1
1	102,4	31
2	127,4	56



### Ordering information, accessories

Description	Art. No.
Cable M12 4-pin female, LED indicator, PUR, L=5m	0118013
Sealing kit P3010, NBR	0104201

The sealing kit includes flap valves, compressed air filter and vacuum filter.

## L7



- ▶ Large vacuum flows
- ▶ Small size and low weight
- ▶ Good for handling porous materials or if leakage is present

Supplied with compressed-air hose connector.

### Technical data

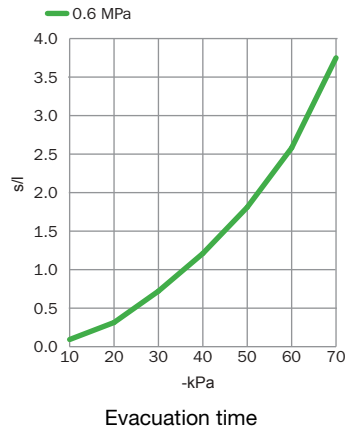
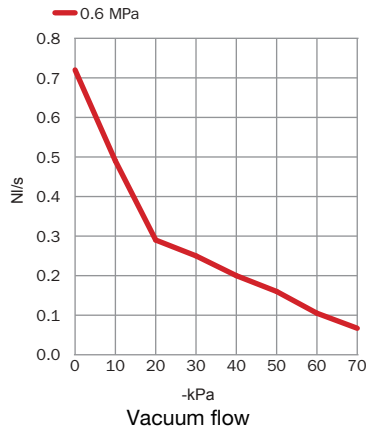
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	57–68
Temperature range	°C	-20–80
Weight	g	30
Material		PA, POM, NBR, SS

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.60	0.49	0.72	0.49	0.29	0.25	0.20	0.16	0.10	0.067	–	–	75

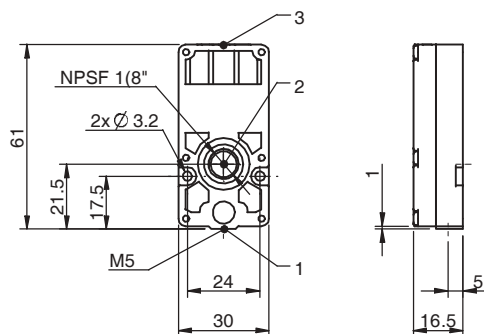
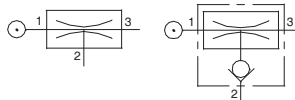
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.60	0.49	0.093	0.31	0.72	1.2	1.8	2.6	3.8	–	–	75



## Ordering information

Description	Art. No.
Vacuum pump MINI L7, conn. A, NBR sealings	0102853



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## L14



- ▶ Large vacuum flows
- ▶ Small size and low weight
- ▶ Good for handling porous materials or if leakage is present
- ▶ Available with connection plate in aluminium (B1) and composite PA (B, C)

Supplied with push-in hose connector for compressed air (for pumps with connection plate B).  
 Supplied with push-in hose connector for compressed air and external through-flow silencer (for pumps with connection plate C).

### Technical data

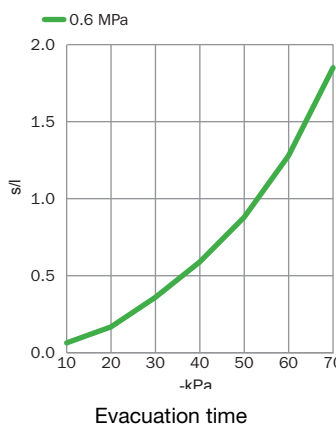
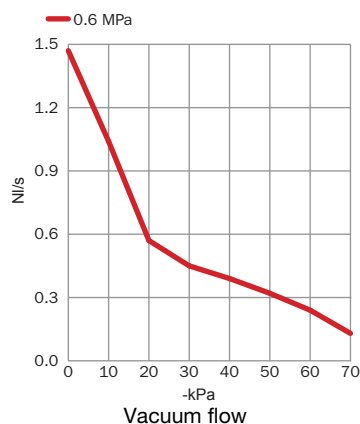
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dB(A)	57-68
Temperature range	°C	-20-80
Weight	g	35-60
Material		Al, ABS, PA, POM, SS, NBR

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.60	0.98	1.5	1.0	0.57	0.45	0.39	0.32	0.24	0.13	-	-	75

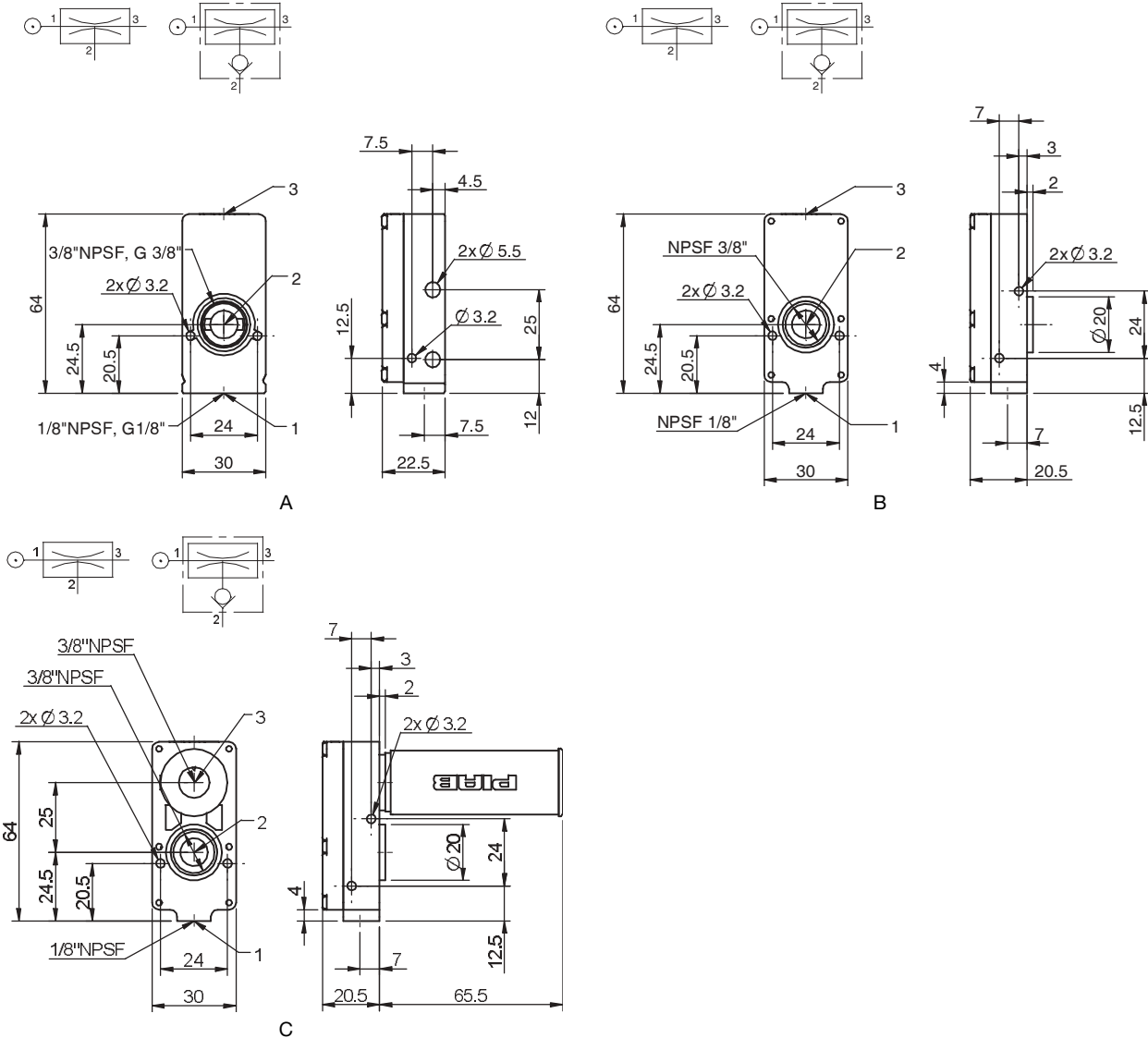
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.60	0.98	0.064	0.17	0.36	0.59	0.88	1.3	1.8	-	-	75



## Ordering information

	Description	Art. No.
A	Vacuum pump MINI L14, conn. B1, NBR sealings	0102831
A	Vacuum pump MINI L14, conn. B1, NBR sealings, non-return valve	0102832
B	Vacuum pump MINI L14, conn. B, NBR sealings	0103055
C	Vacuum pump MINI L14, conn. C, NBR sealings	0102743



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## L28



- ▶ Large vacuum flows
- ▶ Small size and low weight
- ▶ Good for handling porous materials or if leakage is present
- ▶ Available with connection plate in aluminium (B1) and composite PA (B, C)

Supplied with push-in hose connector for compressed air (for pumps with connection plate B).  
 Supplied with push-in hose connector for compressed air and external through-flow silencer (for pumps with connection plate C).

### Technical data

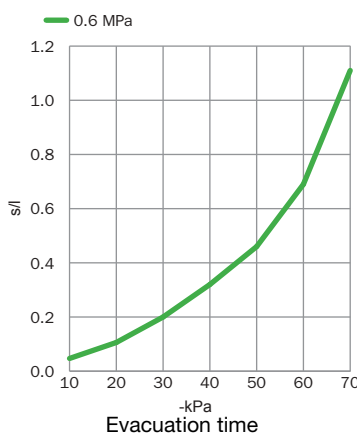
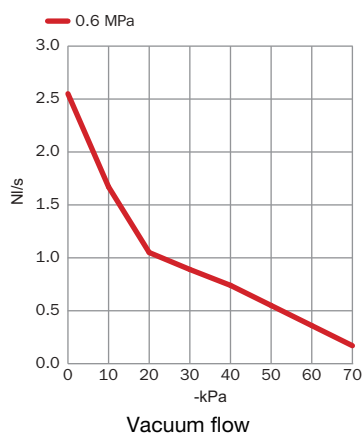
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dB(A)	57-68
Temperature range	°C	-20-80
Weight	g	60-74
Material		Al, ABS, PA, POM, SS, NBR

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.60	2.0	2.6	1.7	1.1	0.89	0.74	0.55	0.36	0.17	-	-	75

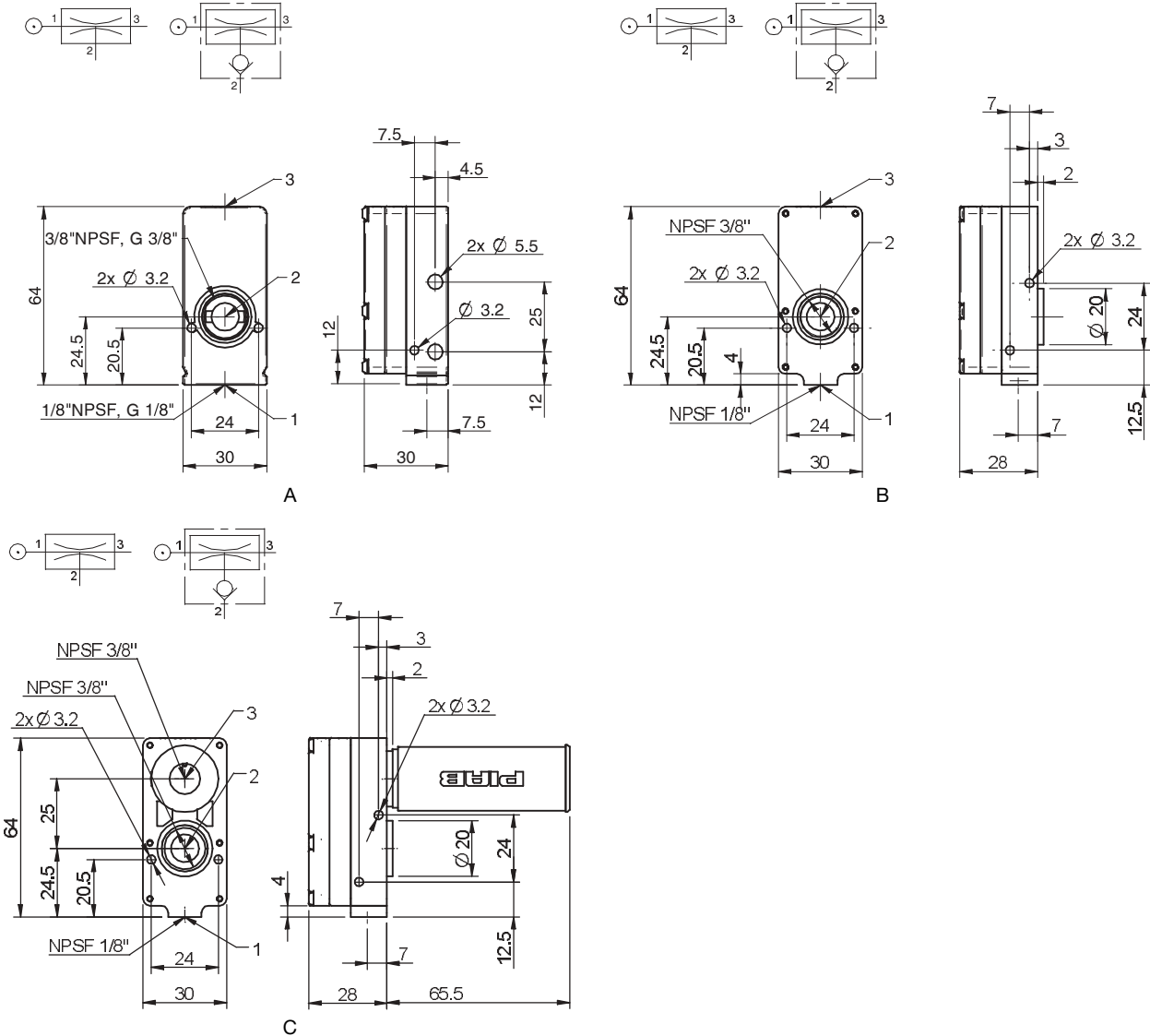
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.60	2.0	0.047	0.11	0.20	0.32	0.46	0.69	1.1	-	-	75



## Ordering information

	Description	Art. No.
A	Vacuum pump MINI L28, conn. B1, NBR sealings	0102833
A	Vacuum pump MINI L28, conn. B1, NBR sealings, non-return valve	0102834
B	Vacuum pump MINI L28, conn. B, NBR sealings	0103061
B	Vacuum pump MINI L28, conn. B, NBR sealings, non-return valve	0103062
C	Vacuum pump MINI L28, conn. C, NBR sealings	0102749
C	Vacuum pump MINI L28, conn. C, NBR sealings, non-return valve	0102750



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## M5L



- ▶ Medium vacuum levels to 90 -kPa
- ▶ Small size and low weight
- ▶ Operates at only 0.38 MPa

Supplied with compressed-air hose connector.

### Technical data

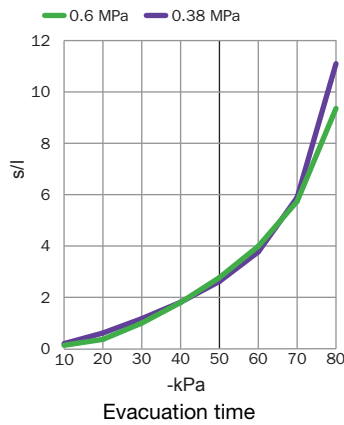
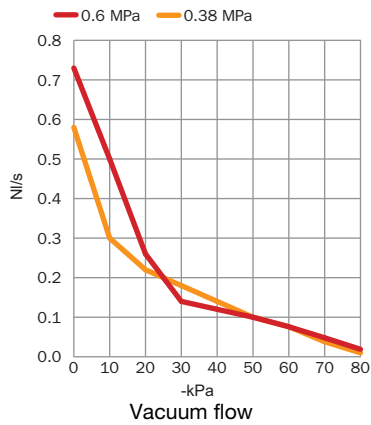
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	57–68
Temperature range	°C	-20–80
Weight	g	30
Material		PA, POM, NBR, SS

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.60	0.55	0.73	0.50	0.26	0.14	0.12	0.10	0.080	0.050	0.020	–	84	
0.38	0.38	0.58	0.30	0.22	0.18	0.14	0.10	0.080	0.040	0.010	–	81	

### Evacuation time

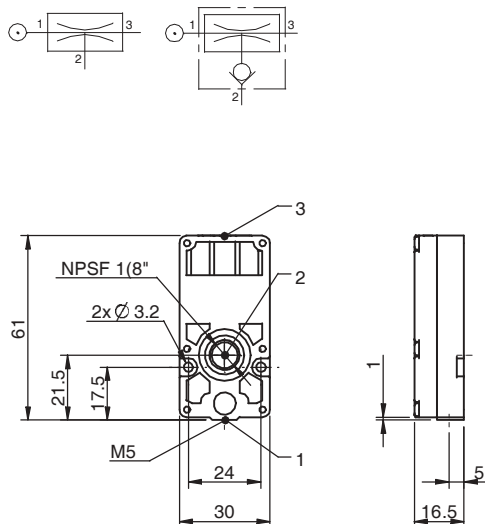
Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.60	0.55	0.13	0.36	1.0	1.8	2.8	4.0	5.7	9.4	–	84	
0.38	0.38	0.20	0.61	1.2	1.8	2.6	3.8	5.9	11.1	–	81	





## Ordering information

Description	Art. No.
Vacuum pump MINI M5L, conn. A, NBR sealings	0102865
Vacuum pump MINI M5L, conn. A, NBR sealings, non-return valve	0102866



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## M10L



- ▶ Medium vacuum levels to 90 -kPa
- ▶ Small size and low weight
- ▶ Operates at only 0.38 MPa

Supplied with compressed-air hose connector.

### Technical data

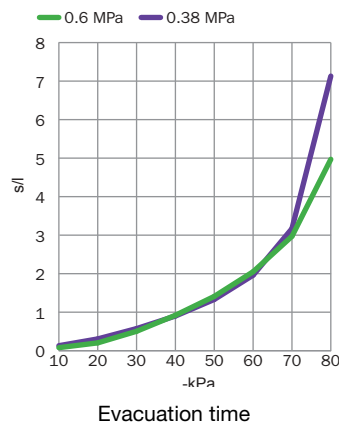
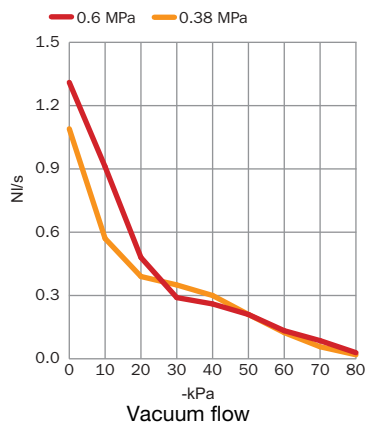
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	57–68
Temperature range	°C	-20–80
Weight	g	30
Material		PA, POM, NBR, SS

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.60	1.1	1.3	0.91	0.48	0.29	0.26	0.21	0.13	0.090	0.030	–	84	
0.38	0.76	1.1	0.57	0.39	0.35	0.30	0.21	0.12	0.060	0.020	–	81	

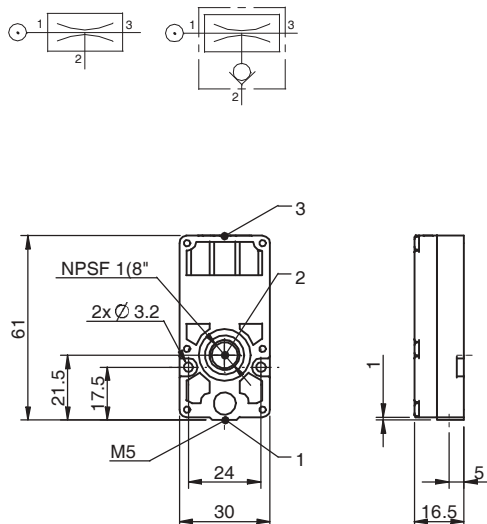
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.60	1.1	0.079	0.20	0.50	0.92	1.4	2.1	3.0	5.0	–	84	
0.38	0.76	0.13	0.31	0.57	0.90	1.3	2.0	3.2	7.1	–	81	



## Ordering information

Description	Art. No.
Vacuum pump MINI M10L, conn. A, NBR sealings	0102871
Vacuum pump MINI M10L, conn. A, NBR sealings, non-return valve	0102872



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## M20L



- ▶ Medium vacuum levels to 90 -kPa
- ▶ Small size and low weight
- ▶ Operates at only 0.38 MPa
- ▶ Available with connection plate in aluminium (B1) and composite PA (B, C)

Supplied with push-in hose connector for compressed air (for pumps with connection plate B).  
 Supplied with push-in hose connector for compressed air and external through-flow silencer (for pumps with connection plate C).

### Technical data

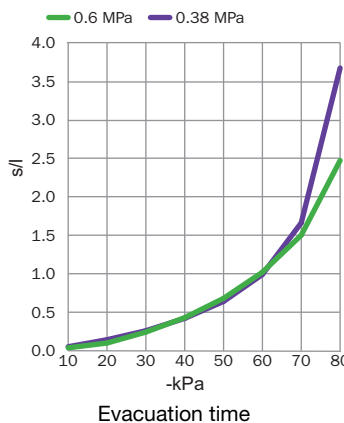
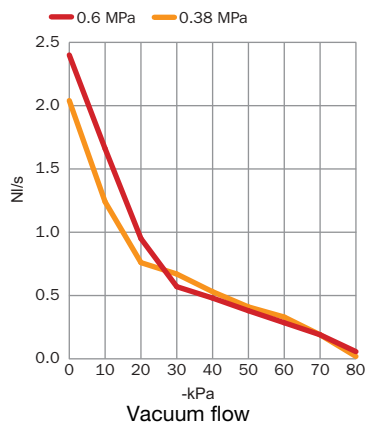
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	57-68
Temperature range	°C	-20-80
Weight	g	60-74
Material		Al, ABS, PA, POM, SS, NBR

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.60	2.2	2.4	1.7	0.95	0.57	0.48	0.38	0.29	0.19	0.060	-	84	
0.38	1.5	2.0	1.2	0.76	0.67	0.53	0.41	0.33	0.19	0.020	-	81	

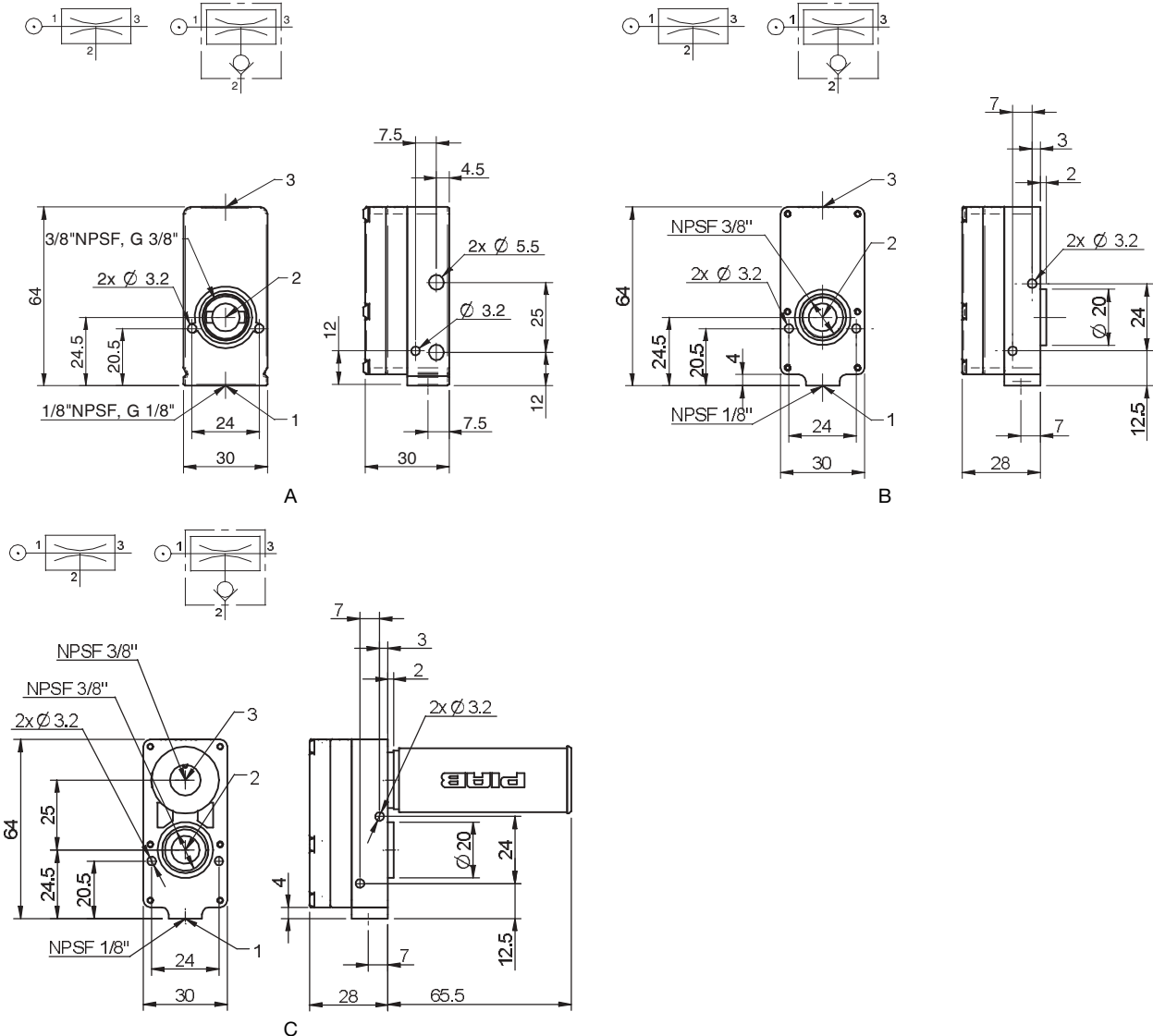
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.60	2.2	0.038	0.10	0.24	0.43	0.68	1.0	1.5	2.5	-	84	
0.38	1.5	0.052	0.14	0.26	0.42	0.64	1.0	1.7	3.7	-	81	



## Ordering information

	Description	Art. No.
A	Vacuum pump MINI M20L, conn. B1, NBR sealings	0102839
A	Vacuum pump MINI M20L, conn. B1, NBR sealings, non-return valve	0102840
B	Vacuum pump MINI M20L, conn. B, NBR sealings	0103079
B	Vacuum pump MINI M20L, conn. B, NBR sealings, non-return valve	0103080
C	Vacuum pump MINI M20L, conn. C, NBR sealings	0102767
C	Vacuum pump MINI M20L, conn. C, NBR sealings, non-return valve	0102768



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## X5L



- ▶ Extra vacuum level to 93 -kPa
- ▶ Small size and low weight
- ▶ Use in tightly sealed or non-porous applications

Supplied with compressed-air hose connector.

### Technical data

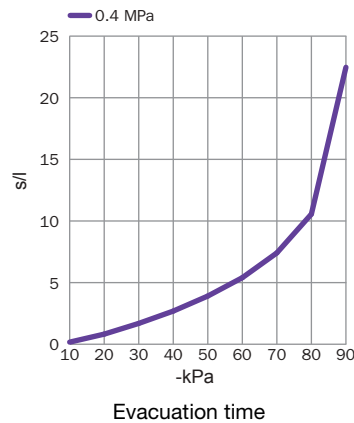
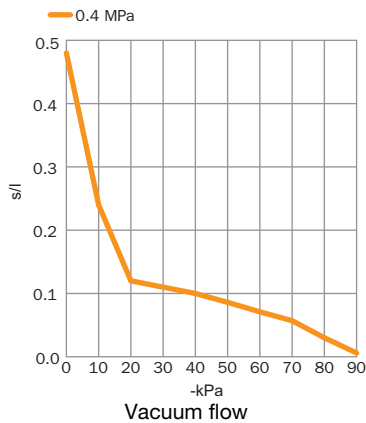
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	62–66
Temperature range	°C	-20–80
Weight	g	30
Material		PA, POM, NBR, SS

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90		
0.40	0.39	0.48	0.24	0.12	0.11	0.10	0.086	0.071	0.057	0.030	0.006	93	

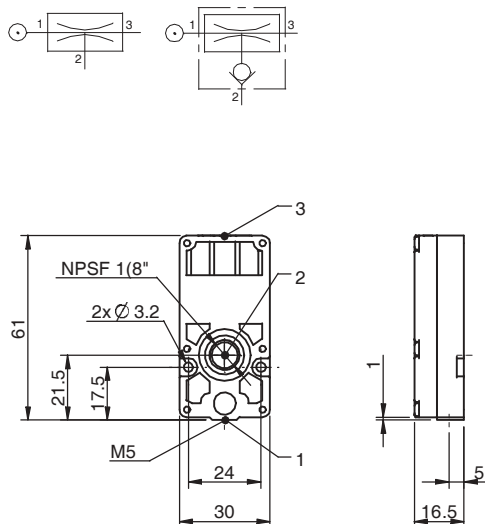
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
		10	20	30	40	50	60	70	80	90		
0.40	0.39	0.17	0.82	1.7	2.7	3.9	5.4	7.4	10.6	22.5	93	



## Ordering information

Description	Art. No.
Vacuum pump MINI X5L, conn. A, NBR sealings	3222127
Vacuum pump MINI X5L, conn. A, NBR sealings, non-return valve	3222127A



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## X10L



- ▶ Extra vacuum level to 93 -kPa
- ▶ Small size and low weight
- ▶ Use in tightly sealed or non-porous applications

Supplied with compressed-air hose connector.

### Technical data

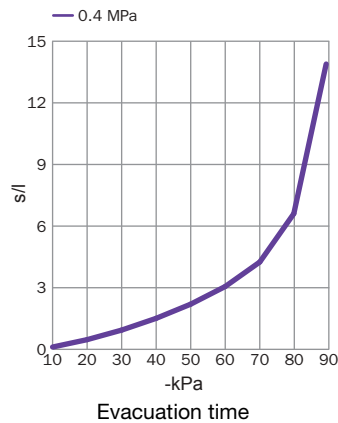
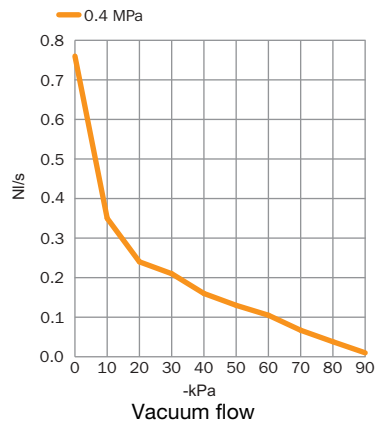
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	62–66
Temperature range	°C	-20–80
Weight	g	30
Material		PA, POM, NBR, SS

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.40	0.79	0.76	0.35	0.24	0.21	0.16	0.13	0.10	0.070	0.040	0.010	93

### Evacuation time

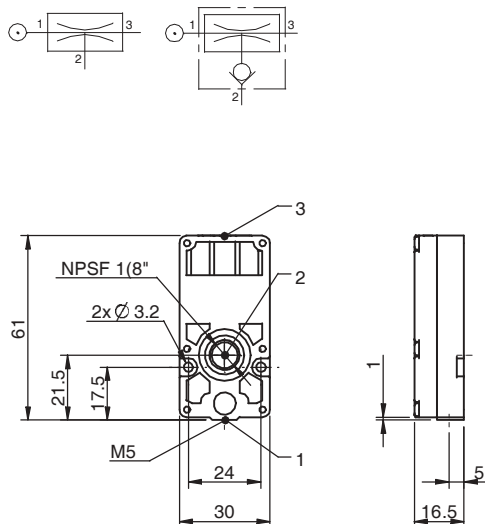
Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.40	0.79	0.11	0.47	0.94	1.5	2.2	3.1	4.3	6.6	14.0	93





## Ordering information

Description	Art. No.
Vacuum pump MINI X10L, conn. A, NBR sealings	3222157
Vacuum pump MINI X10L, conn. A, NBR sealings, non-return valve	3222157A



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## X20L



- ▶ Extra vacuum level to 93 -kPa
- ▶ Small size and low weight
- ▶ Use in tightly sealed or non-porous applications
- ▶ Available with connection plate in aluminium (B1) and composite PA (B, C)

Supplied with push-in hose connector for compressed air (for pumps with connection plate B).  
Supplied with push-in hose connector for compressed air and external through-flow silencer (for pumps with connection plate C).

### Technical data

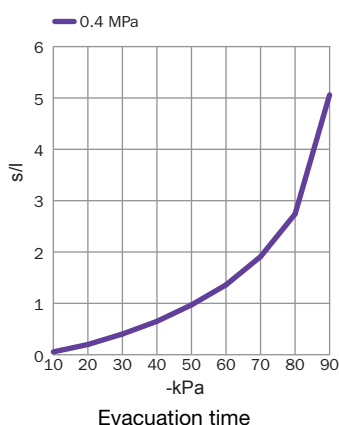
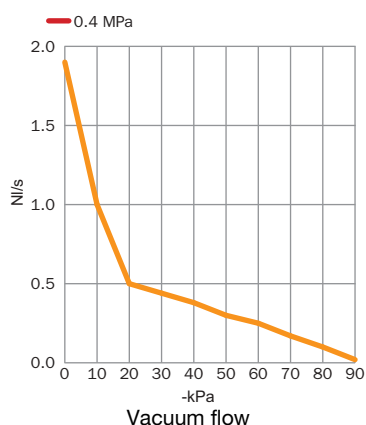
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	62-66
Temperature range	°C	-20-80
Weight	g	60-74
Material		Al, ABS, PA, POM, SS, NBR

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80	90	
0.40	1.6	1.9	1.0	0.50	0.44	0.38	0.30	0.25	0.17	0.10	0.020	93

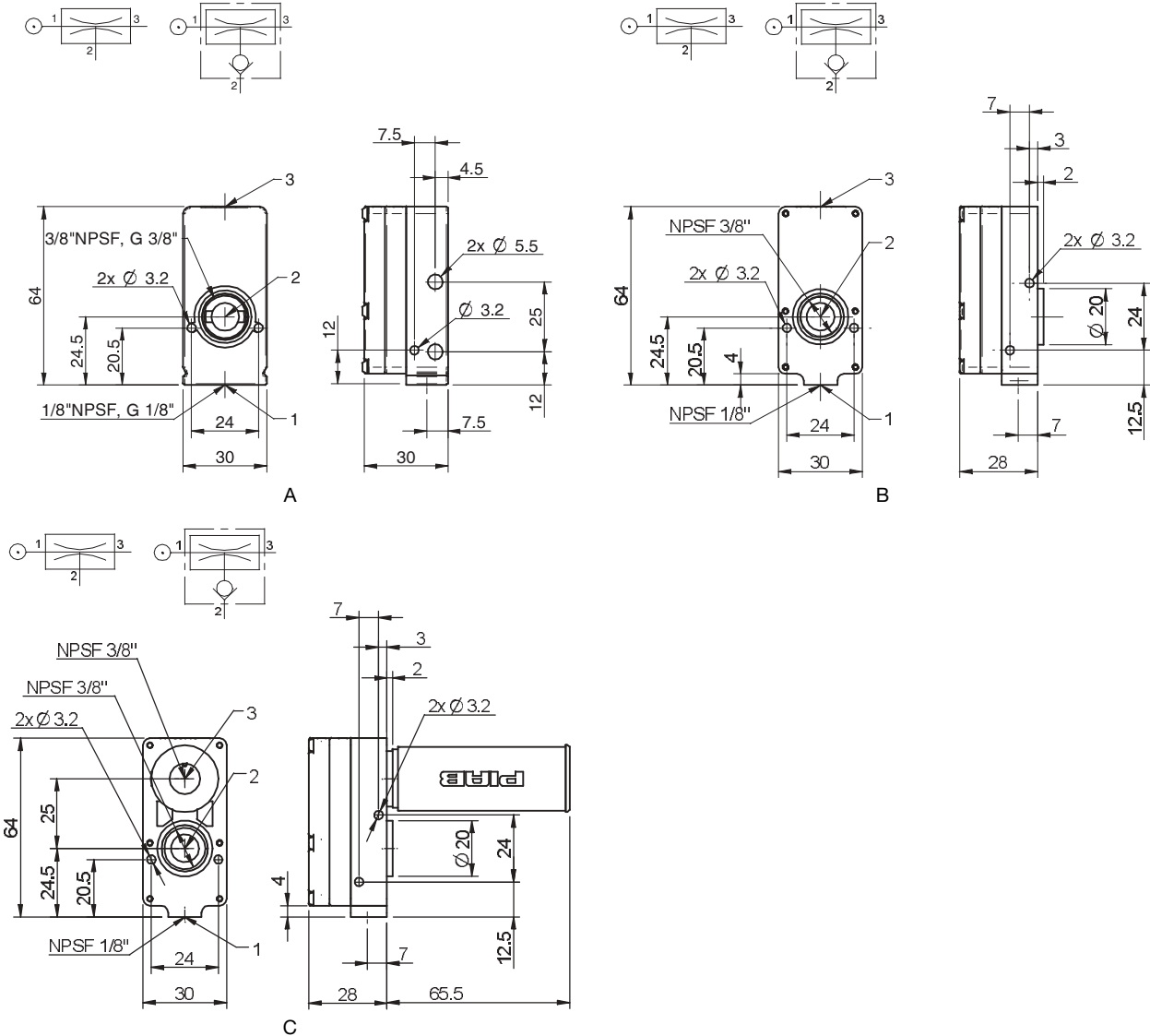
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
		10	20	30	40	50	60	70	80	90	
0.40	1.6	0.055	0.20	0.40	0.65	0.97	1.4	1.9	2.7	5.1	93



## Ordering information

	Description	Art. No.
A	Vacuum pump MINI X20L, conn. B1, NBR sealings	0103203
A	Vacuum pump MINI X20L, conn. B1, NBR sealings, non-return valve	0103204
B	Vacuum pump MINI X20L, conn. B, NBR sealings	3222278
B	Vacuum pump MINI X20L, conn. B, NBR sealings, non-return valve	3222278A
C	Vacuum pump MINI X20L, conn. C, NBR sealings	3222279
C	Vacuum pump MINI X20L, conn. C, NBR sealings, non-return valve	3222279A



## Ordering information, accessories

Description	Art. No.
Sealing kit MINI 5-28, NBR	3201097
Sealing kit MINI 5-28, Viton®	3201097V
Sealing kit MINI 5-28, EPDM	3201097E

Sealing kits include flap valves, gaskets and compressed-air filters.

## piINLINE® MIDI



piINLINE® Patent Pending

- ▶ Patented COAX® cartridge technology.
- ▶ High vacuum flow capacity in relation to energy consumption.
- ▶ Low weight inline design with push-in fittings for vacuum and compressed air.
- ▶ Quick and easy installation directly on the hose.
- ▶ Si cartridge for extra vacuum flow.
- ▶ Pi cartridge for high performance at low feed pressures.
- ▶ Xi cartridge when high flow and deep vacuum is needed.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		PA, NBR, SS, CuZn
Temperature range	°C	-10-80

### Technical data, specific

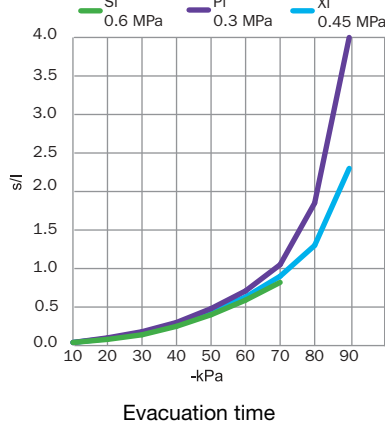
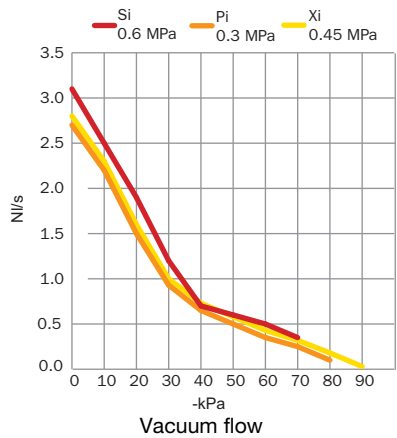
Description	Unit	Value		
		Si8-12	Pi8-12	Xi8-12
Noise level, min-max	dBA	90-98	90-98	93-99
Weight	g	87	87	87
Connection, vacuum	mm	12	12	12
Connection, compressed air	mm	8	8	8

## Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90		
Si	0.6	1.75	3.10	2.50	1.90	1.20	0.70	0.60	0.50	0.35	—	—	75	
Pi	0.3	2.00	2.70	2.20	1.50	0.93	0.65	0.50	0.35	0.25	0.10	—	90	
Xi	0.45	1.83	2.80	2.30	1.60	1.00	0.73	0.58	0.43	0.32	0.18	0.03	95	

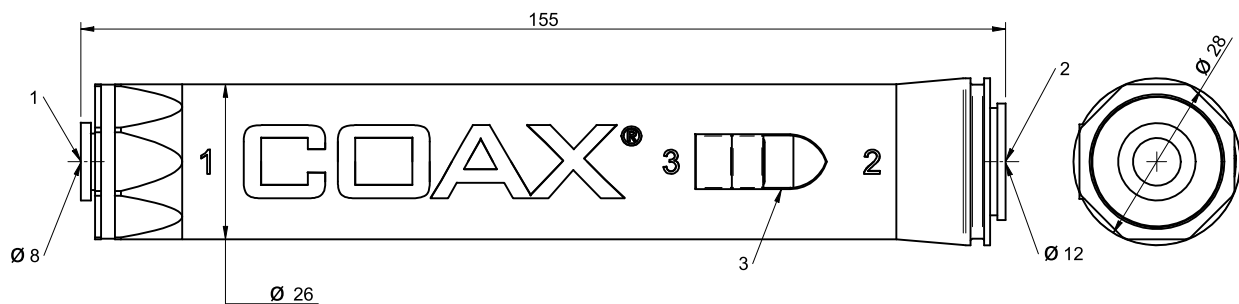
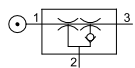
## Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
			10	20	30	40	50	60	70	80	90		
Si	0.6	1.75	0.04	0.08	0.14	0.25	0.40	0.59	0.82	—	—	75	
Pi	0.3	2.00	0.04	0.10	0.18	0.30	0.48	0.71	1.05	1.85	4.00	90	
Xi	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.90	1.30	2.30	95	



## Ordering information

Description	Art. No.
piINLINE® vacuum generator MIDI Si, 8-12 mm	0122032
piINLINE® vacuum generator MIDI Pi, 8-12 mm	0122899
piINLINE® vacuum generator MIDI Xi, 8-12 mm	0122900



## Ordering information, accessories

Description	Art. No.
Snap-in piINLINE® 1x MIDI mounting bracket	0123095
Snap-in piINLINE® 1x MIDI mounting bracket for silencer	0123096
Silencer piINLINE® MIDI	0123031

## P5010



- ▶ New patented COAX® push-in technology allows insertion and removal of the cartridge without tools.
- ▶ Available with a two or three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed.
- ▶ Integrated flow-through silencer that is unaffected by dust and dirt.
- ▶ Substantially lower air-consumption as compared to conventional ejectors of similar sizes.
- ▶ Slim, compact, configurable and modular design.
- ▶ Low weight.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Noise level *)	dBA	68–70
Temperature range	°C	-10–80
Weight	g	230–600
Material		AL,CuZn, NBR, PA, SS, PE

\*) At vacuum level 40 -kPa and feed pressure 0.3 MPa.

### Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90		
Pi48-2	0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	—	90	
Pi48-3	0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	—	90	
Si32-2	0.60	1.75	3.3	3.0	2.6	1.7	0.90	0.60	0.50	0.35	—	—	75	
Si32-3	0.60	1.75	6.0	3.5	2.6	1.7	0.90	0.60	0.50	0.35	—	—	75	
Xi40-2	0.45	1.83	2.8	2.3	1.6	1.0	0.73	0.58	0.43	0.32	0.18	0.03	95	
Xi40-3	0.45	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95	

For vacuum flows at other feed pressures, see section Vacuum cartridges/integration.

### Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
			10	20	30	40	50	60	70	80	90		
Pi48-2	0.30	2.0	0.030	0.070	0.13	0.26	0.46	0.70	1.0	1.6	4.0	90	
Pi48-3	0.30	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0	90	
Si32-2	0.60	1.75	0.030	0.070	0.10	0.18	0.33	0.53	0.80	—	—	75	
Si32-3	0.60	1.75	0.020	0.050	0.10	0.18	0.33	0.53	0.80	—	—	75	
Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.90	1.3	2.3	95	
Xi40-3	0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	95	

For evacuation times at other feed pressures, see section Vacuum cartridges/integration.

\*) Pin no. 5 is not used. M12 4-pin cable will fit the M12 5-pin connector.

## Blow flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
			0	20	40	60	70	80	90	100	110	120	130	140	
Pi48-2	0.6	3.5	6.15	6.15	5.95	5.03	4.49	4.49	4.49	4.49	4.49	4.26	4.0	3.63	140
Pi48-3	0.6	3.55	9.5	6.5	6.0	5.3	4.7	4.6	4.6	4.5	4.5	4.3	4.0	3.7	140
Si32-2	0.6	1.75	5.05	4.25	3.30	2.65	2.35	1.8	—	—	—	—	—	—	70
Si32-3	0.6	1.75	7.8	4.6	3.3	2.7	2.3	1.8	—	—	—	—	—	—	70
Xi40-2	0.6	2.33	5.1	4.6	3.4	3.3	3.1	2.8	2.4	—	—	—	—	—	90
Xi40-3	0.6	2.33	8.4	5.1	3.92	3.39	3.23	2.95	2.58	—	—	—	—	—	90

For performance graphs, see section Vacuum cartridges/integration.

## Ordering information

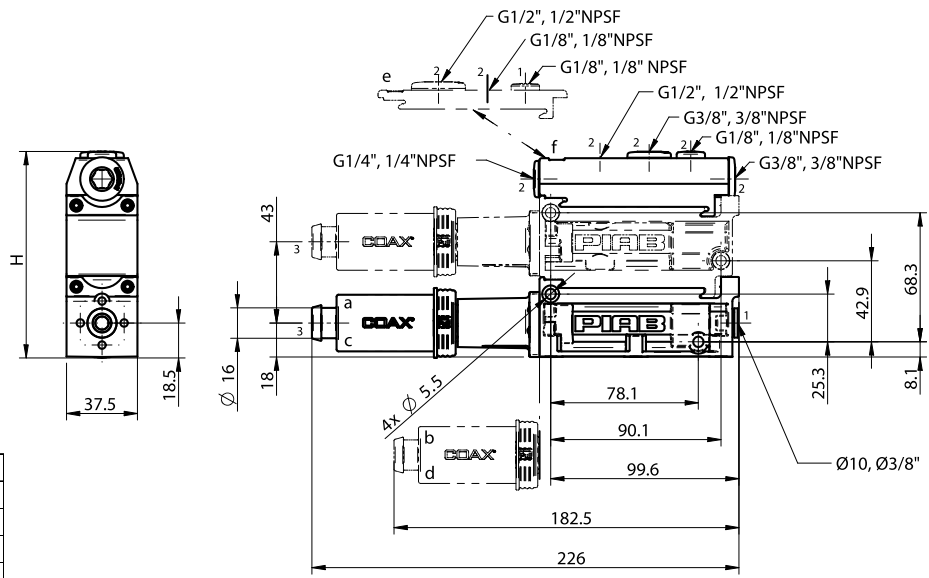
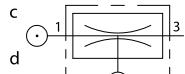
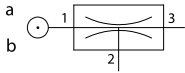
1. Select Housing	P5010 code
Housing, connection Ø 10 mm	00
Housing, connection Ø 3/8"	01

	2. COAX® push-in modules	P5010 Code
b	COAX® push-in module Pi48-2X1	AI
a	COAX® push-in module Pi48-3X1	AJ
d	COAX® push-in module Pi48-2X1, non-return valve	AK
c	COAX® push-in module Pi48-3X1, non-return valve	AL
b	COAX® push-in module Pi48-2X2	AM
a	COAX® push-in module Pi48-3X2	AN
d	COAX® push-in module Pi48-2X2, non-return valve	AO
c	COAX® push-in module Pi48-3X2, non-return valve	AP
b	COAX® push-in module Si32-2X1	AA
a	COAX® push-in module Si32-3X1	AB
d	COAX® push-in module Si32-2X1, non-return valve	AC
c	COAX® push-in module Si32-3X1, non-return valve	AD
b	COAX® push-in module Si32-2X2	AE
a	COAX® push-in module Si32-3X2	AF
d	COAX® push-in module Si32-2X2, non-return valve	AG
c	COAX® push-in module Si32-3X2, non-return valve	AH
b	COAX® push-in module Xi40-2X1	AQ
a	COAX® push-in module Xi40-3X1	AR
d	COAX® push-in module Xi40-2X1, non-return valve	AS
c	COAX® push-in module Xi40-3X1, non-return valve	AT
b	COAX® push-in module Xi40-2X2	AU
a	COAX® push-in module Xi40-3X2	AV
d	COAX® push-in module Xi40-2X2, non-return valve	AW
c	COAX® push-in module Xi40-3X2, non-return valve	AX

	3. Select connection and function module	P5010 Code
e	Connection module low, G threads	01
f	Connection module high, G threads	02
e	Connection module low, NPSF threads	03
f	Connection module high, NPSF threads	04
	Function AVM™2 NO, G threads	05
	Function AVM™2 NC, G threads	06
	Function AVM™2 NO, NPSF threads	07
	Function AVM™2 NC, NPSF threads	08
	Function CU NC, G threads	09
	Function CU NC, NPSF threads	10
	Function P5010 ES 2/2 NO large hysteresis	11
	Function P5010 ES 2/2 NO small hysteresis	12

AVM™2 NC Failsafe Option - Vacuum stays on if power is lost - E-Stop Condition. For detailed information on AVM™2, CU and ES, see separate datasheets.

Example	Ordering number
Housing, connection Ø 10 mm Pi48-2X1, Connection module, low G threads	P5010 00 AI 01



		H
x1	e	50,5
x1	f	66,2
x2	e	93,5
x2	f	109,2

### Ordering information, accessories

Description	Art. No.
Common feed adapter Ø10 mm P5010	0117762
Mounting rail DIN P5010	0117763
Mounting rail x1 P5010	0118209
Mounting rail x2 P5010	0118208
Vacuum gauge 100 -kPa	0112531

*Vacuum gauge recommended with high connection modules (02/04)*



## P5010 AVM™2



- ▶ P5010 multistage ejector with Pi, Si or Xi COAX® push-in cartridge(s).
- ▶ AVM™2, Automatic Vacuum Management, unit with built-in control and monitoring functions.
- ▶ Valves for vacuum on/off and blow-off.
- ▶ Special safety feature for the version with normally closed on/off valve. It changes to an open valve if power is lost (E-stop).
- ▶ Enhanced blow-off effect thanks to a directed blow-off pipe.
- ▶ Analogue vacuum sensor with two digital outputs, 16 pre-set combinations of signal levels to choose from.
- ▶ Digital display with “-kPa” or “-inHg” as unit options.
- ▶ Integrated energy saving function (ES) that minimizes the air consumption in sealed systems. The ES function can be activated manually or via a signal (signal override).
- ▶ Three-colour LED status indicators for valves, signal outputs and ES.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level *)	dBA	68–71
Temperature range	°C	0–50
Weight	g	430–720
Signal range, adjustable	-kPa	20–80
Hysteresis	kPa	7±1
Material		AL, CuZn, NBR, PA, SS, PE, PMMA
Voltage	VDC	24 (22–28)
Ripple, max.	V <sub>p</sub>	1V <sub>rms</sub>
Current consumption, nominal	mA	110
Safety classification		IP65 [NEMA 4]
Current, max. output load		100
Display		LED indicators, numeric
Flow. blow-off	NI/s	0–7.5

\*) At vacuum level 40 -kPa and at recommended feed pressure for respective push-in cartridge.

### Ordering information

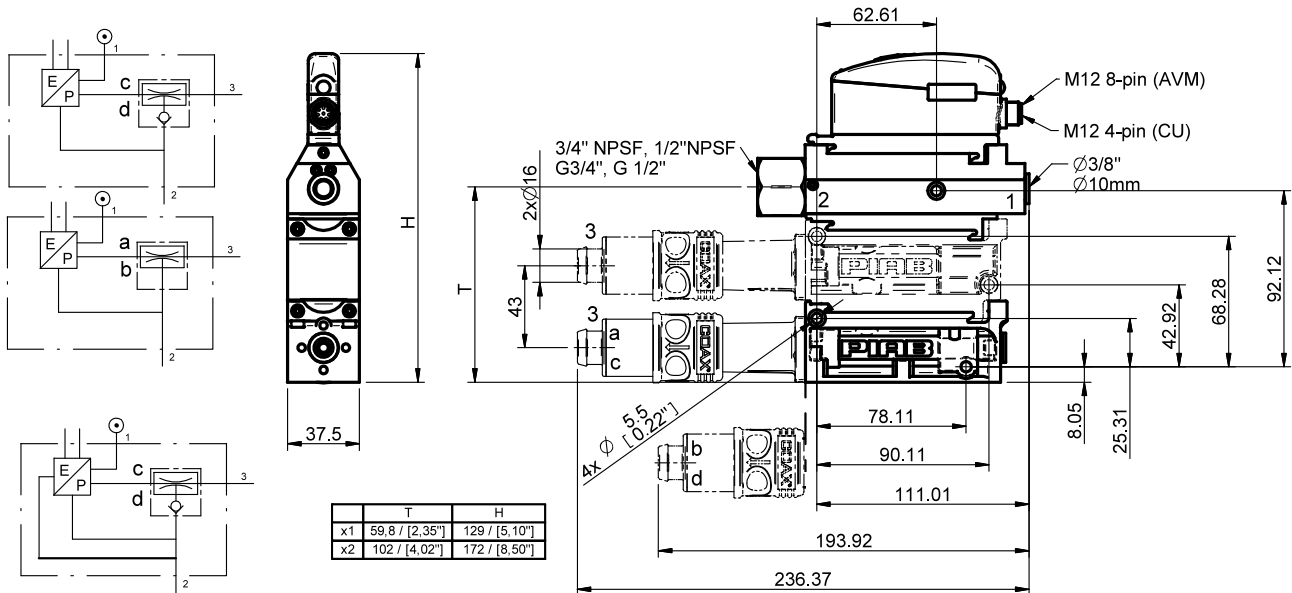
1. Select Housing	P5010 code
Housing, connection Ø 10 mm	00
Housing, connection Ø 3/8"	01

	2. COAX® push-in modules	P5010 Code
d	COAX® push-in module Pi48-2X1, non-return valve	AK
c	COAX® push-in module Pi48-3X1, non-return valve	AL
d	COAX® push-in module Pi48-2X2, non-return valve	AO
c	COAX® push-in module Pi48-3X2, non-return valve	AP
d	COAX® push-in module Si32-2X1, non-return valve	AC
c	COAX® push-in module Si32-3X1, non-return valve	AD
d	COAX® push-in module Si32-2X2, non-return valve	AG
c	COAX® push-in module Si32-3X2, non-return valve	AH
d	COAX® push-in module Xi40-2X1, non-return valve	AS
c	COAX® push-in module Xi40-3X1, non-return valve	AT
d	COAX® push-in module Xi40-2X2, non-return valve	AW
c	COAX® push-in module Xi40-3X2, non-return valve	AX

3. Functions	P5010 Code
Function AVM™2 NO, G threads	05
Function AVM™2 NC, G threads	06
Function AVM™2 NO, NPSF threads	07
Function AVM™2 NC, NPSF threads	08

\*) Open if electric power disrupted.

Example	Ordering number
Housing, connection Ø 10 mm Pi48-2X1, Function AVM™2, NO, G-threads	P5010 00 AK 05



	T	H
x1	59,8 / [2,35"]	129 / [5,10"]
x2	102 / [4,02"]	172 / [6,80"]

### Ordering information, accessories

Description	Art. No.
Cable M12 8-pin female, PUR, L=2m	0110238
Cable M12 8-pin female, PUR, L=5m	0117746
Y-cable M12 8-pin female, 2xM12 4-pin male, PNP, PUR, L=2m	0118407
Y-cable M12 8-pin female, 2xM12 5-pin male, NPN, PUR, L=2m	0120229
Y-cable MIL 18-pin male, 2xM12 8-pin female, PNP, L=0.3m	0113248

## P5010 CU



- ▶ P5010 multistage ejector with Pi, Si or Xi COAX® push-in cartridge(s).
- ▶ Integrated Control Unit (CU) with electric valves for vacuum on-off and blow-off control.
- ▶ Mechanical valve for blow-off flow adjustment.
- ▶ Enhanced blow-off power thanks to a directed blow-off pipe.
- ▶ Slim, compact, configurable and modular design.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Noise level *)	dBA	68–71
Temperature range	°C	0–50
Weight	g	430–720
Material		AL, CuZn, NBR, PA, SS, PE, PMMA
Voltage	VDC	24 (22–28)
Safety classification		IP65 [NEMA4]
Humidity	%RH	90
Current consumption, nominal	mA	60
Ripple, max.	V <sub>p</sub>	1 V <sub>rms</sub>
Flow, blow-off	NI/s	0–7.5
Function, on/off		NC

\*) At vacuum level 40 -kPa and at recommended feed pressure for respective push-in cartridge.

### Ordering information

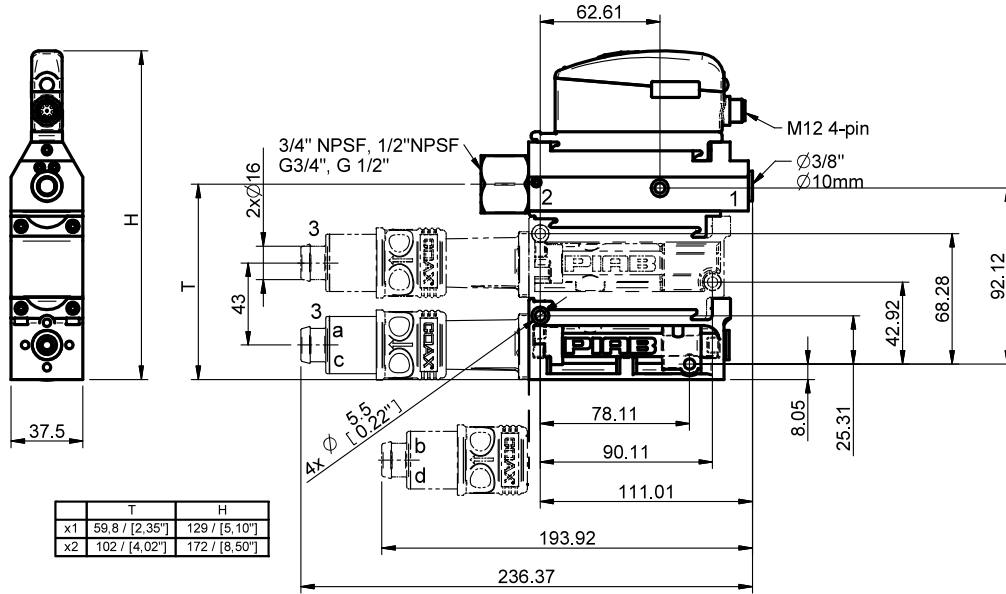
1. Select Housing		P5010 code
Housing, connection Ø 10 mm		00
Housing, connection Ø 3/8"		01

2. COAX® push-in modules		P5010 Code
b	COAX® push-in module Pi48-2X1	AI
a	COAX® push-in module Pi48-3X1	AJ
d	COAX® push-in module Pi48-2X1, non-return valve	AK
c	COAX® push-in module Pi48-3X1, non-return valve	AL
b	COAX® push-in module Pi48-2X2	AM
a	COAX® push-in module Pi48-3X2	AN
d	COAX® push-in module Pi48-2X2, non-return valve	AO
c	COAX® push-in module Pi48-3X2, non-return valve	AP
b	COAX® push-in module Si32-2X1	AA
a	COAX® push-in module Si32-3X1	AB
d	COAX® push-in module Si32-2X1, non-return valve	AC
c	COAX® push-in module Si32-3X1, non-return valve	AD
b	COAX® push-in module Si32-2X2	AE
a	COAX® push-in module Si32-3X2	AF
d	COAX® push-in module Si32-2X2, non-return valve	AG
c	COAX® push-in module Si32-3X2, non-return valve	AH
b	COAX® push-in module Xi40-2X1	AQ
a	COAX® push-in module Xi40-3X1	AR
d	COAX® push-in module Xi40-2X1, non-return valve	AS
c	COAX® push-in module Xi40-3X1, non-return valve	AT
b	COAX® push-in module Xi40-2X2	AU
a	COAX® push-in module Xi40-3X2	AV
d	COAX® push-in module Xi40-2X2, non-return valve	AW
c	COAX® push-in module Xi40-3X2, non-return valve	AX

3. Function	P5010 Code
Function CU NC, G threads	09
Function CU NC, NPSF threads	10

Example	Ordering number
Housing, connection Ø 10 mm Pi48-2X2, non-return valve, function CU NC G threads	P5010 00 AO 09



	T	H
x1	59.8 / [2,36"]	129 / [5,10"]
x2	102 / [4,02"]	172 / [6,80"]

### Ordering information, accessories

Description	Art. No.
Cable M12 4-pin female, PUR, L=5m*	0121817
Cable M12 4-pin female, M12 4-pin male, PUR, L=2m	0118322

\*) Pin No. 1 is not used.

## P5010 ES



- ▶ P5010 multistage ejector with Pi, Si or Xi COAX® push-in cartridge.
- ▶ Integrated air-saving function (ES) that minimises the air consumption by controlling the incoming air flow to the pump.
- ▶ Operates on a roughly similar system to that of a thermostat in a heating system.
- ▶ Large hysteresis is recommended for sealed vacuum handling applications such as metal sheet, glass or plastic handling.
- ▶ Small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process.
- ▶ Adjustable ES switch level.
- ▶ Pneumatic function.
- ▶ Configurable and modular design.
- ▶ Separate port with built-in blow-off check valve. High flow capacity to maximize efficiency to release an object.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Feed pressure, minimum to break away for blow-off	MPa	0.4*
Noise level	dBA	68-71
Material		NBR, PA, Al, SS, POM, CuZn
Temperature range	°C	0-60
Weight	g	640-890
Signal range	-kPa	15-99
Function		2/2 NO
Flow, blow-off at 0.6 MPa	NI/s	7.5

\*For Pi cartridge(s) - do not use common feed pressure for pump and blow-off.

### Technical data, specific

Description	Unit	Value	
		ES small hysteresis	ES large hysteresis
Hysteresis	kPa	1-6	5-10

## Performance tables

Depending upon choice of COAX® cartridge, applicable performance data of the P5010 ES can be found in the tables for vacuum flow and evacuation time for models P5010 Pi, Si and Xi.

### Function

A vacuum-controlled valve shuts off the flow of compressed air to the pump when the pre-set vacuum level is reached (1). The vacuum level is set by a knob. Because of minor leakage in a vacuum system the vacuum level drops, and after a while the start-up level of the valve is reached (2). Then the pump will start and work until the shut-off level is reached again (3), etc.

### Connection for ES function\*

A = Vacuum pump with non-return valve

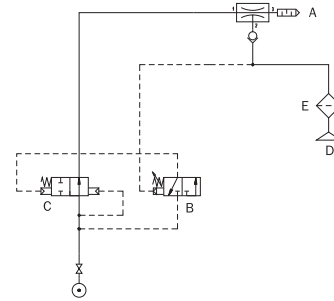
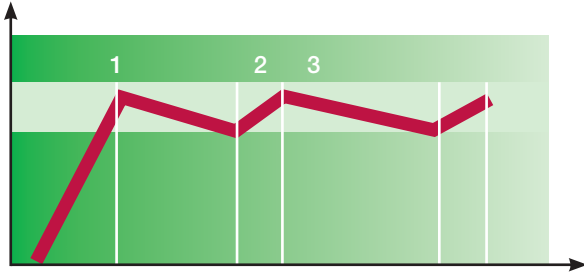
B = Vacuum switch

C = Feed valve

D = Suction cup

E = Vacuum filter

\*Connection for blow-off found with dimensional drawing below.



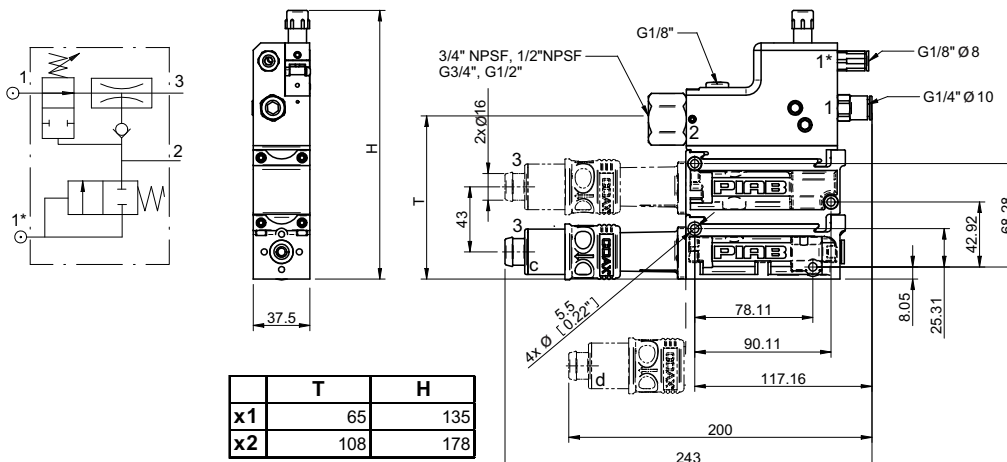
## Ordering information

1. Select Housing		P5010 code
Housing, connection Ø 10 mm		00
Housing, connection Ø 3/8"		01

2. COAX® push-in modules		P5010 Code
d	COAX® push-in module Pi48-2X1, non-return valve	AK
c	COAX® push-in module Pi48-3X1, non-return valve	AL
d	COAX® push-in module Pi48-2X2, non-return valve	AO
c	COAX® push-in module Pi48-3X2, non-return valve	AP
d	COAX® push-in module Si32-2X1, non-return valve	AC
c	COAX® push-in module Si32-3X1, non-return valve	AD
d	COAX® push-in module Si32-2X2, non-return valve	AG
c	COAX® push-in module Si32-3X2, non-return valve	AH
d	COAX® push-in module Xi40-2X1, non-return valve	AS
c	COAX® push-in module Xi40-3X1, non-return valve	AT
d	COAX® push-in module Xi40-2X2, non-return valve	AW
c	COAX® push-in module Xi40-3X2, non-return valve	AX

3. Function		P5010 Code
Function P5010 ES 2/2 NO large hysteresis		11
Function P5010 ES 2/2 NO small hysteresis		12

Example	Ordering number
Housing, connection Ø 10 mm Pi48-2X1, non-return valve, Function P5010 ES 2/2 NO small hysteresis	P5010 00 AK 12



	T	H
x1	65	135
x2	108	178

## P6010



- ▶ Patented COAX® technology.
- ▶ Available with a three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed.
- ▶ Substantially lower air consumption as compared to conventional ejectors.
- ▶ Modular design.
- ▶ Available with multiple connection alternatives.
- ▶ Low noise level.
- ▶ Short evacuation time.

Supplied with a vacuum gauge.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Noise level*	dBA	60–67
Temperature range	°C	-10–80
Weight	g	1700–1800
Material		Al, PA, NBR, SS, TPE

\*At vacuum level 40 -kPa and feed pressure 0.3 MPa.

### Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90		
Pi48-3	0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	—	—	90
Si32-3	0.60	1.75	6.0	3.5	2.6	1.7	0.90	0.60	0.50	0.35	—	—	75/52*	
Xi40-3	0.45	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95/51*	

Values for one COAX® cartridge. Multiply with number of cartridges. For vacuum flows at other feed pressures, see section Vacuum cartridges/integration.

\* COAX® cartridge module, 1x flap valve

### Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
			10	20	30	40	50	60	70	80	90		
Pi48-3	0.30	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0	90	
Si32-3	0.60	1.75	0.020	0.050	0.10	0.18	0.33	0.53	0.80	—	—	75/52*	
Xi40-3	0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	95/51*	

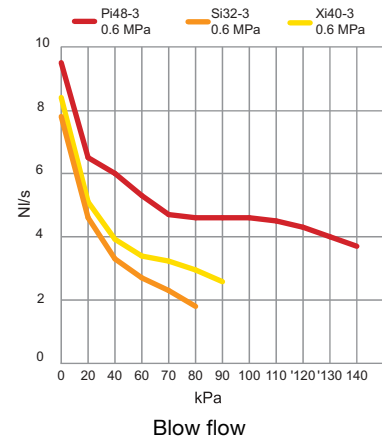
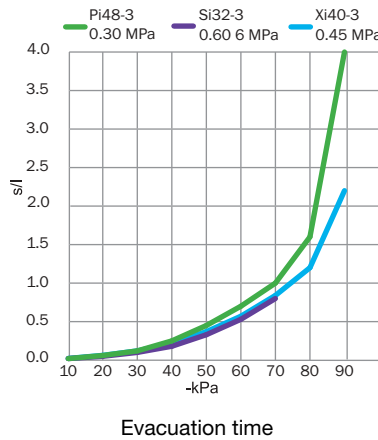
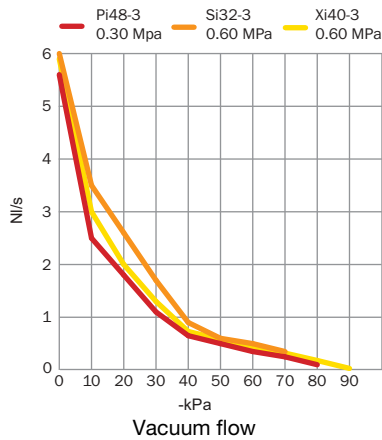
Values for one COAX® cartridge. Divide with number of cartridges. For evacuation times at other feed pressures, see section Vacuum cartridges/integration.

\* COAX® cartridge module, 1x flap valve

## Blow flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)													Max pressure kPa
			0	20	40	60	70	80	90	100	110	120	130	140		
Pi48-3	0.6	3.55	9.5	6.5	6.0	5.3	4.7	4.6	4.6	4.6	4.5	4.3	4.0	3.7	140	
Si32-3	0.6	1.75	7.8	4.6	3.3	2.7	2.3	1.8	—	—	—	—	—	—	80	
Xi40-3	0.6	2.33	8.4	5.1	3.92	3.39	3.23	2.95	2.58	—	—	—	—	—	90	

Values for one COAX® cartridge. Multiply with number of cartridges.



## Ordering information

1. Housing		P6010 Code
Housing		P6010
2. COAX® cartridge modules		P6010 code
COAX® cartridge module blind x4		AA
a	COAX® cartridge module Pi48-3X1	AJ
a	COAX® cartridge module Pi48-3X2	AK
a	COAX® cartridge module Pi48-3X3	AL
a	COAX® cartridge module Pi48-3X4	AM
b	COAX® cartridge module Pi48-3X1, non-return valve	AN
b	COAX® cartridge module Pi48-3X2, non-return valve	AO
b	COAX® cartridge module Pi48-3X3, non-return valve	AP
b	COAX® cartridge module Pi48-3X4, non-return valve	AQ
a	COAX® cartridge module Si32-3X1	AB
a	COAX® cartridge module Si32-3X2	AC
a	COAX® cartridge module Si32-3X3	AD
a	COAX® cartridge module Si32-3X4	AE
b	COAX® cartridge module Si32-3X1, non-return valve	AF
b	COAX® cartridge module Si32-3X2, non-return valve	AG
b	COAX® cartridge module Si32-3X3, non-return valve	AH
b	COAX® cartridge module Si32-3X4, non-return valve	AI
a	COAX® cartridge module Si32-3X1, 1x flap valve	BB
a	COAX® cartridge module Si32-3X2, 1x flap valve	BC
a	COAX® cartridge module Si32-3X3, 1x flap valve	BD
a	COAX® cartridge module Si32-3X4, 1x flap valve	BE
a	COAX® cartridge module Xi40-3X1	AR
a	COAX® cartridge module Xi40-3X2	AS
a	COAX® cartridge module Xi40-3X3	AT
a	COAX® cartridge module Xi40-3X4	AU
b	COAX® cartridge module Xi40-3X1, non-return valve	AV
b	COAX® cartridge module Xi40-3X2, non-return valve	AW
b	COAX® cartridge module Xi40-3X3, non-return valve	AX
b	COAX® cartridge module Xi40-3X4, non-return valve	AY
a	COAX® cartridge module Xi40-3X1, 1x flap valve	BJ
a	COAX® cartridge module Xi40-3X2, 1x flap valve	BK
a	COAX® cartridge module Xi40-3X3, 1x flap valve	BL
a	COAX® cartridge module Xi40-3X4, 1x flap valve	BM



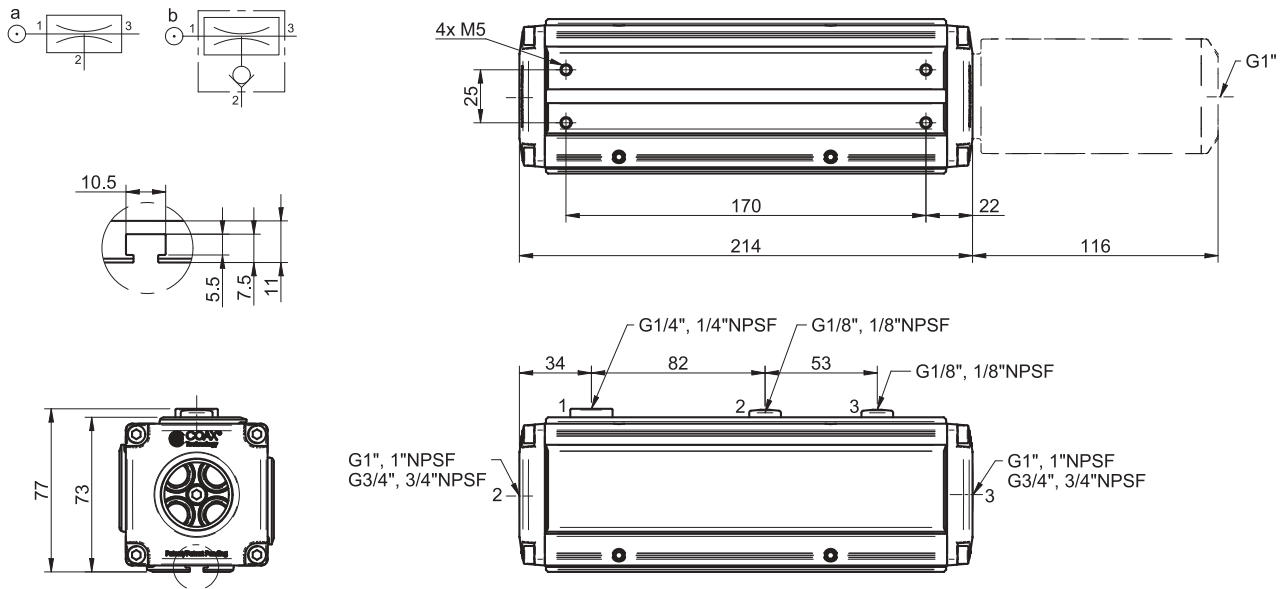
3. Mounting	P6010 Code
Mounting T-slot, Cover plate with PIAB label	01

4. Select Cover plate and Function	P6010 Code
Cover plate G thread connections, cover plate plain	LA
Cover plate NPSF thread connections, cover plate plain	LJ
Cover plate Classic G thread connections, cover plate plain	LI
Cover plate Classic NPSF thread connections, cover plate plain	LK
Function PCC Vacuum, cover plate G thread connections	LB
Function PCC Vacuum, cover plate NPSF thread connections	LT
Function AVM™2 NO, cover plate G thread connections	LU
Function AVM™2 NC, cover plate G thread connections	LV
Function AVM™2 NO, cover plate NPSF thread connections	LW
Function AVM™2 NC, cover plate NPSF thread connections	LX
Function CU NC, cover plate G thread connections	LY
Function CU NC, cover plate NPSF thread connections	LZ

AVM™2 NO = Normally open valve for vacuum on/off, AVM™2 NC = Normally closed valve for vacuum on/off. CU NC = Normally closed valve for vacuum on/off. For detailed information on Classic plate, PCC, AVM™2 and CU, see separate datasheets.

5. Select Connections for vacuum and exhaust	P6010 Code
Connections 2x G1"	51
Connections 2x G1", silencer 1"	52
Connections 2x G3/4"	53
Connections 2x G3/4", silencer 3/4"	54
Connections 2x 1" NPSF	55
Connections 2x 1" NPSF, silencer 1"	56
Connections 2x 3/4" NPSF	57
Connections 2x 3/4" NPSF, silencer 3/4"	58

Example	Ordering number
P6010 Pi48-3X1, Mounting T-slot, Cover plate G-threads, Connections 2x G1" and silencer 1"	P6010 AJ 01 LA 52



## Ordering information, accessories

Description	Art. No.
Silencer G1"	0112499
Silencer 1" NPSF	0113003
Manometer 250 kPa	0112533
Manometer 1 MPa	0112532

## P6010 Classic



- ▶ Patented COAX® technology
- ▶ Connections can be made on the long side of the ejector
- ▶ Retro-compatible with PIAB's Classic model in regard to mounting

Supplied with a vacuum gauge.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Noise level*	dBA	50–67
Temperature range	°C	-10–80
Weight	g	1700–1800
Material		Al, PA, NBR, SS, TPE

\*At vacuum level 40 -kPa and feed pressure 0.3–0.6 MPa.

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the P6010 Classic can be found in the tables for vacuum flow, evacuation time and blow flow for models P6010 Pi, Si and Xi.

### Ordering information

1. Housing		P6010 Code
Housing		P6010
2. COAX® cartridge modules		P6010 code
	COAX® cartridge module blind x4	AA
a	COAX® cartridge module Pi48-3X1	AJ
a	COAX® cartridge module Pi48-3X2	AK
a	COAX® cartridge module Pi48-3X3	AL
a	COAX® cartridge module Pi48-3X4	AM
b	COAX® cartridge module Pi48-3X1, non-return valve	AN
b	COAX® cartridge module Pi48-3X2, non-return valve	AO
b	COAX® cartridge module Pi48-3X3, non-return valve	AP
b	COAX® cartridge module Pi48-3X4, non-return valve	AQ
a	COAX® cartridge module Si32-3X1	AB
a	COAX® cartridge module Si32-3X2	AC
a	COAX® cartridge module Si32-3X3	AD
a	COAX® cartridge module Si32-3X4	AE
b	COAX® cartridge module Si32-3X1, non-return valve	AF
b	COAX® cartridge module Si32-3X2, non-return valve	AG
b	COAX® cartridge module Si32-3X3, non-return valve	AH
b	COAX® cartridge module Si32-3X4, non-return valve	AI
a	COAX® cartridge module Si32-3X1, 1x flap valve	BB
a	COAX® cartridge module Si32-3X2, 1x flap valve	BC
a	COAX® cartridge module Si32-3X3, 1x flap valve	BD
a	COAX® cartridge module Si32-3X4, 1x flap valve	BE
a	COAX® cartridge module Xi40-3X1	AR
a	COAX® cartridge module Xi40-3X2	AS
a	COAX® cartridge module Xi40-3X3	AT
a	COAX® cartridge module Xi40-3X4	AU
b	COAX® cartridge module Xi40-3X1, non-return valve	AV
b	COAX® cartridge module Xi40-3X2, non-return valve	AW

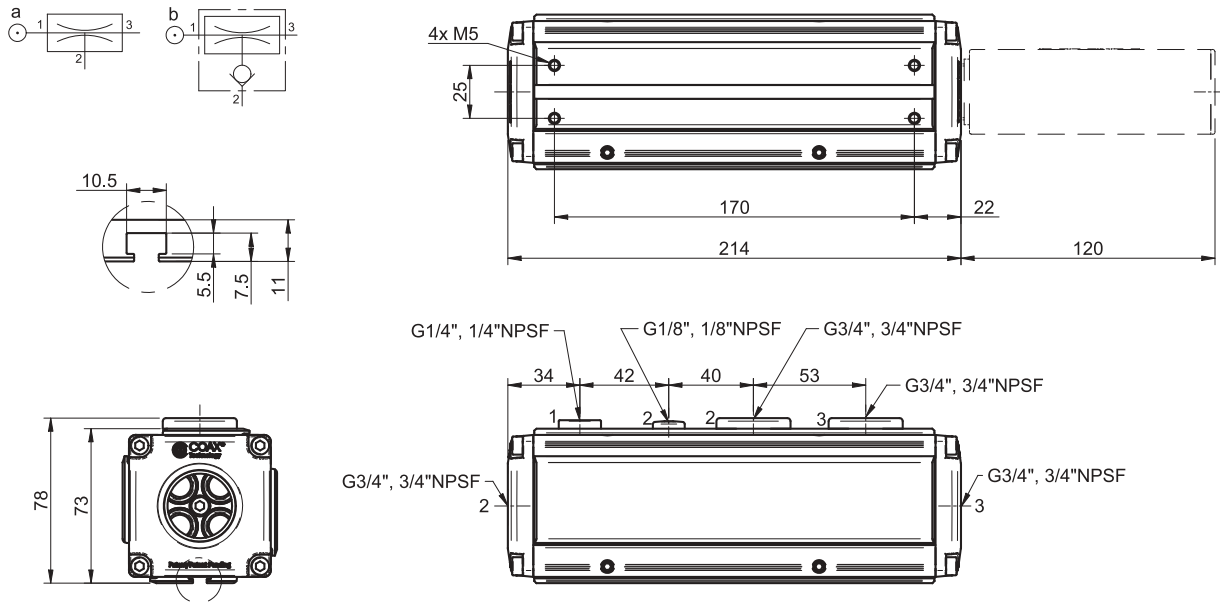
2. COAX® cartridge modules		P6010 code
b	COAX® cartridge module Xi40-3X3, non-return valve	AX
b	COAX® cartridge module Xi40-3X4, non-return valve	AY
a	COAX® cartridge module Xi40-3X1, 1x flap valve	BJ
a	COAX® cartridge module Xi40-3X2, 1x flap valve	BK
a	COAX® cartridge module Xi40-3X3, 1x flap valve	BL
a	COAX® cartridge module Xi40-3X4, 1x flap valve	BM

3. Mounting	P6010 Code
Mounting T-slot, Cover plate with PIAB label	01

4. Cover plates	P6010 Code
Cover plate Classic G thread connections, cover plate plain	LI
Cover plate Classic NPSF thread connections, cover plate plain	LK

5. Connections for vacuum and exhaust	P6010 Code
Connections 2x G3/4"	53
Connections 2x G3/4", silencer 3/4"	54
Connections 2x 3/4" NPSF	57
Connections 2x 3/4" NPSF, silencer 3/4"	58

Example	Ordering number
P6010 Pi48-3X4, Mounting T-slot, Cover plate Classic G-threads, Connections 2x G3/4" and silencer 3/4"	P6010 AM 01 LI 54



### Ordering information, accessories

Description	Art. No.
Manometer 250 kPa	0112533
Manometer 1 MPa	0112532
Silencer G3/4"	3216002

## P6010 AVM™2



- ▶ COAX® P6010 multistage ejector with Pi, Si or Xi vacuum cartridge(s).
- ▶ AVM™2, Automatic Vacuum Management, unit with built-in control and monitoring functions.
- ▶ Valves for vacuum on/off and blow-off.
- ▶ Special safety feature for the version with normally closed on/off valve. It changes to an open valve if power is lost (E-stop).
- ▶ Analogue vacuum sensor with two digital outputs, 16 pre-set combinations of signal levels to choose from.
- ▶ Digital display with “-kPa” or “-inHg” as unit options.
- ▶ Integrated energy saving function (ES) that minimizes the air consumption in sealed systems. The ES function can be activated manually or via a signal (signal override).
- ▶ Three-colour LED status indicators for valves, signal outputs and ES.
- ▶ On AVM™2 units for P6010, there is an option to blow from a separate port to maximize blow-off efficiency in the vacuum system.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level, range	dBA	50–70
Material		Al, PA, NBR, SS, PMMA, TPE
Temperature range	°C	0–50
Weight, range	g	2000–2100
Signal range, adjustable	-kPa	20–80
Hysteresis	kPa	7±1
Voltage	VDC	24 (22–28)
Safety classification		IP65 [NEMA 4]
Current, max. output load	mA	100
Humidity	%RH	90
Current consumption, nominal	mA	110
Ripple, max.	V <sub>p</sub>	1 V <sub>rms</sub>
Display		LED indicators, numeric
Flow, blow-off	NI/s	0–7.5

### Technical data, specific

Description	Value	
	LU, LW, MA, MC (P6010 Code)	LV, LX, MB, MD (P6010 Code)
Function, on/off	NO	NC

### Performance tables

Depending upon choice of COAX® cartridge, applicable performance data of the P6010 AVM™2 can be found in the tables for vacuum flow and evacuation time for models P6010 Pi, Si and Xi.

## Ordering information

1. Housing	P6010 Code
Housing	P6010

2. COAX® cartridge modules	P6010 code
COAX® cartridge module Pi48-3X1, non-return valve	AN
COAX® cartridge module Pi48-3X2, non-return valve	AO
COAX® cartridge module Pi48-3X3, non-return valve	AP
COAX® cartridge module Pi48-3X4, non-return valve	AQ
COAX® cartridge module Si32-3X1, non-return valve	AF
COAX® cartridge module Si32-3X2, non-return valve	AG
COAX® cartridge module Si32-3X3, non-return valve	AH
COAX® cartridge module Si32-3X4, non-return valve	AI
COAX® cartridge module Xi40-3X1, non-return valve	AV
COAX® cartridge module Xi40-3X2, non-return valve	AW
COAX® cartridge module Xi40-3X3, non-return valve	AX
COAX® cartridge module Xi40-3X4, non-return valve	AY

3. Mounting	P6010 Code
Mounting T-slot, Cover plate with PIAB label	01

4. Cover plates	P6010 Code
Function AVM™2 NO, cover plate G thread connections	LU
Function AVM™2 NC, cover plate G thread connections	LV
Function AVM™2 NO, cover plate NPSF thread connections	LW
Function AVM™2 NC, cover plate NPSF thread connections	LX
Function AVM™2 NO, cover plate G thread connections, separated blow-off	MA
Function AVM™2 NC, cover plate G thread connections, separated blow-off	MB
Function AVM™2 NO, cover plate NPSF thread connections, separated blow-off	MC
Function AVM™2 NC, cover plate NPSF thread connections, separated blow-off	MD

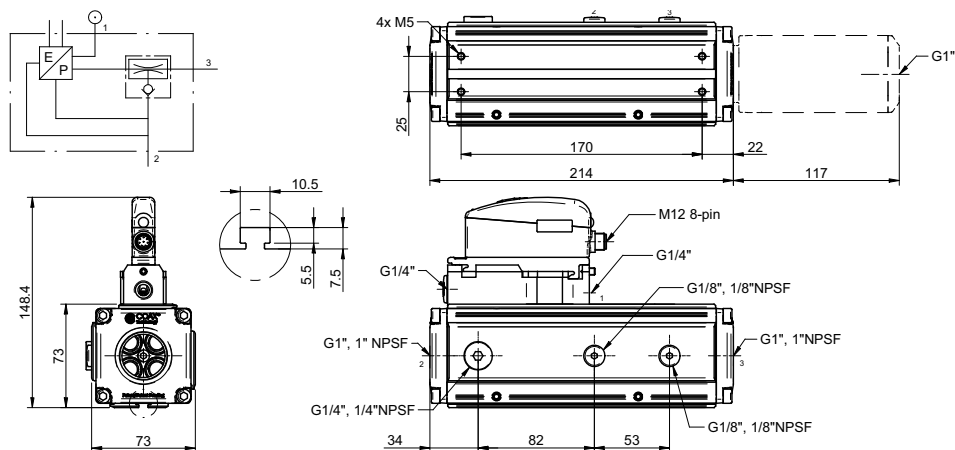
*NO = Normally open valve for vacuum on/off, NC = Normally closed valve for vacuum on/off.*

5. Select Connections for vacuum and exhaust	P6010 Code
Connections 2x G1"	51
Connections 2x G1", silencer 1"	52
Connections 2x G3/4"	53
Connections 2x G3/4", silencer 3/4"	54
Connections 2x 1" NPSF	55
Connections 2x 1" NPSF, silencer 1"	56
Connections 2x 3/4" NPSF	57
Connections 2x 3/4" NPSF, silencer 3/4"	58

Example	Ordering number
P6010 Si32-3X2, non-return valve, Mounting T-slot, Cover plate with AVM™2 NO function and G-threads, Connections 2x G1" and silencer 1"	P6010 AG 01 LU 52



## Ordering information, accessories

Description	Art. No.
Silencer G1"	0112499
Silencer 1" NPSF	0113003
Manometer 1 MPa	0112532
Cable M12 8-pin female, PUR, L=2m	0110238
Cable M12 8-pin female, PUR, L=5m	0117746
Y-cable M12 8-pin female, 2xM12 4-pin male, PNP, PUR, L=2m	0118407
Y-cable M12 8-pin female, 2xM12 5-pin male, NPN, PUR, L=2m	0120229
Y-cable MIL 18-pin male, 2xM12 8-pin female, PNP, L=0.3m	0113248

## P6010 CU



- ▶ COAX® P6010 multistage ejector with Pi, Si or Xi vacuum cartridge(s).
- ▶ Integrated Control Unit (CU) with electric valves for vacuum on-off and blow-off control.
- ▶ Mechanical valve for blow-off flow adjustment.
- ▶ Configurable and modular design.
- ▶ On CU units for P6010, there is an option to blow from a separate port to maximize blow-off efficiency in the vacuum system.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level, range	dBA	50–70
Material		Al, PA, NBR, SS, PMMA, TPE
Temperature range	°C	0–50
Weight, range	g	2000–2100
Function, on/off		NC
Voltage	VDC	24 (22–28)
Safety classification		IP65 [NEMA 4]
Humidity	%RH	90
Current consumption, nominal	mA	60
Ripple, max.	VP	1 V <sub>rms</sub>
Flow, blow-off	NI/s	0–7.5

### Performance tables

Depending upon choice of COAX® cartridge, applicable performance data of the P6010 CU can be found in the tables for vacuum flow, evacuation time and blow flow for models P6010 Pi, Si and Xi.

### Ordering information

1. Housing		P6010 Code
Housing		P6010
2. COAX® cartridge modules		P6010 code
	COAX® cartridge module blind x4	AA
a	COAX® cartridge module Pi48-3X1	AJ
a	COAX® cartridge module Pi48-3X2	AK
a	COAX® cartridge module Pi48-3X3	AL
a	COAX® cartridge module Pi48-3X4	AM
b	COAX® cartridge module Pi48-3X1, non-return valve	AN
b	COAX® cartridge module Pi48-3X2, non-return valve	AO
b	COAX® cartridge module Pi48-3X3, non-return valve	AP
b	COAX® cartridge module Pi48-3X4, non-return valve	AQ
a	COAX® cartridge module Si32-3X1	AB
a	COAX® cartridge module Si32-3X2	AC
a	COAX® cartridge module Si32-3X3	AD
a	COAX® cartridge module Si32-3X4	AE
b	COAX® cartridge module Si32-3X1, non-return valve	AF
b	COAX® cartridge module Si32-3X2, non-return valve	AG
b	COAX® cartridge module Si32-3X3, non-return valve	AH
b	COAX® cartridge module Si32-3X4, non-return valve	AI
a	COAX® cartridge module Xi40-3X1	AR
a	COAX® cartridge module Xi40-3X2	AS
a	COAX® cartridge module Xi40-3X3	AT
a	COAX® cartridge module Xi40-3X4	AU

2. COAX® cartridge modules		P6010 code
b	COAX® cartridge module Xi40-3X1, non-return valve	AV
b	COAX® cartridge module Xi40-3X2, non-return valve	AW
b	COAX® cartridge module Xi40-3X3, non-return valve	AX
b	COAX® cartridge module Xi40-3X4, non-return valve	AY

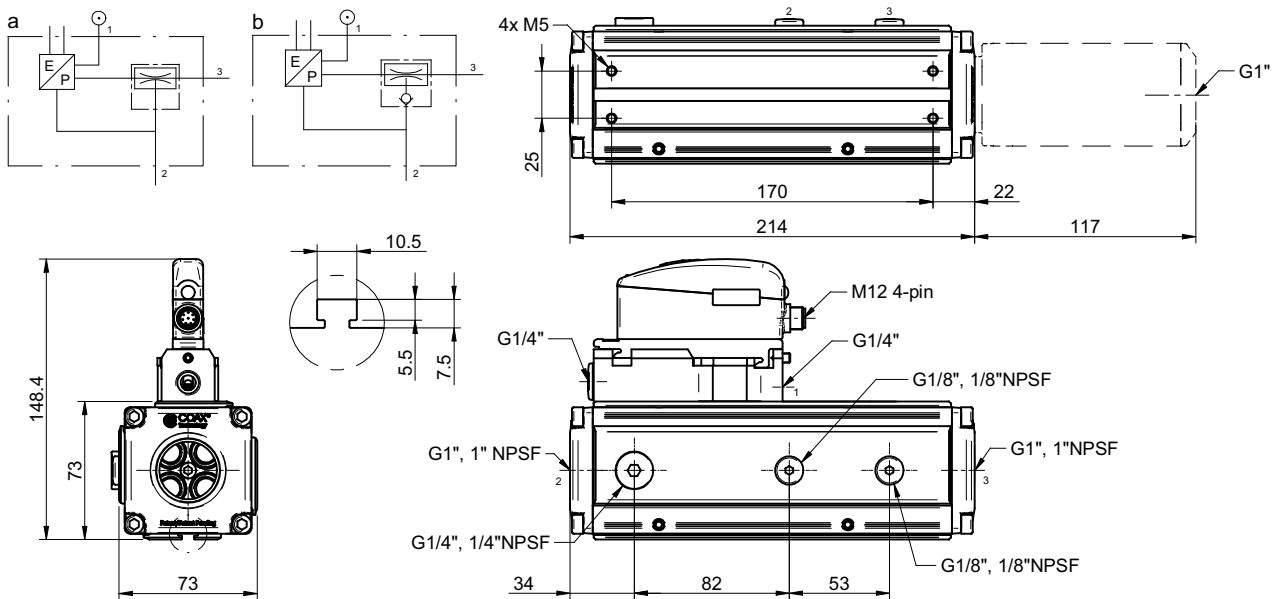
3. Mounting		P6010 Code
Mounting T-slot, Cover plate with PIAB label		01

4. Cover plates		P6010 Code
Function CU NC, cover plate G thread connections		LY
Function CU NC, cover plate NPSF thread connections		LZ
Function CU NC, cover plate G thread connections, separated blow-off		ME
Function CU NC, cover plate NPSF thread connections, separated blow-off		MF

NC = Normally closed valve for vacuum on/off.

5. Select Connections for vacuum and exhaust		P6010 Code
Connections 2x G1"		51
Connections 2x G1", silencer 1"		52
Connections 2x G3/4"		53
Connections 2x G3/4", silencer 3/4"		54
Connections 2x 1" NPSF		55
Connections 2x 1" NPSF, silencer 1"		56
Connections 2x 3/4" NPSF		57
Connections 2x 3/4" NPSF, silencer 3/4"		58

Example	Ordering number
P6010 Si32-3X2, non-return valve, Mounting T-slot, Cover plate with CU NC function and G-threads, Connections 2x G1" and silencer 1"	P6010 AG 01 LY 52



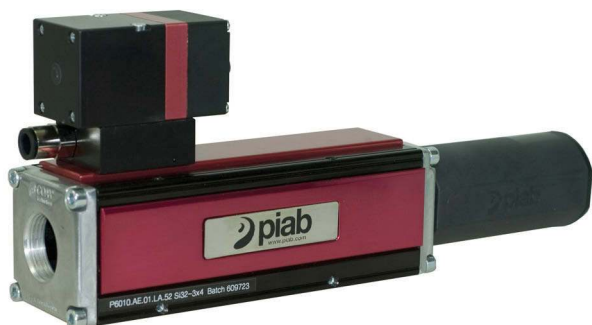
### Ordering information, accessories

Description	Art. No.
Silencer G1"	0112499
Silencer 1" NPSF	0113003
Manometer 1 MPa	0112532
Cable M12 4-pin female, PUR, L=5m*	0121817
Cable M12 4-pin female, M12 4-pin male, PUR, L=2m	0118322

\*) Pin No. 1 is not used.



## P6010 PCC



- ▶ COAX® P6010 multistage ejector with Pi, Si or Xi vacuum cartridge(s).
- ▶ PPC , Piab Cruise Control, is programmable for constant vacuum level in the system
- ▶ Quick adjustment
- ▶ Easy to install in control systems
- ▶ Low power consumption, 24 VDC/120 mA
- ▶ Integrated analogue vacuum or blow-pressure sensor

Supplied with a vacuum gauge.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	1.0
Feed pressure, min.	MPa	0.12
Air consumption, internal	NI/s	0.04
Noise level	dBA	50-70
Material		Al, CuZn, PA, NBR, SS
Temperature range	°C	3-50
Connection, vacuum & exhaust		G1"/1"NPSF
Connection, compressed air		G1/4"
Connection, regulator/exhaust		G1/8"
Voltage supply	VDC	24 (21.8-26.4)
Voltage signal, input	VDC	0-10
Safety classification		IP65
Current consumption	mA	30
Electric connection		M12 5-pin male
Pressure drop	MPa	0.1
Linearity	%FS	<1.5
Hysteresis	%FS	<0.5
Repeatability	%FS	<0.5
Regulator operating range, vacuum level	-kPa	0-90
Input impedance, signal in	kΩ	55
Nominal flow rate (0.6 MPa in, 0.1 Mpa P)	NI/s	18.3
Outlet pressure, to vacuum pump	MPa	0.02-0.9
Particle size, max.	µm	20

The design of PCC requires that the inlet pressure is 0.1 MPa higher than the outlet pressure.

### Performance tables

Depending upon choice of COAX® Cartridge, applicable performance data of the P6010 PCC can be found in the tables for vacuum flow and evacuation time for models P6010 Pi, Si and Xi.

### Ordering information

1. Housing		P6010 Code
Housing		P6010
2. COAX® cartridge modules		P6010 code
COAX® cartridge module blind x4		AA
a	COAX® cartridge module Pi48-3X1	AJ
a	COAX® cartridge module Pi48-3X2	AK
a	COAX® cartridge module Pi48-3X3	AL
a	COAX® cartridge module Pi48-3X4	AM
b	COAX® cartridge module Pi48-3X1, non-return valve	AN
b	COAX® cartridge module Pi48-3X2, non-return valve	AO
b	COAX® cartridge module Pi48-3X3, non-return valve	AP
b	COAX® cartridge module Pi48-3X4, non-return valve	AQ
a	COAX® cartridge module Si32-3X1	AB
a	COAX® cartridge module Si32-3X2	AC
a	COAX® cartridge module Si32-3X3	AD

<b>2. COAX® cartridge modules</b>		<b>P6010 code</b>
a	COAX® cartridge module Si32-3X4	AE
b	COAX® cartridge module Si32-3X1, non-return valve	AF
b	COAX® cartridge module Si32-3X2, non-return valve	AG
b	COAX® cartridge module Si32-3X3, non-return valve	AH
b	COAX® cartridge module Si32-3X4, non-return valve	AI
a	COAX® cartridge module Xi40-3X1	AR
a	COAX® cartridge module Xi40-3X2	AS
a	COAX® cartridge module Xi40-3X3	AT
a	COAX® cartridge module Xi40-3X4	AU
b	COAX® cartridge module Xi40-3X1, non-return valve	AV
b	COAX® cartridge module Xi40-3X2, non-return valve	AW
b	COAX® cartridge module Xi40-3X3, non-return valve	AX
b	COAX® cartridge module Xi40-3X4, non-return valve	AY

<b>3. Mounting</b>		<b>P6010 Code</b>
Mounting T-slot, Cover plate with PIAB label		01

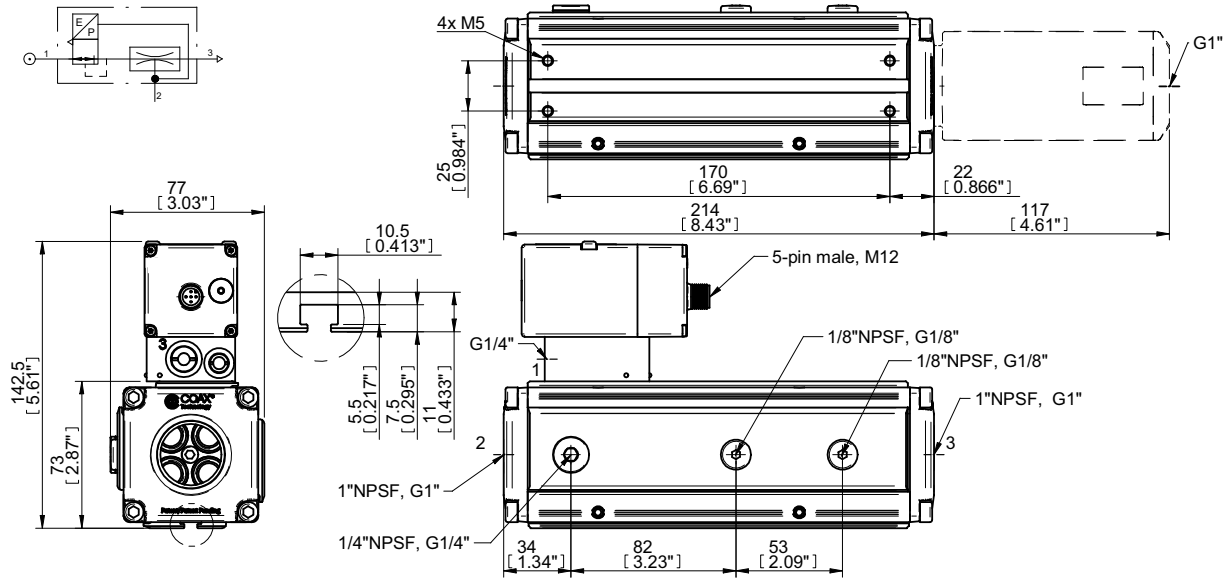
<b>4. Cover plates</b>		<b>P6010 Code</b>
Function PCC Vacuum, cover plate G thread connections		LB
Function PCC Vacuum, cover plate NPSF thread connections		LT

<b>5. Select Connections for vacuum and exhaust</b>		<b>P6010 Code</b>
Connections 2x G1"		51
Connections 2x G1", silencer 1"		52
Connections 2x G3/4"		53
Connections 2x G3/4", silencer 3/4"		54
Connections 2x 1" NPSF		55
Connections 2x 1" NPSF, silencer 1"		56
Connections 2x 3/4" NPSF		57
Connections 2x 3/4" NPSF, silencer 3/4"		58

<b>Example</b>		<b>Ordering number</b>
P6010 Si32-3X2, Mounting T-slot, Cover plate with PCC vacuum function and G-threads, Connections 2x G1" and silencer 1"		P6010 AC 01 LB 52



## Ordering information, accessories

Description	Art. No.
Silencer G1"	0112499
Silencer 1" NPSF	0113003
Manometer 1 MPa	0112532
Cable M12 4-pin female PUR, 5m*	0121817

\*) Pin no. 5 is not used. M12 4-pin cable will fit the M12 5-pin connector.

## piCLASSIC Si32-3



- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ The Si cartridge offers extra vacuum flow.
- ▶ Suitable for handling porous materials or if leakage is present.
- ▶ Large capacity range, available with 1 to 6 COAX® Si32 three-stage cartridges.
- ▶ Can be easily be upgraded with more capacity if needed.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.60
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	75
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Internal volume, vacuum chamber, 3-4 cartridges	cm <sup>3</sup>	246
Internal volume, vacuum chamber, 5-6 cartridges	cm <sup>3</sup>	353
Noise level at 40 -kPa & optimal feed pressure	dBA	66-77
Temperature range	°C	-10-80
Materials		PA, Al, SS, NBR (FKM), CuZn

### Technical data, specific

Weight	Value (g)
1-2 cartridges	500-550
3-4 cartridges	720-790
5-6 cartridges	795-875
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.6 MPa)

COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)							
		0	10	20	30	40	50	60	70
Si32-3 x1	1.75	6.00	3.50	2.60	1.70	0.90	0.60	0.50	0.35
Si32-3 x2	3.50	12.0	7.00	5.20	3.40	1.80	1.20	1.00	0.70
Si32-3 x3	5.25	18.0	10.5	7.80	5.10	2.70	1.80	1.50	1.10
Si32-3 x4	7.00	24.0	14.0	10.4	6.80	3.60	2.40	2.00	1.40
Si32-3 x5	8.75	25.5	15.8	12.4	8.50	4.50	3.00	2.50	2.10
Si32-3 x6	10.5	28.8	17.9	14.8	10.2	5.40	3.60	3.00	2.20

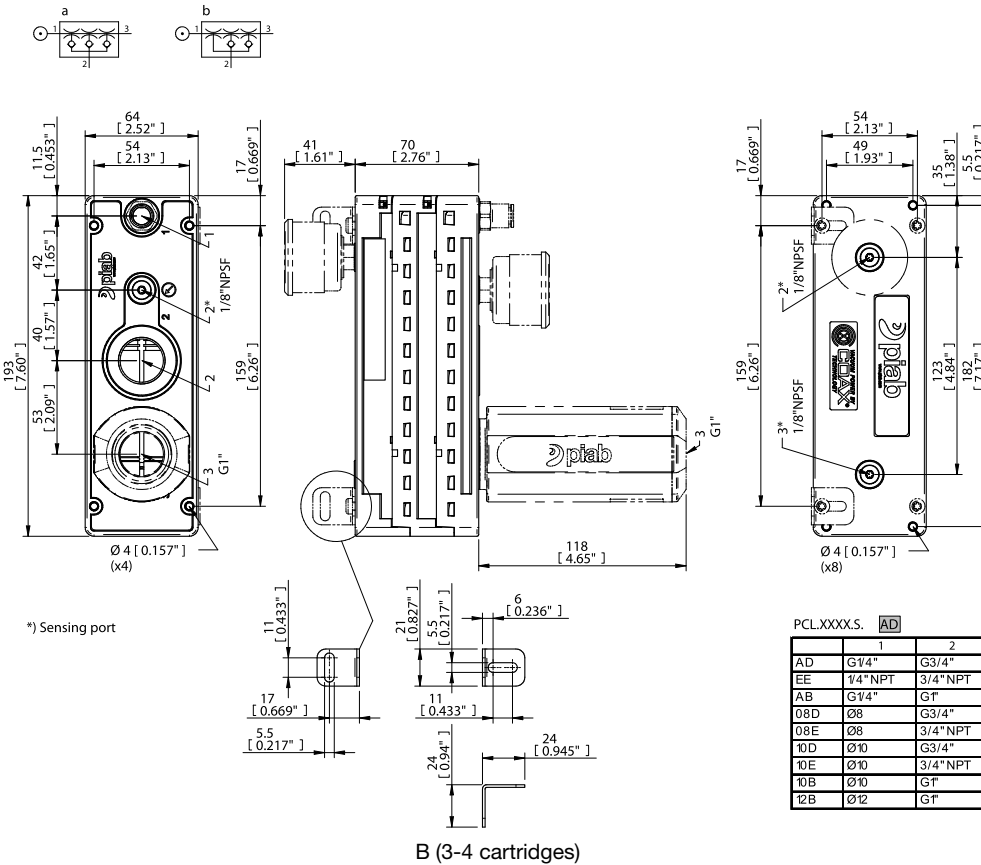
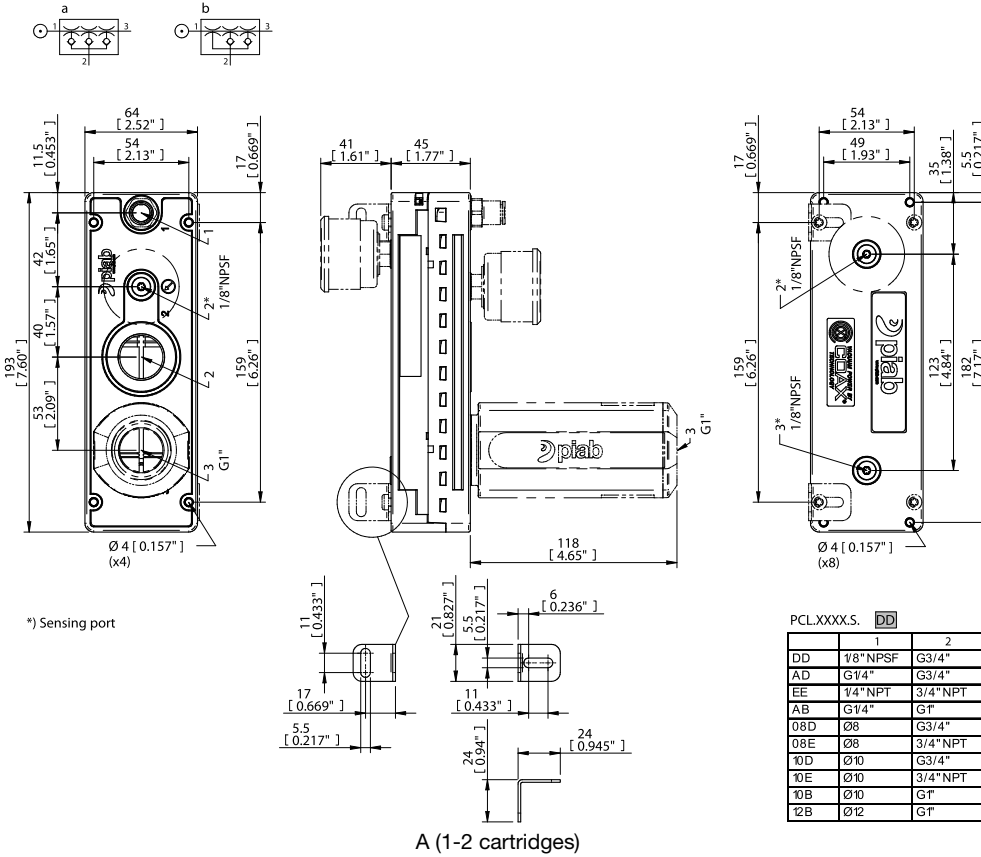
### Evacuation time at recommended feed pressure (0.6 MPa)

COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)						
		10	20	30	40	50	60	70
Si32-3 x1	1.75	0.02	0.05	0.10	0.18	0.33	0.53	0.80
Si32-3 x2	3.50	0.01	0.025	0.05	0.09	0.17	0.27	0.40
Si32-3 x3	5.25	0.007	0.017	0.033	0.06	0.11	0.18	0.27
Si32-3 x4	7.00	0.005	0.013	0.025	0.045	0.083	0.13	0.20
Si32-3 x5	8.75	0.005	0.012	0.022	0.036	0.066	0.11	0.16
Si32-3 x6	10.5	0.004	0.010	0.018	0.03	0.055	0.09	0.13

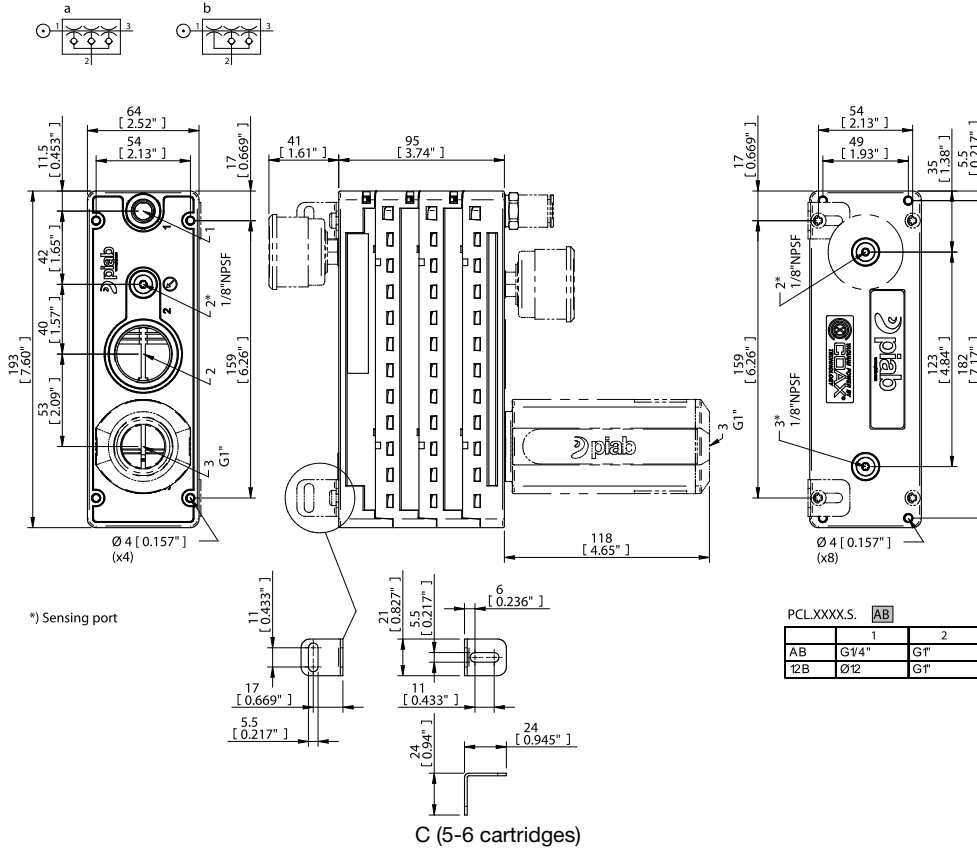
## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
A	COAX® cartridge module Si32-3x1	S1
A	COAX® cartridge module Si32-3x2	S2
B	COAX® cartridge module Si32-3x3	S3
B	COAX® cartridge module Si32-3x4	S4
C	COAX® cartridge module Si32-3x5	S5
C	COAX® cartridge module Si32-3x6	S6
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
a	Standard	B
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Standard		S
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
G1/4" female		A
1/4" NPT female		E
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
*Push-in 10 mm-1/4" female		10
*Push-in 12 mm-1/4" female		12
<i>*Compressed air push-in connector included separately.</i>		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
G1" female		B
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Si32-3x1, Standard Valve, Nitrile Sealing, Function Standard, Connections Comp. Air G1/4" female--Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.S1BN.S.AD.SV

## Dimensional drawing for piCLASSIC Si32-3



## Dimensional drawing for piCLASSIC Si32-3



## Crossover Classic to piCLASSIC

Classic Art. No.	Classic Code No.	piCLASSIC Art. No.	piCLASSIC Code No.
0102117	L25B6ADN	9904047	PCL.S1BN.S.08D.SV
0102119	L50B6ADN	9904040	PCL.S2BN.S.08D.SV
0102121	L100B6ADN	9904043	PCL.S3BN.S.08D.SV
0102122	L100B6ADNA	9904052	PCL.S3AN.S.08D.SV
0102027	L50B6-DN	9904050	PCL.S2BN.S.DD.SV
0102401	L25B6-EN	9904048	PCL.S1BN.S.08E.SV
0102403	L50B6-EN	9904046	PCL.S2BN.S.08E.SV
0102405	L100B6-EN	9904045	PCL.S3BN.S.08E.SV

## Ordering information, accessories

Description	Art. No.
Silencer G3/4" with thread insert 1"-3/4"	0126362

Recommended for piCLASSIC pumps with 1-2 cartridges. Choose a piCLASSIC without Silencer G 1" in the ordering code.

## piCLASSIC Pi48-3



- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ High performance reliability in cases of fluctuating or low compressed air pressure.
- ▶ Deep vacuum level achieved at very low feed pressure, 0.3 MPa.
- ▶ Fluctuating compressed air is commonplace in large plants and when the compressor has a high degree of utilization.
- ▶ Large capacity range, available with 1 to 6 COAX® Pi48 three-stage cartridges. A smaller piCLASSIC can easily be upgraded with more capacity if needed.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.30
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	90
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Internal volume, vacuum chamber, 3-4 cartridges	cm <sup>3</sup>	246
Internal volume, vacuum chamber, 5-6 cartridges	cm <sup>3</sup>	353
Noise level at 40 -kPa & optimal feed pressure	dBA	65-68
Temperature range	°C	-10-80
Materials		PA, Al, SS, NBR (FKM), CuZn

### Technical data, specific

Weight	Value (g)
1-2 cartridges	500-550
3-4 cartridges	720-790
5-6 cartridges	795-875
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.30 MPa)

COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								
		0	10	20	30	40	50	60	70	80
Pi48-3 x1	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10
Pi48-3 x2	4.0	11.2	5.0	3.6	2.2	1.3	1.0	0.70	0.50	0.20
Pi48-3 x3	6.0	16.8	7.5	5.4	3.3	1.95	1.5	1.05	0.75	0.30
Pi48-3 x4	8.0	22.4	10.0	7.2	4.4	2.6	2.0	1.4	1.0	0.40
Pi48-3 x5	10.0	23.8	11.3	8.6	5.5	3.25	2.5	1.75	1.25	0.50
Pi48-3 x6	12.0	26.9	12.8	10.3	6.6	3.9	3.0	2.1	1.5	0.60

### Evacuation time at recommended feed pressure (0.30 MPa)

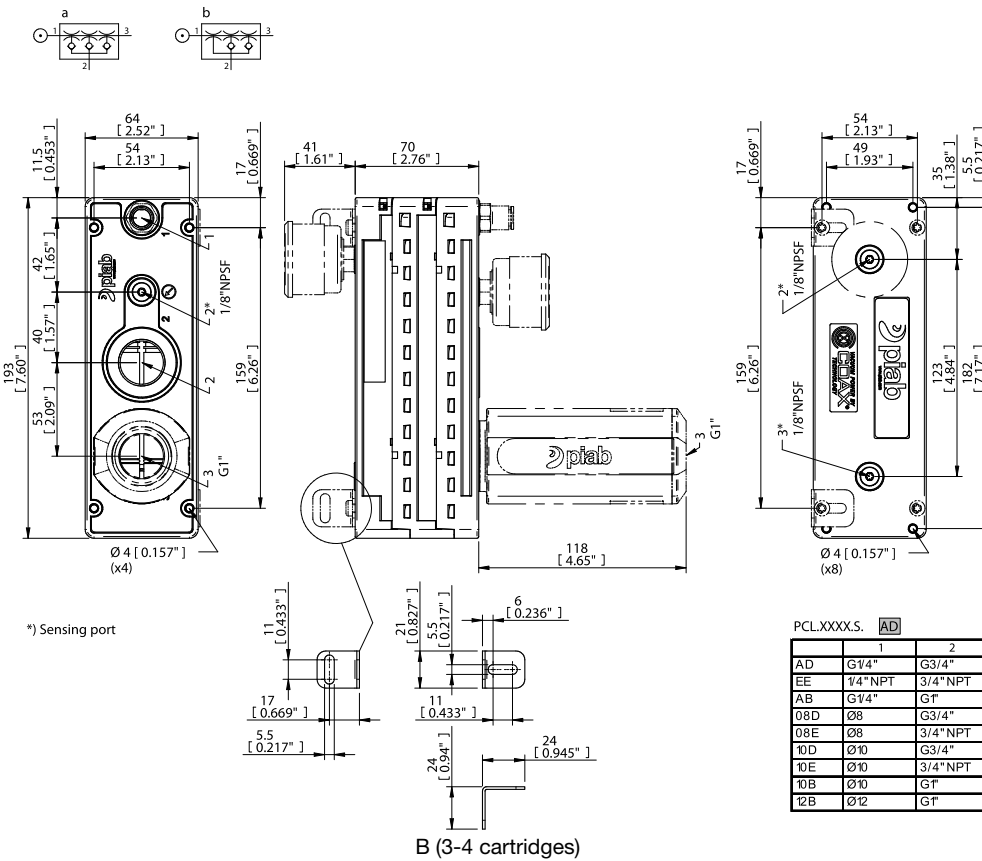
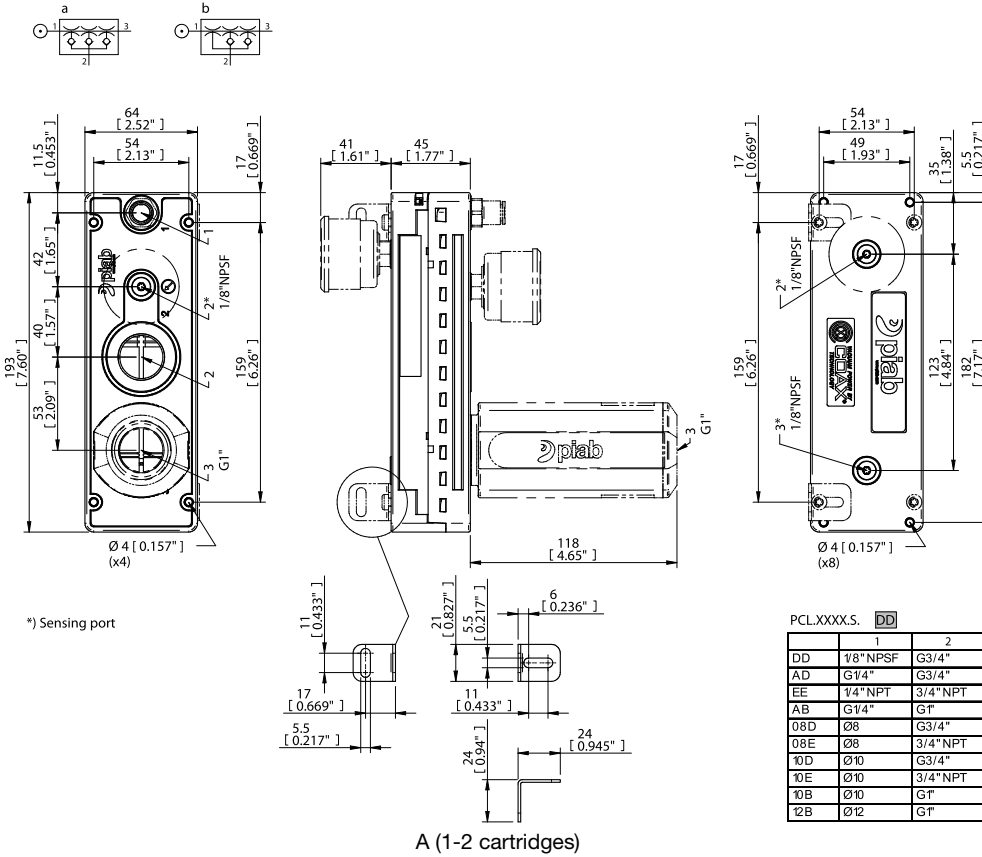
COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								
		10	20	30	40	50	60	70	80	90
Pi48-3 x1	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0
Pi48-3 x2	4.0	0.010	0.030	0.06	0.13	0.23	0.35	0.50	0.80	2.0
Pi48-3 x3	6.0	0.007	0.020	0.04	0.08	0.15	0.23	0.33	0.53	1.33
Pi48-3 x4	8.0	0.005	0.015	0.03	0.06	0.11	0.18	0.25	0.40	1.0
Pi48-3 x5	10.0	0.005	0.014	0.028	0.05	0.09	0.14	0.20	0.32	0.80
Pi48-3 x6	12.0	0.004	0.013	0.025	0.04	0.08	0.12	0.17	0.27	0.67



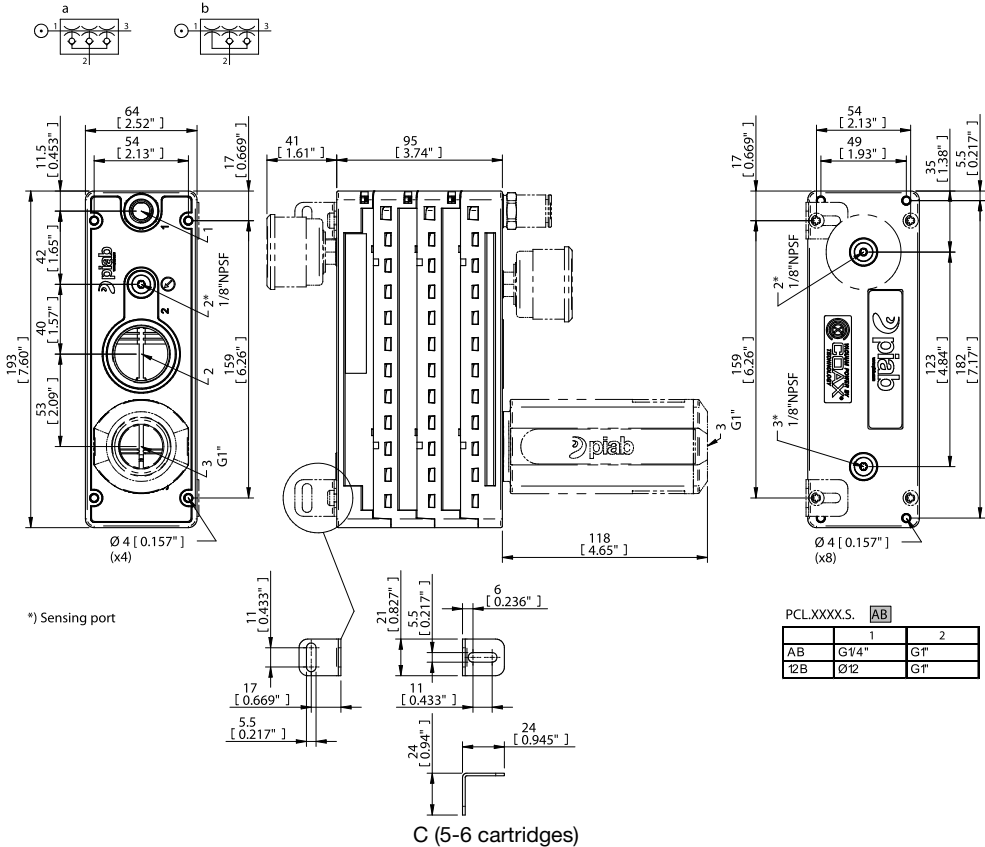
## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
A	COAX® cartridge module Pi48-3x1	P1
A	COAX® cartridge module Pi48-3x2	P2
B	COAX® cartridge module Pi48-3x3	P3
B	COAX® cartridge module Pi48-3x4	P4
C	COAX® cartridge module Pi48-3x5	P5
C	COAX® cartridge module Pi48-3x6	P6
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
a	Standard	B
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Standard		S
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
G1/4" female		A
1/4" NPT female		E
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
*Push-in 10 mm-1/4" female		10
*Push-in 12 mm-1/4" female		12
<i>*Compressed air push-in connector included separately.</i>		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
G1" female		B
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Pi48-3x1, Standard Valve, Nitrile Sealing, Function Standard, Connections Comp. Air G1/4" female--Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.P1BN.S.AD.SV

## Dimensional drawing for piCLASSIC Pi48-3



## Dimensional drawing for piCLASSIC Pi48-3



## piCLASSIC Xi40-3



- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ The Xi cartridge offers high flow at deep vacuum levels to 95 -kPa.
- ▶ Suitable for non-porous applications when deep vacuum level is needed.
- ▶ Large capacity range, available with 1 to 6 COAX® Xi40 three-stage cartridges. A smaller piCLASSIC can easily be upgraded with more capacity if needed.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.45
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	95
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Internal volume, vacuum chamber, 3-4 cartridges	cm <sup>3</sup>	246
Internal volume, vacuum chamber, 5-6 cartridges	cm <sup>3</sup>	353
Noise level at 40 -kPa & optimal feed pressure	dBA	64-69
Temperature range	°C	-10-80
Materials		PA, Al, SS, NBR (FKM), CuZn

### Technical data, specific

Weight	Value (g)
1-2 cartridges	500-550
3-4 cartridges	720-790
5-6 cartridges	795-875
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.45 MPa)

COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)									
		0	10	20	30	40	50	60	70	80	90
Xi40-3 x1	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03
Xi40-3 x2	3.66	11.8	6.0	4.0	2.6	1.46	1.16	0.86	0.64	0.36	0.06
Xi40-3 x3	5.49	17.7	9.0	6.0	3.9	2.19	1.74	1.29	0.96	0.54	0.09
Xi40-3 x4	7.32	23.6	12.0	8.0	5.2	2.92	2.32	1.72	1.28	0.72	0.12
Xi40-3 x5	9.15	25.1	13.5	9.5	6.5	3.65	2.90	2.15	1.60	0.90	0.15
Xi40-3 x6	11.0	28.3	15.3	11.4	7.8	4.38	3.44	2.58	1.92	1.08	0.18

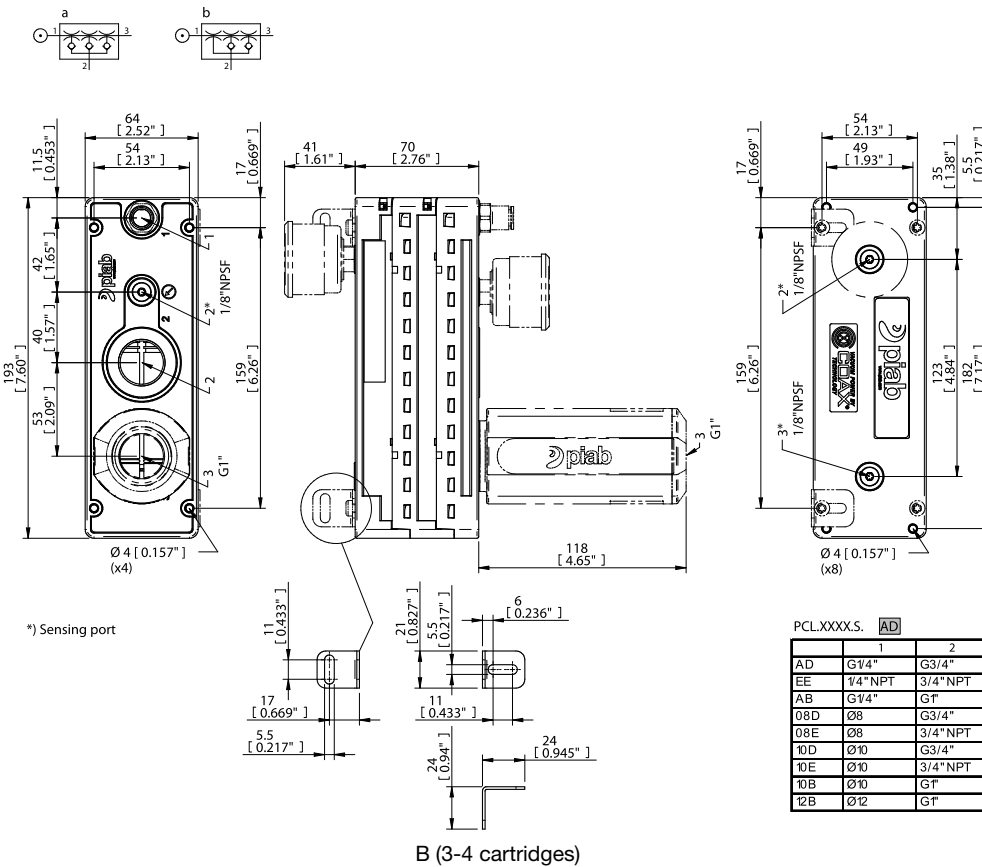
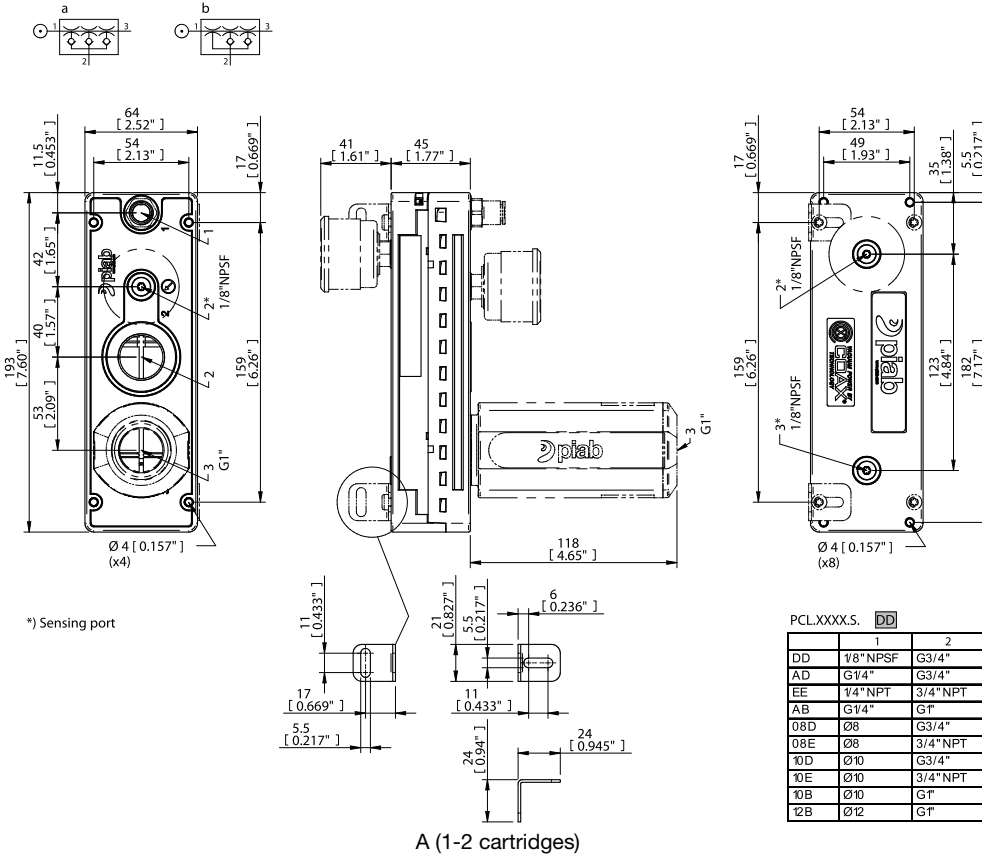
### Evacuation time at recommended feed pressure (0.45 MPa)

COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								
		10	20	30	40	50	60	70	80	90
Xi40-3 x1	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2
Xi40-3 x2	3.66	0.011	0.031	0.06	0.11	0.19	0.29	0.42	0.6	1.1
Xi40-3 x3	5.49	0.007	0.021	0.04	0.07	0.12	0.19	0.28	0.4	0.73
Xi40-3 x4	7.32	0.006	0.016	0.03	0.055	0.09	0.14	0.21	0.3	0.55
Xi40-3 x5	9.15	0.005	0.014	0.026	0.044	0.07	0.11	0.17	0.24	0.44
Xi40-3 x6	11.0	0.005	0.012	0.022	0.040	0.06	0.10	0.14	0.20	0.37

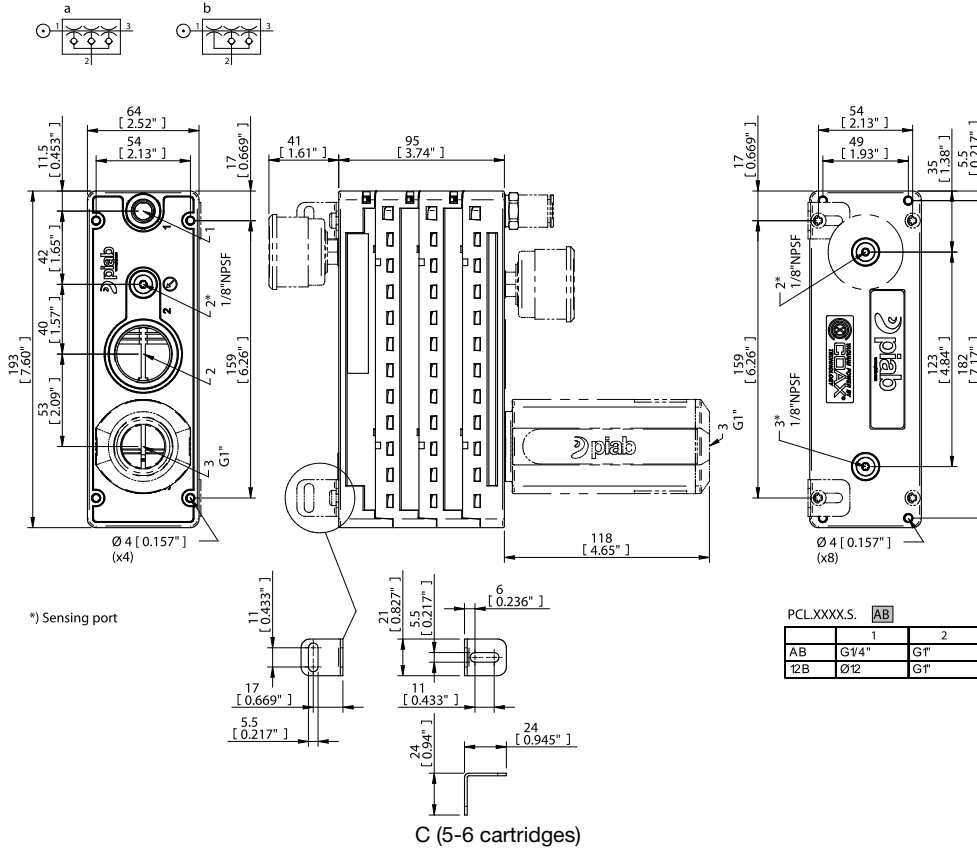
## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
A	COAX® cartridge module Xi40-3x1	X1
A	COAX® cartridge module Xi40-3x2	X2
B	COAX® cartridge module Xi40-3x3	X3
B	COAX® cartridge module Xi40-3x4	X4
C	COAX® cartridge module Xi40-3x5	X5
C	COAX® cartridge module Xi40-3x6	X6
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
a	Standard	B
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Standard		S
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
G1/4" female		A
1/4" NPT female		E
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
*Push-in 10 mm-1/4" female		10
*Push-in 12 mm-1/4" female		12
<i>*Compressed air push-in connector included separately.</i>		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
G1" female		B
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Xi40-3x1, Standard Valve, Nitrile Sealing, Function Standard, Connections Comp. Air G1/4" female- -Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.X1BN.S.AD.SV

## Dimensional drawing for piCLASSIC Xi40-3



## Dimensional drawing for piCLASSIC Xi40-3



## Crossover Classic to piCLASSIC

Classic Art. No.	Classic Code No.	piCLASSIC Art. No.	piCLASSIC Code No.
0102133	M25B5-ADN	9904039	PCL.X1BN.S.08D.SV
0102184	M25B6-ADN	9904039	PCL.X1BN.S.08D.SV
0102135	M50B5-ADN	9904034	PCL.X2BN.S.08D.SV
0102113	M50B6-ADN	9904034	PCL.X2BN.S.08D.SV
0102137	M100B5-ADN	9904035	PCL.X3BN.S.08D.SV
0102115	M100B6-ADN	9904035	PCL.X3BN.S.08D.SV
0102136	M50B5-ADNA	9904053	PCL.X2AN.S.08D.SV
0102138	M100B5-ADNA	9904051	PCL.X3AN.S.08D.SV
0102031	M25B5-DN	9904044	PCL.X1BN.S.DD.SV
0100366	M25B6-DN	9904044	PCL.X1BN.S.DD.SV
0102033	M50B5-DN	9904041	PCL.X2BN.S.DD.SV
0100372	M50B6-DN	9904041	PCL.X2BN.S.DD.SV
0102035	M100B5-DN	0126065	piCLASSIC Xi x3, Connection plate DD
0100378	M100B6-DN	0126065	piCLASSIC Xi x3, Connection plate DD
0102411	M25B5-EN	9904038	PCL.X1BN.S.08E.SV
0102395	M25B6-EN	9904038	PCL.X1BN.S.08E.SV
0102413	M50B5-EN	9904036	PCL.X3BN.S.08E.SV
0102397	M50B6-EN	9904036	PCL.X2BN.S.08E.SV
0102415	M100B5-EN	9904037	PCL.X3BN.S.08E.SV
0102399	M100B6-EN	9904037	PCL.X3BN.S.08E.SV

## piCLASSIC Si32-3 Energy Saving



- ▶ Integrated Energy Saving device, results in a large air-consumption reduction.
- ▶ Recommended for sealed or almost sealed applications.
- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ The Si cartridge offers extra good vacuum flow.
- ▶ Available with 1 to 4 COAX® Si32 three-stage cartridges.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.60
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	75
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Internal volume, vacuum chamber, 3-4 cartridges	cm <sup>3</sup>	246
Noise level at 40 -kPa & optimal feed pressure	dBA	66-77
Temperature range	°C	-10-60
Materials		PA, Al, SS, NBR (FKM), CuZn, POM
Hysteresis	kPa	12
Kv, Flow @ P1=0.6 MPa and Δp=0.1 Mpa	NI/s	7.8
Life span	cycles	>10,000,000

### Technical data, specific

Weight	Value (g)
1-2 cartridges	600-630
3-4 cartridges	820-870
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.6 MPa)

COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)							
		0	10	20	30	40	50	60	70
Si32-3 x1	1.75	6.00	3.50	2.60	1.70	0.90	0.60	0.50	0.35
Si32-3 x2	3.50	12.0	7.00	5.20	3.40	1.80	1.20	1.00	0.70
Si32-3 x3	5.25	18.0	10.5	7.80	5.10	2.70	1.80	1.50	1.10
Si32-3 x4	7.00	24.0	14.0	10.4	6.80	3.60	2.40	2.00	1.40

### Evacuation time at recommended feed pressure (0.6 MPa)

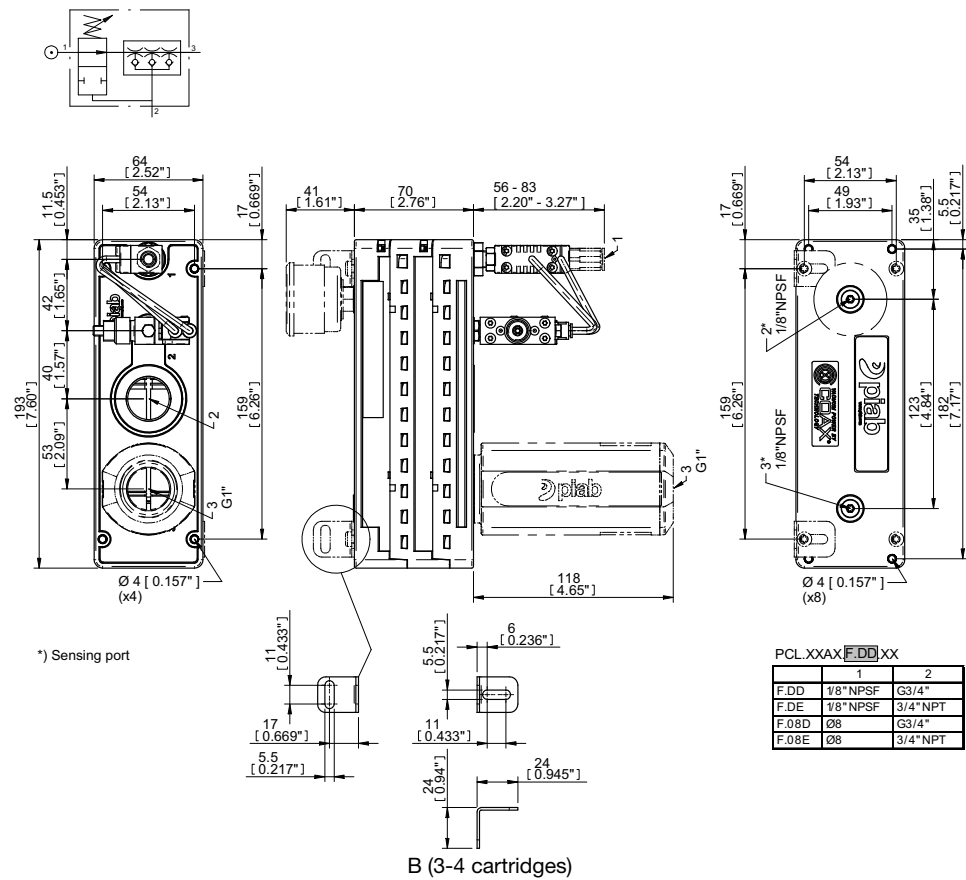
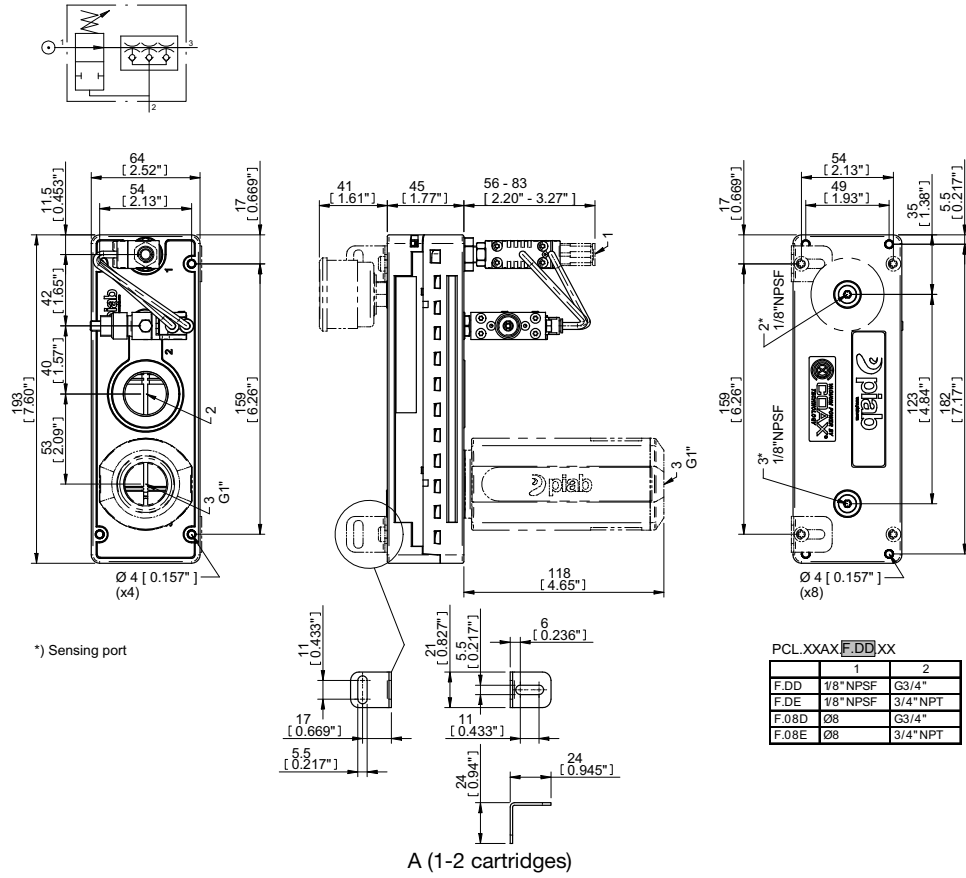
COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)						
		10	20	30	40	50	60	70
Si32-3 x1	1.75	0.02	0.05	0.10	0.18	0.33	0.53	0.80
Si32-3 x2	3.50	0.01	0.025	0.05	0.09	0.17	0.27	0.40
Si32-3 x3	5.25	0.007	0.017	0.033	0.06	0.11	0.18	0.27
Si32-3 x4	7.00	0.005	0.013	0.025	0.045	0.083	0.13	0.20



## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
A	COAX® cartridge module Si32-3x1	S1
A	COAX® cartridge module Si32-3x2	S2
B	COAX® cartridge module Si32-3x3	S3
B	COAX® cartridge module Si32-3x4	S4
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Energy saving system (ES)		F
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
<i>*Compressed air push-in connector included separately.</i>		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Si32-3x1, Non-return Valve, Nitrile Sealing, Energy saving Function, Connections Comp. Air 1/8" NPSF (G) female--Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.S1AN.F.DD.SV

## Dimensional drawing for piCLASSIC Si32-3 ES



## piCLASSIC Pi48-3 Energy Saving



- ▶ Integrated Energy Saving device, results in a large air-consumption reduction.
- ▶ Recommended for sealed or almost sealed applications.
- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ High performance reliability in cases of fluctuating or low compressed air pressure.
- ▶ Deep vacuum level achieved at very low feed pressure, 0.3 MPa.
- ▶ Available with 1 or 2 COAX® Pi48 three-stage cartridges.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.30
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	90
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Noise level at 40 -kPa & optimal feed pressure	dBa	65-68
Temperature range	°C	-10-60
Materials		PA, Al, SS, NBR (FKM), CuZn, POM
Hysteresis	kPa	12
Kv, Flow @ P1=0.6 MPa and Δp=0.1 Mpa	NI/s	7.8
Life span	cycles	>10,000,000

### Technical data, specific

Weight	Value (g)
1-2 cartridges	600-630
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.30 MPa)

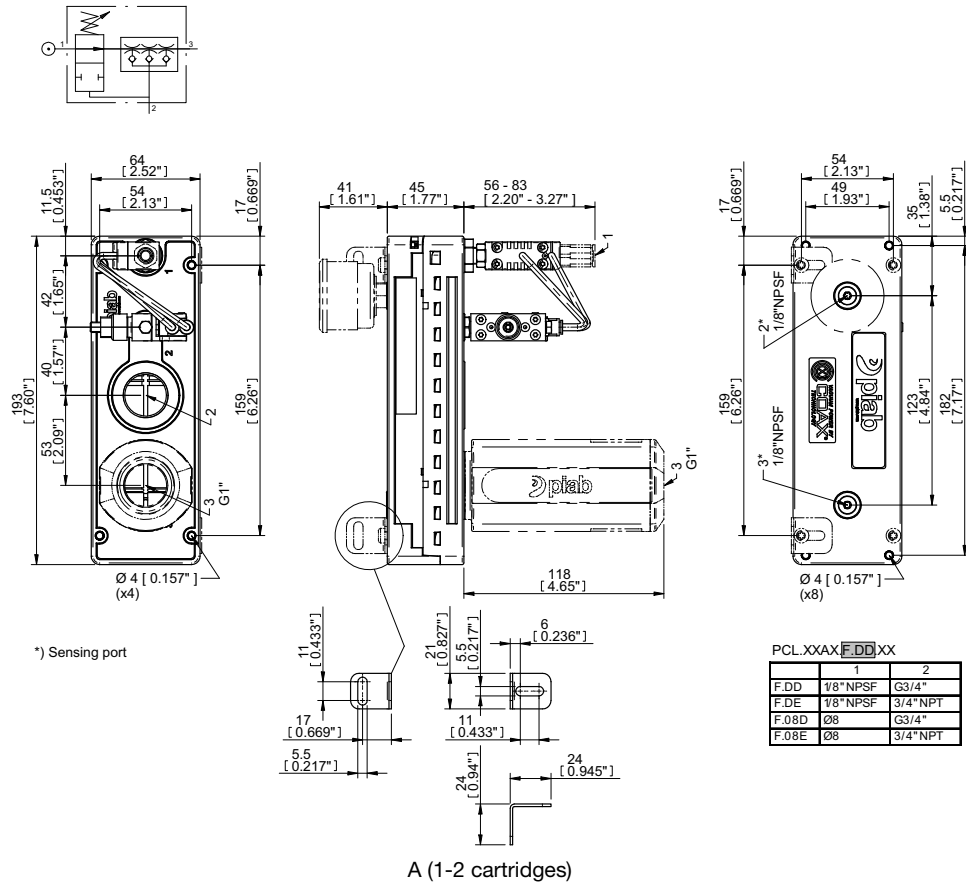
COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								
		0	10	20	30	40	50	60	70	80
Pi48-3 x1	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10
Pi48-3 x2	4.0	11.2	5.0	3.6	2.2	1.3	1.0	0.70	0.50	0.20

### Evacuation time at recommended feed pressure (0.30 MPa)

COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								
		10	20	30	40	50	60	70	80	90
Pi48-3 x1	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0
Pi48-3 x2	4.0	0.010	0.030	0.06	0.13	0.23	0.35	0.50	0.80	2.0

## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
COAX® cartridge module Pi48-3x1		P1
COAX® cartridge module Pi48-3x2		P2
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Energy saving system (ES)		F
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
*Compressed air push-in connector included separately.		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Pi48-3x1, Non-return Valve, Nitrile Sealing, Energy saving Function, Connections Comp. Air 1/8" NPSF (G) female--Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.P1AN.F.DD.SV



## piCLASSIC Xi40-3 Energy Saving



- ▶ Integrated Energy Saving device, results in a large air-consumption reduction.
- ▶ Recommended for sealed or almost sealed applications.
- ▶ Patented COAX® technology inside – the most energy efficient ejector technology.
- ▶ The Xi cartridge offers high flow at deep vacuum levels to 95 -kPa.
- ▶ Available with 1 to 3 COAX® Xi40 three-stage cartridges.
- ▶ Low-weight, configurable and modular design.
- ▶ Easy disassembly for maintenance.

### Technical data

Description	Unit	Value
Feed pressure, optimum	MPa	0.45
Feed pressure, max.	MPa	0.7
Max. vacuum	-kPa	95
Internal volume, vacuum chamber, 1-2 cartridges	cm <sup>3</sup>	140
Internal volume, vacuum chamber, 3 cartridges	cm <sup>3</sup>	246
Noise level at 40 -kPa & optimal feed pressure	dBA	64-69
Temperature range	°C	-10-60
Materials		PA, Al, SS, NBR (FKM), CuZn, POM
Hysteresis	kPa	12
Kv, Flow @ P1=0.6 MPa and Δp=0.1 Mpa	NI/s	7.8
Life span	cycles	>10,000,000

### Technical data, specific

Weight	Value (g)
1-2 cartridges	600-630
3 cartridges	820
Silencer	120
Vacuum gauge	50

### Vacuum flow at recommended feed pressure (0.45 MPa)

COAX® cartridge	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)									
		0	10	20	30	40	50	60	70	80	90
Xi40-3 x1	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03
Xi40-3 x2	3.66	11.8	6.0	4.0	2.6	1.46	1.16	0.86	0.64	0.36	0.06
Xi40-3 x3	5.49	17.7	9.0	6.0	3.9	2.19	1.74	1.29	0.96	0.54	0.09

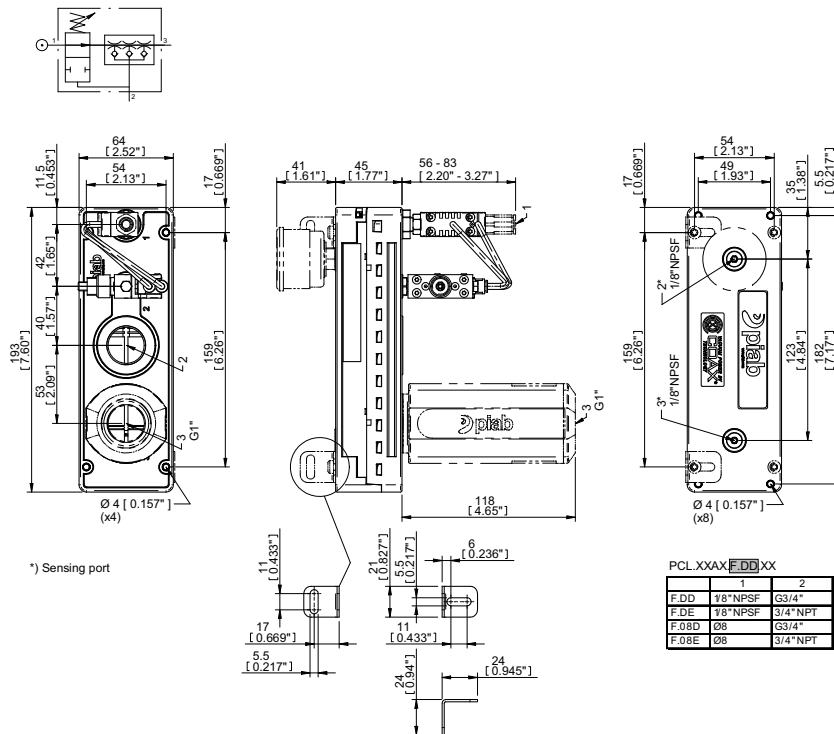
### Evacuation time at recommended feed pressure (0.45 MPa)

COAX® cartridge	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								
		10	20	30	40	50	60	70	80	90
Xi40-3 x1	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2
Xi40-3 x2	3.66	0.011	0.031	0.06	0.11	0.19	0.29	0.42	0.6	1.1
Xi40-3 x3	5.49	0.007	0.021	0.04	0.07	0.12	0.19	0.28	0.4	0.73

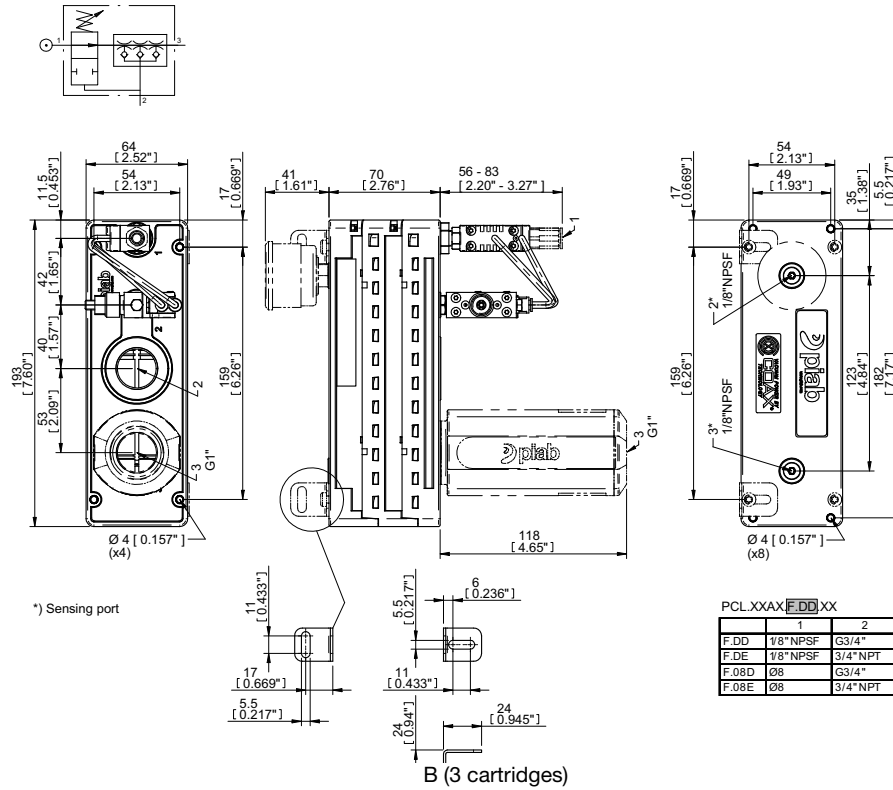
## Ordering information

<b>1. Housing</b>		<b>piCLASSIC Code</b>
Housing		PCL
<b>2a. COAX® cartridge modules</b>		<b>piCLASSIC Code</b>
A	COAX® cartridge module Xi40-3x1	X1
A	COAX® cartridge module Xi40-3x2	X2
B	COAX® cartridge module Xi40-3x3	X3
<b>2b. Valve Configuration</b>		<b>piCLASSIC Code</b>
b	Non-return valve	A
<b>2c. Sealing material</b>		<b>piCLASSIC Code</b>
Nitrile		N
Viton		V
<b>3. Function</b>		<b>piCLASSIC Code</b>
Energy saving system (ES)		F
<b>4a. Compressed air connection</b>		<b>piCLASSIC Code</b>
1/8" NPSF (G) female		D
*Push-in 8 mm (5/32")-1/4" female		08
*Compressed air push-in connector included separately.		
<b>4b. Vacuum connection</b>		<b>piCLASSIC Code</b>
G3/4" female		D
3/4" NPT female		E
<b>5. Accessory</b>		<b>piCLASSIC Code</b>
None		X
Silencer G1" male		S
Vacuum gauge		V
Silencer G1" male & vacuum gauge		SV
<b>Example</b>		<b>Ordering number</b>
piCLASSIC Xi40-3x1, Non-return Valve, Nitrile Sealing, Energy saving Function, Connections Comp. Air 1/8" NPSF (G) female--Vacuum G3/4" female, Silencer G1" male & vacuum gauge		PCL.X1AN.F.DD.SV

## Dimensional drawing for piCLASSIC Xi40-3 ES



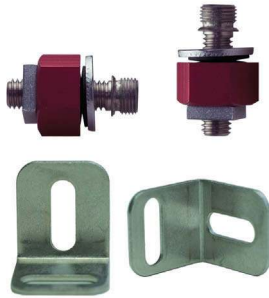
A (1-2 cartridges)



## Crossover Classic to piCLASSIC

Classic Art. No.	Classic Code No.	piCLASSIC Art. No.	piCLASSIC Code No.
0103092	M50B5-ADNAF	9904049	PCL.X2AN.F.08D.SV
0103265	M100B6-ADNAF	9904051	PCL.X3AN.F.08D.SV

## Mounting brackets



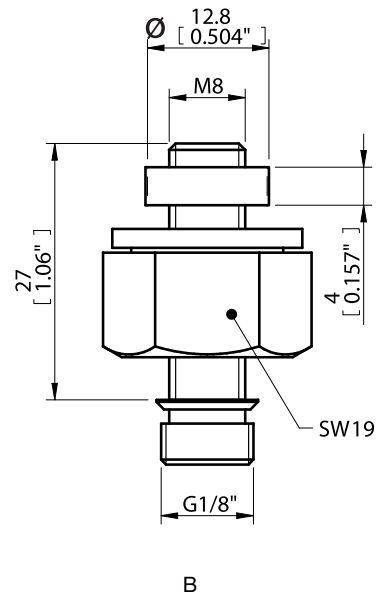
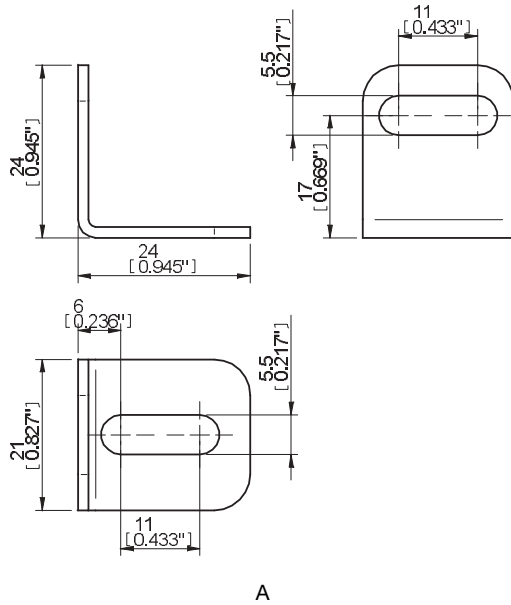
- ▶ Corrosion-resistant material.
- ▶ Included as a set (2 pieces) with each vacuum pump.
- ▶ Suitable for vacuum pumps piCLASSIC.

### Technical data

Description	Unit	Value	
		0124869	0125073
Weight	g	10-27	56
Material		SS	Al, SS, Steel

### Ordering information

	Description	Art. No.
A	Mounting bracket piCLASSIC cpl	0124869
B	Mounting kit M8/27 piCLASSIC, profile	0125073





## Round pump



- ▶ Energy efficient due to the COAX® technology
- ▶ High vacuum flow with 6x COAX® Si MIDI cartridges
- ▶ Small, compact and light in weight
- ▶ Easy to mount and install in a vacuum line
- ▶ Integrated hose connectors

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBa	70–82
Material		PPS, PA, NBR, Viton®, SS
Temperature range	°C	-10–80
Weight	g	1130

### Vacuum flow

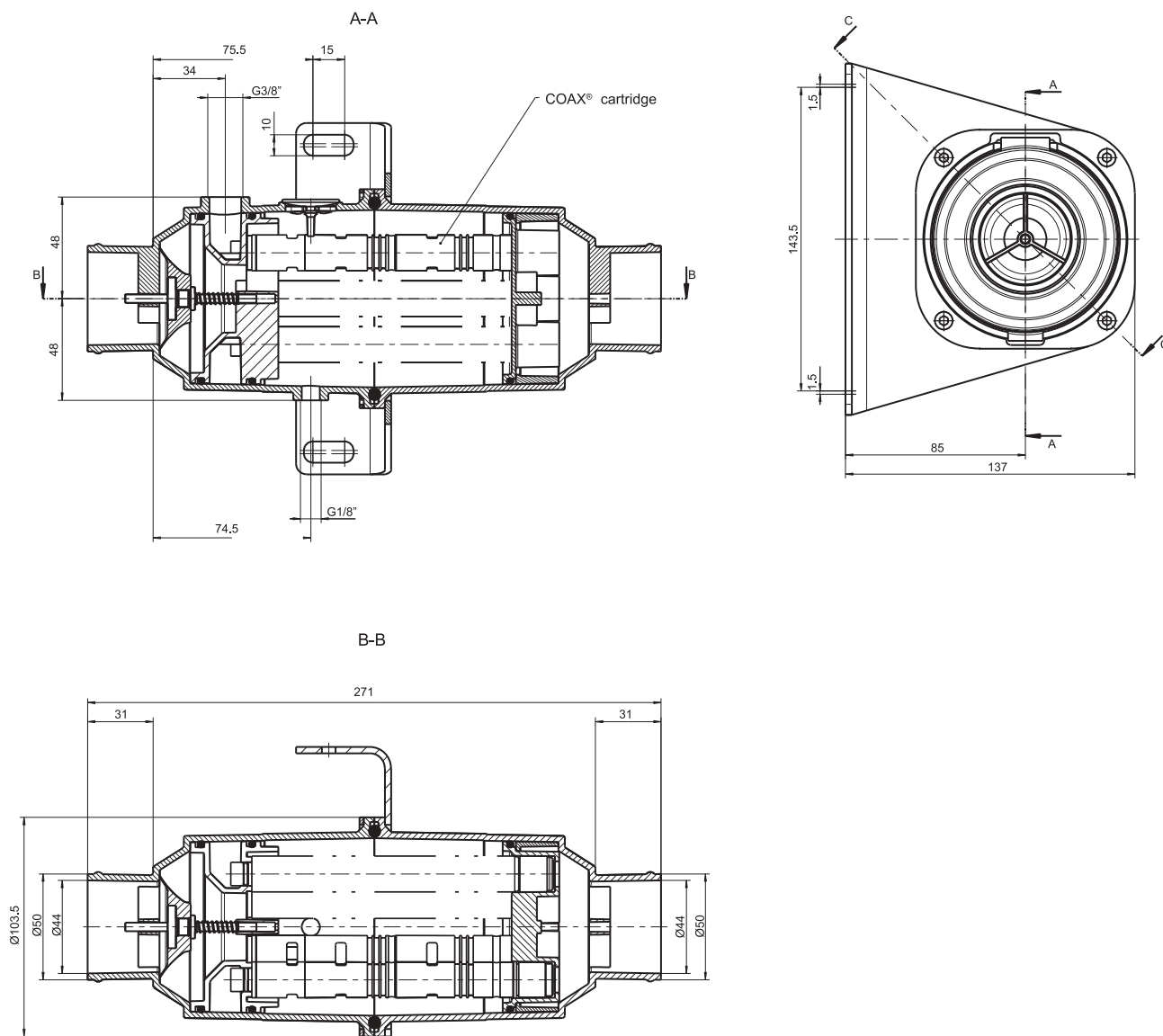
Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)								Max vacuum -kPa
		0	10	20	30	40	50	60	70	
0.40	7.5	30.0	17.4	11.4	7.2	4.8	2.4	0.6	—	60
0.50	9.0	34.2	19.8	13.2	8.4	5.1	3.72	2.1	1.08	70
0.60	10.5	36.0	21.0	15.6	10.2	5.4	3.6	3.0	2.1	75

### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum -kPa
		10	20	30	40	50	60	70	
0.40	7.5	0.005	0.012	0.023	0.040	0.070	0.167	—	60
0.50	9.0	0.003	0.010	0.018	0.035	0.058	0.100	0.167	70
0.60	10.5	0.003	0.008	0.017	0.030	0.055	0.088	0.133	75

## Ordering information

Description	Art. No.
Round pump COAX® 6xSi32-3	0121632



## P6040



- ▶ Patented COAX® technology.
- ▶ Available with a three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed.
- ▶ Substantially lower air consumption.
- ▶ Modular design for flexible performance.
- ▶ Compact and durable with no moving parts.

### Technical data

Description	Unit	Value
Feed pressure, max	MPa	0.7
Noise level	dBA	57-76
Temperature range	°C	-10-80
Weight	g	4300-5600
Material		Al, PA, NBR, SS, POM, HDPE

### Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)											Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90		
Pi48-3	0.30	2.0	5.6	2.5	1.8	1.1	0.65	0.50	0.35	0.25	0.10	—	90/53*	
Si32-3	0.60	1.75	6.0	3.5	2.6	1.7	0.90	0.60	0.50	0.35	—	—	75/52*	
Xi40-3	0.45	1.83	5.9	3.0	2.0	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95/51*	

Values for one COAX® cartridge. Multiply with number of cartridges. For vacuum flows at other feed pressures, see section Vacuum cartridges/integration.

\* COAX® cartridge module, 1x flap valve

### Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum -kPa
			10	20	30	40	50	60	70	80	90		
Pi48-3	0.30	2.0	0.020	0.060	0.12	0.25	0.45	0.70	1.0	1.6	4.0	90/53*	
Si32-3	0.60	1.75	0.020	0.050	0.10	0.18	0.33	0.53	0.80	—	—	75/52*	
Xi40-3	0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	95/51*	

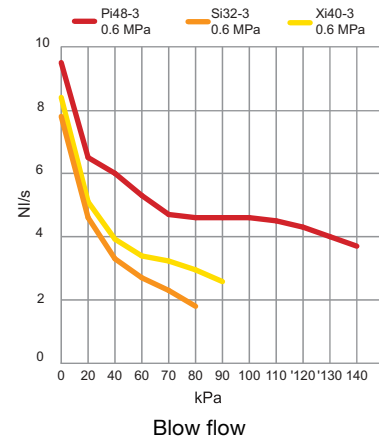
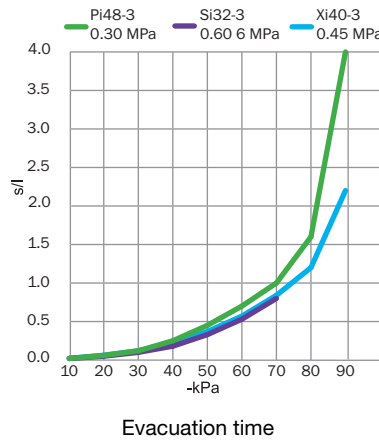
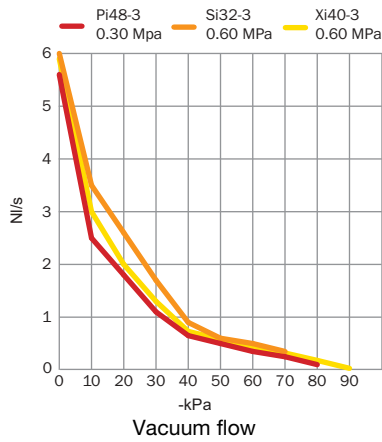
Values for one COAX® cartridge. Divide with number of cartridges. For evacuation times at other feed pressures, see section Vacuum cartridges/integration.

\* COAX® cartridge module, 1x flap valve

### Blow flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Blow flow (NI/s) at different pressure levels (kPa)												Max pressure kPa
			0	20	40	60	70	80	90	100	110	120	130	140	
Pi48-3	0.6	3.55	9.5	6.5	6.0	5.3	4.7	4.6	4.6	4.6	4.5	4.3	4.0	3.7	140
Si32-3	0.6	1.75	7.8	4.6	3.3	2.7	2.3	1.8	—	—	—	—	—	—	80
Xi40-3	0.6	2.33	8.4	5.1	3.92	3.39	3.23	2.95	2.58	—	—	—	—	—	90

Values for one COAX® cartridge. Multiply with number of cartridges.



## Ordering information

<b>1. Housing</b>		<b>P6040 Code</b>
Housing P6040		P6040
<b>2. Select Application type</b>		<b>P6040 Code</b>
P6040 Blow		B
P6040 Vacuum		V
<b>3. COAX® cartridge modules</b>		<b>P6040 Code</b>
a	COAX® cartridge module Pi48-3X5	AA
a	COAX® cartridge module Pi48-3X6	AB
a	COAX® cartridge module Pi48-3X7	AC
a	COAX® cartridge module Pi48-3X8	AD
a	COAX® cartridge module Pi48-3X9	AE
a	COAX® cartridge module Pi48-3X10	AF
a	COAX® cartridge module Pi48-3X11	AG
a	COAX® cartridge module Pi48-3X12	AH
a	COAX® cartridge module Pi48-3X13	AI
a	COAX® cartridge module Pi48-3X14	AJ
a	COAX® cartridge module Pi48-3X15	AK
a	COAX® cartridge module Pi48-3X16	AL
b	COAX® cartridge module Pi48-3X5, non-return valve	AM
b	COAX® cartridge module Pi48-3X6, non-return valve	AN
b	COAX® cartridge module Pi48-3X7, non-return valve	AO
b	COAX® cartridge module Pi48-3X8, non-return valve	AP
b	COAX® cartridge module Pi48-3X9, non-return valve	AQ
b	COAX® cartridge module Pi48-3X10, non-return valve	AR
b	COAX® cartridge module Pi48-3X11, non-return valve	AS
b	COAX® cartridge module Pi48-3X12, non-return valve	AT
b	COAX® cartridge module Pi48-3X13, non-return valve	AU
b	COAX® cartridge module Pi48-3X14, non-return valve	AV
b	COAX® cartridge module Pi48-3X15, non-return valve	AW
b	COAX® cartridge module Pi48-3X16, non-return valve	AX
c	COAX® cartridge module Pi48-3X5, 1x flap valve	AY
c	COAX® cartridge module Pi48-3X6, 1x flap valve	AZ
c	COAX® cartridge module Pi48-3X7, 1x flap valve	BA
c	COAX® cartridge module Pi48-3X8, 1x flap valve	BB
c	COAX® cartridge module Pi48-3X9, 1x flap valve	BC
c	COAX® cartridge module Pi48-3X10, 1x flap valve	BD
c	COAX® cartridge module Pi48-3X11, 1x flap valve	BE
c	COAX® cartridge module Pi48-3X12, 1x flap valve	BF
c	COAX® cartridge module Pi48-3X13, 1x flap valve	BG
c	COAX® cartridge module Pi48-3X14, 1x flap valve	BH
c	COAX® cartridge module Pi48-3X15, 1x flap valve	BI
c	COAX® cartridge module Pi48-3X16, 1x flap valve	BJ
a	COAX® cartridge module Si32-3X5	BK
a	COAX® cartridge module Si32-3X6	BL
a	COAX® cartridge module Si32-3X7	BM
a	COAX® cartridge module Si32-3X8	BN

	<b>3. COAX® cartridge modules</b>	<b>P6040 Code</b>
a	COAX® cartridge module Si32-3X9	BO
a	COAX® cartridge module Si32-3X10	BP
a	COAX® cartridge module Si32-3X11	BQ
a	COAX® cartridge module Si32-3X12	BR
a	COAX® cartridge module Si32-3X13	BS
a	COAX® cartridge module Si32-3X14	BT
a	COAX® cartridge module Si32-3X15	BU
a	COAX® cartridge module Si32-3X16	BV
b	COAX® cartridge module Si32-3X5, non-return valve	BW
b	COAX® cartridge module Si32-3X6, non-return valve	BX
b	COAX® cartridge module Si32-3X7, non-return valve	BY
b	COAX® cartridge module Si32-3X8, non-return valve	BZ
b	COAX® cartridge module Si32-3X9, non-return valve	CA
b	COAX® cartridge module Si32-3X10, non-return valve	CB
b	COAX® cartridge module Si32-3X11, non-return valve	CC
b	COAX® cartridge module Si32-3X12, non-return valve	CD
b	COAX® cartridge module Si32-3X13, non-return valve	CE
b	COAX® cartridge module Si32-3X14, non-return valve	CF
b	COAX® cartridge module Si32-3X15, non-return valve	CG
b	COAX® cartridge module Si32-3X16, non-return valve	CH
c	COAX® cartridge module Si32-3X5, 1x flap valve	CI
c	COAX® cartridge module Si32-3X6, 1x flap valve	CJ
c	COAX® cartridge module Si32-3X7, 1x flap valve	CK
c	COAX® cartridge module Si32-3X8, 1x flap valve	CL
c	COAX® cartridge module Si32-3X9, 1x flap valve	CM
c	COAX® cartridge module Si32-3X10, 1x flap valve	CN
c	COAX® cartridge module Si32-3X11, 1x flap valve	CO
c	COAX® cartridge module Si32-3X12, 1x flap valve	CP
c	COAX® cartridge module Si32-3X13, 1x flap valve	CQ
c	COAX® cartridge module Si32-3X14, 1x flap valve	CR
c	COAX® cartridge module Si32-3X15, 1x flap valve	CS
c	COAX® cartridge module Si32-3X16, 1x flap valve	CT
a	COAX® cartridge module Xi40-3X5	CU
a	COAX® cartridge module Xi40-3X6	CV
a	COAX® cartridge module Xi40-3X7	CW
a	COAX® cartridge module Xi40-3X8	CX
a	COAX® cartridge module Xi40-3X9	CY
a	COAX® cartridge module Xi40-3X10	CZ
a	COAX® cartridge module Xi40-3X11	DA
a	COAX® cartridge module Xi40-3X12	DB
a	COAX® cartridge module Xi40-3X13	DC
a	COAX® cartridge module Xi40-3X14	DD
a	COAX® cartridge module Xi40-3X15	DE
a	COAX® cartridge module Xi40-3X16	DF
b	COAX® cartridge module Xi40-3X5, non-return valve	DG
b	COAX® cartridge module Xi40-3X6, non-return valve	DH
b	COAX® cartridge module Xi40-3X7, non-return valve	DI
b	COAX® cartridge module Xi40-3X8, non-return valve	DJ
b	COAX® cartridge module Xi40-3X9, non-return valve	DK
b	COAX® cartridge module Xi40-3X10, non-return valve	DL
b	COAX® cartridge module Xi40-3X11, non-return valve	DM
b	COAX® cartridge module Xi40-3X12, non-return valve	DN
b	COAX® cartridge module Xi40-3X13, non-return valve	DO
b	COAX® cartridge module Xi40-3X14, non-return valve	DP
b	COAX® cartridge module Xi40-3X15, non-return valve	DQ
b	COAX® cartridge module Xi40-3X16, non-return valve	DR
c	COAX® cartridge module Xi40-3X5, 1x flap valve	DS
c	COAX® cartridge module Xi40-3X6, 1x flap valve	DT
c	COAX® cartridge module Xi40-3X7, 1x flap valve	DU
c	COAX® cartridge module Xi40-3X8, 1x flap valve	DV
c	COAX® cartridge module Xi40-3X9, 1x flap valve	DW
c	COAX® cartridge module Xi40-3X10, 1x flap valve	DX
c	COAX® cartridge module Xi40-3X11, 1x flap valve	DY
c	COAX® cartridge module Xi40-3X12, 1x flap valve	DZ
c	COAX® cartridge module Xi40-3X13, 1x flap valve	EA

3. COAX® cartridge modules		P6040 Code
c	COAX® cartridge module Xi40-3X14, 1x flap valve	EB
c	COAX® cartridge module Xi40-3X15, 1x flap valve	EC
c	COAX® cartridge module Xi40-3X16, 1x flap valve	ED

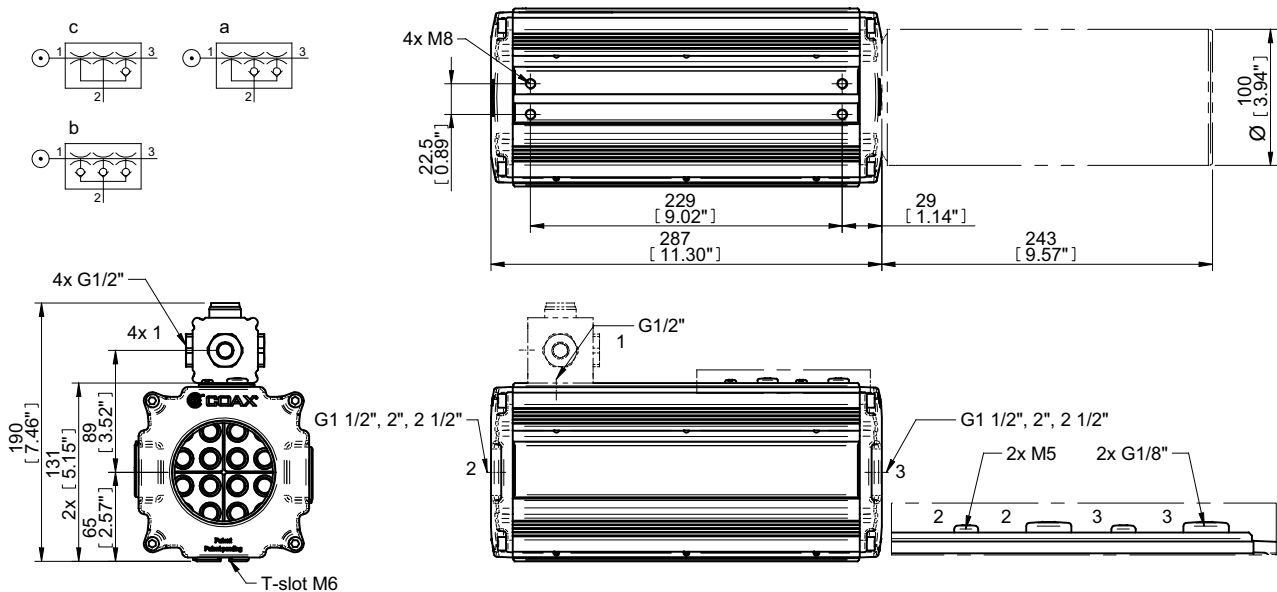
4. Mounting		P6040 Code
T-slot		00

5. Select Cover plate, function		P6040 Code
Connection G1/2"		AA
Connection 4x G1/2"		AB
Function V30		AC
Function ES Vacuum		AD
Function ES Blow		AE

For detailed information on V30, ES Vacuum and ES Blow, see separate datasheets.

6. Select Connections for vacuum and blow		P6040 Code
Connection G 1 1/2"		00
Connection G 2"		01
Connection G 2 1/2"		02
Connection G 1 1/2", silencer		03
Connection G 2", silencer		04
Connection G 2 1/2", silencer		05
Connection G 1 1/2", inlet silencer		06
Connection G 2", inlet silencer		07
Connection G 2 1/2", inlet silencer		08

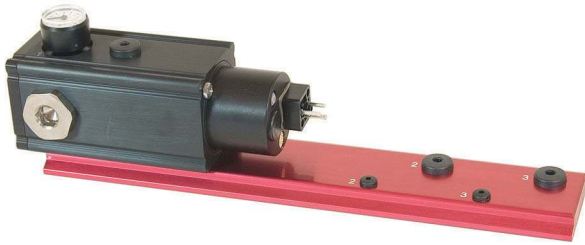
Example	Ordering No.
P6040 Vacuum, Pi48-3X5, Mounting T-slot, Cover plate with 4 connections G1/2", Connection G 2 1/2" and silencer	P6040 V AA 00 AB 05
P6040 Vacuum, Pi48-3X5, Mounting T-slot, Cover plate with connection G1/2", Connection G 2 1/2" and silencer	P6040 V AA 00 AA 05



### Ordering information, accessories

Description	Art. No.
Manometer 250 kPa	3101626

## P6040 Function V30



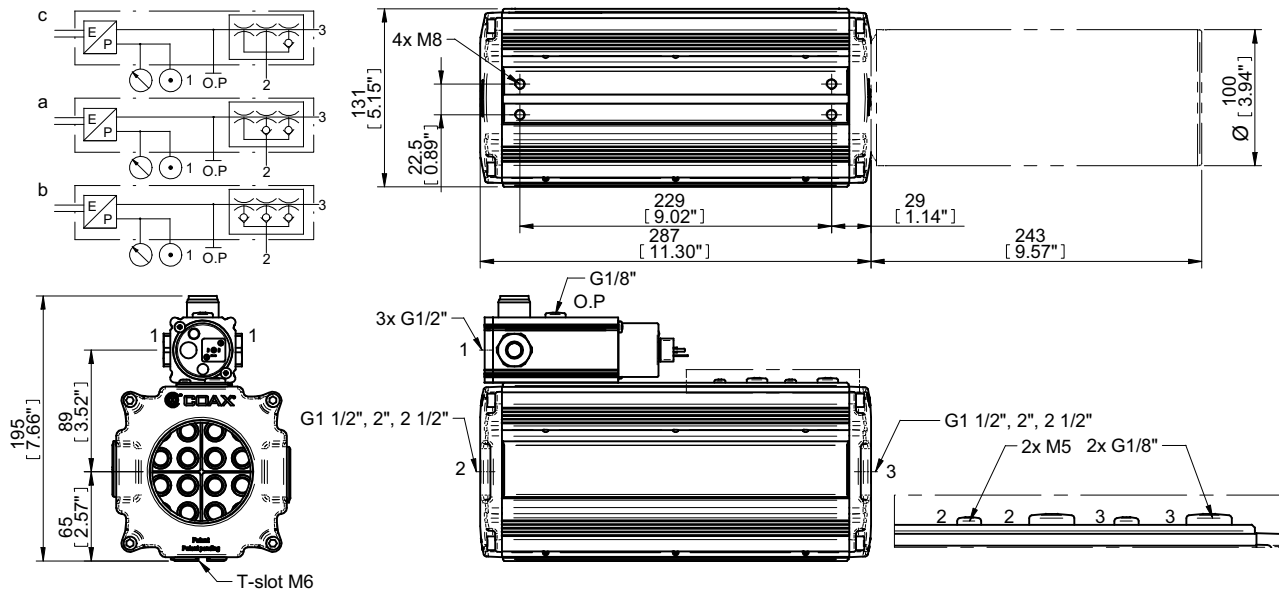
- ▶ Patented COAX® technology
- ▶ Substantially lower air consumption
- ▶ Modular design for flexible performance
- ▶ Compact and durable with no moving parts
- ▶ With its low energy consumption it can be controlled directly from the control system

### Technical data

Description	Unit	Value
Feed pressure	MPa	0.7
Noise level	dBA	57–76
Temperature range	°C	0–50
Voltage	V	24
Voltage range	V	14–28
Current consumption	mA	40
Ripple	V <sub>p</sub>	1 V <sub>rms</sub>
Safety classification	IP	65
Display		LED
Weight	g	4900–5900
Material		Al, PA, NBR, SS, POM, HDPE, CuZn, PBT

### Ordering information

Description	Art. No.
Function V30	0117783
Example	Ordering No.
P6040 Vacuum, Pi48-3X5, Mounting T-slot, Cover plate with function V30, Connection G 2 1/2" and silencer	P6040 V AA 00 AC 05



## P6040 Function ES Vacuum



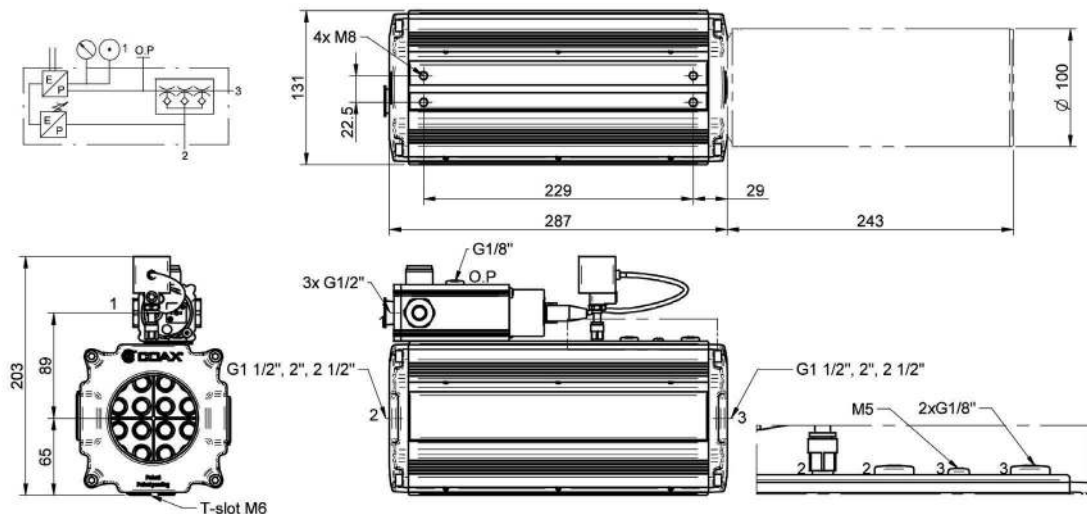
- ▶ Patented COAX® technology
- ▶ Substantially lower air consumption
- ▶ Modular design for flexible performance
- ▶ Compact and durable with no moving parts
- ▶ Saves energy when the vacuum requirement varies

### Technical data

Description	Unit	Value
Feed pressure	MPa	0.7
Noise level	dBA	57-76
Temperature range	°C	0-50
Signal range	-kPa	15-95
Hysteresis	kPa	1-79
Voltage	V	24
Voltage range	V	14-28
Current consumption	mA	60
Ripple	V <sub>p</sub>	1 V <sub>rms</sub>
Safety classification	IP	40
Display		LED
Weight	g	5000-6000
Material		Al, PA, NBR, SS, POM, HDPE, PC, CuZn, PBT

### Ordering information

Description	Art. No.
Function ES Vacuum	0117784
Example	Ordering No.
P6040 Vacuum, Si32-3X5 with non-return valve, Mounting T-slot, Cover plate with function ES vacuum, Connection G 2 1/2" with silencer	P6040 V BW 00 AD 05





## P6040 Function ES Blow



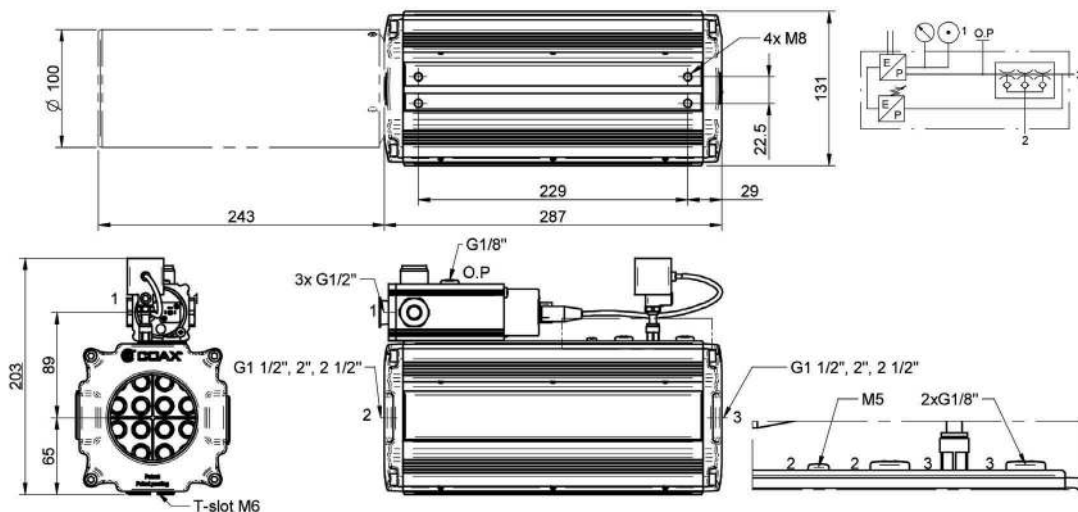
- ▶ Patented COAX® technology
- ▶ Substantially lower air consumption
- ▶ Modular design for flexible performance
- ▶ Compact and durable with no moving parts
- ▶ Saves energy when the blow-air requirement varies

### Technical data

Description	Unit	Value
Feed pressure	MPa	0.7
Noise level	dBA	57-76
Temperature range	°C	0-50
Signal range	kPa	15-100
Hysteresis	kPa	1-79
Voltage	V	24
Voltage range	V	14-28
Current consumption	mA	60
Ripple	V <sub>p</sub>	1 V <sub>rms</sub>
Safety classification	IP	40
Display		LED
Weight	g	4900-5900
Material		Al, PA, NBR, SS, POM, HDPE, PC, CuZn, PBT

### Ordering information

Description	Art. No.
Function ES Blow	0117785
Example	Ordering No.
P6040 Blow, Si32-3X5 with non-return valve, Mounting T-slot, Cover plate with function ES blow, Connection G 2 1/2" with inlet silencer	P6040 B BW 00 AE 08



## Silencer MINI



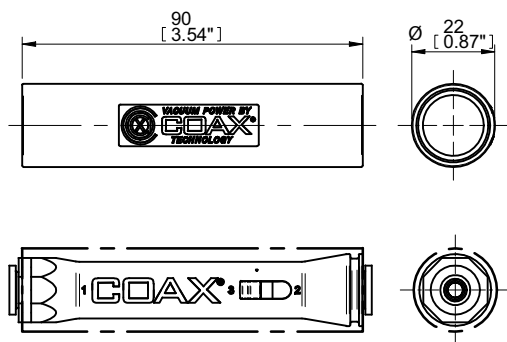
► Reduces noise from exhaust on piINLINE® MINI.

### Technical data

Description	Unit	Value
Noise level, max. reduction	dBA	10
Material		Al
Weight	g	20

### Ordering information

Description	Art. No.
Silencer piINLINE® MINI	0125466



### Ordering information, accessories

Description	Art. No.
Snap-in piINLINE® 1x MINI mounting bracket for silencer	0126009

## Silencer MIDI

► Reduces noise from exhaust on MIDI piINLINE®.

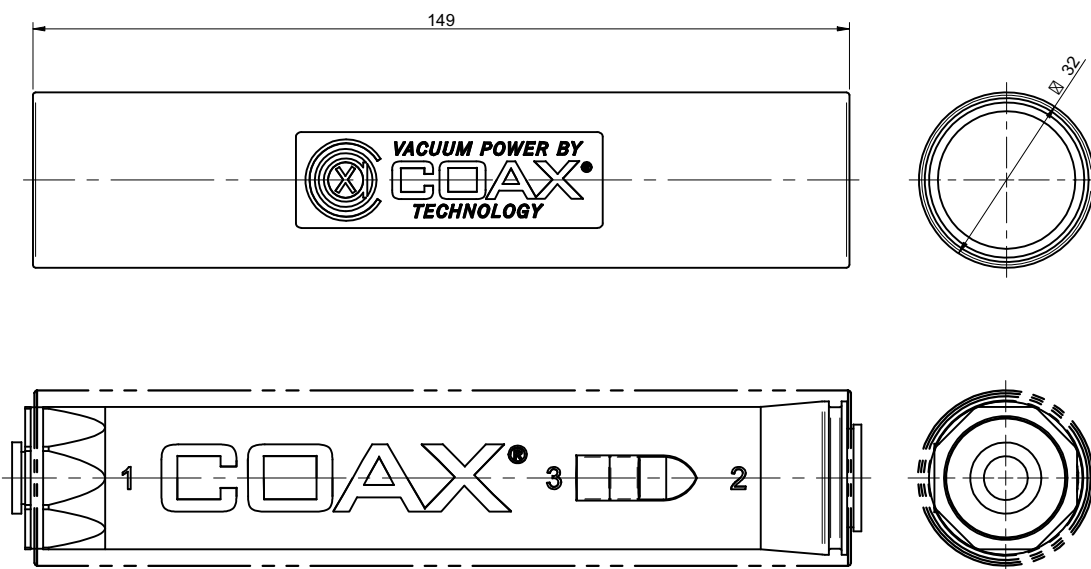


### Technical data

Description	Unit	Value
Noise level, max. reduction	dBA	15
Material		Al
Weight	g	70

### Ordering information

Description	Art. No.
Silencer piINLINE® MIDI	0123031



### Ordering information, accessories

Description	Art. No.
Snap-in piINLINE® 1x MIDI mounting bracket for silencer	0123096

## P3010 mounting rail

- ▶ Rigid and easy to mount
- ▶ For dynamic loads

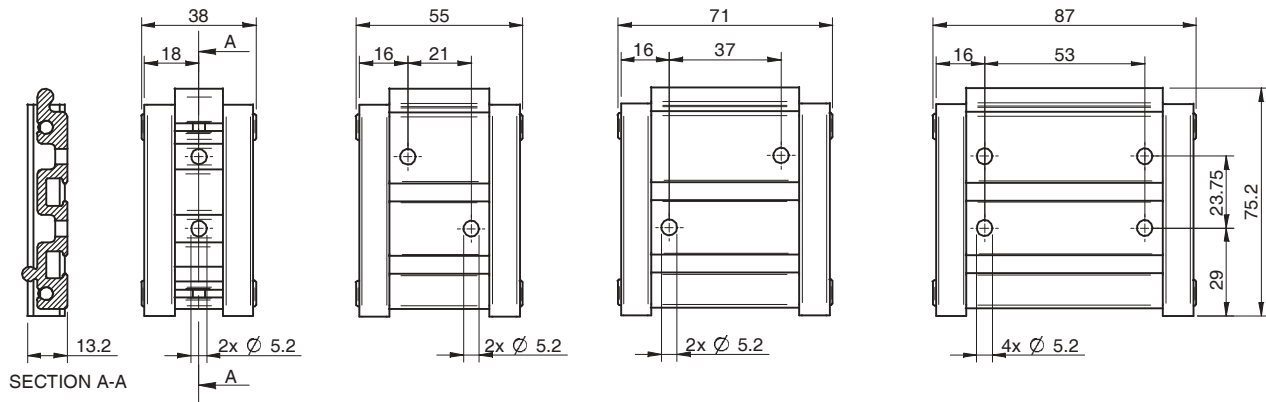


### Technical data

Description	Unit	Value
Temperature range	°C	-10-50
Weight	g	60-120
Material		Al, SS

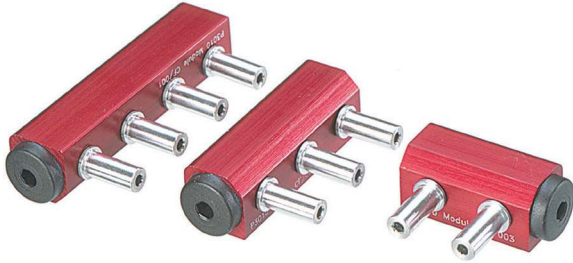
### Ordering information

Description	Art. No.
Mounting rail P3010, one pump module	0106167
Mounting rail P3010, 2 pump modules	0106162
Mounting rail P3010, 3 pump modules	0106168
Mounting rail P3010, 4 pump modules	0106160



## P3010 common-feed adapters

- One compressed air connection required to feed air to several pumps.

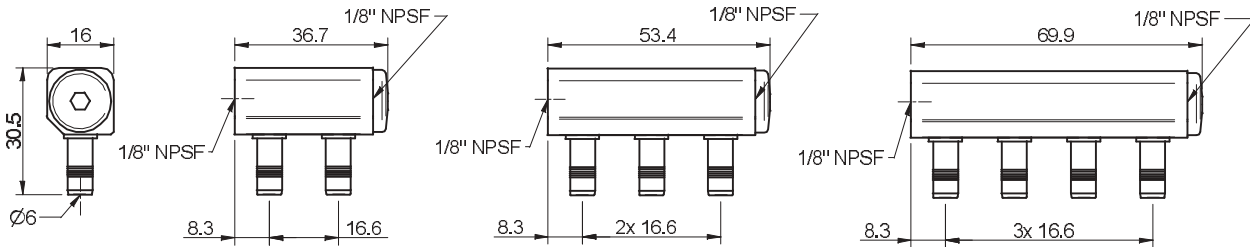


### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Temperature range	°C	-10–50
Weight	g	20–40
Material		Al, PPS

### Ordering information

Description	Art. No.
Common-feed adapter P3010, 2 pump modules	0106157
Common-feed adapter P3010, 3 pump modules	0106158
Common-feed adapter P3010, 4 pump modules	0106159



## P3010 exhaust adapter



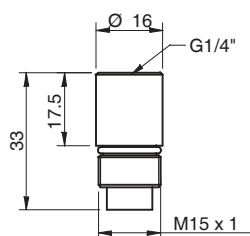
- ▶ Connection of exhaust air
- ▶ For clean environment
- ▶ Directed blowing air

### Technical data

Description	Unit	Value
Temperature range	°C	-10–50
Weight	g	8
Connection, exhaust		G1/4" / Ø16 mm
Material		Al

### Ordering information

Description	Art. No.
Exhaust adapter	0106344



## Mountings P5010



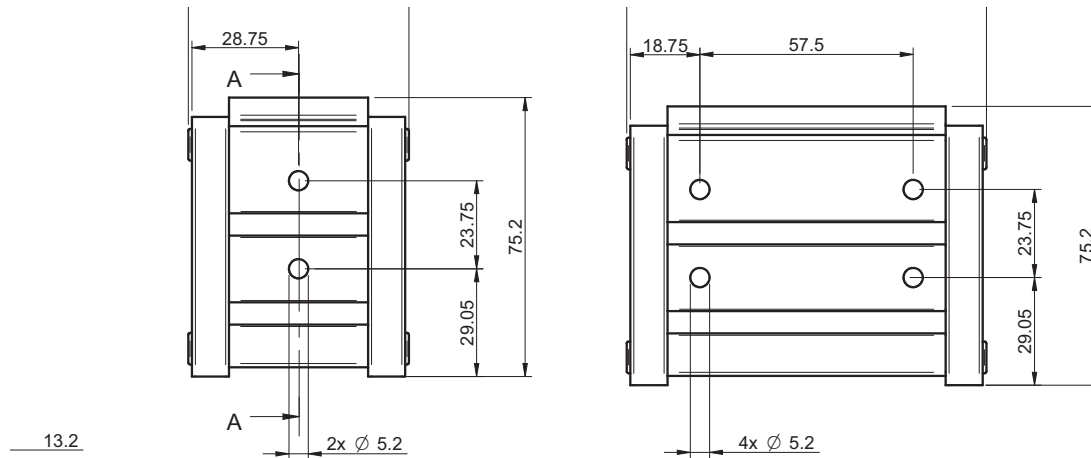
- ▶ P5010 Piab mounting rail
  - Rigid and suitable for dynamic loads.
  - Available for one or two pump modules.
- ▶ P5010 DIN mounting
  - Fits industry standard DIN rail systems.
  - Easy to mount and dismount.

### Technical data

Description	Unit	Value
Temperature range	°C	-10-80
Weight	g	122-203
Material		Al, SS

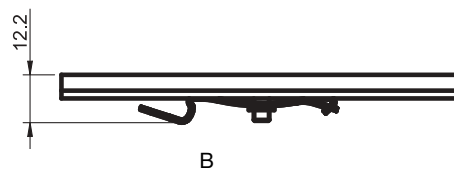
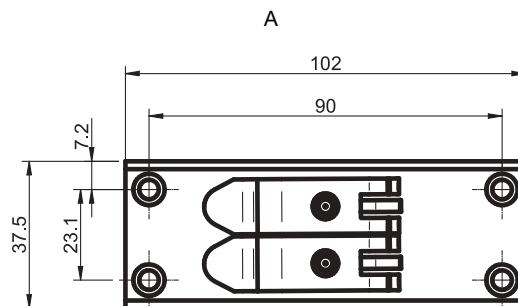
### Ordering information

	Description	Art. No.
A	Mounting rail x1 P5010	0118209
A	Mounting rail x2 P5010	0118208
B	Mounting rail DIN P5010	0117763



13.2

ION A-A



## Common feed adapter P5010



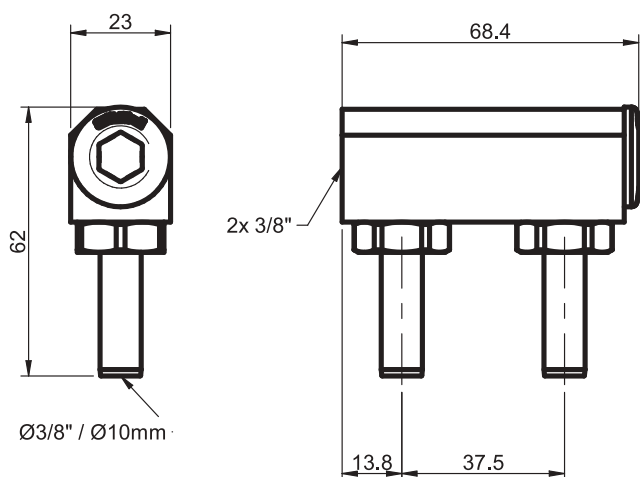
- ▶ One compressed-air connection required to feed air to two P5010 vacuum pumps.
- ▶ Suitable when two P5010 pumps are used for a dual-channel system (shoe-laced system).

### Technical data

Description	Unit	Value
Temperature range	°C	-10-80
Weight	g	70
Material		Al, NBR, PA

### Ordering information

Description	Art. No.
Common feed adapter Ø10 mm P5010	0117762





## Vacuum filters



- ▶ To filter dust and other small particles from the vacuum flow.
- ▶ Reduces the risk of operation breakdown or stoppage in the pump.
- ▶ Replaceable filter element.
- ▶ Available with special filter element with increased filter area

### Technical data

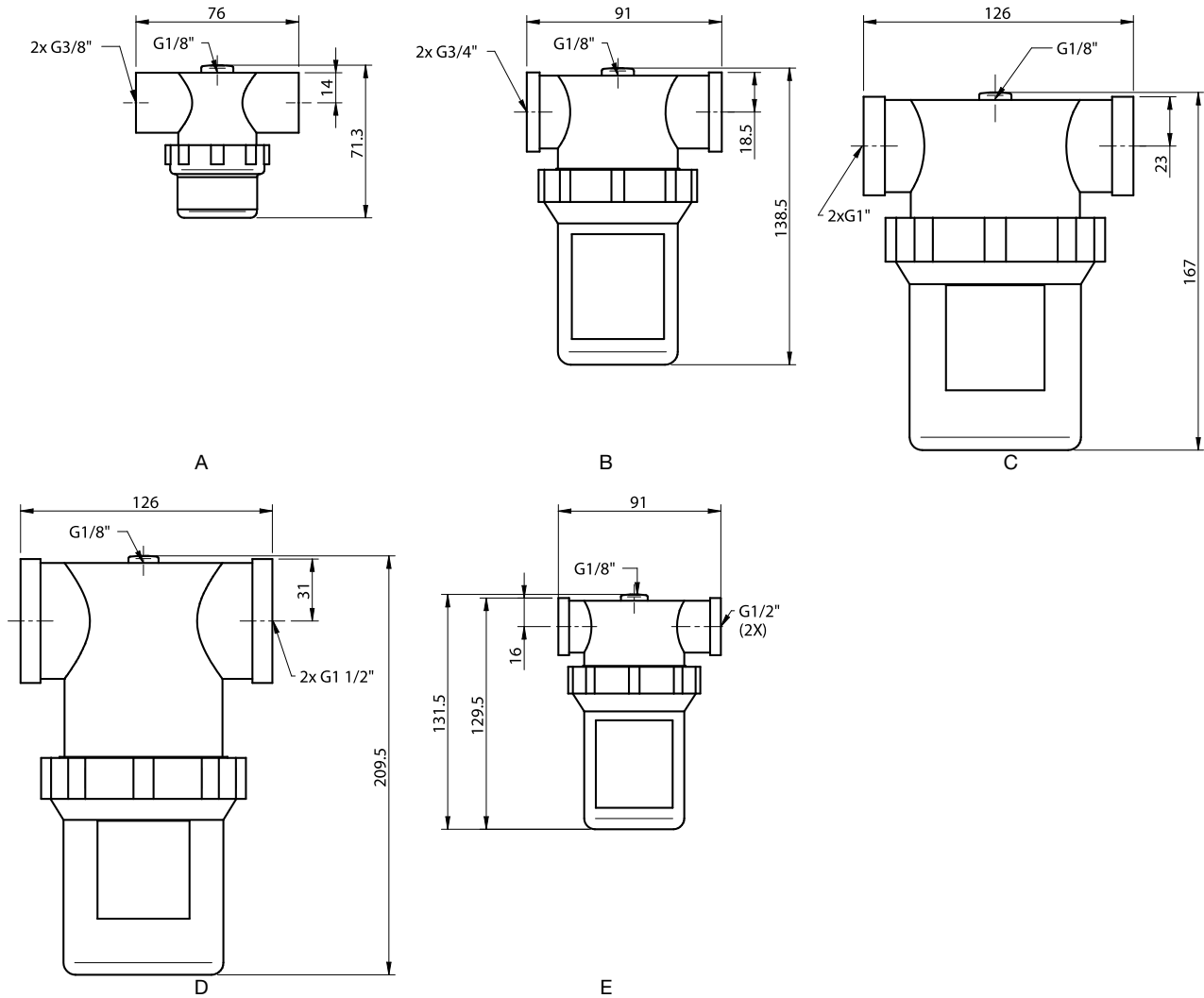
Description	Unit	Value
Pressure range	MPa	-0.1–0 MPa
Material		PE, PP, PA
Temperature range	°C	-20–80
Removal efficiency	µm	10

### Technical data, specific

Description	Unit	Value				
		3116671	3116651	3116652	3116672	3116653
Weight	g	70	168	170	424	550
Flow nominal	l/s	2.5	15	15	42	85
Volume Internal	cm <sup>3</sup>	45	195	205	495	675
Filter area	m <sup>2</sup>	0.003	0.010	0.010	0.019	0.023

## Ordering information

	Description	Art. No.
A	Vacuum filter G3/8"	3116671
B	Vacuum filter G3/4"	3116652
C	Vacuum filter G1"	3116672
D	Vacuum filter G1½"	3116653
E	Vacuum filter G1/2"	3116651
E	Vacuum filter G1/2" (special)	0110521
B	Vacuum filter G3/4" (special)	0110522
D	Vacuum filter G1 1/2" (special)	0110523



## Technical data, accessories

Description	Unit	Value					
		3116673	3116674	3116675	3116676	3116223	3116224
Weight	g	7	26	50	74	80	144
Filter area	m <sup>2</sup>	0.003	0.010	0.019	0.023	0.028	0.074
Removal efficiency	µm	10	10	10	10	5	5

## Ordering information, accessories

Description	Art. No.
Filter element 3/8"	3116673
Filter element 1/2" & 3/4"	3116674
Filter element 1"	3116675
Filter element 1½"	3116676
Filter element 1/2" & 3/4" (special)	3116223
Filter element 1½" (special)	3116224

## Vacuum filter S



- ▶ To filter dust and other small particles from the vacuum flow.
- ▶ Reduces the risk of operation breakdown or stoppage in the pump.

### Technical data

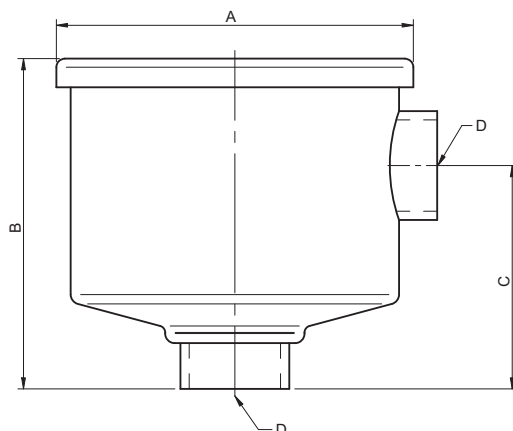
Description	Unit	Value
Pressure range	MPa	-0.1-0
Material		Baked enamel steel, SS, NBR, Polyester
Temperature range	°C	-30-90
Removal efficiency	µm	5

### Technical data, specific

Description	Unit	Value			
		3116709	3116654	3116710	0111311
Weight	kg	1.0	2.1	4.9	4.2
Flow	NI/s	16.5	37.7	82.6	100
Volume, internal	cm	810	2560	5830	7000
Filter area	cm	600	1900	4200	7500

### Ordering information

Description	Art. No.
Vacuum filter 1", steel	3116709
Vacuum filter 1 1/2", steel	3116654
Vacuum filter 2", steel	3116710
Vacuum filter 2 1/2", steel	0111311



### Measures

Description	Art. No.	A [Ø mm]	B [mm]	C [mm]	D
Vacuum filter 1", steel	3116709	150	111	67	G 1"
Vacuum filter 1 1/2", steel	3116654	185	170	115	G 1 1/2"
Vacuum filter 2", steel	3116710	220	260	130	G 2"
Vacuum filter 2 1/2", steel	0111311	200	260	134	G 2 1/2"

## Technical data, accessories

Description	Unit	Value			
		3116711	3116658	3116712	0111558
Weight	kg	0.18	0.53	1.00	0.50
Material		Polyester	Polyester	Polyester	Polyester
For Vacuum Filter		3116709	3116654	3116710	0111311

## Ordering information, accessories

Description	Art. No.
Filter element 1"	3116711
Filter element 1 1/2"	3116658
Filter element 2"	3116712
Filter element 2 1/2"	0111558

## Filter fittings



- ▶ Adjustable mounting angle due to the use of locking nut.
- ▶ No need for seal with Teflon tape or glue due to the use of O-ring seals.

### Technical data

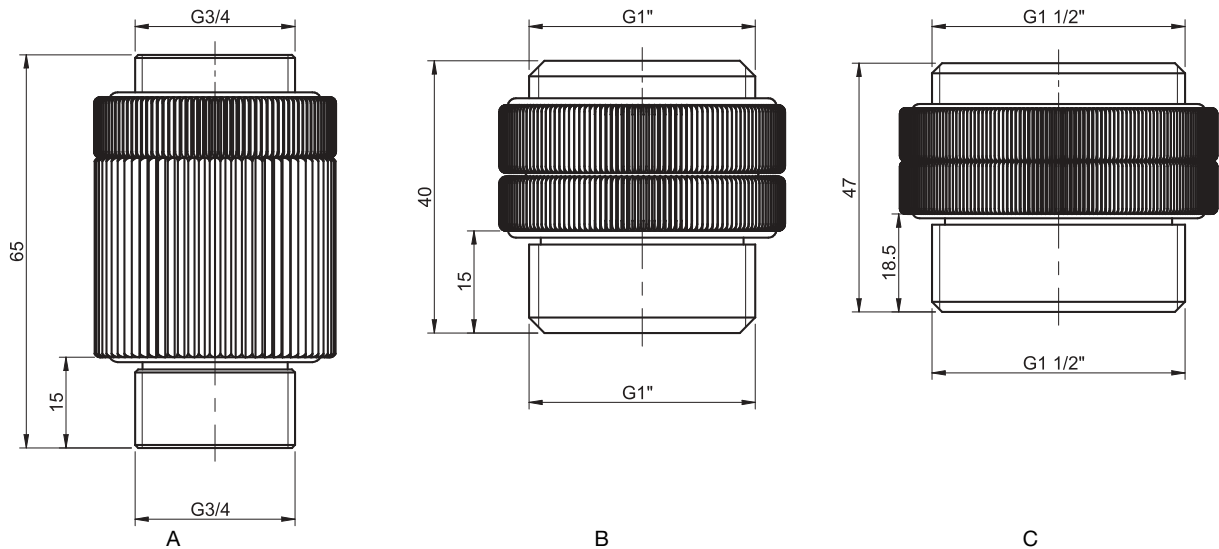
Description	Unit	Value
Material		Al, NBR
Temperature range	°C	-20-80

### Technical data, specific

Description	Unit	Value		
		3330052	0113979	3330051
Weight	g	90	58	110
Connection		2 x G3/4"	2 x G1"	2 x G1 1/2"

### Ordering information

	Description	Art. No.
A	Filter fitting 3/4"	3330052
B	Filter fitting 1"	0113979
C	Filter fitting 1 1/2"	3330051



## Silencers



- ▶ Reduce noise from exhaust
- ▶ Flow-through design

### Technical data

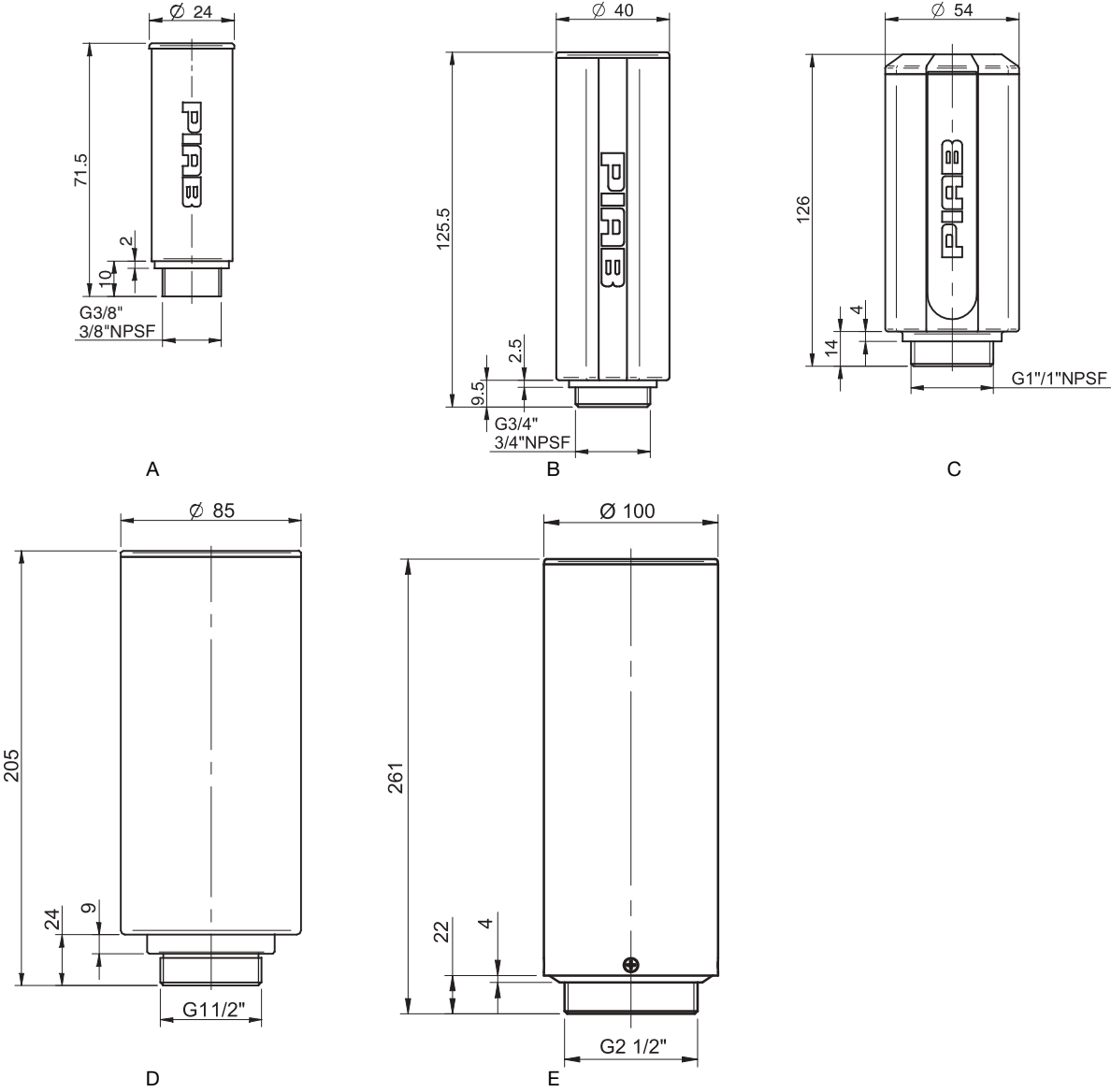
Description	Unit	Value	
			<b>0117605</b>
Noise level reduction, approximately	dB(A)	-10	-10
Temperature range	°C	-20-100	-20-100
Material		PA, HDPE	Al, POM, HDPE, SS

### Technical data, specific

Description	Unit	Value				
		<b>3216009</b>	<b>3216002</b>	<b>0112499/0113003</b>	<b>0103224</b>	<b>0117782</b>
Weight	g	14	61	120	425	893

### Ordering information

	Description	Art. No.
A	Silencer G3/8"	3216009
B	Silencer G3/4"	3216002
C	Silencer G1"	0112499
C	Silencer 1" NPSF	0113003
D	Silencer G1½"	0103224
E	Silencer G2½"	0117782



## Silencer COAX®



- ▶ Reduces noise from the exhaust
- ▶ Compatible with aluminium holders for COAX® MINI and COAX® MIDI cartridges
- ▶ Simple snap locking when mounting
- ▶ Through-flow design that eliminates the risk of impaired performance due to clogging of the silencer

### Technical data

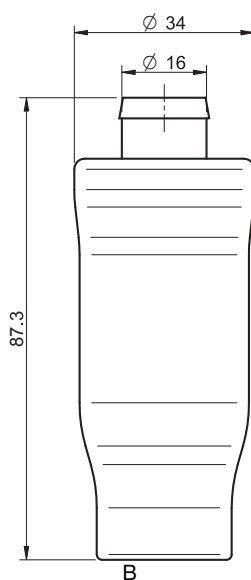
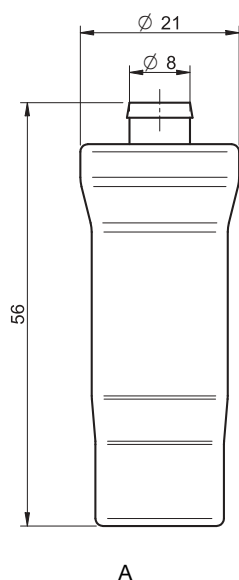
Description	Unit	Value
Material		PA, TPU, PE
Temperature range	°C	-20-80
Noise level reduction	dB(A)	≥10

### Technical data, specific

Description	Unit	Value	
		0111977	0111976
Weight	g	8.64	36.56

### Ordering information

	Description	Art. No.
A	Silencer COAX® MINI	0111977
B	Silencer COAX® MIDI	0111976





## Vacuum gauge and manometers



- ▶ Analogue indicator, springjoint – lever system
- ▶ The instruments include nut for installation on a panel

### Technical data

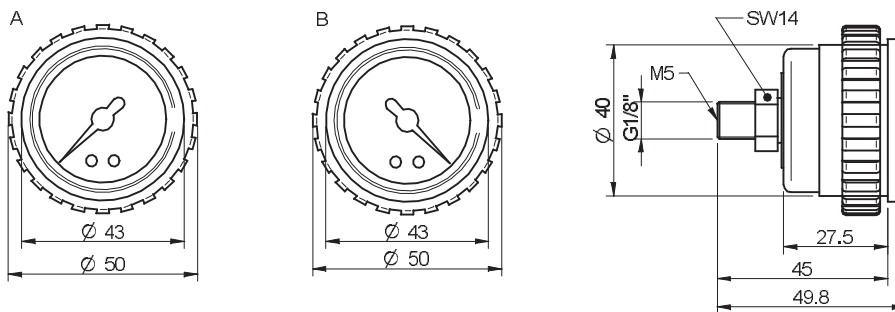
Description	Unit	Value
Accuracy, of full scale	%	2.5
Material		CuZn, ABS, PMMA

### Technical data, specific

Description	Unit	Value		
		3101602	3101603	3101626
Weight	g	90	55	50
Signal range	MPa	0–0.1	0–1	0–0.25
Medium		Vacuum	Over pressure	

### Ordering information

	Description	Art. No.
B	Vacuum gauge 100 -kPa, with nut	3101602
A	Manometer 1 MPa	3101603
A	Manometer 250 kPa	3101626



## Connection kits



- ▶ Push-in connectors with hose dimensions compatible with the pump connections.
- ▶ Corrosion-resistant material.
- ▶ Complete kit for one pump.

### Technical data

Description	Unit	Value		
		Connection kits	Barrel nipples	Hose connectors
Temperature range	°C	-25-75	0-60	0-80
Material		POM, NBR, SS, CuZn, Al	PVC	PPG

### Technical data, specific

Description	0104901	0104902	3207005	0104903	3207010	3401008
Connection kit for vacuum pump	MINI 5	MINI 10	MINI 5	MINI 5-20	CLASSIC 25-120	MAXI*
Connection plate	A	A	B	B, C	D	All
Hose dimension ** for compressed air	d=2 mm	d=4 mm	D=4 mm	D=6 mm	D=8 mm	D=6 or 4 mm
Hose dimension ** for vacuum	D=4 or 6 mm	D=6 or 8 mm	D=8 mm	D=10 mm	d=12, 19, 25 mm	—

\* Remote control

\*\* d = inner diameter, D = outer diameter

### Technical data, specific

Description	0118715	0118716	0118717	0118714	0106856	0106857	0106858	0106860
Thread	G1 1/2"	G2"	G2 1/2"	G2 1/2"	G1 1/2"	G1 1/2"	G2"	G2"
Hose dimension	—	—	—	Ø75	Ø40	Ø50	Ø60/64	Ø50
Max pressure (bar)*	PN16	PN16	PN16	PN10	PN10	PN10	PN10	PN10

\* at 20 °C, water temperature.

### Ordering information

Description	Art. No.
Connection kit for pump MINI 10, connection plate A	0104902
Connection kit for pump MINI 5-20, connection plate C and pump MINI 10-20, connection plate B	0104903
Connection kit for pump CLASSIC 25-120, connection plate D	3207010
Connection kit for pump MAXI*, all connection plates	3401008
Barrel nipple G1½" PVC	0118715
Barrel nipple G2" PVC	0118716
Barrel nipple G2½" PVC	0118717
Hose connector 2½"-75, plastic	0118714
Hose connector 1½"-40, plastic	0106856
Hose connector 1½"-50, plastic	0106857
Hose connector 2"-60/64, plastic	0106858
Hose connector 2"-50, plastic	0106860





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## Best to use a decentralized vacuum system

A decentralized system with the vacuum pump/cartridge placed directly at the point of suction eliminates the risk of loss in the vacuum piping and the need for expensive, oversized components. The response time will be reduced substantially without unnecessary volume to be evacuated. In addition, each cup is independent, so a pressure loss in one cup will not affect the others.

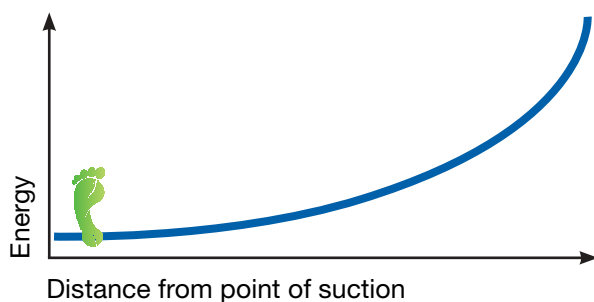


Typical decentralized vacuum system. Vacuum gripper VGS™3010 with suction cup FC75P.

**Red tubing = Compressed air**

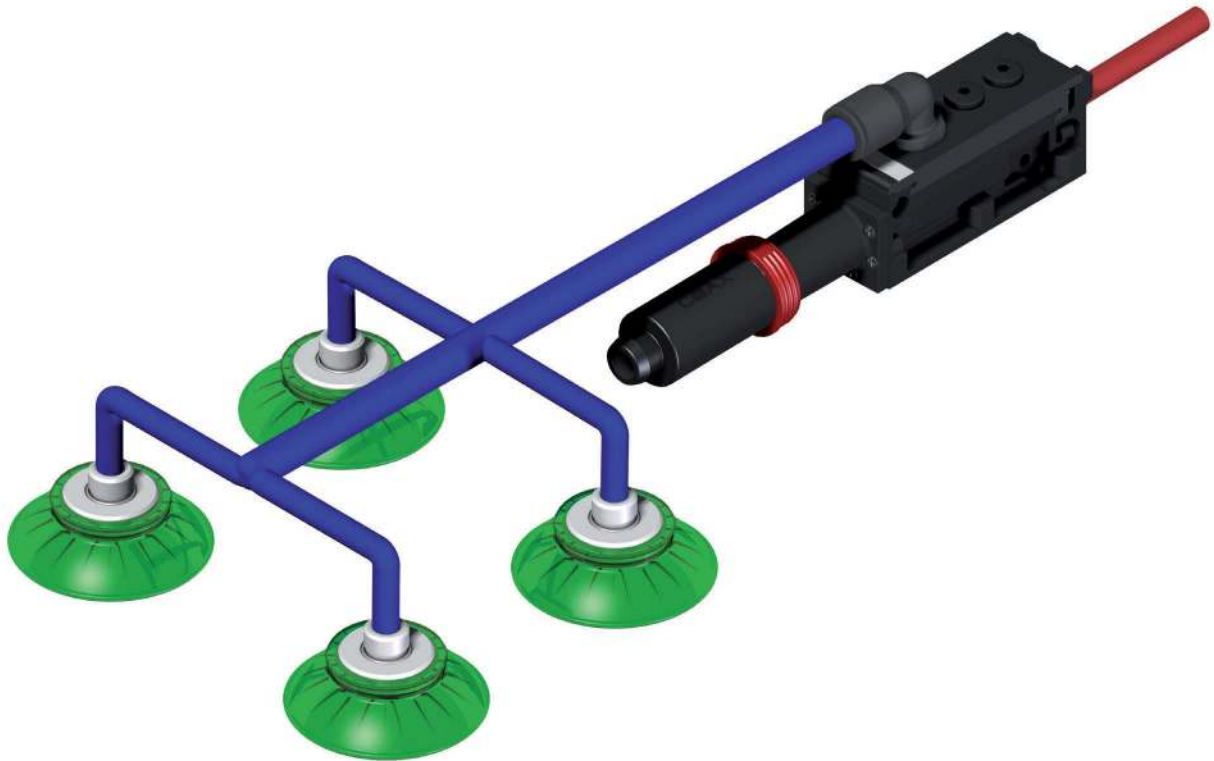
### Decentralized system (VGS™) - Best option!

- ▶ Lowest energy
- ▶ Fastest cycle time
- ▶ Safest product handling
- ▶ Most flexible design for zoning
- ▶ Easiest troubleshooting
- ▶ Most consistent /even performance



## If not, design a centralized vacuum system

A centralized vacuum system is designed to have one vacuum source for multiple suction points. With the vacuum source located further from the cup, system performance loss increases due to restrictions in tubing fittings and manifolds. More energy needs to be expended to overcome these losses and achieve required system performance.



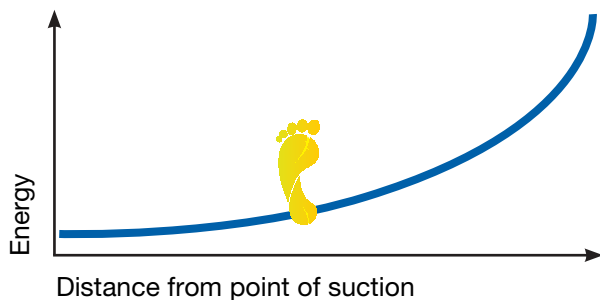
Typical centralized vacuum system. Vacuum pump P5010 with suction cup FC75P.

Red tubing = Compressed air

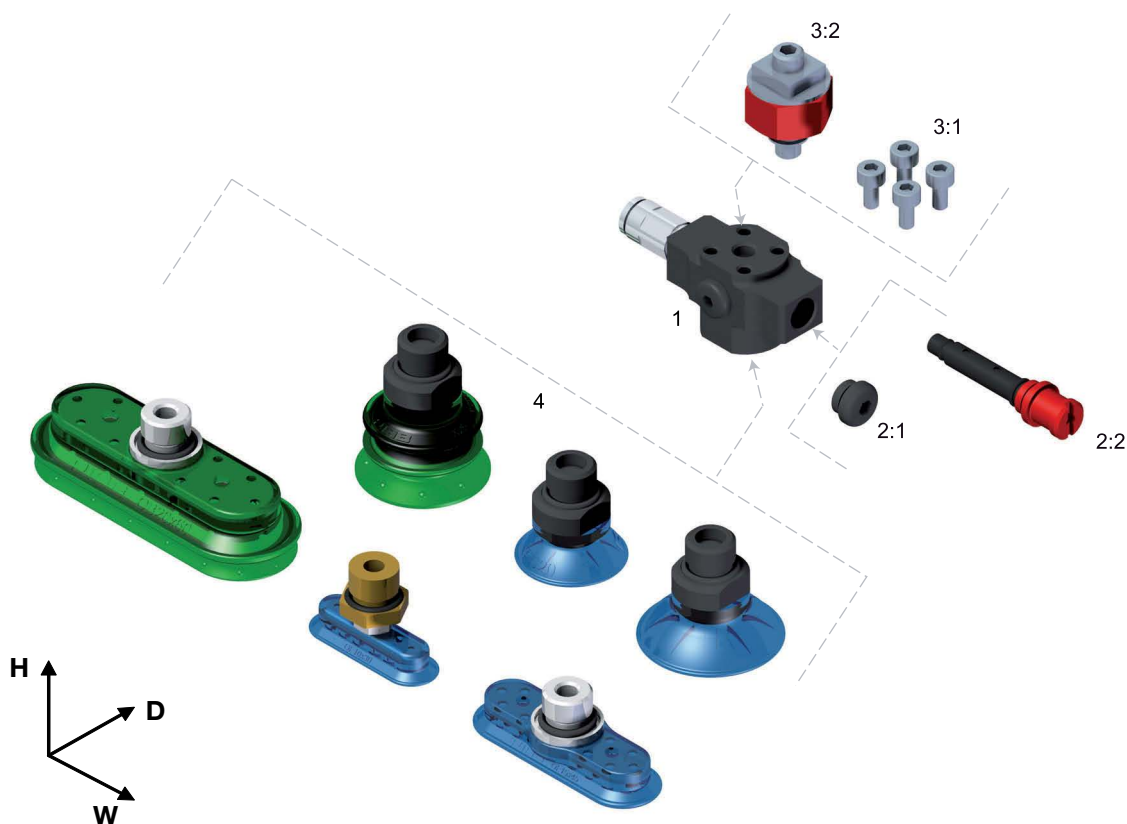
Blue tubing = Vacuum

### Centralized system

- ▶ Easy installation
- ▶ Easy vacuum sensing and controls
- ▶ Light end of arm tooling
- ▶ Easy filtration options



## VGS™2010



Dimension and connection			W mm	D mm	H mm	Feed pressure	Vacuum	Exhaust/blow
1	Housing	VGS2010		20	19 <sup>a</sup>	Ø4 mm		
2	COAX® cartridge	2:1 No COAX® cartridge	49					
		2:2 COAX® cartridge 2-stage	55					Ø7 mm
3	Mounting / orientation	3:1 4 x M3 top, flush mount					2x M5	
		3:2 M6 19 mm, profile kit		20	20		2x M5	
4	Suction cup	No suction cup					G1/8"	
		Suction cup	b	b	b			

For complete dimensions add the measurements from all selected modules or visit [www.piab.com](http://www.piab.com) and download your configuration in the CAD download centre.

<sup>a</sup> For suction cups OF10x30P 50° Shore A add an extra 3 mm to account for the bushing.

<sup>b</sup> For suction cup dimensions, see suction cup data sheet.





### Technical data

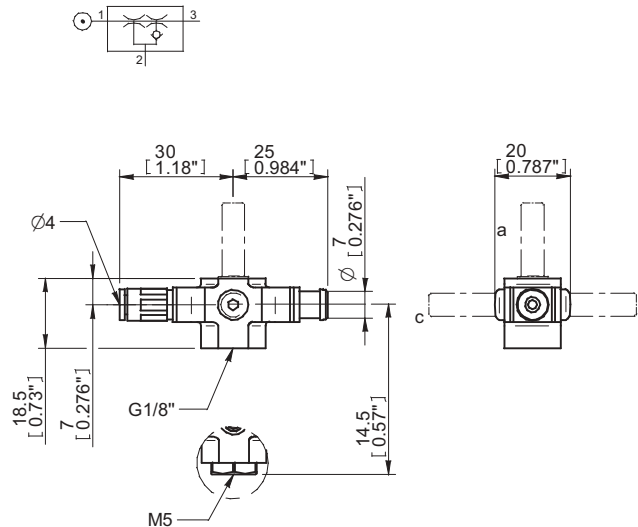
Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	55–61
Temperature range	°C	10–50
Material		Al, SS, NBR, TPE, PA, PU

For more technical information about the COAX® cartridges, please go to the data sheet for the COAX® cartridge MICRO.

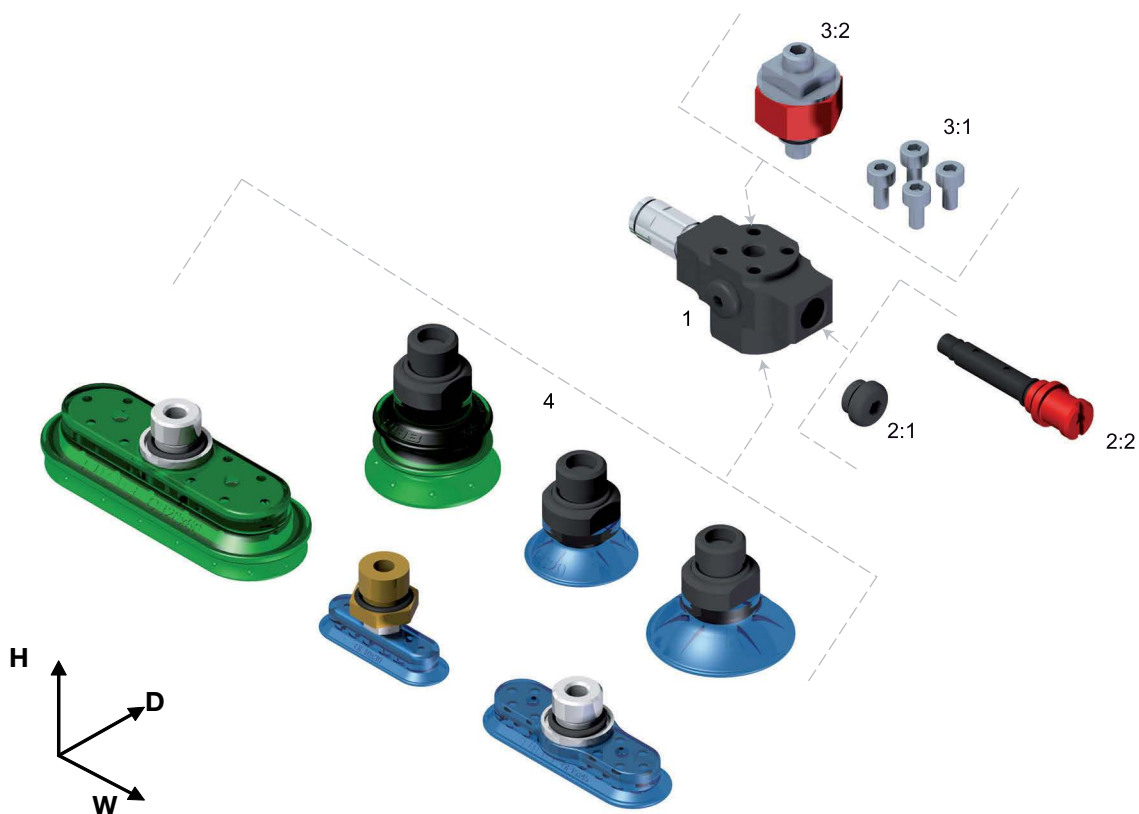


## Ordering information

1. Select housing				VGS™2010 code	
Housing				VGS2010	
2. Select COAX® cartridge module		Initial flow NI/s	Evacuation time to reach 60 - kPa s/l	COAX® cartridge	VGS™2010 code
				No COAX® cartridge (slave unit)	AA
Bi		0.23	16.0	COAX® cartridge MICRO Bi03-2	AB
Si		0.28	6.90	COAX® cartridge MICRO Si02-2	AF
Xi		0.24	11.3	COAX® cartridge MICRO Xi2.5-2	AJ
Ti		0.32/0.31	5.00/4.20	COAX® cartridge MICRO Ti05-2	AN
3. Select mounting/orientation				VGS™2010 code	
	4x M3 top, flush mount			00	
a	M6 19 mm top, profile kit			01	
b	M6 19 mm right, profile kit			02	
c	M6 19 mm left, profile kit			03	
4. Select suction cup with fitting				VGS™2010 code	
No suction cup				BA	
BX25P 30°/60° Shore A				DA	
BX25P 60° Shore A				DB	
FC20P 50° Shore A				DC	
FC25P 50° Shore A				DD	
OB20x60P 60° Shore A				DE	
OF10x30P 50° Shore A				DF	
OF15x45P 50° Shore A				DG	
Example				Ordering number	
VGS™2010 BX25P – Bi03-2, M6 19 mm top, profile kit, BX25P 30/60° Shore A				VGS2010.AB.01.DA	



## VGS™3010



Dimension and connection			W mm	D mm	H mm	Feed pressure	Vacuum	Exhaust/blow
1	Housing	VGS3010		23	30	Ø6 mm, 3x G1/8", M5		
2	COAX® cartridge	2:1 No COAX® cartridge	65					
		2:2 COAX® cartridge 2-stage	88					Ø11 mm
		2:3 COAX® cartridge 3-stage	111					Ø11 mm
3	Mounting / orientation	3:1 4 x M4 top, flush mount						
		3:2 M8 16 mm		16	16			2x G1/8"
		3:3 M8 27 mm, profile kit		27	27			2x G1/8"
		3:4 M6 22 mm, profile kit		22	22			2x G1/8"
		3:5 Ball joint		40				2x G1/8"
		3:6 Lock-pin 19 mm		32				2x G1/8"
		3:7 Level compensator LC30	a	a	81			3x G1/8"
4	Suction cup	No suction cup						G3/8"
		Suction cup	b	b	b			

For complete dimensions add the measurements from all selected modules or visit [www.piab.com](http://www.piab.com) and download your configuration in the CAD download centre.

a For complete dimensions, configure your CAD model at [www.piab.com](http://www.piab.com)

b For suction cup dimensions see suction cup data sheet.




## Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	60–74
Temperature range	°C	10–50
Material		PP, PA, NBR, AL, SS, PU

For more technical information about the COAX® cartridges, please go to the data sheet for the COAX® cartridge MINI.

## Ordering information

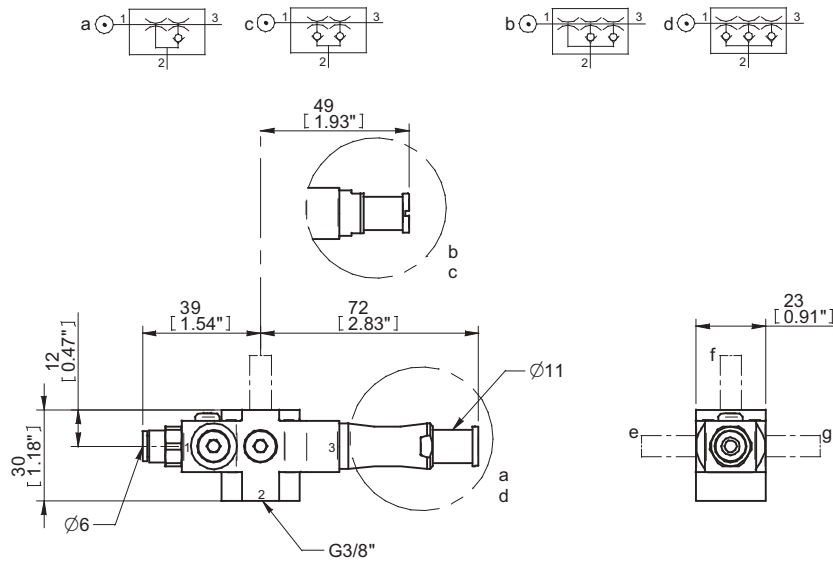
1. Select housing	VGS™3010 code
Housing	VGS3010

	2. Select COAX® cartridge module	Initial flow NI/s	Evacuation time to reach 60 -kPa s/l	COAX® cartridge	VGS™3010 code
				No COAX® cartridge (slave unit)	AA
a	Pi 	0.68	2.7	COAX® cartridge MINI Pi12-2	AB
c		0.68	2.7	COAX® cartridge MINI Pi12-2, non-return valve	AD
b		1.4	2.6	COAX® cartridge MINI Pi12-3	AC
d		1.4	2.6	COAX® cartridge MINI Pi12-3, non-return valve	AE
a	Si 	0.77	2.1	COAX® cartridge MINI Si08-2	AF
c		0.77	2.1	COAX® cartridge MINI Si08-2, non-return valve	AH
b		1.34	2.0	COAX® cartridge MINI Si08-3	AG
d		1.34	2.0	COAX® cartridge MINI Si08-3, non-return valve	AI
a	Xi 	0.75	2.3	COAX® cartridge MINI Xi10-2	AJ
c		0.75	2.3	COAX® cartridge MINI Xi10-2, non-return valve	AL
b		1.43	2.2	COAX® cartridge MINI Xi10-3	AK
d		1.43	2.2	COAX® cartridge MINI Xi10-3, non-return valve	AM

	3. Select mounting/orientation	VGS™3010 code
	4x M4 top, flush mount	00
f	M8 16 mm top	01
g	M8 16 mm right	02
e	M8 16 mm left	03
f	M8 27 mm top, profile kit	04
g	M8 27 mm right, profile kit	05
e	M8 27 mm left, profile kit	06
f	M6 22 mm top, profile kit	07
g	M6 22 mm right, profile kit	08
e	M6 22 mm left, profile kit	09
g	Ball joint VGS™3010 right	11
e	Ball joint VGS™3010 left	12
g	Lock-pin VGS™3010, right	13
e	Lock-pin VGS™3010, left	14
	Level compensator LC30	15

4. Select suction cup with fitting	VGST <sup>TM</sup> 3010 code
No suction cup	BA
B75P 30°/60° Shore A	BB
B75P 60° Shore A	BC
BF80P 30°/50° Shore A	BD
BF80P 60° Shore A	BE
BF110P 30°/60° Shore A	CO
BF110P 60° Shore A	CP
BL30-3P 30°/70° Shore A	CS
BL40-3P 30°/70° Shore A	CT
BL40-4 Silicone	CU
BL40-5 Silicone	CV
BX35P 30°/60° Shore A	BF
BX35P 60° Shore A	BG
BX52P 30°/60° Shore A	BH
BX52P 60° Shore A	BI
BX75P 30°/60° Shore A	BJ
BX75P 60° Shore A	BK
BX110P 30°/60° Shore A	CQ
BX110P 60° Shore A	CR
F75P 30°/60° Shore A	BL
F75P 60° Shore A	BM
F110P 30°/60° Shore A	BN
F110P 60° Shore A	BO
FC50P 40° Shore A	BP
FC50P 60° Shore A	BQ
FC75P 40° Shore A	BR
FC75P 60° Shore A	BS
FC100P 40° Shore A	BT
FC100P 60° Shore A	BU
OB35X90P PU30°/60° Shore A	CA
OB35X90P PU60° Shore A	CB
OB50X140P PU30°/60° Shore A	CC
OB50X140P PU60° Shore A	CD
OB65X170P PU30°/60° Shore A	CE
OB65X170P PU60° Shore A	CF
OBL40x90P 70° Shore A	BV
OF25X70P PU40° Shore A	CG
OF25X70P PU60° Shore A	CH
OF40X110P PU40° Shore A	CI
OF40X110P PU60° Shore A	CJ
OF55X150P PU40° Shore A	CK
OF55X150P PU60° Shore A	CL
OF70X175P PU40° Shore A	CM
OF70X175P PU60° Shore A	CN

Example	Ordering number
VGS™3010 B75P – Pi12-3, M8 27 mm top including profile kit, B75P 30/60° Shore A	VGS3010.AC.04.BB



## VGS™3040



- ▶ COAX® cartridge integrated.
- ▶ Available in lock pin 16, 19 or ball joint mountings, industry standard.
- ▶ Available with level compensator to compensate for differences in level of object.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level, range	dB(A)	65-74
Material		Al, NBR, PA, Steel
Temperature range	°C	-10-80
Weight, range	g	204-264

### Vacuum flow

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
			0	10	20	30	40	50	60	70	80	90	
Si08-2	0.60	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	—	—	75
Si08-3	0.60	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
Xi10-2	0.50	0.46	0.75	0.63	0.49	0.33	0.19	0.15	0.11	0.07	0.05	0.011	94
Xi10-3	0.50	0.46	1.43	0.70	0.50	0.33	0.19	0.15	0.11	0.07	0.05	0.011	94
Pi12-2	0.314	0.44	0.68	0.60	0.44	0.27	0.19	0.14	0.10	0.06	0.03	—	90
Pi12-3	0.314	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.06	0.03	—	90

### Evacuation time

COAX® cartridge	Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum -kPa
			10	20	30	40	50	60	70	80	90	
Si08-2	0.60	0.44	0.14	0.31	0.55	0.90	1.40	2.10	3.10	—	—	75
Si08-3	0.60	0.44	0.10	0.25	0.48	0.80	1.30	2.00	2.90	—	—	75
Xi10-2	0.50	0.46	0.14	0.30	0.60	1.00	1.60	2.30	3.50	5.30	8.90	94
Xi10-3	0.50	0.46	0.09	0.26	0.50	0.80	1.50	2.20	3.40	5.20	8.80	94
Pi12-2	0.314	0.44	0.17	0.32	0.58	1.10	1.80	2.70	4.00	6.40	—	90
Pi12-3	0.314	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	—	90

For performance graphs, see section Vacuum cartridges/integration.

### Ordering information

1. Housing	VGS Code
Housing Left hand	00
Housing Right hand	01

2. COAX® cartridge	VGS Code
COAX® cartridge MINI Pi12-2	AB
COAX® cartridge MINI Pi12-3	AC
COAX® cartridge MINI Pi12-2, non-return valve	AD
COAX® cartridge MINI Pi12-3, non-return valve	AE
COAX® cartridge MINI Si08-2	AF
COAX® cartridge MINI Si08-3	AG
COAX® cartridge MINI Si08-3, non-return valve	AI
COAX® cartridge MINI Si08-2, non-return valve	AH
COAX® cartridge MINI Xi10-2	AJ

2. COAX® cartridge	VGS Code
COAX® cartridge MINI Xi10-3	AK
COAX® cartridge MINI Xi10-2, non-return valve	AL
COAX® cartridge MINI Xi10-3, non-return valve	AM

3. Mounting style	VGS Code
No mounting style	00
P Mounting Lock pin 16 mm	01
C Mounting Lock pin 19 mm	02
I Mounting Ball joint	03
P Mounting Lock pin 16 mm level compensator	04
C Mounting Lock pin 19 mm level compensator	05
I Mounting Ball joint level compensator	06
Mounting Extrusion mount level compensator	07
Mounting Profile mount	08

4. Energy saving	VGS Code
No energy saving	AA
Energy saving Vacustat 65 -kPa	AB
Energy saving Vacustat, Adjustable (factory set at 45 -kPa)	AC

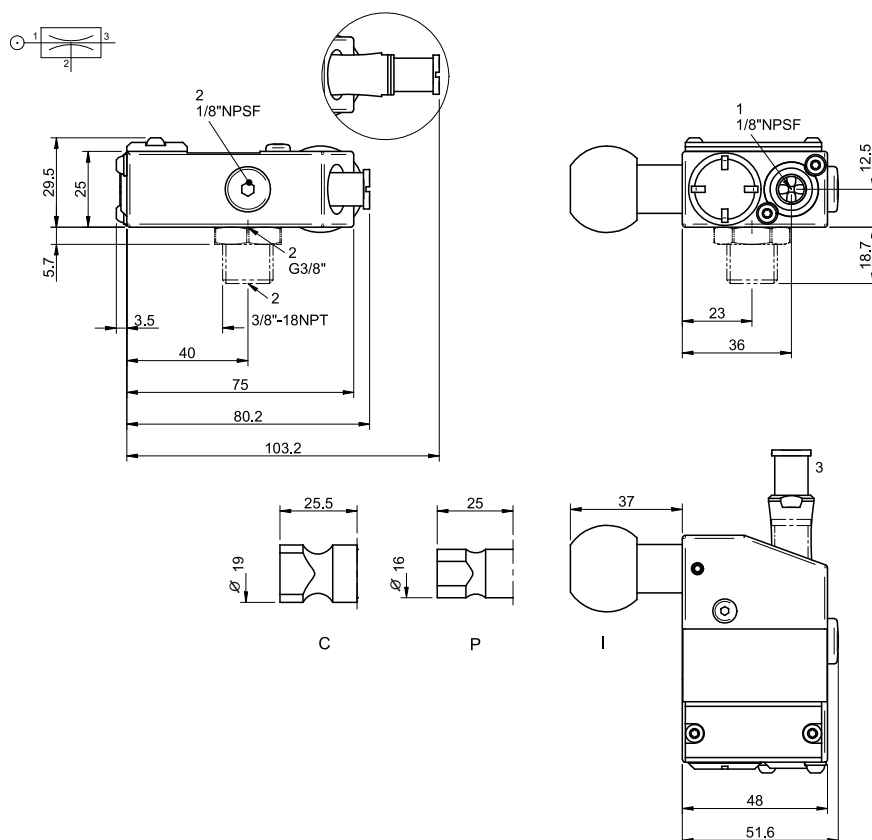
For detailed information on Vacustat, see separate datasheet.

5. Release function	VGS Code
Release Blow-off	01
Release AQR 02 internal	02
Release AQR 02 external	03

For detailed information on Blow-off and AQR 02, see separate datasheets.

6. Vacuum connection	VGS Code
G3/8" female	AA
G3/8" male - 3/8" NPT male adapter	AB

Example	Ordering number
VGS™3040 with left hand housing, COAX® cartridge MINI Pi 12-2, mounting lock pin 16mm, no energy saving, release blow-off, G3/8" female vacuum connection	VGS3040 00 AB 01 AA 01 AA



All drawings are of left-handed tooling.

## VGS™3040 with profile mount



- ▶ COAX® cartridge integrated.
- ▶ Easy attachment to standard extrusion and profile systems.
- ▶ Adjustable position.
- ▶ Quick setup and change-over.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level, range	dBA	65-74
Material		Al, NBR, PA
Temperature range	°C	-10-80
Weight, range	g	225-775

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the VGS™3040 can be found in the tables for vacuum flow and evacuation time on the VGS™3040 or Vacuum cartridges/integration datasheets.

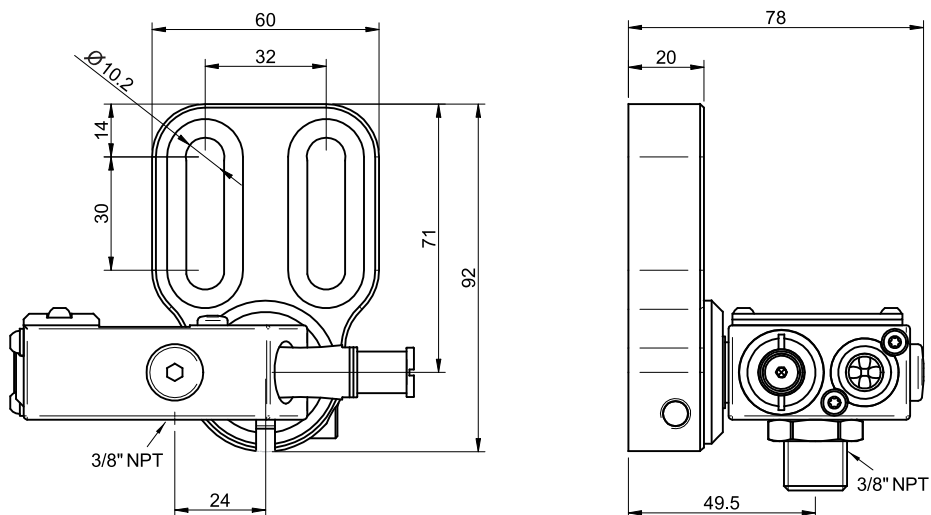
### Ordering information

<b>1. Housing</b>	<b>VGS Code</b>
Housing Left hand	00
Housing Right hand	01
<b>2. COAX® cartridge</b>	<b>VGS Code</b>
COAX® cartridge MINI Pi12-2	AB
COAX® cartridge MINI Pi12-3	AC
COAX® cartridge MINI Pi12-2, non-return valve	AD
COAX® cartridge MINI Pi12-3, non-return valve	AE
COAX® cartridge MINI Si08-2	AF
COAX® cartridge MINI Si08-3	AG
COAX® cartridge MINI Si08-3, non-return valve	AI
COAX® cartridge MINI Si08-2, non-return valve	AH
COAX® cartridge MINI Xi10-2	AJ
COAX® cartridge MINI Xi10-3	AK
COAX® cartridge MINI Xi10-2, non-return valve	AL
COAX® cartridge MINI Xi10-3, non-return valve	AM
<b>3. Mounting style</b>	<b>VGS Code</b>
Mounting Profile mount	08
<b>4. Energy saving</b>	<b>VGS Code</b>
No energy saving	AA
Energy saving Vacustat 65 -kPa	AB
Energy saving Vacustat, Adjustable (factory set at 45 -kPa)	AC
<i>For detailed information on Vacustat, see separate datasheet.</i>	
<b>5. Release function</b>	<b>VGS Code</b>
Release Blow-off	01
Release AQR 02 internal	02
Release AQR 02 external	03
<i>For detailed information on Blow-off and AQR 02, see separate datasheets.</i>	



6. Vacuum connection	VGS Code
G3/8" female	AA
G3/8" male - 3/8" NPT male adapter	AB

Example	Ordering number
VGS™3040 with left hand housing, COAX® cartridge MINI Pi 12-2, mounting Profile mount, no energy saving, release blow-off, G3/8" female vacuum connection	VGS3040 00 AB 08 AA 01 AA



All drawings are of left-handed tooling.

## VGS™3040 with Vacustat



- ▶ COAX® cartridge integrated.
- ▶ Integrated energy-saving device, Vacustat results in very low air consumption in sealed applications.
- ▶ Built-in blow off check valve for fast release of object.
- ▶ Available in lock pin 16, 19 or ball joint mountings, industry standard.
- ▶ Available with level compensator to compensate for differences in level of object.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Feed pressure, range	MPa	0.17-0.7
Noise level	dB(A)	65-74
Material		PA, Al, SS, NBR, PE, TPU, POM, CuZn
Temperature range	°C	0-60
Weight, range	g	279-340
Singal range	-kPa	adjustable/ -65
Function		2/2 NO
Hysteresis	kPa	8

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the VGS™3040 can be found in the tables for vacuum flow and evacuation time on the VGS™3040 or Vacuum cartridges/integration datasheets.

### Ordering information

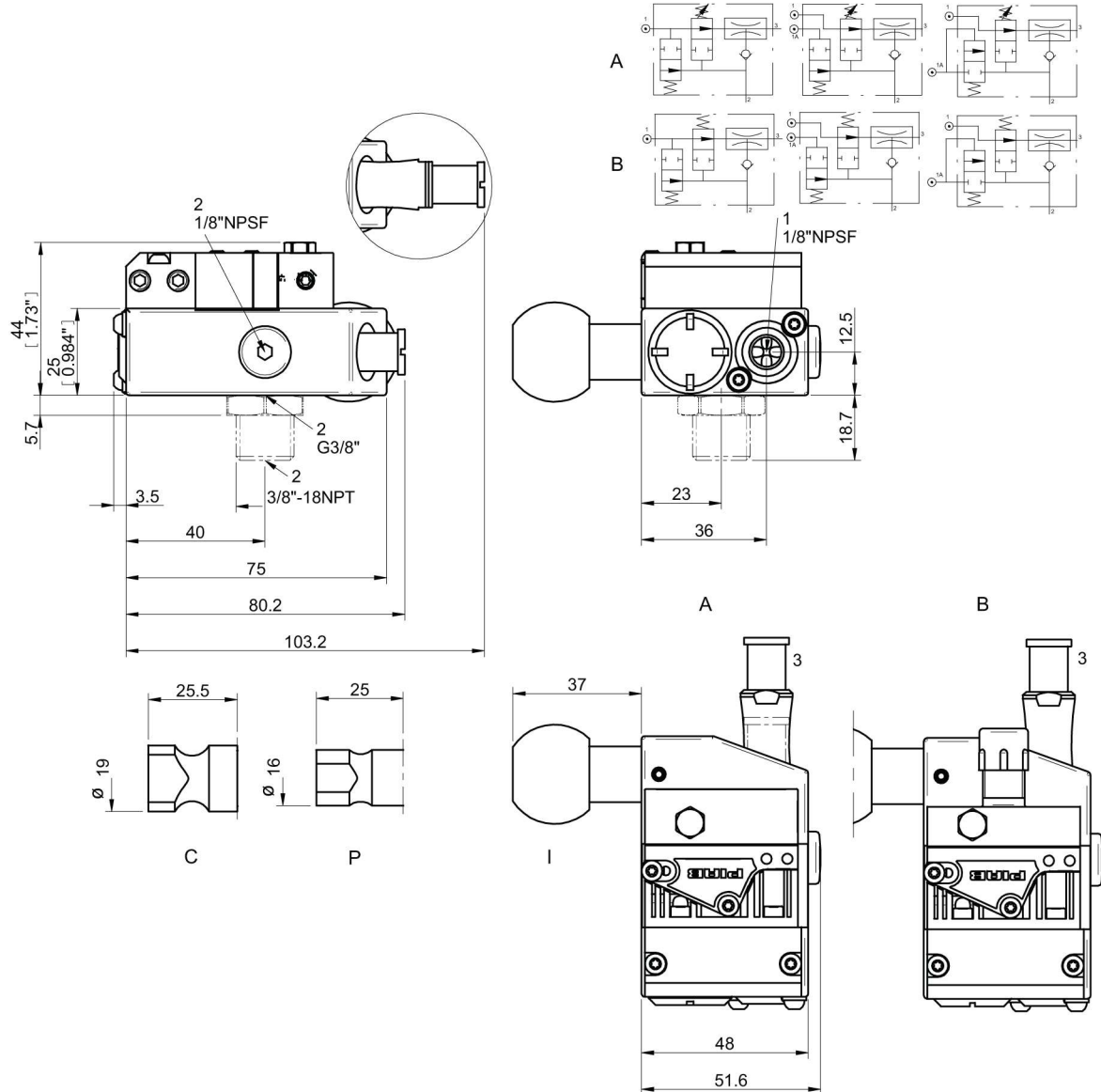
1. Housing		VGS Code
Housing Left hand		00
Housing Right hand		01
2. COAX® cartridge		VGS Code
COAX® cartridge MINI Pi12-2, non-return valve		AD
COAX® cartridge MINI Pi12-3, non-return valve		AE
COAX® cartridge MINI Si08-3, non-return valve		AI
COAX® cartridge MINI Si08-2, non-return valve		AH
COAX® cartridge MINI Xi10-2, non-return valve		AL
COAX® cartridge MINI Xi10-3, non-return valve		AM
3. Mounting style		VGS Code
No mounting style		00
P	Mounting Lock pin 16 mm	01
C	Mounting Lock pin 19 mm	02
I	Mounting Ball joint	03
P	Mounting Lock pin 16 mm level compensator	04
C	Mounting Lock pin 19 mm level compensator	05
I	Mounting Ball joint level compensator	06
	Mounting Extrusion mount level compensator	07
	Mounting Profile mount	08
4. Energy saving		VGS Code
A	Energy saving Vacustat 65 -kPa	AB
B	Energy saving Vacustat, Adjustable (factory set at 45 -kPa)	AC

5. Release function	VGS Code
Release Blow-off	01
Release AQR 02 internal	02
Release AQR 02 external	03

For detailed information on Blow-off and AQR 02, see separate datasheets.

6. Vacuum connection	VGS Code
G3/8" female	AA
G3/8" male - 3/8" NPT male adapter	AB

Example	Ordering number
VGS™3040 with left hand housing, COAX® cartridge MINI Pi 12-2, non-return valve, mounting lock pin 16mm, energy saving Vacuostat 65 -kPa, release blow-off, G3/8" female vacuum connection	VGS3040 01 AD 01 AB 01 AA



All drawings are of left-handed tooling.

## VGS™3040 with Atmospheric quick-release valve - AQR 02



- ▶ COAX® cartridge integrated.
- ▶ Built-in quick release for fast release of object, internal or separate feed.
- ▶ Available in lock pin 16, 19 or ball joint mountings, industry standard.
- ▶ Available with level compensator to compensate for differences in level of object.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Feed pressure, range	MPa	0.3-0.7
Noise level, range	dBA	65-74
Material		Al, NBR, PA, SS
Temperature range	°C	0-50
Weight, range	g	221-282
Flow, atmospheric, average	l/s	7.85

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the VGS™3040 can be found in the tables for vacuum flow and evacuation time on the VGS™3040 or Vacuum cartridges/integration datasheets.

### Ordering information

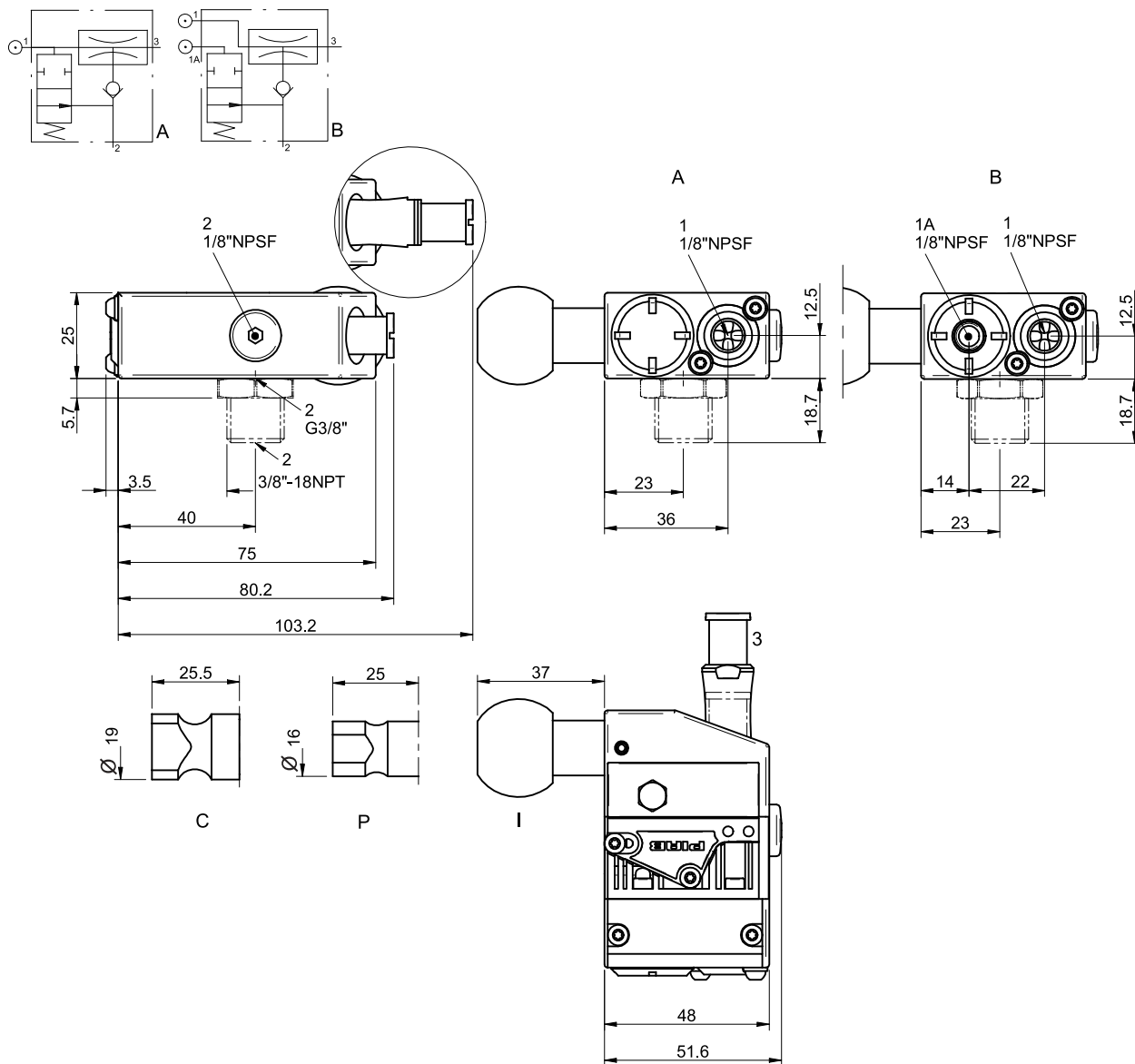
1. Housing		VGS Code
Housing Left hand		00
Housing Right hand		01
2. COAX® cartridge		VGS Code
COAX® cartridge MINI Pi12-2		AB
COAX® cartridge MINI Pi12-3		AC
COAX® cartridge MINI Pi12-2, non-return valve		AD
COAX® cartridge MINI Pi12-3, non-return valve		AE
COAX® cartridge MINI Si08-2		AF
COAX® cartridge MINI Si08-3		AG
COAX® cartridge MINI Si08-3, non-return valve		AI
COAX® cartridge MINI Si08-2, non-return valve		AH
COAX® cartridge MINI Xi10-2		AJ
COAX® cartridge MINI Xi10-3		AK
COAX® cartridge MINI Xi10-2, non-return valve		AL
COAX® cartridge MINI Xi10-3, non-return valve		AM
3. Mounting style		VGS Code
No mounting style		00
P	Mounting Lock pin 16 mm	01
C	Mounting Lock pin 19 mm	02
I	Mounting Ball joint	03
P	Mounting Lock pin 16 mm level compensator	04
C	Mounting Lock pin 19 mm level compensator	05
I	Mounting Ball joint level compensator	06
	Mounting Extrusion mount level compensator	07
	Mounting Profile mount	08
4. Energy saving		VGS Code
No energy saving		AA
Energy saving Vacustat 65 -kPa		AB
Energy saving Vacustat, Adjustable (factory set at 45 -kPa)		AC

For detailed information on Vacustat, see separate datasheet.

5. Release function		VGS Code
A	Release AQR 02 internal	02
B	Release AQR 02 external	03

6. Vacuum connection		VGS Code
G3/8" female		AA
G3/8" male - 3/8" NPT male adapter		AB

Example	Ordering number
VGST <sup>TM</sup> 3040 with left hand housing, COAX <sup>®</sup> cartridge MINI Pi 12-2, mounting lock pin 16mm, no energy saving, release AQR 02 internal, G3/8" female vacuum connection	VG3040 01 AB 01 AA 02 AA



All drawings are of left-handed tooling.

## VGS™3040 with blow-off



- ▶ COAX® cartridge integrated.
- ▶ Built-in blow off check valve for fast release of object.
- ▶ Available in lock pin 16, 19 or ball joint mountings, industry standard.
- ▶ Available with level compensator to compensate for differences in level of object.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Feed pressure, range	MPa	0.3-0.7
Feed pressure, min.	MPa	0.1
Noise level, range	dBA	65-74
Material		Al, NBR, PA, SS, CuZn
Temperature range	°C	-10-80
Weight, range	g	223-284
Flow, rate of 0-0.7 MPa	l/s	1.5-2.8

### Performance tables

Depending upon choice of COAX® cartridge, performance data of the VGS™3040 can be found in the tables for vacuum flow and evacuation time on the VGS™3040 or Vacuum cartridges/integration datasheets.

### Ordering information

1. Housing	VGS Code
Housing Left hand	00
Housing Right hand	01

2. COAX® cartridge	VGS Code
COAX® cartridge MINI Pi12-2	AB
COAX® cartridge MINI Pi12-3	AC
COAX® cartridge MINI Pi12-2, non-return valve	AD
COAX® cartridge MINI Pi12-3, non-return valve	AE
COAX® cartridge MINI Si08-2	AF
COAX® cartridge MINI Si08-3	AG
COAX® cartridge MINI Si08-3, non-return valve	AI
COAX® cartridge MINI Si08-2, non-return valve	AH
COAX® cartridge MINI Xi10-2	AJ
COAX® cartridge MINI Xi10-3	AK
COAX® cartridge MINI Xi10-2, non-return valve	AL
COAX® cartridge MINI Xi10-3, non-return valve	AM

3. Mounting style	VGS Code
No mounting style	00
P Mounting Lock pin 16 mm	01
C Mounting Lock pin 19 mm	02
I Mounting Ball joint	03
P Mounting Lock pin 16 mm level compensator	04
C Mounting Lock pin 19 mm level compensator	05
I Mounting Ball joint level compensator	06
Mounting Extrusion mount level compensator	07
Mounting Profile mount	08

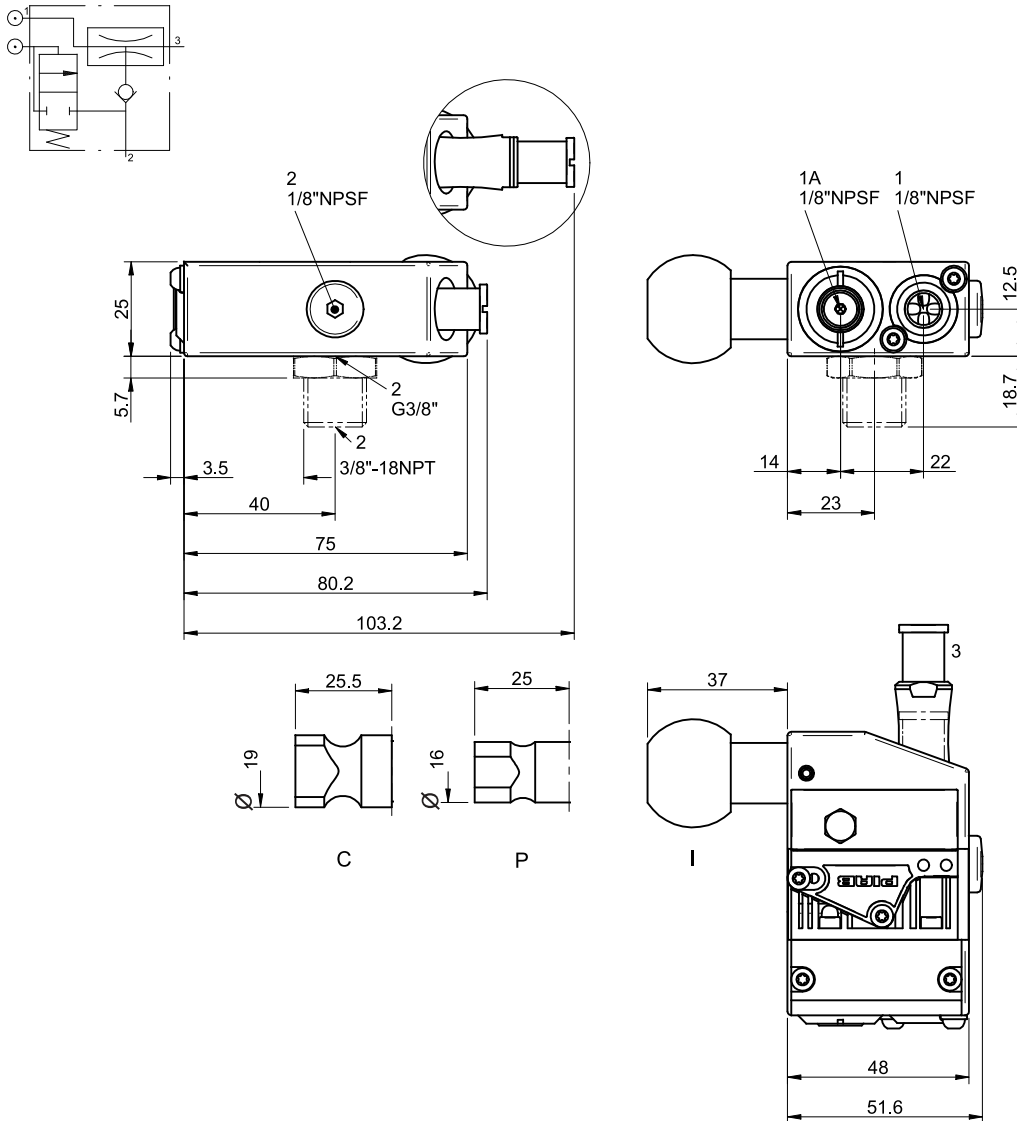
4. Energy saving	VGS Code
No energy saving	AA
Energy saving Vacustat 65 -kPa	AB
Energy saving Vacustat, Adjustable (factory set at 45 -kPa)	AC

For detailed information on Vacustat, see separate datasheet.

5. Release function	VGS Code
Release Blow-off	01

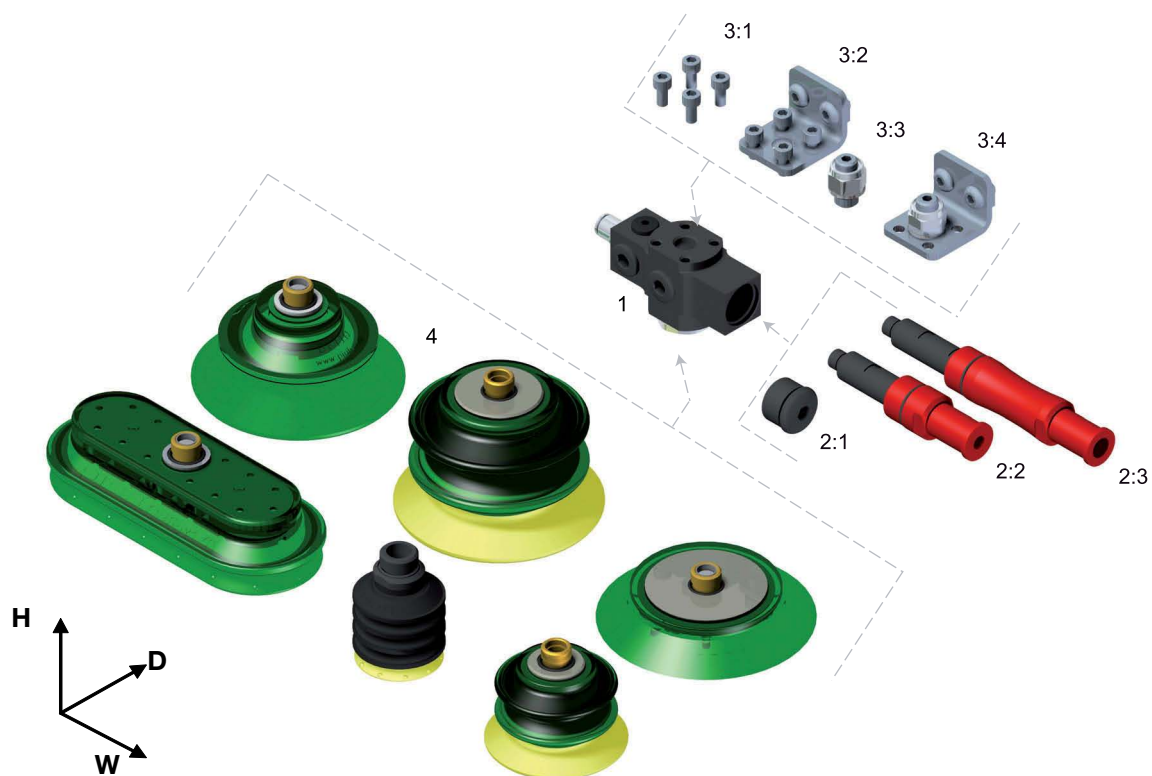
6. Vacuum connection	VGS Code
G3/8" female	AA
G3/8" male - 3/8" NPT male adapter	AB

Example	Ordering number
VGST <sup>TM</sup> 3040 with left hand housing, COAX <sup>®</sup> cartridge MINI Pi 12-2, mounting lock pin 16mm, no energy saving, release Blow-off, G3/8" female vacuum connection	VGS3040 01 AB 01 AA 01 AA



All drawings are of left-handed tooling.

## VGS™5010



Dimension and connection			W mm	D mm	H mm	Feed pressure mm	Vacuum	Exhaust/blow mm
1	Housing	VGS5010		33	45 <sup>a</sup>	Ø8 mm, 3x G1/4", G1/8"		
2	COAX® cartridg <sup>e</sup>	2:1 No COAX® cartridge	110					
		2:2 COAX® cartridge 2-stage	153					Ø19 mm
		2:3 COAX® cartridge 3-stage	199					Ø19 mm
3	Mounting / orientation	3:1 4 x M6 top, flush mount					2x G1/4"	
		3:2 4 x M6 top, angle bracket		b	b		2x G1/4"	
		3:3 M12 20 mm		20	20		2x G1/4"	
		3:4 M12 20 mm, angle bracket		b	b		2x G1/4"	
4	Suction cup	No suction cup					G1/2"	
		Suction cup	c	c	c			

For complete dimensions add the measurements from all selected modules or visit [www.piab.com](http://www.piab.com) and download your configuration at the CAD download centre.

a For suction cups with G3/8" thread connection add an extra 5 mm to account for the bushing.

b For complete dimensions, configure your CAD model at [www.piab.com](http://www.piab.com)

c For suction cup dimensions see suction cup data sheet.






## Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Noise level	dBA	73–83
Temperature range	°C	10–50
Material		Al, SS, NBR, PA, PP, PU

For more technical information about the COAX® cartridges, please go to the data sheet for the COAX® cartridge MIDI.

## Ordering information

1. Select housing	VGS™5010 code
Housing	VGS5010

	2. Select COAX® cartridge module	Initial flow NI/s	Evacuation time to reach 60 -kPa s/l	Description	VGS™5010 code
				No COAX® cartridge (slave unit)	AA
a	 Pi	2.8	0.7	COAX® cartridge MIDI Pi48-2	AB
c		2.8	0.7	COAX® cartridge MIDI Pi48-2, non-return valve	AD
b		5.6	0.7	COAX® cartridge MIDI Pi48-3	AC
d		5.6	0.7	COAX® cartridge MIDI Pi48-3, non-return valve	AE
a	 Si	3.3	0.53	COAX® cartridge MIDI Si32-2	AF
c		3.3	0.53	COAX® cartridge MIDI Si32-2, non-return valve	AH
b		6.0	0.53	COAX® cartridge MIDI Si32-3	AG
d		6.0	0.53	COAX® cartridge MIDI Si32-3, non-return valve	AI
a	 Xi	2.8	0.63	COAX® cartridge MIDI Xi40-2	AJ
c		2.8	0.63	COAX® cartridge MIDI Xi40-2, non-return valve	AL
b		5.9	0.57	COAX® cartridge MIDI Xi40-3	AK
d		5.9	0.57	COAX® cartridge MIDI Xi40-3, non-return valve	AM

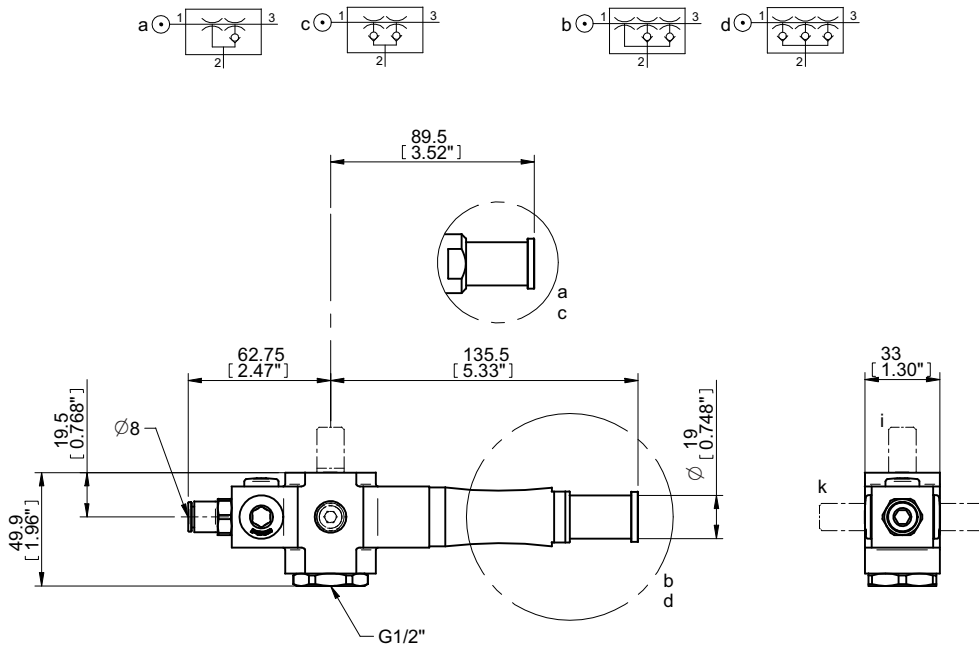
	3. Select mounting/orientation	VGS™5010 code
	4x M6 top, flush mount	00
	4x M6 top, angle bracket	01
i	M12 20 mm top	02
j	M12 20 mm right	03
k	M12 20 mm left	04
i	M12 20 mm top, angle bracket	05
j	M12 20 mm right, angle bracket	06
k	M12 20 mm left, angle bracket	07

	4. Select suction cup with fitting	VGS™5010 code
	No suction cup	BA
	BF110P 30°/60° Shore A	CO
	BF110P 60° Shore A	CP
	BL50-3P 30°/70° Shore A	CX
	BX75P 30°/60° Shore A	CY
	BX75P 60° Shore A	CZ
	BX110P 30°/60° Shore A	CQ
	BX110P 60° Shore A	CR
	F110P 30°/60° Shore A	CS
	F110P 60° Shore A	CT
	OB65x170P 30°/60° Shore A	CU
	OB65x170P 60° Shore A	CV

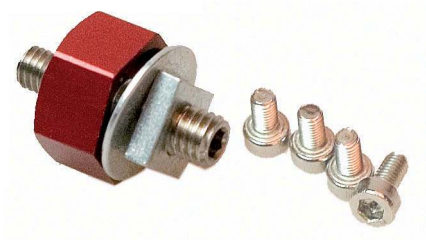
# Combined pump and gripper Large



Example	Ordering number
VGS™5010 BF110P – Pi48-2, M12 20 mm top, BF110P 30/60° Shore A	VGS5010.AB.02.CO



## VGS™2010 mounting-kits



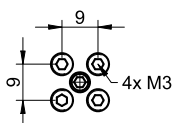
- ▶ Easy attachment to standard extrusion and profile systems
- ▶ Flexible positioning
- ▶ Quick setup and change-over
- ▶ Durable and non-rotating installation

### Technical data

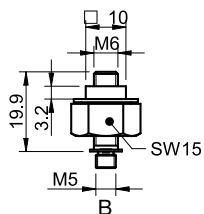
Description	Unit	Value	
		0114097	0114098
Material		SS, PA, NBR	Al, SS, Steel, PA, NBR
Weight	g	4.1	13.1

### Ordering information

Description	Art. No.
A 4x M3 top, flush mount	0114097
B M6 19 mm top, profile kit	0114098



A



B

## VGS™3010 mounting-kits



- ▶ Fits standard robot end-of-arm tooling interfaces.
- ▶ Easy attachment to standard extrusion and profile systems.
- ▶ Flexible positioning.
- ▶ Quick setup and change-over.
- ▶ Durable and non-rotating installation.

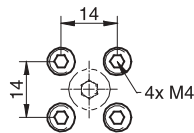
### Technical data, specific

Description	Unit	Value					
		0106915	0106927	0106949	0108488	0108731	0108734
Material		SS, NBR	SS, PA, NBR	Al, SS, Steel, NBR	Al, SS, Steel, NBR	AL, SS, NBR	SS, NBR
Weight	g	24	24	36	22	46	70

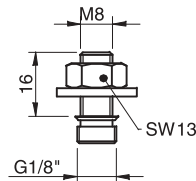
### Ordering information

Description	Art. No.
A 4x M4 top, flush mount	0106915
B M8 16 mm	0106927
C M8 27 mm, profile kit	0106949
D M6 22 mm, profile kit	0108488
E Ball joint VGS™3010	0108731
F Lock pin VGS™3010	0108734

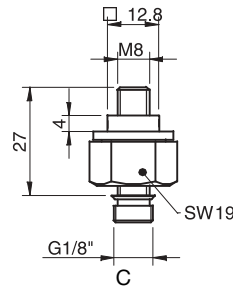
B–D 4x plug G1/8" included.



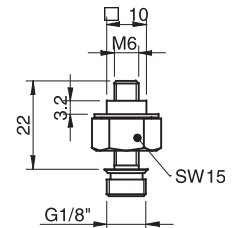
A



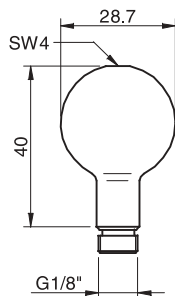
B



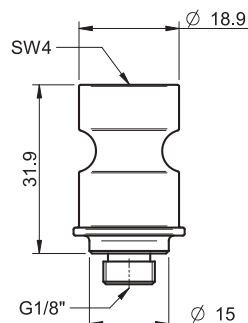
C



D



E



F

## VGS™5010 mounting-kits



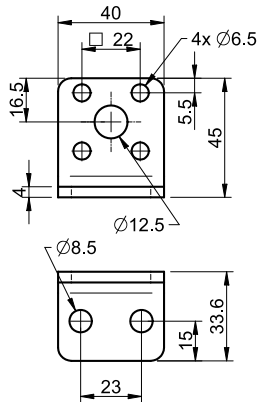
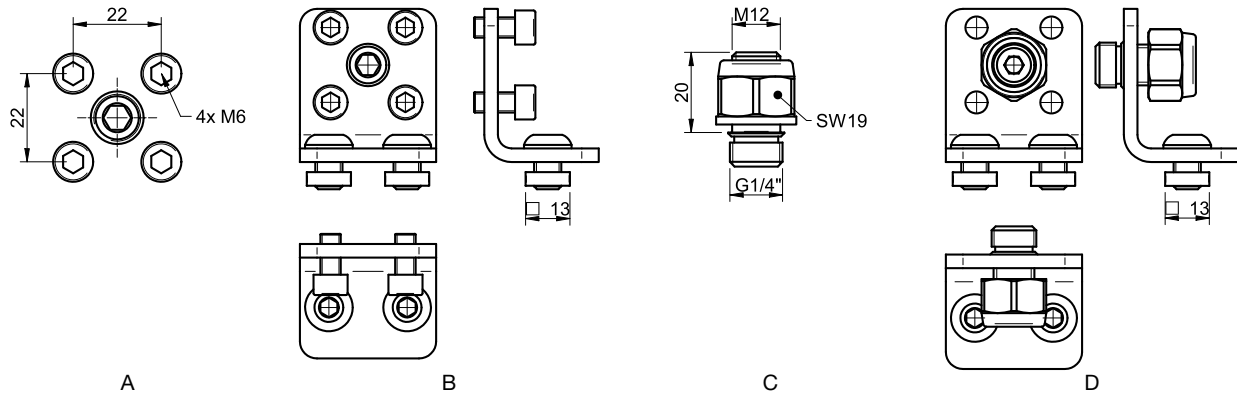
- ▶ Easy attachment to standard extrusion and profile systems
- ▶ Flexible positioning
- ▶ Quick setup and change-over
- ▶ Durable and non-rotating installation

### Technical data

Description	Unit	Value			
		0114162	0114163	0114164	0114152
Material		Al, SS, PA, NBR	Al, SS, Steel, PA, NBR	SS, Steel, PA, NBR	SS, Steel, PA, NBR
Weight	g	34.8	133.1	58.7	154.1

### Ordering information

Description	Art. No.
A 4x M6 top, flush mount	0114162
B 4x M6 top, angle bracket	0114163
C M12 20 mm top	0114164
D M12 20 mm top, angle bracket	0114152



Angle bracket included in B & D



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Piab Cruise Control .....	506
Automatic Vacuum Management ..	507

Optimising controls		For pump/system		Air saving	Control Vacuum on/off
		Included in the code	Recommended		
AVM™2 (Automatic Vacuum Management)		P3010 P5010 P6010		X	X
CU (Control Unit)		P3010 P5010 P6010			X
Vacustat/ES (Automatic energy saving)		P3010 P5010 P6010 piCLASSIC	VGS™3010 VGS™5010 Any system	X	
PCC (Piab Cruise Control)		P6010		X	X
Solenoid valves		P3010 P6040	Any system		X
Regulators			Any system	X	
QR (Quick-release valve)		P3010 VGS™3040	VGS™3010 VGS™5010 Any system	X	
Blow-off check valve		VGS™3040	VGS™3010 P3010 Any system		
Vacuum switches (Pneumatic)			Any system		
Vacuum switches (Electro-mechanical)		P3010	Any system		
Vacuum switches (Solid state)		piCOMPACT P3010	Any system		



Function			Features and benefits
Release/ blow-off	Vacuum sensing	Pressure sensing	
X	X		<ul style="list-style-type: none"> <li>▶ Complete electrical operated control unit with built in air saving and monitoring system.</li> <li>▶ Suitable for pumps in sealed applications.</li> </ul>
X			<ul style="list-style-type: none"> <li>▶ Electrical operated control unit.</li> <li>▶ Suitable for pumps in leaking applications or small, fast pick-and-place applications.</li> </ul>
	X	X	<ul style="list-style-type: none"> <li>▶ Independent air saving for vacuum or blow pumps, pneumatic or electrical operated.</li> <li>▶ Suitable in sealed applications or centralized vacuum system with external manifolds.</li> </ul>
			<ul style="list-style-type: none"> <li>▶ Electrical operated control device which automatically regulates the feed pressure towards an optimal programmed vacuum level.</li> <li>▶ The function gives air savings in leaking applications.</li> </ul>
			<ul style="list-style-type: none"> <li>▶ Electrical operated air valves to control when the pump is to be turned on/off.</li> </ul>
			<ul style="list-style-type: none"> <li>▶ Pneumatic or mechanical compressed air regulators for controlling the pump's optimum feed pressure.</li> </ul>
X			<ul style="list-style-type: none"> <li>▶ Valves that uses the atmospheric pressure to quickly eliminate vacuum in, e.g. suction cups.</li> <li>▶ Saves energy and simplifies the vacuum system since its control is synchronized with pump.</li> </ul>
X			<ul style="list-style-type: none"> <li>▶ Non-return valve that separates the vacuum- and the blow-off part in a vacuum system.</li> <li>▶ Optimized opening blow-off pressure for being used in decentralized vacuum systems.</li> </ul>
	X		<ul style="list-style-type: none"> <li>▶ Air operated vacuum sensors that gives a pneumatic clear signal at desired vacuum level.</li> <li>▶ Suitable for increased safety and monitoring in fully pneumatic system e.g. ergonomic lifting devices.</li> </ul>
	X		<ul style="list-style-type: none"> <li>▶ Electrical operated vacuum sensors that gives a electrical clear signal at desired vacuum level.</li> <li>▶ Suitable to be used to feed another load, like connecting several sensors serially to provide one common output to a PLC or BUS-I/O, e.g. in decentralized vacuum systems in robot applications.</li> </ul>
	X	X	<ul style="list-style-type: none"> <li>▶ Electrical operated vacuum sensors with a transistor output that gives a clear signal at desired vacuum level.</li> <li>▶ Available with display and recommended when accuracy and repeatability are needed.</li> <li>▶ Intended for integrations into control and monitoring systems.</li> </ul>

## Vacuum switches, pneumatic



- ▶ Converts a vacuum level to a pneumatic signal.
- ▶ Vacuum-actuated membrane linked to a pneumatic switch.
- ▶ Available preset or with adjustable vacuum level.

### Technical data

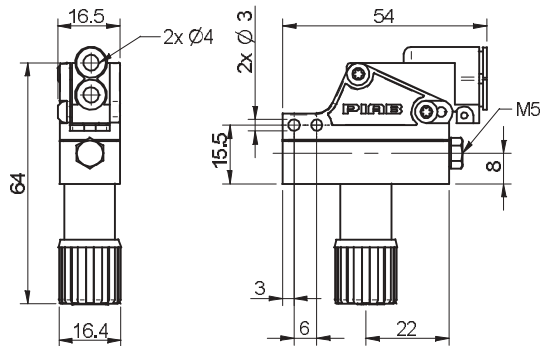
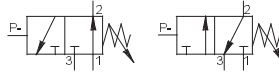
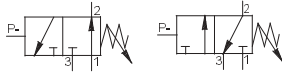
Description	Unit	Value
Feed pressure, range	MPa	0.15–0.8
Feed pressure, max @ vacuum connection	MPa	0.6
Material		PA, SS, NBR, POM, Al, CuZn
Temperature range	°C	-10-60
Weight	g	39
Connection, compressed air	mm	2 x Ø4
Connection, vacuum	mm	M5

### Technical data, specific

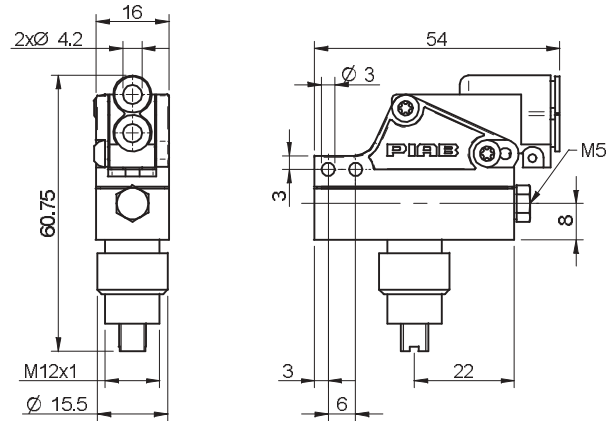
Description	Unit	Value						
		3116062	3116063	3116083	3116084	3116085	3116087	3116088
Vacuum, level setting		Screw/Knob	Screw/Knob	Preset	Preset	Preset	Preset	Preset
Signal range	-kPa	10–95	15–95	10±2	25±4	65±8	30±5	70±10
Function output		NO	NC	NO	NO	NO	NC	NC
Hysteresis	kPa	3	12	3	3	3	12	12

## Ordering information

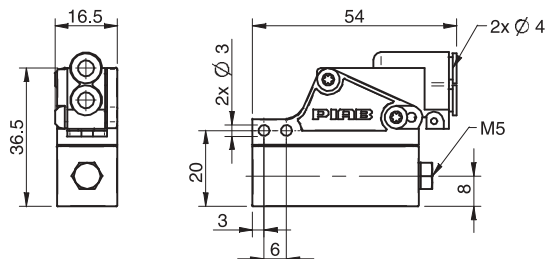
	Description	Art. No.
A	Vacuum switch, pneumatic, adjustable with screw and knob (NO)	3116062
A	Vacuum switch, pneumatic, adjustable with screw and knob (NC)	3116063
B	Vacuum switch, pneumatic, preset (NO 10 -kPa)	3116083
B	Vacuum switch, pneumatic, preset (NO 25 -kPa)	3116084
B	Vacuum switch, pneumatic, preset (NO 65 -kPa)	3116085
B	Vacuum switch, pneumatic, preset (NC 30 -kPa)	3116087
B	Vacuum switch, pneumatic, preset (NC 70 -kPa)	3116088



A Knob



A Screw



B

## Ordering information, accessories

Description	Art. No.
Connection set for vacuum switch	0100488

Contents: Barrel nipple G1/8" M5 long, hose connector 4/2 M5. Material: Nickel-plated brass, SS, PA66, NBR, PA6. Fits: All pre-set and adjustable vacuum switches.

## Vacuum switches VS4118/VS4128



- ▶ Pre-set vacuum switch with digital output.
- ▶ Durable and compact design with G1/8" 90° angle swivel connection for easy installation.
- ▶ VS4118 hardwired enables PNP NO/NC or NPN NO/NC functionality.
- ▶ VS4128 suitable for plug in I/Os. Available in PNP NO or NPN NO models.
- ▶ Possible to connect several units serially with T-connectors to provide a common output (VS4128 PNP).

### Technical data

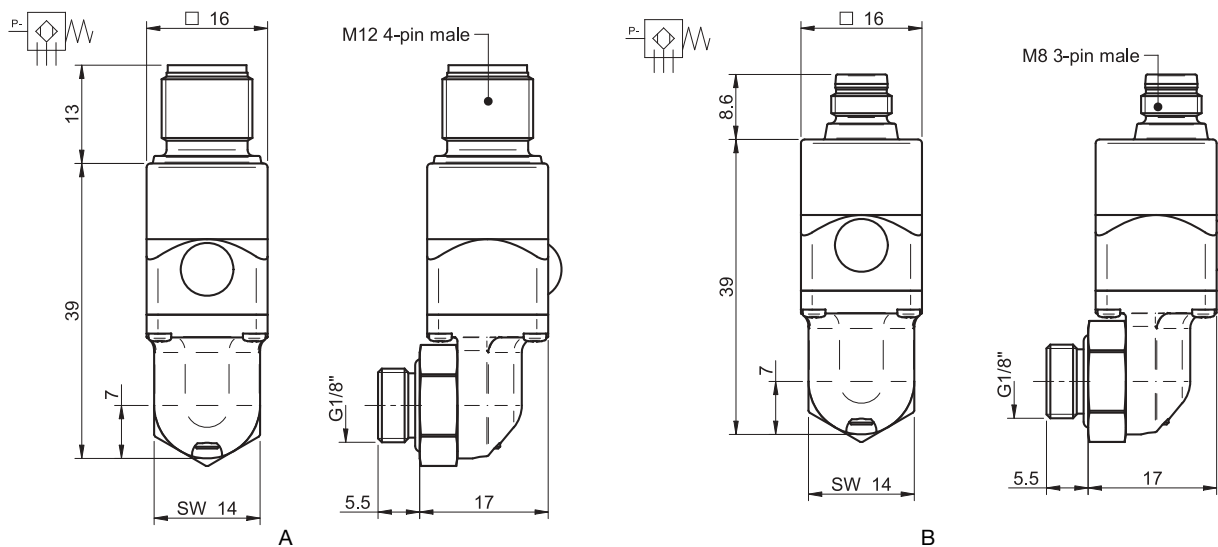
Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.6
Material		AL, SS, CuZn, PA
Temperature range	°C	-25 – 85
Weight	g	23
Connection, vacuum		G1/8"
Function		NO/NC
Hysteresis	kPa	8
Voltage	VDC	24 (12-30)
Safety classification		IP65
Current, max inductive	A	0,1
Current, max resistive	A	0,4
Voltage drop, max (100mA/24V inductive load)	VDC	0.055
Response time	ms	4
Display		LED indicator

### Technical data, specific

Description	Unit	Value							
		0110630	0124449	0110631	0124450	0110632	0110730	0110731	0110732
Signal range	-kPa	30±4	30±4	50±4	50±4	70±4	30±4	50±4	70±4
Electric connection		M12 4-pin	M12 4-pin	M12 4-pin	M12 4-pin	M12 4-pin	M8 3-pin	M8 3-pin	M8 3-pin
Dimension, WxDxH	mm	52x16x17	52x16x17	52x16x17	52x16x17	52x16x17	47.6x16x17	47.6x16x17	47.6x16x17

## Ordering information

	Description	Art. No.
A	Vacuum Switch VS4128 30 -kPa, M12 PNP NO	0110630
A	Vacuum Switch VS4128 50 -kPa, M12 PNP NO	0110631
A	Vacuum Switch VS4128 70 -kPa, M12 PNP NO	0110632
A	Vacuum switch VS4128 30 -kPa, M12 NPN NO	0124449
A	Vacuum Switch VS4128 50 -kPa, M12 NPN NO	0124450
B	Vacuum Switch VS4118 30 -kPa, M8 PNP/NPN NO/NC	0110730
B	Vacuum Switch VS4118 50 -kPa, M8 PNP/NPN NO/NC	0110731
B	Vacuum Switch VS4118 70 -kPa, M8 PNP/NPN NO/NC	0110732



## Ordering information, accessories

Description	Art. No.
Cable M8 3-pin female L=2m	0108141
Cable M12 4-pin female L=1.5m	0118961
Cable M12 4-pin female, LED indicator, PUR, L=5m	0118013

## T-connector M12



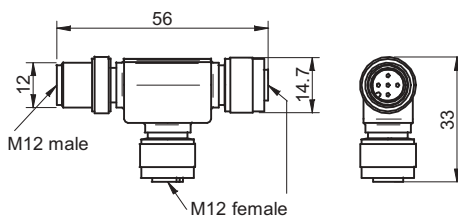
- ▶ Serially connects two or several vacuum switches, VS4128, into one common output to the PLC or BUS-I/O.
- ▶ Quick and simple installation with standard male to female M12 eurofast cable assemblies.
- ▶ Suitable if the PLC or BUS-I/O is limited to one or two input signals from a vacuum system with several vacuum switches.

### Technical data

Description	Unit	Value
Material		TPU, Zn
Temperature range	°C	-25 – 90
Weight	g	25
Voltage, max	VDC	60
Safety classification		IP65
Current, max	A	4
Humidity	%RH	90
Electric connection		3x M12 4-pin
Dimension, WxDxH	mm	56x14,7x33

### Ordering information

Description	Art. No.
T-connector M12 male, 2xM12 female	0119558



### Ordering information, accessories

Description	Art. No.
Cable M12 4-pin female, M12 4-pin male, PUR, L=2	0118322

## Vacuum switches VS4015/VS4016



- ▶ Pre-set vacuum switch with digital output.
- ▶ Very low weight and small format, push-in or thread connections.
- ▶ PNP NO/NC or NPN NO/NC output functions.

### Technical data

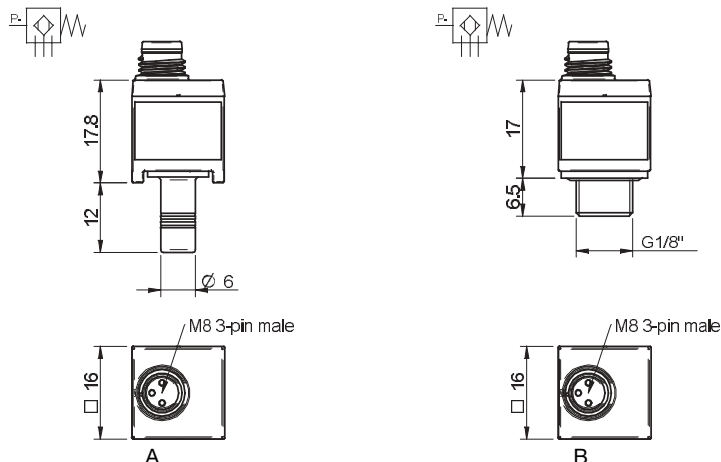
Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.2
Material		PA, TPU, SS, CuZn(Au)
Temperature range	°C	-25 – 85
Weight	g	5
Function		NO/NC
Hysteresis	kPa	6 ± 1
Voltage	VDC	24 (12-30)
Safety classification		IP40
Current, max inductive	A	0,1
Current, max resistive	A	0,4
Voltage drop, max (100mA/24V inductive load)	VDC	0.055
Response time	ms	4
Display		LED indicator
Electric connection		M8 3-pin

### Technical data, specific

Description	Unit	Value					
		0110245	0110246	0110247	0110248	0110249	0110250
Connection, vacuum	mm / inch	Ø6	Ø6	Ø6	G1/8"	G1/8"	G1/8"
Signal range	-kPa	30 +5/-3	50 +5/-3	70 +5/-3	30 +5/-3	50 +5/-3	70 +5/-3
Dimension, WxDxH	mm	16x16x22.3	16x16x22.3	16x16x22.3	16x16x21.5	16x16x21.5	16x16x21.5

### Ordering information

	Description	Art. No.
A	Vacuum switch VS4015, Ø6, 30 -kPa	0110245
A	Vacuum switch VS4015, Ø6, 50 -kPa	0110246
A	Vacuum switch VS4015, Ø6, 70 -kPa	0110247
B	Vacuum switch VS4016, G1/8" male, 30 -kPa	0110248
B	Vacuum switch VS4016, G1/8" male, 50 -kPa	0110249
B	Vacuum switch VS4016, G1/8" male, 70 -kPa	0110250



### Ordering information, accessories

Description	Art. No.
Cable M8 3-pin female L=2m	0108141

## Vacuum switches, electro-mechanical



- ▶ Converts a vacuum level to an electric signal, VAC or VDC.
- ▶ Vacuum-actuated membrane linked to an electro-mechanical switch.
- ▶ Integrated cable with open ends included.
- ▶ Available preset or with adjustable vacuum level.

### Technical data

Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0,6
Material		PBTP, PVC, PA, SS, NBR, POM, Al, CuZn
Temperature range	°C	-20 – 80
Weight	g	62
Connection, vacuum	mm	M5
Function		NO/NC
Hysteresis	kPa	10
Cable		3 x 0.75 mm <sup>2</sup> x 0.5 m
Voltage, max	VAC/VDC	250/30
Safety classification		IP67
Current, max	A	5

### Technical data, specific

Description	Unit	Value		
		3116061	3116095	3116096
Vacuum, level setting		Screw/Knob	Preset	Preset
Signal range	-kPa	15–95	25±5	65±10
Dimension, WxDxH	mm	48x16.5x64.5	48x16.5x44.5	48x16.5x44.5

#### Note:

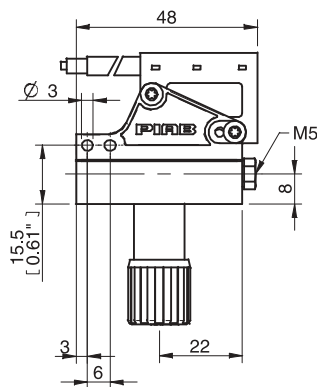
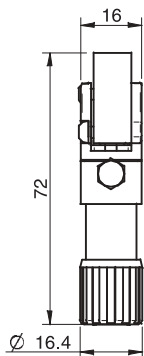
NO, Normally Open, in electrical circuits corresponds to an open circuit breaker, which means that, if the gate is open, no current can pass through.

NO, Normally Open, in pneumatic circuits corresponds to an open valve, which means that, if the valve is open, compressed air passes through.

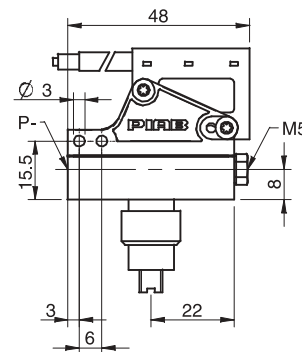
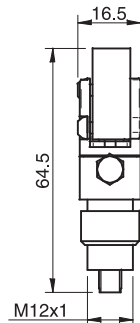


## Ordering information

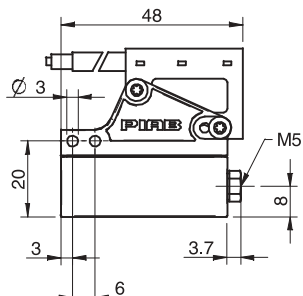
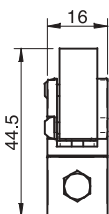
	Description	Art. No.
A	Vacuum switch, electro-mechanical, adjustable with screw and knob	3116061
B	Vacuum switch, electro-mechanical, preset (Signal range 25 -kPa)	3116095
B	Vacuum switch, electro-mechanical, preset (Signal range 65 -kPa)	3116096



A Knob



A Screw



B

## Ordering information, accessories

Description	Art. No.
Connection set for vacuum switch	0100488

Contents: Barrel nipple G1/8" M5 long, hose connector 4/2 M5. Material: Nickel-plated brass, SS, PA66, NBR, PA6. Fits: All pre-set and adjustable vacuum switches.

## Vacuum switches, inductive universal



- ▶ Converts a vacuum level to a digital signal, 24 VDC.
- ▶ Vacuum-actuated membrane linked to a proximity-inductive universal switch.
- ▶ Integrated cable with open ends included.
- ▶ PNP NO/NC or NPN NO/NC output functions.
- ▶ The switch must be connected in series with the load.

### Technical data

Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.6
Material		PBTP, PVC, PA, SS, NBR, POM, Al, CuZn
Temperature range	°C	-25–80
Weight	g	71
Function		PNP NO/NC, NPN NO/NC
Hysteresis	kPa	2
Cable		2 x 0.14 mm <sup>2</sup> x 2m
Voltage	VDC	24 (5–36)
Safety classification		IP67
Current, max	A	0.2
Voltage drop, max	VDC	4.6

### Technical data, specific

Description	Unit	Value				
		0104350	3116064	3116089	3116090	3116091
Vacuum, level setting		Knob	Knob	Preset	Preset	Preset
Connection, vacuum	mm	Ø6	M5	M5	M5	M5
Signal range	-kPa	10–95	10–95	10±1	30±3	70±5
Dimension, WxDxH	mm	48.5x16.5x63.8	47.5x16.5x63.8	47.5x16.5x36.5	47.5x16.5x36.5	47.5x16.5x36.5

### Supplement

PNP NO = Normally Open, Positive logic. As the switch is activated, the gate at the feed current (+) closes and contact is established.

PNP NC = Normally Closed, Positive logic. As the switch is activated, the gate at the feed current (+) opens and contact is interrupted.

NPN NO = Normally Open, Negative logic. As the switch is activated, the gate at ground (-) closes and contact is established.

NPN NC = Normally Closed, Negative logic. As the switch is activated, the gate at ground (-) opens and contact is interrupted.

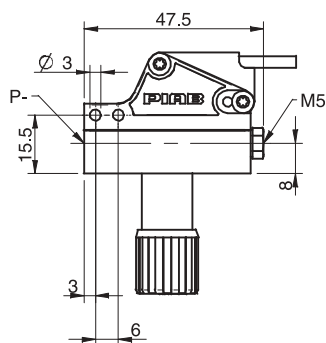
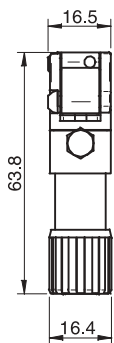
### Note:

NO, Normally Open, in electrical circuits corresponds to an open circuit breaker, which means that, if the gate is open, no current can pass through.

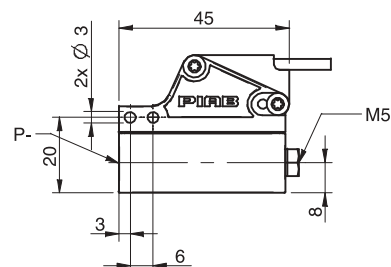
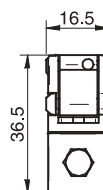
NO, Normally Open, in pneumatic circuits corresponds to an open valve, which means that, if the valve is open, compressed air passes through.

## Ordering information

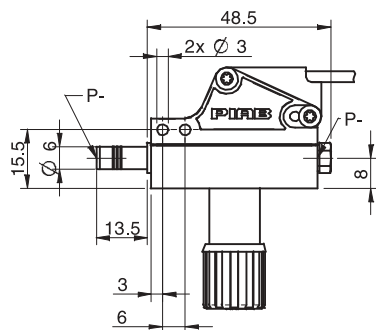
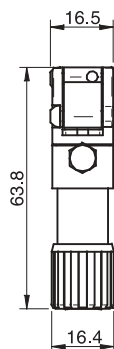
	Description	Art. No.
A	Vacuum switch, inductive universal, adjustable with knob	3116064
B	Vacuum switch, inductive universal, preset (Signal range 10 -kPa)	3116089
B	Vacuum switch, inductive universal, preset (Signal range 30 -kPa)	3116090
B	Vacuum switch, inductive universal, preset (Signal range 70 -kPa)	3116091
C	Vacuum switch, inductive universal, adjustable with knob Ø6	0104350



A



B



C

## Ordering information, accessories

Description	Art. No.
Connection set for vacuum switch	0100488

Contents: Barrel nipple G1/8" M5 long, hose connector 4/2 M5. Material: Nickel-plated brass, SS, PA66, NBR, PA6. Fits: All pre-set and adjustable vacuum switches.

## Vacuum switch, MM8



- ▶ Converts vacuum to an analogue output signal and an adjusted vacuum level to a digital output.
- ▶ Adjustable hysteresis.
- ▶ Separate cable with open ends included.

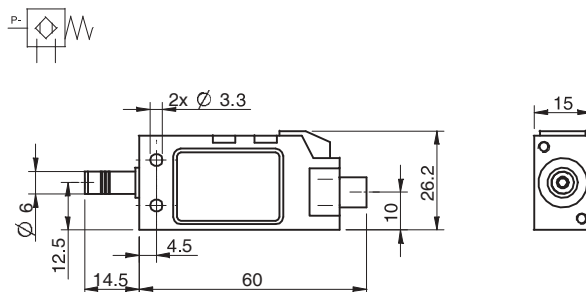
### Technical data

Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.2
Material		PC, POM, NBR, SS
Temperature range	°C	-20–70
Weight	g	68
Connection vacuum	mm	Ø6/M5
Signal range	-kPa	0–100
Function		NO
Hysteresis	% F.S.	1–5
Voltage	VDC	24 (10.8–30)
Voltage, output	VDC	1–15
Safety classification		IP40
Current, max output	A	0.08
Current, max analogue output (load resistance min. 5kΩ)	A	0.001
Voltage drop, max	VDC	4.6
Humidity	% RH	35–85
Response time	ms	2
Accuracy, @ 25°C	% F.S.	±3
Current consumption	mA	17
High-voltage resistance	VAC	500
Insulation, resistance @ 500 VDC	MOhm	100
Vibration resistant, 1,5 mm, XYZ, 2 h	Hz	10–500
Electric connection		M8 4-pin
Dimension, WxDxH	mm	26x15x60

*Non-lubricated air, non-corrosive gases, compatible with Polycarbonate and Polyacetal.*

### Ordering information

Description	Art. No.
Vacuum switch, adjustable, PNP NO MM8	0107729
Vacuum switch, adjustable, NPN NO MM8	0107730



## Vacuum switch, DM8



- ▶ Converts adjusted vacuum levels to 2 separate digital outputs.
- ▶ Digital vacuum level display.
- ▶ Integrated cable with M8 connector included.

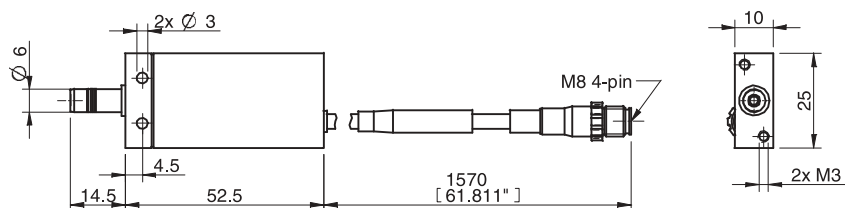
### Technical data

Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.2
Material		PC, POM, NBR, Al
Temperature range	°C	-20–60
Weight	g	52
Connection vacuum	mm	Ø6/M5
Signal range	-kPa	0–100
Function		NO
Hysteresis	% F.S.	2
Cable	m	1.5
Voltage	VDC	12–24
Safety classification		IP40
Current, max output	A	0.08
Humidity	% RH	35–85
Response time	ms	2
Accuracy, @ 25°C	% F.S.	±3
Current consumption	mA	35
High-voltage resistance	VAC	500
Insulation, resistance @ 500 VDC	MOhm	100
Display		LED indicators, numeric
Electric connection		M8 4-pin
Dimension, WxDxH	mm	25x10x53

*Non-lubricated air, non-corrosive gases, compatible with Polycarbonate and Polyacetal.*

### Ordering information

Description	Art. No.
Vacuum switch, adjustable, PNP NO DM8	0107732
Vacuum switch, adjustable, NPN NO DM8	0107733



## Vacuum switch, LM8



- ▶ Converts an adjusted vacuum level to a digital output.
- ▶ Very low weight and small format with push-in connection.
- ▶ Integrated cable with M8 connector included.

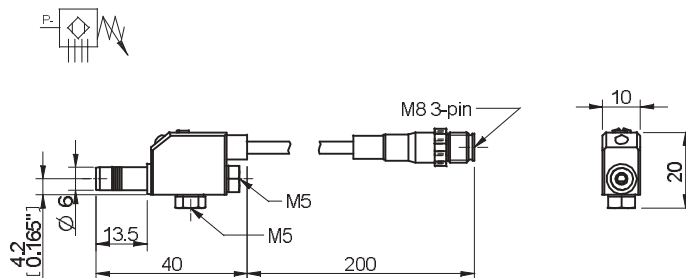
### Technical data

Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.2
Material		PC, AI, SS
Temperature range	°C	-100–60
Weight	g	55
Connection vacuum	mm	Ø6/M5
Signal range	-kPa	0–100
Function		NO PNP
Hysteresis	% F.S.	2
Cable	m	0.2
Voltage	VDC	24 (10.8–30)
Safety classification		IP40
Current, max output	A	0.08
Humidity	% RH	35–85
Response time	ms	1
Accuracy, @ 25°C	% F.S.	±3
Current consumption	mA	20
High-voltage resistance	VDC	500
Insulation, resistance @ 500 VDC	MOhm	100
Vibration resistance, 1.5 mm, XYZ, 2 h	Hz	10–55
Display		LED indicator
Electric connection		M8 3-pin
Dimension, WxDxH	mm	20x10x27

*Non-lubricated air, non-corrosive gases, compatible with Polycarbonate and Polyacetal.*

### Ordering information

Description	Art. No.
Vacuum switch, adjustable, PNP NO LM8	0107731



## Vacuum switch, M5



- ▶ Converts an adjusted vacuum level to a digital output signal for pressure or vacuum.
- ▶ NC in vacuum range 0–100 -kPa. NO in pressure range 0–300 kPa.
- ▶ Very low weight and small format with M5 90° angle swivel connection.
- ▶ Integrated cable with open ends included.

### Technical data

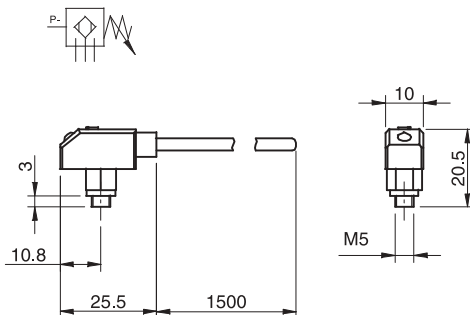
Description	Unit	Value
Feed pressure, max @ vacuum connection	MPa	0.6
Material		PC, SS
Temperature range	°C	-10–60
Weight	g	6
Connection vacuum	mm	M5
Signal range	kPa	-100–300
Function		NO, NC
Hysteresis	% F.S.	2
Cable		3 x 0.14 mm <sup>2</sup> x 1.5 m
Voltage	VDC	24 (10.8–30)
Safety classification		IP40
Current, max output	A	0.08
Humidity	% RH	35–85
Response time	ms	1
Accuracy, @ 25°C	% F.S.	±3
Current consumption	mA	20
High-voltage resistance	VDC	500
Insulation, resistance @ 500 VDC	MOhm	100
Vibration resistance, 1.5 mm, XYZ, 2 h	Hz	10–55
Display		LED indicator
Dimension, WxDxH	mm	26x10x18

*Non-lubricated air, non-corrosive gases, compatible with Polycarbonate and Polyacetal.*

Note: Normally closed, opens at set value from -100–300 kPa.

### Ordering information

Description	Art. No.
Vacuum switch PNP M5	0110358
Vacuum switch NPN M5	0110359



## Vacuum switch/sensor, piCOMPACT10



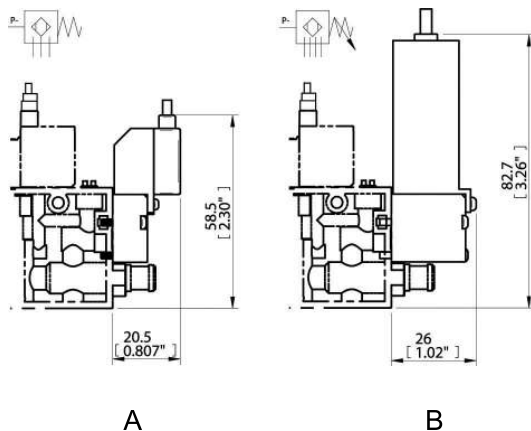
- ▶ Vacuum sensor/switch options for piCOMPACT10.
- ▶ Sensor with analog output 1-5 VDC.
- ▶ Digital switch with LED Display, PNP or NPN output + analog output (1-5 VDC).
- ▶ Easy to set vacuum level, hysteresis and change display units (bar, kPa, inHg, mmHg)
- ▶ 2m cable included, open ends.

### Technical data

Description	Unit	Value	
		Vacuum sensor 1A Analog	Vacuum sensor/switch 1D, 2D Digital/ Analog
Vacuum range	-kPa	0-101	0-101
Overpressure, max.	MPa	0.5	0.5
Material		PC, Al	PC, Al
Temperature range	°C	0-50	0-50
Weight	g	32	57
Vacuum connection		M5 threaded female	M5 threaded female
Humidity	%RH	35-85	35-85
Safety classification		IP40	IP40
Voltage supply	VDC	10.8-30, Ripple (Vp-p) 10% max	10.8-30, Ripple (Vp-p) 10% max
Response time	ms	2	2
Dielectric strength, 1 min	VAC	100	100
Accuracy		±1% of F.S.	±2% of F.S.
Repeatability		-	±0.2% of F.S.
Analog output	VDC	1-5 (±0.1), linearity ±0.5% F.S. Output impedance 500 Ω	1-5 (±0.1), linearity ±0.5% F.S. Output impedance 500 Ω
Switch/digital output		-	PNP or NPN open collector Max 125mA (load current)
Display		-	3 1/2 digit 7 segment
Current consumption	mA	20 or less	60 or less
Vibration resistance	Hz	0-55, amplitude 1.5mm XYZ 2h	0-150, amplitude 1.5mm XYZ 2h

### Ordering information, spare parts

	Description	Code	Art. No.
A	No display, analog output vacuum sensor	1A	0125645
B	Display, analog & digital output vacuum sensor PNP	1D	0125648
B	Display, analog & digital output vacuum sensor NPN	2D	0125647





## Blow-off Check valve G1/8"



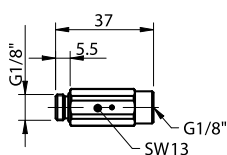
- ▶ Prevents vacuum from being pulled through the blow-off lines, which means faster response time and completely independent vacuum units.
- ▶ Reliable quick-release function even in larger systems with several units, due to the very low feed pressure required to break away for blow-off.
- ▶ Suitable in applications where cleaning of the suction cup filters or cooling of the object to be picked is important.

### Technical data

Description	Unit	Value
Feed pressure, range	MPa	0.3–0.7
Feed pressure, minimum to break away for blow-off	MPa	0.1
Material		AL, CuZn, SS, NBR
Temperature range	°C	-10–80
Weight	g	12.4
Flow, rate @ 0.3-0.7 MPa	l/s	1.5–2.8
Connection, compressed air		G1/8"
Connection, vacuum		G1/8"
Dimension, WxDxH	mm	14x14x31,5

### Ordering information

Description	Art. No.
Blow-off Check valve G1/8"	0115314



## AQR 02 (Atmospheric Quick-Release Valve)



- ▶ Equalises pressure in the suction cups to provide fast release of the product.
- ▶ Extra fast release by accumulating and utilising the feed-air pressure as a boost.
- ▶ ON/OFF activated simultaneously with the ejector.
- ▶ No additional controls required — use a single 3/2 control valve for the ejector and AQR 02.

### Technical data

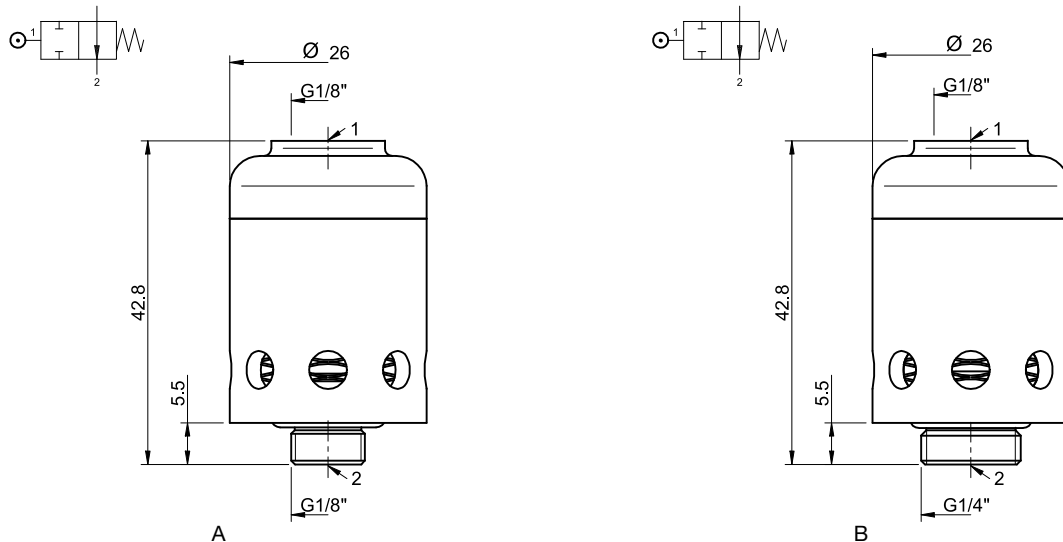
Description	Unit	Value
Feed pressure, range	MPa	0.3–0.7
Material		Al, SS, NBR
Temperature range	°C	0–50
Weight	g	47
Connection, compressed air		G1/8"
Dimension, WxDxH	mm	26x26x37,3

### Technical data, specific

Description	Unit	Value	
		0119721	0119720
Connection, vacuum		G1/8"	G1/4"
Flow, atmospheric	NI/s	3.85	7.85

### Ordering information

Description	Art. No.
A Atmospheric quick-release valve – AQR 0207, G1/8"	0119721
B Atmospheric quick-release valve – AQR 0210, G1/4"	0119720



## AQR (Atmospheric Quick-Release Valve)



- ▶ Equalises pressure in vacuum gripper systems to provide fast release of product.
- ▶ Consumes no additional compressed air.
- ▶ ON/OFF activated simultaneously with the ejector.
- ▶ No additional controls required — use a single 3/2 control valve for the ejector and AQR.
- ▶ Optional with fitting kit containing straight connector G1/8" and nylon tube.

### Technical data

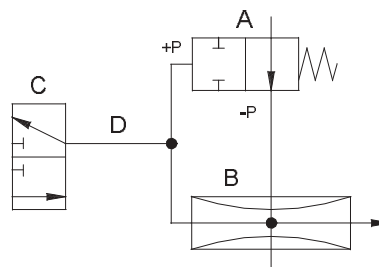
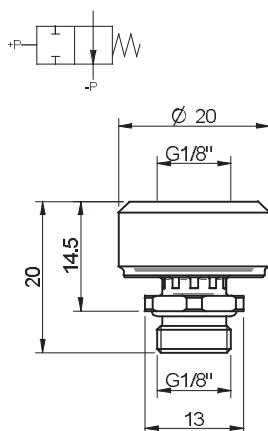
Description	Unit	Value
Feed pressure, range	MPa	0.3–0.7
Temperature range	°C	10–50
Connection, compressed air		G1/8"
Connection, vacuum		G1/8"
Flow, atmospheric	NI/s	3.3
Dimension, WxDxH	mm	20x20x14,5

### Technical data, specific

Description	Unit	Value	
		0111236	0117156
Material		CuZn, PUR, NBR	CuZn, NBR, Ni, PA, PUR, SS
Weight	g	20	36

### Ordering information

Description	Art. No.
Atmospheric quick-release valve – AQR	0111236
Atmospheric quick-release valve – AQR, including fitting kit	0117156



A=AQR, B=Vacuum pump, C=Control valve, D=Rec. max. 1.5m

## QR (Quick-Release valve)



- ▶ For vacuum pump P3010.
- ▶ Quick release by accumulating and utilising the feed-air pressure as a boost.
- ▶ ON/OFF activated simultaneously with the P3010
- ▶ Three sizes for optimising release volume with system volume.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		Al, SS, PPS, NBR, PA
Temperature range	°C	-10-50
Volume, Quick-Release	cm <sup>3</sup>	3

*For dimensions, please go to data sheet for vacuum pump P3010.*

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pump P3010.

### Technical data, accessories

Description	Unit	Value	
		0104272	0104273
Weight	g	72	118
Volume, Quick-Release tank	cm <sup>3</sup>	30	60
Dimension, WxDxH	mm	57,5x16x52	120x16x52

### Ordering information, accessories

Description	Art. No.
Quick-Release tank module P3010, 30 cm <sup>3</sup>	0104272
Quick-Release tank module P3010, 60 cm <sup>3</sup>	0104273

## Solenoid valve DS 23



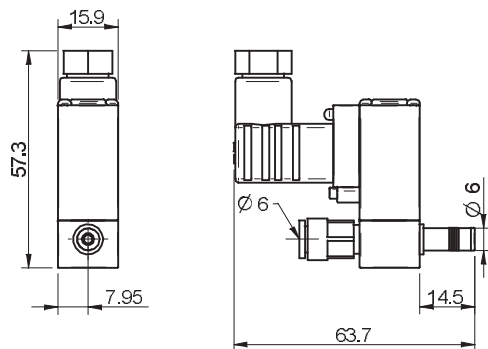
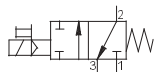
- ▶ Electric 3/2 valve with manual override.
- ▶ Quick and easy mounting with push-in connections.
- ▶ Body with 3 M5 ports.
- ▶ Suitable for compressed air, filtration 40µ.

### Technical data

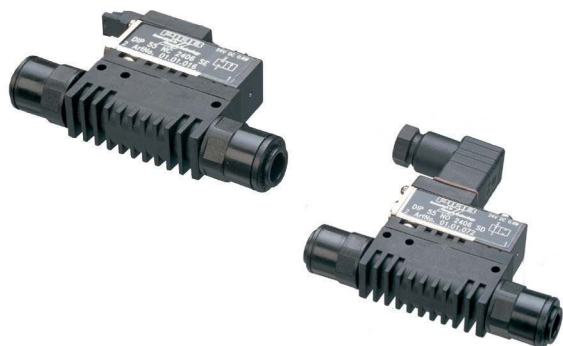
Description	Unit	Value
Feed pressure, range	MPa	0.2-0.7
Material		Ni, Al, SS, POM, CuZn, NBR
Temperature range	°C	-18-50
Weight	g	100
Connection, compressed air	mm	2 x Ø6
Voltage	VDC	24 (22-28)
Safety classification		IP65
Current consumption	mA	100
Display		LED indicator
Flow @ P <sub>1</sub> =6 bar and Δp=1 bar	NI/s	1.3
Life span, mechanical	cycles	100,000,000
Ratings, load time	%	100
Electrical connection		DIN (c)
Dimension, WxDxH	mm	49,7x15,9x57,3

### Ordering information

Description	Art. No.
Solenoid valve DS 23 for control ON/OFF	0104274



## Electrically controlled 2/2 valves DIP 55



- ▶ On/off valve
- ▶ 1/8" NPSF ports
- ▶ 0.6 W solenoid
- ▶ Electrical connections: plug-in contacts and DIN (c)
- ▶ Suitable for PIAB vacuum pumps up to Classic size.
- ▶ Manual override

### Technical data

Description	Unit	Value
Feed pressure, range	MPa	0.4–0.7 MPa
Material		PPS, PA, TPU, AI, NBR, CuZn, PUR
Temperature range	°C	0–60
Weight	g	102
Connection compressed air		2 x NPSF 1/8"
Function		NC
Supply voltage	VDC	24
Display		LED
Flow, nominal	NI/s	8.6
Kv		7.8
Lifespan, mechanical	cycles	10,000,000
Power consumption	W	0.6
Load time rating	%	100
Bore-through diameter, nominal	mm	3.7

Electrical connections are included.

Compressed air, filtration 40µm, non-lubricated.

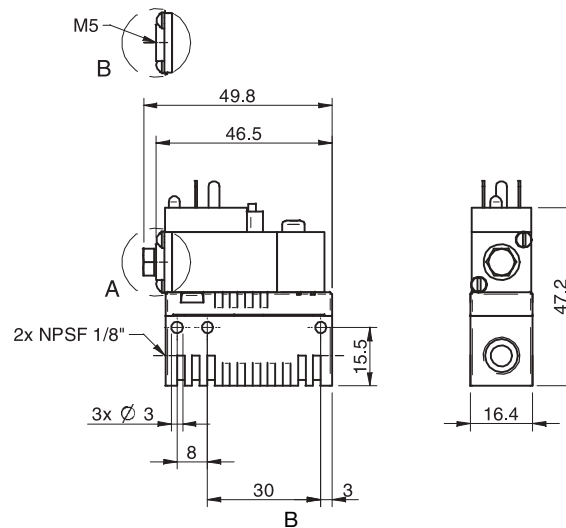
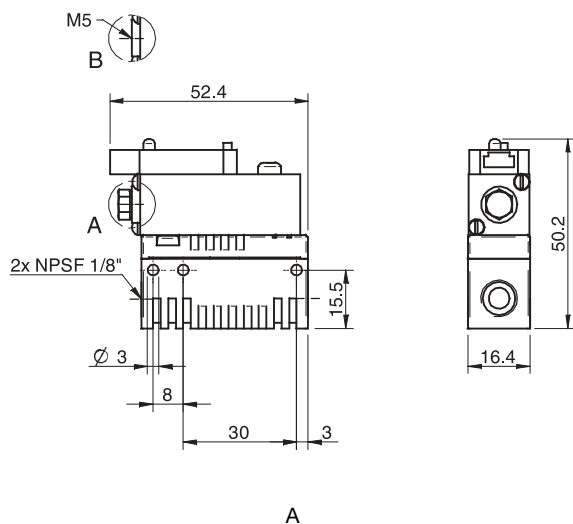
### Technical data, specific

Description	Value			
	0101016 DIP 55 NC 2406SE	0101071 DIP55 NC 2406 SD	0101017 DIP 55 NO 2406 SE	0101072 DIP 55 NO 2406 SD
Electrical connection	Plug-in connection *	DIN (c) *	Plug-in connection *	DIN (c) *
Safety specification	—	IP65	—	IP65

\*) Electrical connections are included. \* Electrical connections are to be ordered separately.

## Ordering information

	Description	Art. No.
A	Electrically controlled 2/2 valve DIP55 NC 2406 SE	0101016
A	Electrically controlled 2/2 valve DIP55 NO 2406 SE	0101017
B	Electrically controlled 2/2 valve DIP55 NC 2406 SD	0101071
B	Electrically controlled 2/2 valve DIP55 NO 2406 SD	0101072



## Vacuum Check Valve VT1



- ▶ Check valve that traps vacuum in sealed applications for safe operation.
- ▶ Built-in blow off check valve for fast release of object.
- ▶ Optional two-stage COAX® cartridge MINI Pi12-2 integrated.
- ▶ Optional integrated energy-saving device, Vacustat results in virtually no air consumption in sealed applications.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Feed pressure, min. breakaway blow-off	MPa	0.25
Material		Al, Steel, Ceramic

### Technical data, specific

Description	Unit	Value		
		0109233/0121236	0110456/0121237	0120323/0121238
Weight	g	272	390	650
Temperature range	°C	-30-70	-10-80	-10-80
Noise level	dBA	—	66-68	66-68
Signal	-kPa	—	—	65
Function		—	—	2/2 NO
Hysteresis	kPa	—	—	8
Vacuum flow, max.	NI/s	—	0.68	0.68

### Vacuum flow

Feed pressure MPa	Air consumption NI/s	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum -kPa
		0	10	20	30	40	50	60	70	80		
0.17	0.29	0.57	0.40	0.22	0.15	0.070	—	—	—	—	—	49
0.22	0.34	0.64	0.48	0.29	0.20	0.14	0.080	0.020	—	—	—	64
0.314	0.44	0.68	0.60	0.44	0.27	0.19	0.14	0.10	0.060	0.030	—	90
0.40	0.53	0.66	0.60	0.52	0.39	0.24	0.12	0.10	0.060	0.020	—	84

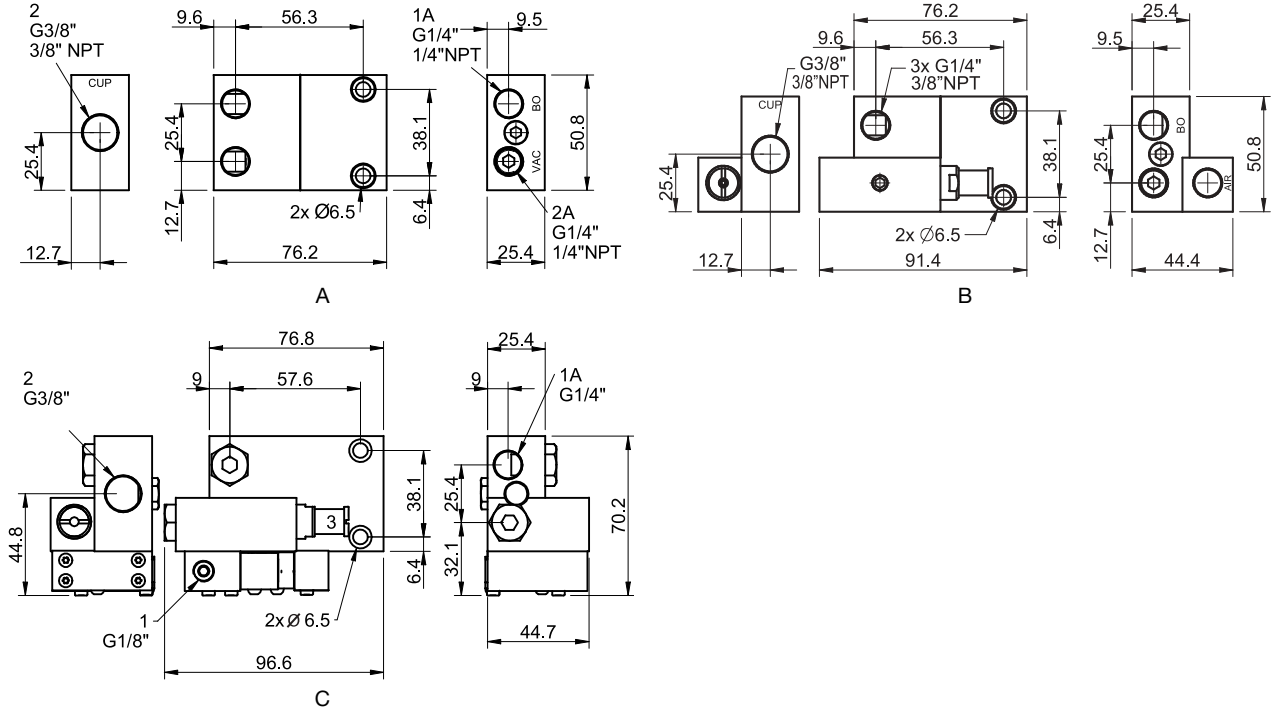
### Evacuation time

Feed pressure MPa	Air consumption NI/s	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum -kPa
		10	20	30	40	50	60	70	80	
0.17	0.29	0.28	0.56	1.13	2.13	—	—	—	—	49
0.22	0.34	0.20	0.42	0.85	1.5	2.3	3.0	—	—	64
0.314	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4.0	6.4	90
0.40	0.53	0.18	0.33	0.54	0.85	1.5	2.5	3.8	7.1	84



## Ordering information

	Description	PMAT No.	Art. No.
A	Vacuum Check Valve VT1 G3/8"-G1/4"	X1000	0109233
A	Vacuum Check Valve VT1 3/8"NPT-1/4"NPT	1000	0121236
B	Vacuum Check Valve VT1 COAX® cartridge MINI Pi12-2, non-return valve G3/8"-G1/4"	X1041	0110456
B	Vacuum Check Valve VT1 COAX® cartridge MINI Pi12-2, 3/8"NPT-1/4"NPT	1041	0121237
C	Vacuum Check Valve VT1 Vacustat COAX® cartridge MINI Pi12-2, G3/8"-G1/4"	X2098	0120323



## CU (Control Unit) P3010, P5010 & P6010



- ▶ For vacuum pumps P3010, P5010 and P6010.
- ▶ CU with electric valves for vacuum on/off and blow-off.
- ▶ Mechanical valve for blow-off flow adjustment.
- ▶ Special M12 4-pin cable assembly with LED for status of valve signal.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		PA, NBR, AI, SS, PMMA
Temperature range	°C	0–50
Function, on/off		NC
Voltage	VDC	24 (22–28)
Safety classification		IP65 [NEMA 4]
Humidity	%RH	90
Current consumption	mA	60
Ripple, max.	V <sub>rms</sub>	1
Electric connection		M 12 4-pin

For dimensions, please go to data sheet for vacuum pumps P3010, P5010 and P6010.

### Technical data, specific

Description	Unit	Value		
		P3010	P5010	P6010
Flow, blow-off @ P <sub>i</sub> =6 bar and Δp=0.5 bar	NI/s	0–7.5	0–7.5	0–7.5

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pumps P3010, P5010 and P6010.

### Ordering information, accessories

Description	Art. No.
Cable M12 4-pin female, LED indicator, PUR, L=5m	0118013

## Pilot regulators



- ▶ Pilot-operated pressure regulator with secondary pressure relief and flow compensation.
- ▶ Suitable for remote control.

### Technical data

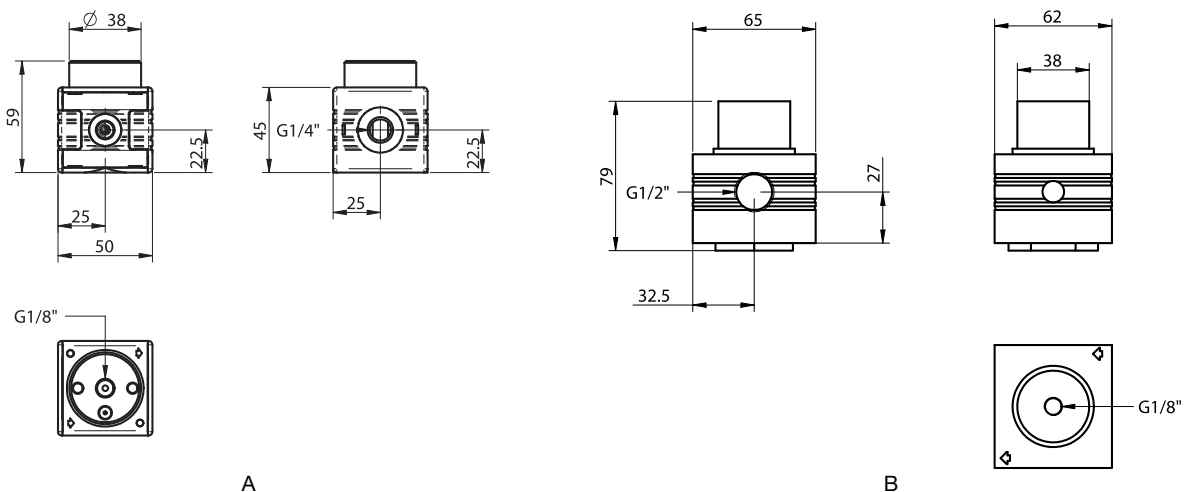
Description	Unit	Value
Feed pressure, max	MPa	1.6
Air consumption, internal	NI/s	0.8xP <sub>2</sub> /60
Temperature range	°C	0–60
Pressure, outlet P <sub>2</sub>	MPa	0.05–0.8

### Technical data, specific

Description	Unit	Value	
		0114283	0107531
Weight	g	400	500
Connection, P <sub>1</sub> /P <sub>2</sub>		G1/4"	G1/2"
Connection, pilot		G1/8"	G1/8"
Connection, gauge		G1/8"	G1/4"
Flow, @ P <sub>1</sub> =0.7 & P <sub>2</sub> =0.6 MPa	NI/s	9	31

### Ordering information

	Description	Art. No.
A	Pressure regulator, pilot operated, G1/4"	0114283
B	Pressure regulator, pilot operated, G1/2"	0107531



## Filter regulators



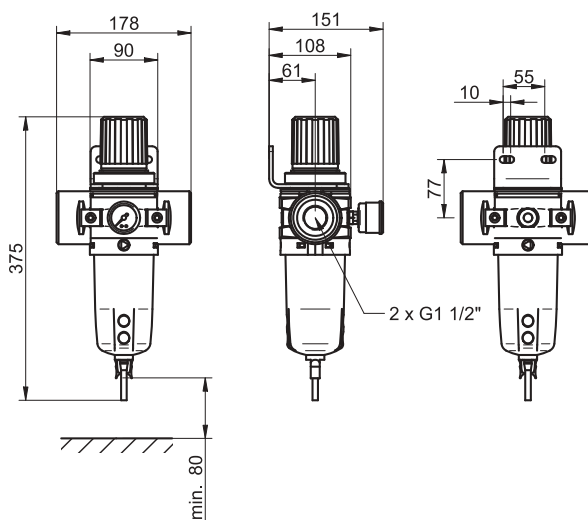
- ▶ Regulator for optimising feed pressure level, high flow capacity.
- ▶ Separates particles and condensation from the compressed air.
- ▶ Reduces the risk of operation breakdown or stoppage of the pump.
- ▶ Replaceable filter element.
- ▶ Manometer for feed pressure control.

### Technical data, specific

Description	Unit	Value		
		0109896	0109897	0113033
Feed pressure, max.	MPa	1,6	1,75	1,75
Temperature range	°C	0–50	-10–50	-10–50
Weight	g	750	1500	2200
Connection		G1/2"	G1"	G1½"
Flow, @ P <sub>1</sub> =0,8 & P <sub>2</sub> =0.7	NI/s	30	100	133
Particle size, min.	µm	5	5	30
Dimension, WxDxH	mm	65x135x253	88,5x151x346	178x151x375

### Ordering information

Description	Art. No.
Filter regulator ½"	0109896
Filter regulator 1"	0109897
Filter regulator 1½"	0113033



### Ordering information, accessories

Description	Art. No.
Filter element ½"	0121243
Filter element 1"	0121244
Filter element 1½"	0113052

## Regulators



- ▶ Regulator for optimising feed pressure to vacuum pumps or smaller vacuum systems.
- ▶ Manometer for feed pressure control.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	1
Temperature range	°C	0–50
Weight	g	110
Dimension, WxDxH	mm	43x88x71

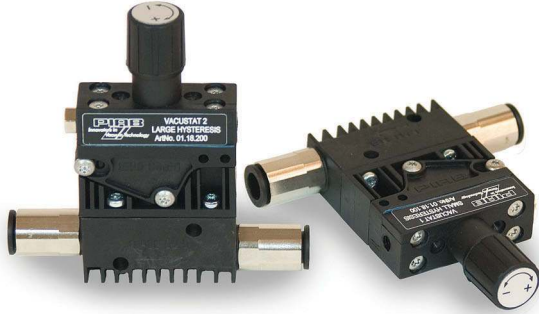
### Technical data, specific

Description	Unit	Value	
		0113122	0113123
Connection		G1/8"	G1/4"
Flow, @ P <sub>1</sub> =0.8 & P <sub>2</sub> =0.7 MPa	NI/s	5	9

### Ordering information

Description	Art. No.
Regulator 1/8", manometer	0113122
Regulator 1/4", manometer	0113123

## Vacustat, 2/2 NO (Automatic energy saving)



- ▶ Independent pneumatic air-saving device for vacuum pumps.
- ▶ Adjustable vacuum controlled 2/2 NO valve.
- ▶ Available with large hysteresis for object handling and small hysteresis for process applications.
- ▶ The Vacustat is recommended for vacuum pumps in non-leaking systems.
- ▶ The vacuum pump must be fitted with a non-return valve.

### Technical data

Description	Unit	Value
Feed pressure, range	MPa	0.17–0.7
Feed pressure, max @ vacuum connection	MPa	0.6
Material		Al, NBR, PA, SS, CuZn
Temperature range	°C	0–60
Weight	g	89
Connection, compressed air		2x Ø8 mm / 2x 1/8" NPSF
Connection, vacuum		2 x M5
Signal range	-kPa	15–99
Function		2/2 NO
Flow @ P <sub>1</sub> =6 bar and Δp=0.5 bar	NI/s	7.3
Life span	cycles	>10,000,000
Dimension, WxDxH	mm	44x16,5x89

For dimensions, please go to data sheet for vacuum pumps P3010 and P5010.

### Technical data, specific

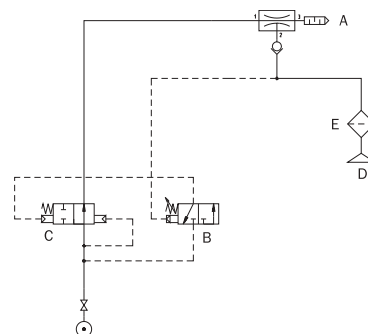
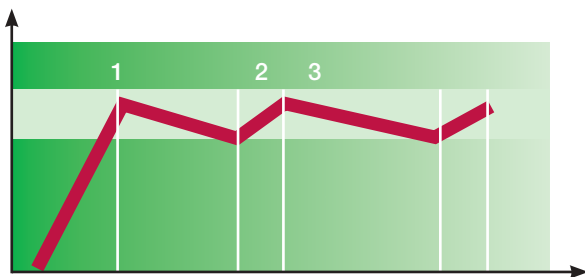
Description	Unit	Value	
		0118100	0118200
Hysteresis	kPa	1–6	5–10

#### Function

A vacuum-controlled valve shuts off the flow of compressed air to the pump when the pre-set vacuum level is reached (1). The vacuum level is set by a knob. Because of minor leakage in a vacuum system the vacuum level drops, and after a while the start-up level of the valve is reached (2). Then the pump will start and work until the shut-off level is reached again (3), etc.

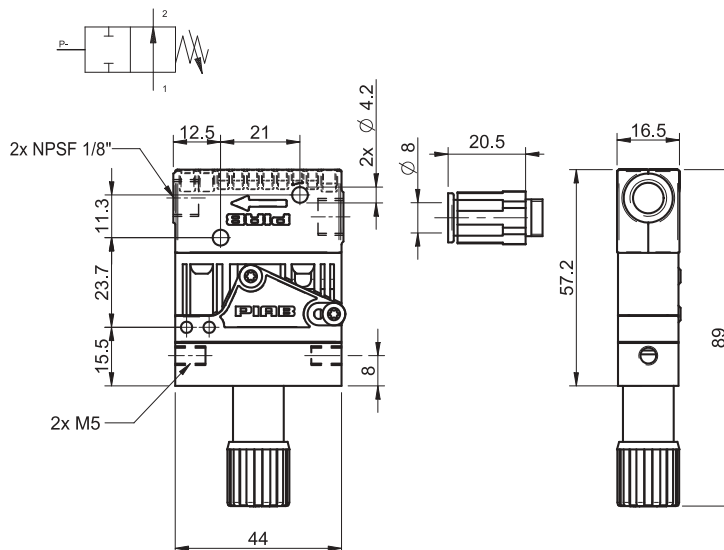
#### Connection

- A = Vacuum pump with non-return valve
- B = Vacuum switch
- C = Feed valve
- D = Suction cup
- E = Vacuum filter



## Ordering information

Description	Art. No.
Vacustat 1 with small hysteresis	0118100
Vacustat 2 with large hysteresis	0118200



## Ordering information, accessories

Description	Art. No.
Connection kit for Vacustat	0100750

## Function ES vacuum



- ▶ Electrically operated air-saving device for P6040 vacuum pump.
- ▶ Adjustable vacuum controlled 2/2 NO valve.
- ▶ Manometer for feed pressure control.
- ▶ Recommended for P6040 vacuum pump in non-leaking systems.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		Al, PA, NBR, SS, POM, HDPE, PC, CuZn, PBT
Temperature range	°C	0–50
Signal range	-kPa	15–95
Hysteresis	kpa	1.5
Voltage	VDC	24 (14–28)
Safety classification		IP40
Current consumption	mA	60
Ripple	V <sub>rms</sub>	1
Display		LED indicator
Electric connection		DIN (c)

*For dimensions, please go to data sheet for vacuum pump P6040.*

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pump P6040.



## Function ES blow



- ▶ Electrically operated air-saving device for P6040 blow pump.
- ▶ Adjustable blow-pressure controlled 2/2 NO valve.
- ▶ Manometer for feed pressure control.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		Al, PA, NBR, SS, POM, HDPE, PC, CuZn, PBT
Temperature range	°C	0–50
Signal range	kPa	15–130
Hysteresis	kPa	6
Voltage	VDC	24 (14–28)
Safety classification		IP40
Current consumption	mA	60
Ripple	V <sub>rms</sub>	1
Display		LED indicator
Electric connection		DIN (c)

*For dimensions, please go to data sheet for vacuum pump P6040.*

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pump P6040.

## PCC (Piab Cruise Control)



- ▶ For vacuum pump P6010.
- ▶ Programmable for constant vacuum level.
- ▶ The signal input regulates the feed pressure to maintain a constant vacuum level.
- ▶ Integrated analogue vacuum sensor.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	1.0
Vacuum, scale factor signal input	-kPa	0–90
Material		Al, PA, NBR, SS, AiSi302
Temperature range	°C	3–50
Voltage	VDC	24 (21.8–26.4)
Voltage, signal input	VDC	0–10
Safety classification		IP65
Current consumption	mA	<120
Electric connection		8-pin DIN 45326

*The design of PCC requires that the inlet pressure is 0.1 MPa higher than the outlet pressure. For dimensions, please go to data sheet for vacuum pump P6010.*

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pump P6010.

### Ordering information, accessories

Description	Art. No.
Cable M16 8-pin female, angled 90°, L=3m	0112395
Cable M16 8-pin female, straight, L=3m	0112393

*\*) Pin no. 5 is not used. M12 4-pin cable will fit the M12 5-pin connector.*

## AVM™2 (Automatic Vacuum Management)



- ▶ For vacuum pumps P3010, P5010 and P6010.
- ▶ AVM™2 unit with built-in control and monitoring functions.
- ▶ Integrated energy saving function (ES) minimises the air consumption in sealed systems.
- ▶ Valves for vacuum on/off and blow-off with electrical power failsafe function.
- ▶ Two digital outputs, 16 pre-set combinations of vacuum levels.
- ▶ Digital vacuum level display.
- ▶ Mechanical valve for blow-off flow adjustment.

### Technical data

Description	Unit	Value
Feed pressure, max.	MPa	0.7
Material		PA, NBR, Al, SS, PMMA
Temperature range	°C	0–50
Signal range, adjustable	-kPa	20–80
Function, on/off		NO/NC
Hysteresis	kPa	7±1
Voltage	VDC	24 (22–28)
Safety classification		IP65 [NEMA 4]
Current, max. output load	mA	100
Humidity	%RH	90
Current consumption	mA	110
Ripple, max.	V <sub>rms</sub>	1
Display		LED indicators, numeric
Electric connection		M12 8-pin

For dimensions, please go to data sheet for vacuum pumps P3010, P5010 and P6010.

### Technical data, specific

Description	Unit	Value		
		P3010	P5010	P6010
Flow, blow-off @ P <sub>1</sub> =6 bar and Δp=0.5 bar	NI/s	0–7.5	0–7.5	0–7.5

### Ordering information

Description
Available in product configuration, please go to data sheet for vacuum pumps P3010, P5010 and P6010.

### Ordering information, accessories

Description	Art. No.
Cable M12 8-pin female, PUR, L=2m	0110238
Cable M12 8-pin female, PUR, L=5m	0117746
Y-cable M12 8-pin female, 2xM12 4-pin male, PNP, PUR, L=2m	0118407
Y-cable M12 8-pin female, 2xM12 5-pin male, NPN, PUR, L=2m	0120229
Y-cable MIL 18-pin male, 2xM12 8-pin female, PNP, L=0.3m	0113248

Piab offers a warranty to distributors, integrators and users of Piab products worldwide as per the following definitions:

- ▶ A five-year warranty is valid for complete vacuum conveyors excluding controls.
- ▶ A five-year warranty is valid for vacuum pumps excluding accessories and controls.
- ▶ A one-year warranty is valid for other products.

General warranty principles:

- ▶ Piab guarantees against defects in the manufacture and materials by normal use in proper environment, when following the instructions for care, maintenance and control described in the appropriate Piab manual.
- ▶ Piab replaces or repairs, free of charge, faulty products provided that these are returned to Piab, and found to be covered by the warranty.
- ▶ It is at Piab's discretion whether a faulty product should be sent back to Piab for replacement or if the repair shall be made locally at Piab's expense.
- ▶ This warranty does not include wear parts such as suction cups, filter elements, sealings, hoses, etc.
- ▶ This warranty does not include subsequent damages caused by defective products.

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