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Move things faster, safer and with less energy consumption

VACUUM AUTOMATION CATALOGUE 8.0



Smart solutions for the automated world™

piab

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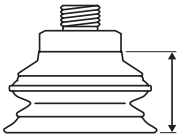
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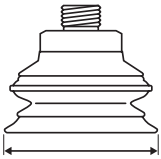
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On the opposite side of this fold-out we present some recommended products for a variety of industries we support.

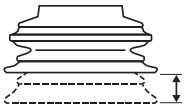
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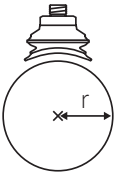
Outer diameter



Max. vertical movement



Volume



Min. curve radius

LET US HELP YOU!

This area is dedicated to local contact information which is customized to each language edition. It is also possible to put a sticker/business card in this area.

INDUSTRY GUIDE FOR OUR PRODUCTS

At Piab we offer leading products to optimize your needs in a variety of industries. Beneath we have selected some products that could be of particular interest for your industrial needs.

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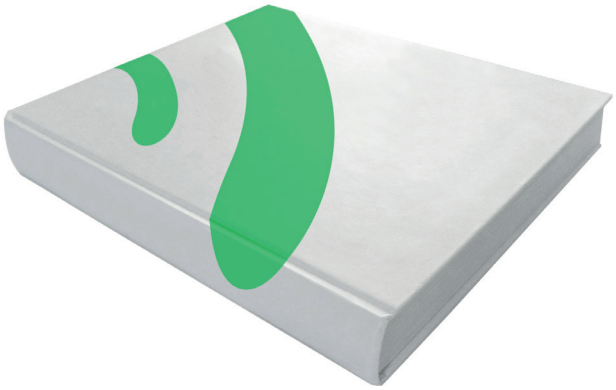
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1951



In 1951, the company took its name from its first product, an innovative compass that simplified the work for designers and draftsmen. Pi, π (=3.14) AB.

Our mission

Smart solutions for the automated world™

INTRODUCTION

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 groundbreaking 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 (π + 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

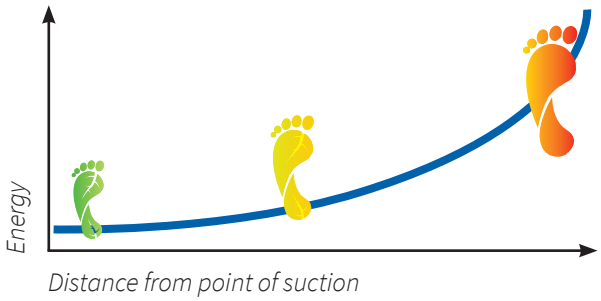
COAX® is an advanced solution for creating vacuum with compressed air. Based on Piab's multi-stage technology, COAX® cartridges are smaller, more efficient and more reliable than conventional ejectors, which allows for the design of a flexible, modular and efficient vacuum system.

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.

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.

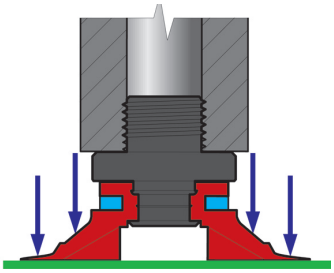
Your pump will require less compressed air when it is placed close to the point of suction, thus reducing CO_2-emissions and energy consumption. The graph below demonstrates the relationship between environmental impact and the distance of the pump from the point of suction.



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^2 which means that a column of air with a cross-sectional area of 1 m^2 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 suction cup adheres to a surface by the surrounding higher pressure.

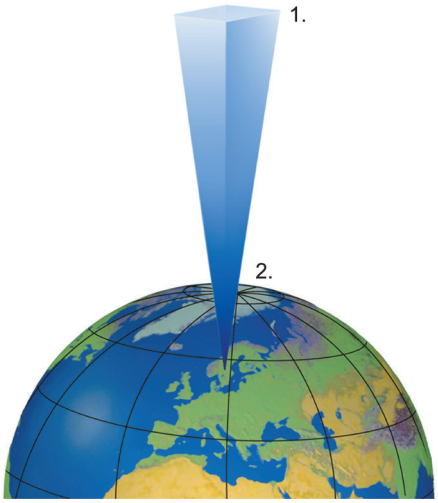


A vacuum cleaner does not suck. Air and dust are pressed into the vacuum cleaner by the surrounding higher atmospheric pressure.

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 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).

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.

EXPRESSIONS AND UNITS

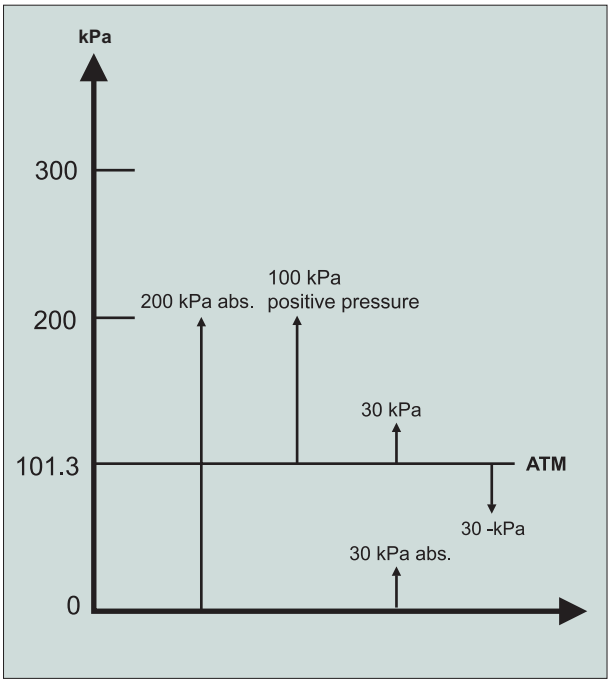
In everyday speech there are many different expressions and units for pressure below the atmospheric pressure. It is therefore important to relate to the same vocabulary in discussions. The adjoining table shows some common expressions and units used in connection with vacuum. For conversion tables between 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	
-inHg	bar
-kPa	mm H_2O
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, -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.

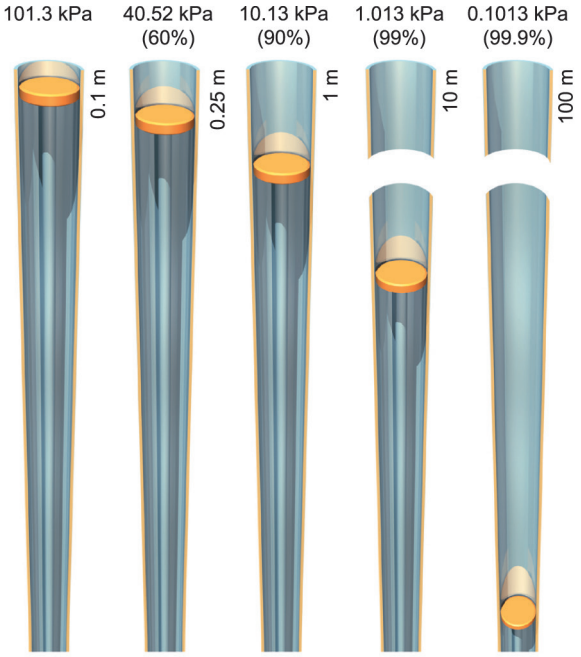
According to Boyle's Law the pressure (p) in a gas is inversely proportional to its volume (V) at constant temperature:
$P_1 \times V_1 = P_2 \times V_2$

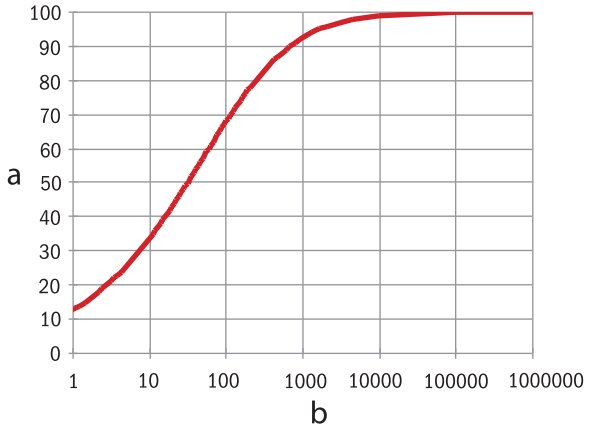
This means that increased volume gives a lower pressure.

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.



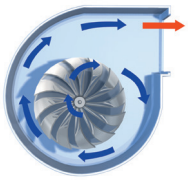
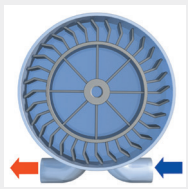


a) Pressure below atmospheric -kPa.
b) Energy factor.

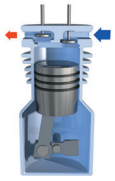
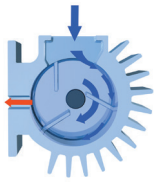
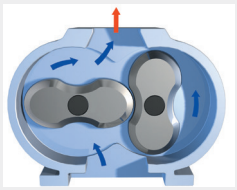
VACUUM PUMPS

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

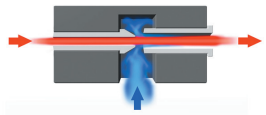
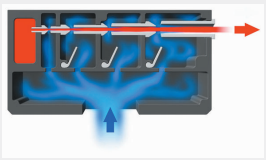
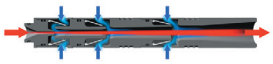
Displacement pumps

Displacement pumps		Advantages	Disadvantages
	Piston pump	• Relatively low price	• High heat emission
	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

Specifications subject to change without notice.

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	• Low price • No heat emission • Compact	• High noise level • Gives either high flow or high vacuum • Poor efficiency
	Multi-stage ejector	• High efficiency • Low energy consumption • High reliability • Low noise level • No heat emission	• Large footprint
	COAX® technology	• High efficiency • Low energy consumption • High reliability • Low noise level • No heat emission • Operates even at low feed pressure • Integrated features • Modularly built • Easy to supplement and upgrade later on • Easy to clean	• Large footprint

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 (Nl/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 (Nl/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^3/h	36	36	36	36	36	36	36	36	36	36
Free air flow	Nl/s	10	9	8	7	6	5	4	3	2	1
	Nm^3/h	36	32.4	28.8	25.2	21.6	18	14.4	10.8	7.2	3.6

Specifications subject to change without notice.

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

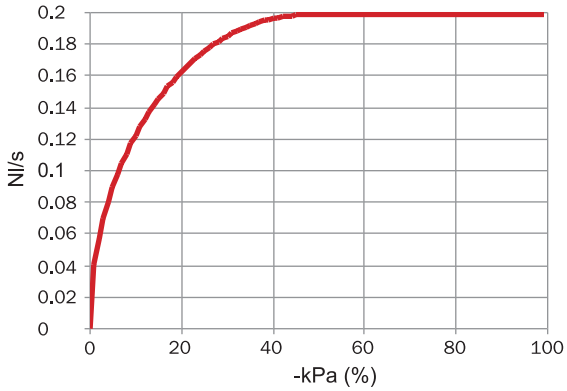
For sealed systems the capacity of the pump is determined by how fast the system can be evacuated to a certain vacuum level. This capacity is called the evacuation time of the pump and is normally specified in s/l. This value is multiplied by the volume of the system in order to obtain the evacuation 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^2 (normal atmospheric pressure at sea level). To obtain the total flow, the value is multiplied by the total leakage area.

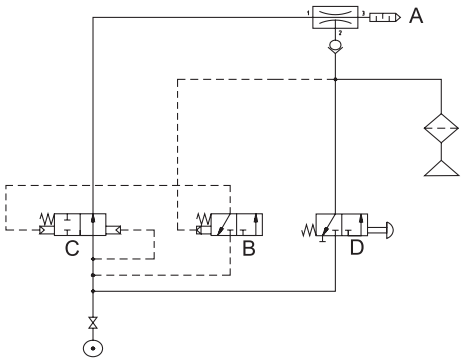
When the leakage occurs through a porous material or in an unknown way, the flow can be established by a test with a vacuum pump. The pump is connected to the system and the obtained vacuum level is read. (It should be at least 20 -kPa.) The flow that is pumped away at this vacuum level can be seen on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

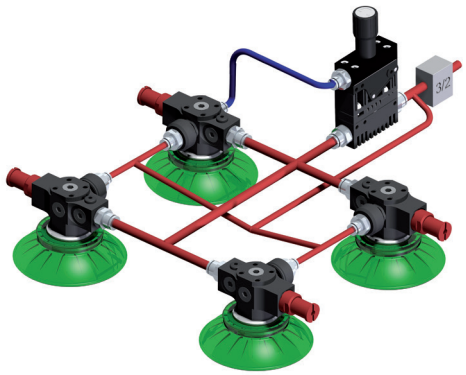
General input

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 facts:

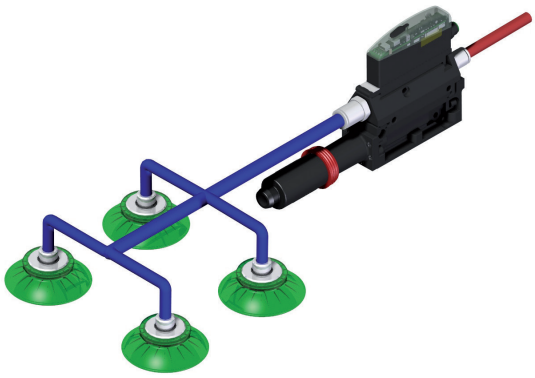
Initial flow required are for the sealed system examples 0.7 Nl/s per suction cup FC75P, and the corresponding value is 1.2 Nl/s for the leaking system examples using the suction cup BX75P. CO_2-emission, world index: 0.019 kg CO_2 per produced m^3 of compressed air and 0.19 kg CO_2 per kWh. Machine operating hours per year: 3.000 h

Sealed system/Handling non-porous material.



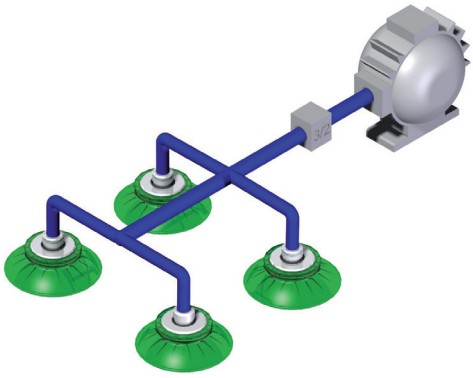
System description:
Decentralized vacuum system using: Vacuum Gripper System VGS™3010 with suction cup FC75P and COAX® cartridge Xi10 2-stage vacuum pump with non return valve, AQR Atmospheric Quick Release, Vacustat and 3/2 on/off-valve.

Annual Cost of Ownership: 188 €
Annual CO_2 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_2 emission: 171 kg
Annual energy usage: 900 kWh



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

Annual Cost of Ownership: 722 €
Annual CO_2 emission: 443 kg
Annual energy usage: 1656 kWh

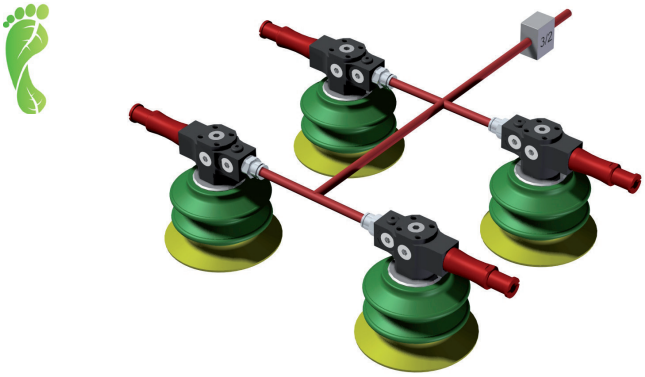
- Electric vane vacuum pumps are constantly running.
- Energy cost: 1.5 Euro-cent per produced 1 m^3 compressed air and 12 Euro-cent per kWh.
- Annual Cost of Ownership, including: energy costs, purchase price, annual cost, service and CO_2-emission tax 0.025 Euro per kg. Suction cups excluded.
- Capital 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 Nl of compressed air will result in a 19 mg CO_2 emission footprint. To calculate your specific footprint, just multiply your air consumption (Nl/s) by 19. The result is your CO_2 emission footprint per second.

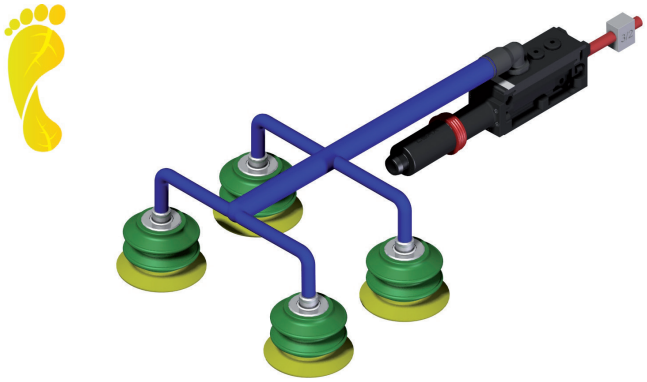


Leaking System/Handling porous material



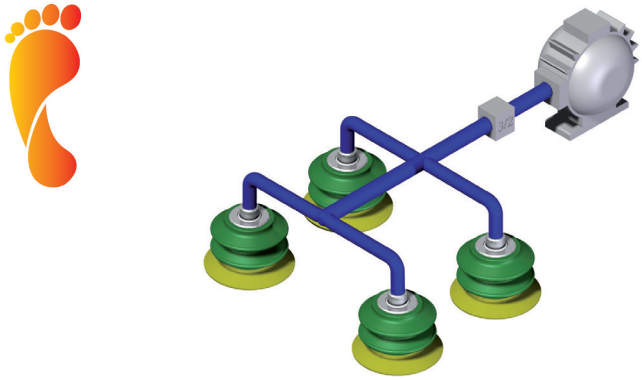
System description:
Decentralized vacuum system using: Vacuum Gripper System VGS™3010 with suction cup BX75P and COAX® cartridge Si08 3-stage vacuum pump and 3/2 on/off-valve.

Annual Cost of Ownership: 249 €
Annual CO_2 emission: 145 kg
Annual energy usage: 762 kWh



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_2 emission: 203 kg
Annual energy usage: 1067 kWh



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_2 emission: 429 kg
Annual energy emission: 2258 kWh

Specifications subject to change without notice.

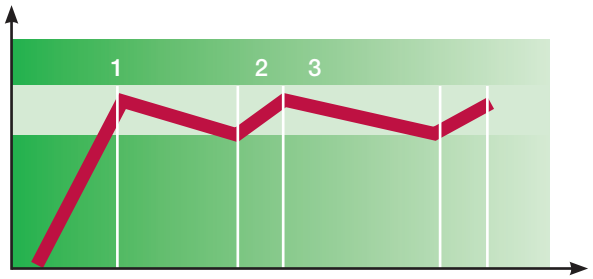
OPTIMIZING CONTROLS
Aside from placing the pump close to the point of suction, it is important to complete and optimize your vacuum system with control accessories that will limit the use of compressed air to the amount that the system requires. This way, you will have an efficient vacuum system with minimum usage of compressed air. Piab has a range of optimizing 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.

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

piSAVE® optimize
The piSAVE® optimize 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 optimized vacuum level requires.

piSAVE® onoff
When handling sealed objects many times the vacuum pump can be turned off when not needed. The piSAVE® onoff is a vacuum-controlled valve that shuts 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 piSAVE® onoff the AVM™ instantly shuts off the flow of compressed air when the preprogrammed 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.

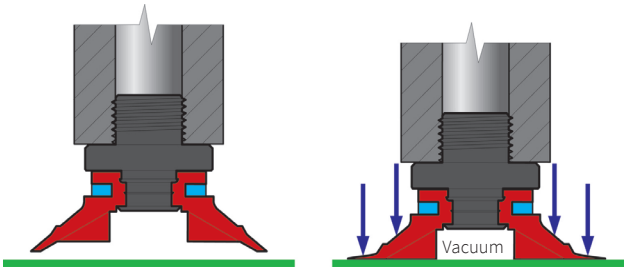
Specifications subject to change without notice.

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.

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

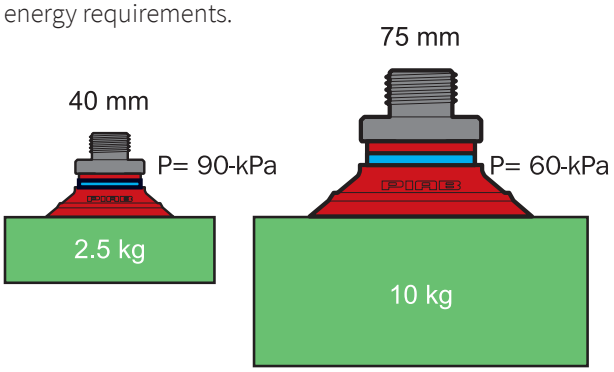


Sizing suction cups

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

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

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 catalog uses the letters NPT and NPSF:

- Conical thread is designated NPT. Example: 1/8"NPT.
- Cylindrical thread is noted as the letters 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 female	G1/8" male	G1/8" female	G1/4" male	G1/4" female	G3/8" male	G3/8" female	G1/2" male	G1/2" female	G3/4" male	G3/4" female	G1" male	G1" female	G2" male	G2" female
10-32UNF female or male	●●	●●●														
1/8" NPSF female			●●●													
1/8"NPT female or male			●	●●												
1/4"NPSF female					●●											
1/4"NPT female or male					●	●										
3/8"NPSF female							●									
3/8"NPT female or male							●	●								
1/2"NPSF female									●●							
1/2"NPT female or male									●	●●●						
3/4'NPSF female											●●					
3/4"NPT female or male											●	●●●				
1"NPT female or male													●	●		
2"NPT 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^2. Common multiple units: MPa and kPa.

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

* 1 torr = 1 mmHg à 0 °C, 1 mm column of water = 9.81 Pa.

Pressure above atmospheric

kPa	bar	psi	atm (kp/cm^2)
1013	10.13	146.9	10.3
1000	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

Pressure below atmospheric

	kPa	mbar	torr	-kPa	-mmHg	-inHg	% vacuum
Sea level	101.3	1013	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

Specifications subject to change without notice.

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

Barometric pressure			The reading on the vacuum gauge at 1013.25 mbar				
mmHg	mbar	Equiv. m above sea level*	60 -kPa	75 -kPa	85 -kPa	90 -kPa	99 -kPa
593	790.6	2000	37.7	52.7	62.7	67.7	76.7
671	894.6	1000	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	1013.25	0	60.0	75.0	85.0	90.0	99.0

* At normal barometric pressure.

Flows

Flows, volume per unit of time. Quantity designations: Q, q, = V/t (volume/time).
SI Unit: cubic meters per second (m^3/s).
Common multiple units: l/min, l/s, m^3/h.

m^3/s	m^3/h	l/min	l/s	ft^3/min (cfm)*
1	3600	60000	1000	2118.9
$0.28x10^{-3}$	1	16.6667	0.2778	0.5885
$16.67x10^{-6}$	0.06	1	0.0167	0.035
$1x10^{-3}$	3.6	60	1	2.1189
$0.472x10^{-3}$	1.6992	28.32	0.4720	1

* 1 ft » 0.305 m.

Leakage flows

The table below shows the leakage flow at different vacuum levels through an opening of 1 mm^2.

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

* 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.

ΔP	=	Pressure drop in kPa
qv	=	Flow in m^3/s
d	=	Inner diameter in mm.
L	=	Length of compressed air hoses in m
P1	=	Absolute starting pressure in kPa

$$\Delta P = \frac{6.82 \times 10^{-4} \times qv^{1.85} \times L}{d^5 \times P1}$$

$$d = \left(\frac{6.82 \times 10^{-4} \times qv^{1.85} \times L}{\Delta P \times P1} \right)^{0.2}$$

Material

Name	Color	Hardness, Shore A°	Temperature, °C
Chloroprene (CR)	Black	50	-40–110
Conductive Silicone (CSIL)	Black	50	-55–230
Ethylene Propylene (EPDM)	Black	50	-40–120
HNBR	Blue	50	-30–140
HNBR	BlueGrey	75	-30–140
Nitrile (NBR)	Black	50	-20–100
Nitrile-PVC (NPV)	Black	50	0–90
Polyurethane (PU30)	Yellow	30	10–50
Polyurethane (PU40)	Red transparent	40	10–50
Polyurethane (PU50)	Blue transparent	50	10–50
Polyurethane (PU55)	Orange	55	10–50
Polyurethane (PU60)	Green transparent	60	10–50
Polyurethane (PU60)	Orange	60	10–50
Polyurethane (PU70)	Black	70	10–50
Silicone (SIL)	Red	50	-40–200
Silicone (SIL)	White	30	-40–200
Silicone (SIL FDA)	Transparent	40	-40–200
Silicone (SIL FDA)	Transparent	50	-40–200
Silicone (SIL FDA detectable)	Blue	40	-40–200
Silicone (SIL FDA detectable)	Transparent	40	-40–200
Thermoplastic Polyurethane (TPE-U)	White transparent	81	-20–80

Specifications subject to change without notice.

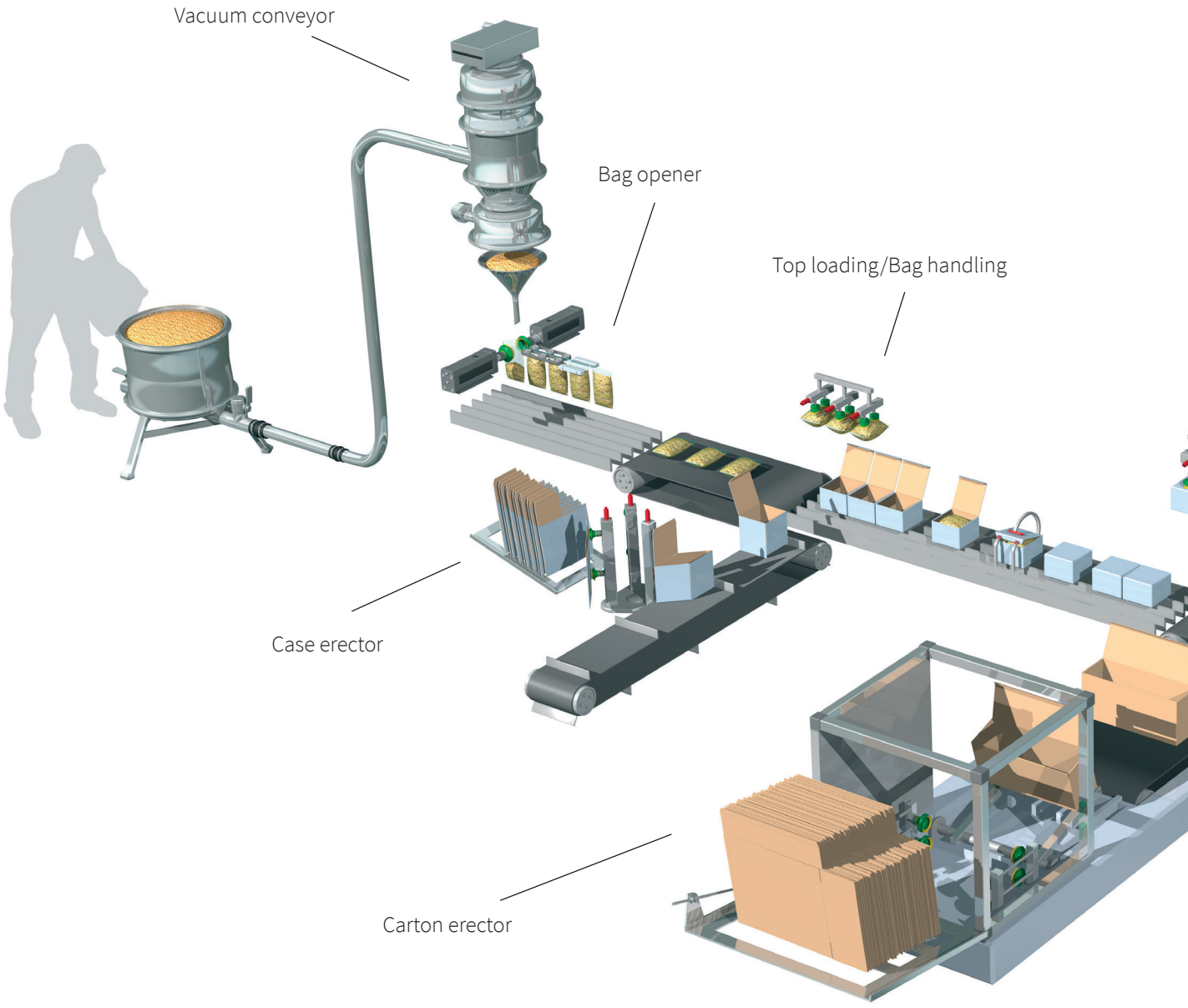
Material resistance

Name	Wear resistance	Oil	Weather and ozone	Hydrolysis	Gasoline	Concentrated acids	Alcohol	Oxidation
Chloroprene (CR)	••••	••	•••	•••	••	•	•••	•••
Conductive Silicone (CSIL)	•••	•	••••	••	•	•	•••	••••
Ethylene Propylene (EPDM)	••	•	••••	•••	•	•	••••	••••
HNBR	••••	••••	••••	•••	••••	••	•••	••••
Nitrile (NBR)	••••	••••	••	•••	•••	••	•••	•••
Nitrile-PVC (NPV)	••••	••••	•••	•••	••••	••	•••	•••
Polyurethane (PU)	••••	••••	••••	••	••	••	••/•*	•
Silicone (SIL)	•••	•	••••	••	•	•	•••	••••
Thermoplastic Polyurethane (TPE-U)	••••	••••	••••	•	•	•	•••	•••

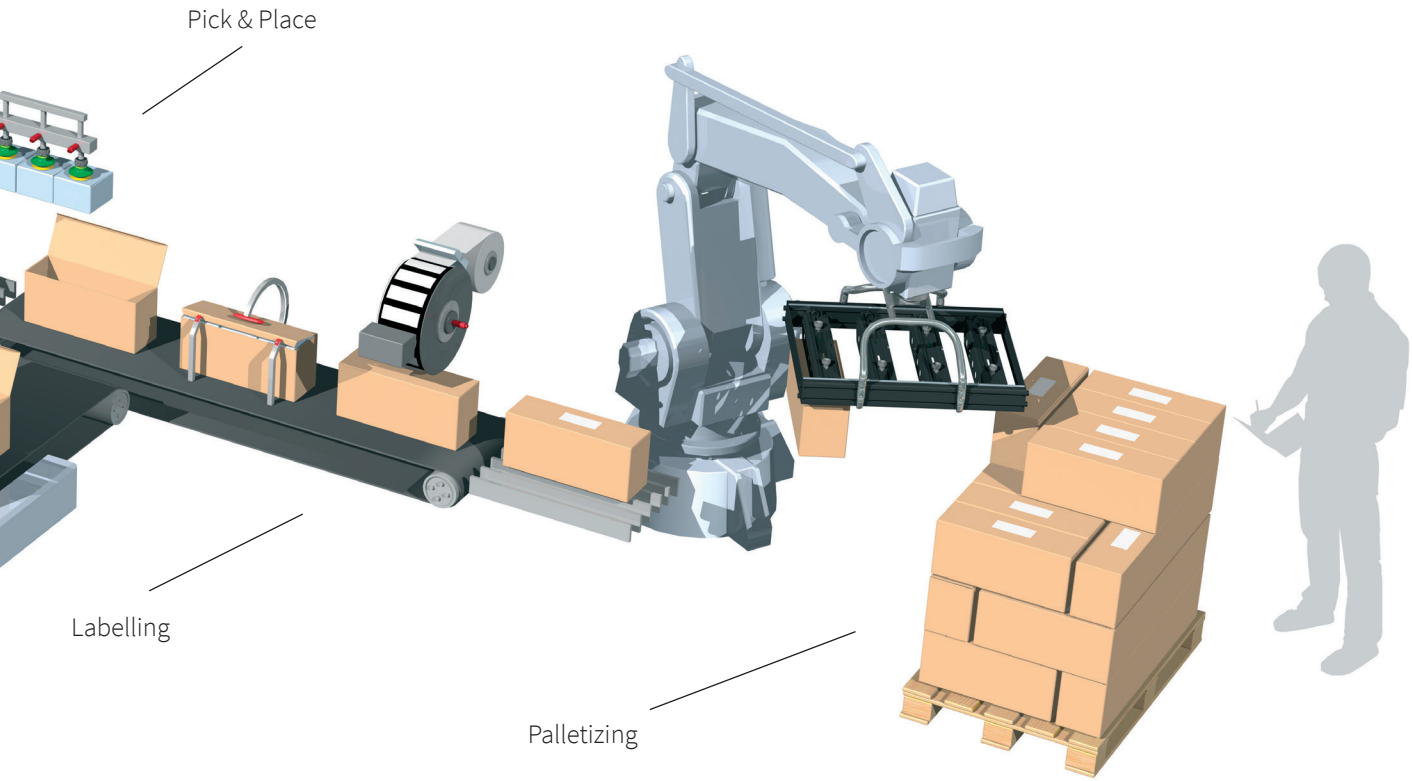
•••• Excellent, ••• Good, •• Fair, • Poor, * Ethanol / methanol.

Specifications subject to change without notice.

APPLICATIONS AND SOLUTIONS



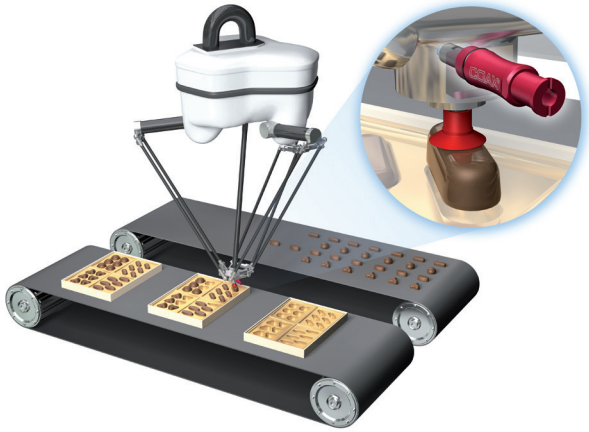
Specifications subject to change without notice.



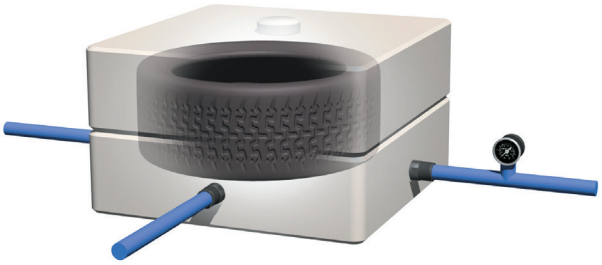
Specifications subject to change without notice.



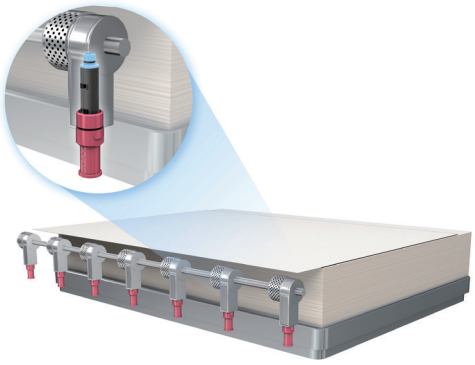
Injection molding



Pick-and-place



Vacuum molding tires



Sheet brake



Press to press transfer

Specifications subject to change without notice.

Suction cups



SUCTION CUPS	**29**
piGRIP®	30
Flat family (F)	48
Flat Concave family (FC)	70
Bellows family (B)	79
Multibellows family (BX/BL)	112
Deep family (D)	138
Deep family (DC)	144
Universal family (U)	147
Oval Bellows family (OB)	158
Oval Flat family (OF)	167
Oval Concave family (OC)	171
Rectangular Bellows (RB)	175

Specifications subject to change without notice.

piGRIP®

THOUSANDS OF SUCTION CUPS READY TO IMPROVE YOUR MACHINE

The piGRIP® is a unique configurable suction cup concept with individually optimized parts for gripping, lifting and height compensation. Also a large selection of fittings makes it ready to fit new machines and easy to retrofit existing cups. The fittings available are both threaded and push on fittings.



FITTING, VALVES & 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. There is also a fitting that has an ejector integrated, the COAX® in piGRIP® for creating a decentralized pump. piSAVE® restrict and piSAVE® sense are options that are suitable for handling different sized or a variable number of objects.

FILTERS

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



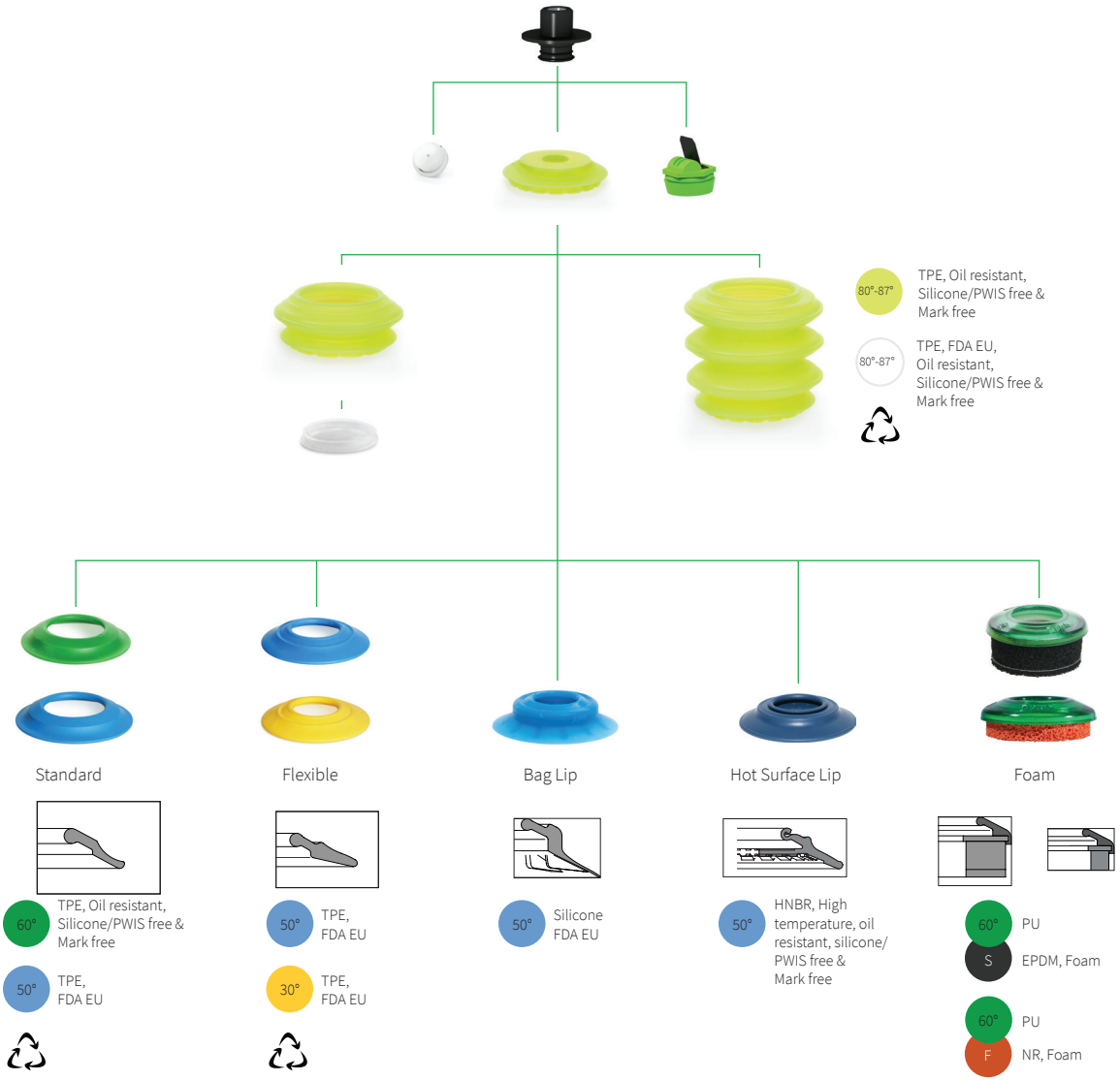
BELLOWS

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 (EU 1935/2004) material available (transparent).



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. Foam lips for objects which are difficult to grip rough surfaces with traditional cups. High temperature lips are also available when so needed.



Specifications subject to change without notice.

Product Group
piGRIP®
G



Lip			
Dimension & Type		Material & Durometer	
S25	Ø 25 mm Standard lip	T60 T50	TPE 60° Shore A TPE 50° Shore A
S35	Ø 35 mm Standard lip		
S50	Ø 50 mm Standard lip		
S70	Ø 70 mm Standard lip		
FX28	Ø 28 mm Flexible lip	T50 T30	TPE 50° Shore A TPE 30° Shore A
FX39	Ø 39 mm Flexible lip		
FX55	Ø 55 mm Flexible lip		
FX77	Ø 77 mm Flexible lip		
FLI25S	Ø 25 mm Foam lip	S	Foam EPDM (soft)
FLI35S	Ø 35 mm Foam lip		
FLI50S	Ø 50 mm Foam lip		
FLI70S	Ø 70 mm Foam lip		
FLI25F	Ø 25 mm Foam lip	F	Foam NR (firm)
FLI35F	Ø 35 mm Foam lip		
FLI50F	Ø 50 mm Foam lip		
FLI70F	Ø 70 mm Foam lip		
BGI25	Ø 25 mm Bag lip with retainer	S50	Silicone 50° Shore A
BGI34	Ø 34 mm Bag lip with retainer		
BGI41	Ø 41 mm Bag lip with retainer		
BGI48	Ø 48 mm Bag lip with retainer		
BGI63	Ø 63 mm Bag lip with retainer		
BGI80	Ø 80 mm Bag lip with retainer		
HS29	Ø 29 mm HS29	HN50	HNBR 50° Shore A
HS39	Ø 39 mm HS39		
HS58	Ø 58 mm HS58		
HS79	Ø 79 mm HS79		

Several of the lips are available as spare parts.



Bellows or Flat Cup	
B1	1 bellows
B3	3 bellows
B6	6 bellows (3+3)
F	No bellows



Support	
S1	Support type 1

G . S50T60 . B3 . S1 . G38M . 01 . ( )

Specifications subject to change without notice.



Fitting					
Type		Size		Style	
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		
		M12	M12		
		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
C	COAX® in piGRIP®	S	High flow	X	No style
		T	Extra high flow		
X	No type	X	No size	X	No style

* Steel material. Push-on fitting sold separately.



Option	
00	No Filter
01	Filter mesh
02	Filter disc (only bellows cup)
03	piSAVE® restrict Ø 0.7
04	piSAVE® restrict Ø 1.0
05	piSAVE® restrict Ø 1.3
06	piSAVE® restrict Ø 0.7 and filter disc
07	piSAVE® restrict Ø 1.0 and filter disc
08	piSAVE® restrict Ø 1.3 and filter disc
13	piSAVE® sense 03/60, C/M*-flow: 0,38/0,10 Nl/s
14	piSAVE® sense 04/60, C/M*-flow: 0,53/0,17 Nl/s
15	piSAVE® sense 05/60, C/M*-flow: 0,73/0,27 Nl/s
16	piSAVE® sense 03/60, C/M*-flow: 0,38/0,10 Nl/s & filter disc
17	piSAVE® sense 04/60, C/M*-flow: 0,53/0,17 Nl/s & filter disc
18	piSAVE® sense 05/60, C/M*-flow: 0,73/0,27 Nl/s & filter disc

* C/M = Closing/Minimum.

FDA EU approved option includes material certificate	
	No*
FDA	US Food and Drug Administration

* Leave blank for no certificate.

Specifications subject to change without notice.

LIFTING FORCES AND GENERAL SPECIFICATIONS – piGRIP® F

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
S25T50	11.4	17	5.7	8.5	25	25	2	0.8
S25T60	11.7	17.9	5.9	9	25	25	1.8	0.8
S35T50	24	34.5	12	17.2	35	40	2.8	1.4
S35T60	25	36	12.5	18	35	40	2.6	1.4
S50T50	50	71.8	25	35.9	50	75	4	4
S50T60	52.2	73.6	26.1	36.8	50	75	3.7	4
S70T50	101	145.6	50.5	72.8	70	80	5.6	11
S70T60	103.5	148	51.8	74	70	80	5.1	11
FX28T30	13.5	18.9	6.7	9.5	28	25	2.7	0.5
FX28T50	14.9	21.3	7.4	10.7	28	25	2.6	0.5
FX39T30	26.8	37.3	13.4	18.7	39	40	3.8	1.3
FX39T50	28.9	41	14.5	20.5	39	40	3.7	1.3
FX55T30	54.2	75	27.1	37.5	55	75	5.4	3.9
FX55T50	56.6	81.1	28.3	40.5	55	75	5.3	3.9
FX77T30	107	150.4	53.5	75.2	77	90	7.6	10.7
FX77T50	112	159	56	79.5	77	90	7.4	10.7
FLI25F	2.2	3.8	1.1	1.9	25.5	*	3.8	0.86
FLI25S	*	*	*	*	25.5	*	5	0.51
FLI35F	5.8	11	2.9	5.5	35.6	*	3.8	1.65

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
FLI35S	*	*	*	*	35.6	*	7.2	0.87
FLI50F	10	16	5	8	51	*	5.6	5.2
FLI50S	*	*	*	*	51	*	16.2	5.1
FLI70F	32	60	16	30	71	*	5.6	15.3
FLI70S	*	*	*	*	71	*	16.5	19.3
HS29HN50	15.9	23.3	13.5	19.8	29	18	2.3	0.9
HS39HN50	29.6	42.2	25.2	35.9	41	25	2.7	2.1
HS58HN50	65.8	94.5	55.9	80.3	59	38	4.9	7
HS79HN50	125.2	177.8	106.4	151.1	80	51	6.4	17.3

* Dependent on application.

LIFTING FORCES AND GENERAL SPECIFICATIONS – piGRIP® B1

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
S25T50	11.4	17	5.7	8.5	25	12	5.1	2.1
S25T60	11.7	17.9	5.9	9	25	12	4.9	2.1
S35T50	24	34.5	12	17.2	35	17	7.2	5.4
S35T60	25	36	12.5	18	35	17	7	5.4
S50T50	50	71.8	25	35.9	50	30	10.2	15.7
S50T60	52.2	73.6	26.1	36.8	50	30	9.9	15.7
S70T50	101	145.6	50.5	72.8	70	50	14.3	43

Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
S70T60	103.5	148	51.8	74	70	50	13.8	43
FX28T30	13.5	18.9	6.7	9.5	28	15	5.8	1.8
FX28T50	14.9	21.3	7.4	10.7	28	15	5.7	1.8
FX39T30	26.8	37.3	13.4	18.7	39	20	8.2	5.3
FX39T50	28.9	41	14.5	20.5	39	20	8.1	5.3
FX55T30	54.2	75	27.1	37.5	55	40	11.6	15.6
FX55T50	56.6	81.1	28.3	40.5	55	40	11.5	15.6
FX77T30	107	150.4	53.5	75.2	77	55	16.3	42.7
FX77T50	112	159	56	79.5	77	55	16.1	42.7
FLI25F	2.2	3.8	1.1	1.9	25.5	*	6.9	2.16
FLI25S	*	*	*	*	25.5	*	8.1	1.81
FLI35F	5.8	11	2.9	5.5	35.6	*	8.2	5.65
FLI35S	*	*	*	*	35.6	*	11.6	4.87
FLI50F	10	16	5	8	51	*	11.8	16.9
FLI50S	*	*	*	*	51	*	22.4	16.8
FLI70F	32	60	16	30	71	*	14.3	47.3
FLI70S	*	*	*	*	71	*	25.2	51.3
BGI25S50	5.1	7.4	2.6	3.7	25	11	4.2	2.2
BGI34S50	10.3	15	5.2	7.5	34	16	4.5	3.3

Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm³
BGI41S50	16.1	23.5	8.1	11.8	41	19	5.7	7.9
BGI48S50	20.9	30.5	10.5	15.3	48	35	6.1	12.5
BGI63S50	39.9	58.2	20.0	29.1	63	39	7.8	26.9
BGI80S50	66.2	96.6	33.1	48.3	80	58	10	65.1
HS29HN50	15.9	23.3	13.5	19.8	29	15	5.4	2.2
HS39HN50	29.6	42.2	25.2	35.9	41	20	7.1	6.1
HS58HN50	65.8	94.5	55.9	80.3	59	27	11.1	18.7
HS79HN50	125.2	177.8	106.4	151.1	80	40	15.1	49.3

* Dependent on application.

LIFTING FORCES AND GENERAL SPECIFICATIONS – piGRIP® B3

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm³
S25T50	11.4	17	5.7	8.5	25	12	13.7	5.2
S25T60	11.7	17.9	5.9	9	25	12	13.5	5.2
S35T50	24	34.5	12	17.2	35	17	19.2	14
S35T60	25	36	12.5	18	35	17	19	14
S50T50	50	71.8	25	35.9	50	30	27.4	40.6
S50T60	52.2	73.6	26.1	36.8	50	30	27.1	40.6
S70T50	101	145.6	50.5	72.8	70	50	38.4	111.3
S70T60	103.5	148	51.8	74	70	50	37.9	111.3

Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
FX28T30	13.5	18.9	6.7	9.5	28	15	14.4	4.9
FX28T50	14.9	21.3	7.4	10.7	28	15	14.3	4.9
FX39T30	26.8	37.3	13.4	18.7	39	20	20.2	13.9
FX39T50	28.9	41	14.5	20.5	39	20	20.1	13.9
FX55T30	54.2	75	27.1	37.5	55	40	28.8	40.5
FX55T50	56.6	81.1	28.3	40.5	55	40	28.7	40.5
FX77T30	107	150.4	53.5	75.2	77	55	40.4	111
FX77T50	112	159	56	79.5	77	55	40.2	111
FLI25F	2.2	3.8	1.1	1.9	25.5	*	15.5	5.26
FLI25S	*	*	*	*	25.5	*	16.7	4.91
FLI35F	5.8	11	2.9	5.5	35.6	*	20.2	14.25
FLI35S	*	*	*	*	35.6	*	23.6	13.47
FLI50F	10	16	5	8	51	*	29	41.8
FLI50S	*	*	*	*	51	*	39.6	41.7
FLI70F	32	60	16	30	71	*	38.4	115.6
FLI70S	*	*	*	*	71	*	49.3	119.6
BGI25S50	5.1	7.4	2.6	3.7	25	11	12.8	5.3
BGI34S50	10.3	15	5.2	7.5	34	30	13.4	7.4
BGI41S50	16.1	23.5	8.1	11.8	41	19	17.7	16.5

Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
BGI48S50	20.9	30.5	10.5	15.3	48	35	18.1	21.1
BGI63S50	39.9	58.2	20	29.1	63	39	25	51.8
BGI80S50	66.2	96.6	33.1	48.3	80	58	34.1	133.4
HS29HN50	15.9	23.3	13.5	19.8	29	15	14	5.3
HS39HN50	29.6	42.2	25.2	35.9	41	20	19.1	14.7
HS58HN50	65.8	94.5	55.9	80.3	59	27	28.3	43.6
HS79HN50	125.2	177.8	106.4	151.1	80	40	39.2	117.6

* Dependent on application.

LIFTING FORCES AND GENERAL SPECIFICATIONS – piGRIP® B6

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
S25T50	11.4	17	5.7	8.5	25	12	25.4	9.6
S25T60	11.7	17.9	5.9	9	25	12	25.2	9.6
S35T50	24	34.5	12	17.2	35	17	35.6	26.6
S35T60	25	36	12.5	18	35	17	35.4	26.6
S50T50	50	71.8	25	35.9	50	30	50.8	77.2
S50T60	52.2	73.6	26.1	36.8	50	30	50.5	77.2
S70T50	101	145.6	50.5	72.8	70	50	71.2	211.6
S70T60	103.5	148	51.8	74	70	50	70.7	211.6
FX28T30	13.5	18.9	6.7	9.5	28	15	26.1	9.3

Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
FX28T50	14.9	21.3	7.4	10.7	28	15	26	9.3
FX39T30	26.8	37.3	13.4	18.7	39	20	36.6	26.5
FX39T50	28.9	41	14.5	20.5	39	20	36.5	26.5
FX55T30	54.2	75	27.1	37.5	55	40	52.2	77.1
FX55T50	56.6	81.1	28.3	40.5	55	40	52.1	77.1
FX77T30	107	150.4	53.5	75.2	77	55	73.2	211.3
FX77T50	112	159	56	79.5	77	55	73	211.3
FLI25F	2.2	3.8	1.1	1.9	25.5	*	27.2	9.66
FLI25S	*	*	*	*	25.5	*	28.4	9.31
FLI35F	5.8	11	2.9	5.5	35.6	*	36.6	26.85
FLI35S	*	*	*	*	35.6	*	40	26.07
FLI50F	10	16	5	8	51	*	52.4	78.4
FLI50S	*	*	*	*	51	*	63	78.3
FLI70F	32	60	16	30	71	*	71.2	215.9
FLI70S	*	*	*	*	71	*	82.1	219.9
BGI25S50	5.1	7.4	2.6	3.7	25	11	24.5	9.7
BGI34S50	10.3	15	5.2	7.5	34	30	25.1	11.8
BGI41S50	16.1	23.5	8.1	11.8	41	19	34.1	29.1
BGI48S50	20.9	30.5	10.5	15.3	48	35	34.5	33.7
BGI63S50	39.9	58.2	20	29.1	63	39	48.4	88.4

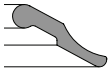
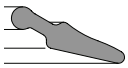
Specifications subject to change without notice.

Lip	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level		Outer diameter	Min. curve radius at 60 -kPa	Max vertical movement	Volume
	40 -kPa	60 -kPa	40 -kPa	60 -kPa	mm	mm	mm	cm^3
BGI80S50	66.2	96.6	33.1	48.3	80	58	66.9	233.7
HS29HN50	15.9	23.3	13.5	19.8	29	15	25.7	9.7
HS39HN50	29.6	42.2	25.2	35.9	41	20	35.5	27.3
HS58HN50	65.8	94.5	55.9	80.3	59	27	51.7	80.2
HS79HN50	125.2	177.8	106.4	151.1	80	40	72	217.9

* Dependent on application.

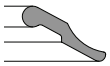
SUCTION CUP DIMENSIONS, mm

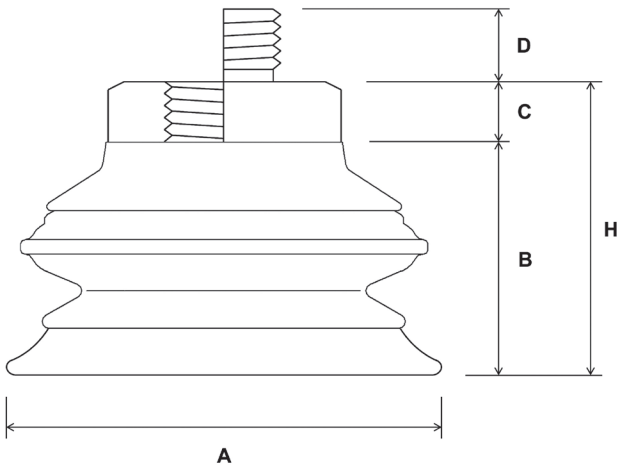


Lip type & size		Dim. A	Dim. B			
			F (Flat)	B-1 (1 Bellows)	B-3 (3 Bellows)	B-6 (3+3 Bellows)
	S25	25	10.9	18.7	29.8	48.7
	S35	35	12.4	23.3	38.8	65.2
	S50	50	14.7	30.3	52.4	90.1
	S70	70	17.8	39.6	70.6	123.4
	FX28	28	11.4	19.2	30.3	49.2
	FX39	38	13.1	24.0	39.5	65.9
	FX55	55	15.7	31.3	53.4	91.1
	FX77	77	19.2	41	72	124.8
	FLI25S	25	17.5	25.3	36.4	55.3
	FLI35S	35	21.5	32.4	47.9	74.3
	FLI50S	50	32.1	47.7	69.8	107.5
	FLI70S	70	34.1	55.9	86.9	139.7
	FLI25F	25	16	23.8	34.9	53.8
	FLI35F	35	17	27.9	43.4	69.8
	FLI50F	50	21.1	36.7	58.8	96.5
	FLI70F	70	23.1	44.9	75.9	128.7

Specifications subject to change without notice.



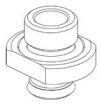
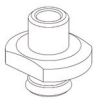
Lip type & size		Dim. A	Dim. B			
			F (Flat)	B-1 (1 Bellows)	B-3 (3 Bellows)	B-6 (3+3 Bellows)
	BGI25	25	—	22.7	33.8	52.7
	BGI34	34	—	24.8	35.9	54.8
	BGI41	41	—	29.5	45.0	71.4
	BGI48	48	—	30.9	46.4	72.8
	BGI63	63	—	39.9	62.0	99.7
	BGI80	80	—	49.4	80.4	133.2
	HS29	29	13.4	14.2	25.3	44.2
	HS39	39	15.6	19.5	35	61.4
	HS58	58	19.5	27.5	50.2	87.9
	HS79	79	24.3	39.1	70.1	122.9

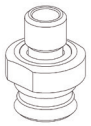


BUILD HEIGHT
B + C = H
Ex. 18.7 + 5 = 23.7

Specifications subject to change without notice.

FITTING DIMENSIONS, mm

Type	Code	Dim. C	Dim. D	Description	Recommended fitting size for best performance*			
					S25 FX28 FLI25 BGI25 BGI34 HS29	S35 FX39 FLI35 BGI41 BGI48 HS39	S50 FX55 FLI50 BGI63 HS58	S70 FX77 FLI70 HS79 BGI80
	G18M	5	6	Fitting G1/8" male	●	●	●	
	G14M	6	9	Fitting G1/4" male	●	●	●	●
	G38M	6	10	Fitting G3/8" male		●	●	●
	G12M	6	10	Fitting G1/2" male			●	●
	GL18M	1.5	6	Fitting G1/8" low male	●	●	●	
	GL14M	1.5	9	Fitting G1/4" low male	●	●	●	●
	GL38M	1.5	10	Fitting G3/8" low male		●	●	●
	NT18M	5	7	Fitting 1/8" NPT male	●	●	●	
	NT14M	6	11	Fitting 1/4" NPT male	●	●	●	●
	NT38M	6	11.5	Fitting 3/8" NPT male		●	●	●
	NT12M	6	15	Fitting 1/2" NPT male			●	●
	NTL18M	1.5	7	Fitting 1/8" NPT low male	●	●	●	
	NTL14M	1.5	11	Fitting 1/4" NPT low male	●	●	●	●
	NTL38M	1.5	11.5	Fitting 3/8" NPT low male		●	●	●

Type	Code	Dim. C	Dim. D	Description	Recommended fitting size for best performance*			
					S25 FX28 FLI25 BGI25 BGI34 HS29	S35 FX39 FLI35 BGI41 BGI48 HS39	S50 FX55 FLI50 BGI63 HS58	S70 FX77 FLI70 HS79 BGI80
	MM6M	5	6	Fitting M6 male	●	●		
	MMF8M	5	6	Fitting M8 x 1 male	●	●	●	
	MM10M	6	10	Fitting M10 male	●	●	●	
	MM12M	6	10	Fitting M12 male	●	●	●	
	MMF14M	6	12	Fitting M14 × 1 male	●	●	●	●
	MMF16M	6	12	Fitting M16 × 1.5 male		●	●	●
	G14F	10	—	Fitting G1/4" fem	●	●	●	
	G38F	13	—	Fitting G3/8" fem		●	●	●
	G12F	14	—	Fitting G1/2" fem			●	●
	NS18F**	7	—	Fitting 1/8" NPSF fem	●	●	●	
	NS14F	10	—	Fitting 1/4" NPSF fem	●	●	●	●
	NS38F	13	—	Fitting 3/8" NPSF fem		●	●	●
	NS12F	14	—	Fitting 1/2" NPSF fem			●	●
	NS518F**	18	—	Fitting 5×1/8" NPSF fem	●	●	●	
	NT14F	12	—	Fitting 1/4" NPT fem	●	●	●	●
	NT38F	13	—	Fitting 3/8" NPT fem		●	●	●

Specifications subject to change without notice.

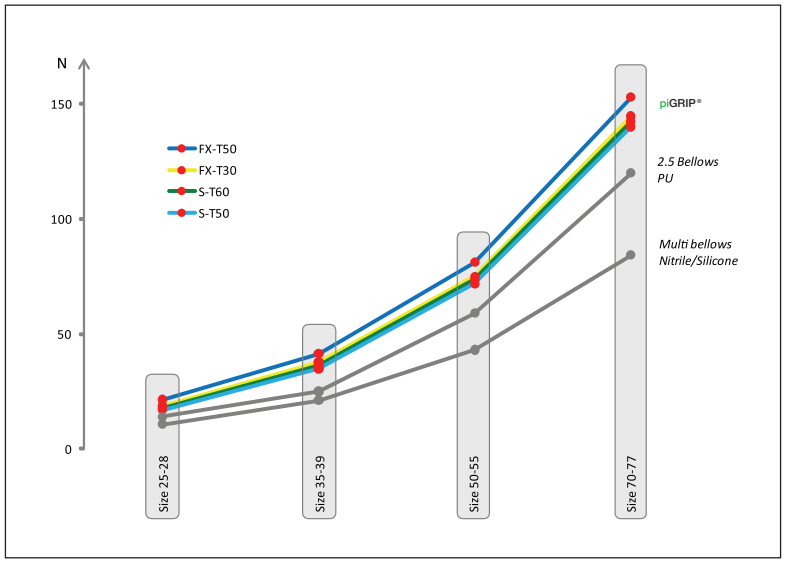
Type	Code	Dim. C	Dim. D	Description	Recommended fitting size for best performance*			
					S25 FX28 FLI25 BGI25 BGI34 HS29	S35 FX39 FLI35 BGI41 BGI48 HS39	S50 FX55 FLI50 BGI63 HS58	S70 FX77 FLI70 HS79 BGI80
	U12F	12	—	Fitting 1/2" UNC fem			●	●
	MM5F	6	—	Fitting M5 fem	●	●		
	MM6F	6	—	Fitting M6 fem	●	●		
	MM8F	7	—	Fitting M8 fem	●	●	●	
	MM10F	7	—	Fitting M10 fem	●	●	●	
	MM12F	12	—	Fitting M12 fem	●	●	●	
	MMF16F	13	—	Fitting M16 × 1.5 fem		●	●	●

* 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 **piab.com** to configure your suction cup.

piGRIP® MATERIAL DATA

Up to 50% improved lifting force with piGRIP®. Use fewer cups or smaller sizes. See suction cup selection guide on **piab.com** for specified performance data



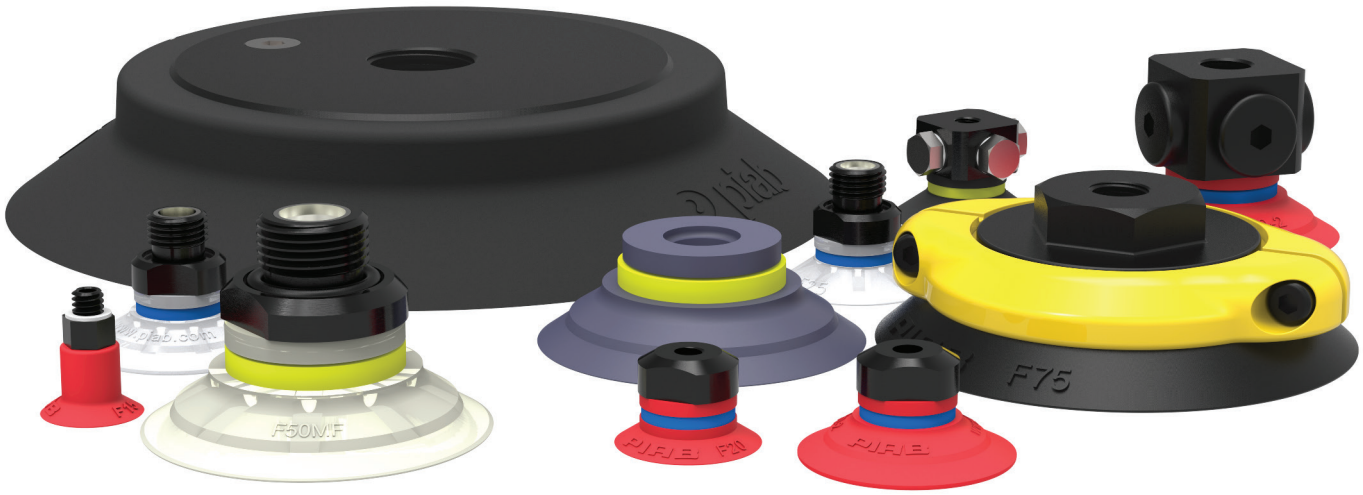
Proven function and lifting capacity within specified area of operation.

MATERIAL SPECIFICATIONS

Material	Hardness, Shore A °	Item(s)	Colour	Temp. range, °C	Special qualities
TPE	80–87	Support S1	Lime/Transparent	-20–60/100*	FDA EU**, silicone/PWIS free, mark free, oil resistant
TPE	87	Bellows	Lime/Transparent	-20–60/100*	FDA EU**, silicone/PWIS free, mark free, oil resistant
TPE	60	Standard Lip (S) T60	Green	-20–60/120*	Silicone/PWIS free, mark free, oil resistant
TPE	50	Standard Lip (S) T50	Blue	-40–60/120*	FDA EU
TPE	50	Flexible Lip (FX) T50	Blue	-40–60/120*	FDA EU
TPE	30	Flexible Lip (FX) T30	Yellow	-40–60/100*	FDA EU
EPDM	—	Foam Lip (FLI-S)	Green/Black	-20–80	Ultra soft cellular rubber
NR	—	Foam Lip (FLI-F)	Green/Orange	-20–80	Firm natural rubber
Silicone	50	Bag Lip (BGI)	Blue	-40–200	FDA EU
HNBR	50	Hot Surface Lip (HS)	Blue	-30–120/150*	PWIS free, mark free
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 EU approved option in transparent material.

Flat family (F)



There is a variety of cups in this family to suit a number of different flat surfaces, e.g. cardboard, glass and metal sheets. The cleats stop deformation by preventing suction of the object into the cup. The suction cup has good stability and very little movement. Also suitable when the lifting force is parallel to the surface as the cleats increase friction. There is also a variety in materials from mark-free to high temperature applications and FDA compliant material (FDA 21 CFR 177.2600) that meets EU's regulation EU 1935/2004.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
F15	3.5	8.5	11	3.5	6.5	7.5
F20	6	14.5	19	5	8	8.5
F25	9	19.5	25	8	9	10
F30-2	12	25	31	11	16	20
F40-2	20	40	50	15	25	30
F50-2	36	74	96	24	40	50
F75	80	200	270	60	110	140
F110	140	420	560	140	250	300
F150	300	850	1100	250	600	800
F26 FDA	11	25	31	9	21	26
F33 FDA	16	38	49	13.5	32.5	41.5

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
F75P	70/82*	193/231*	273/330*	44/47*	176/113*	308/169*
F110P	167/191*	432/498*	591/705*	149/297*	441/523*	617/664*
F15MF	4	8	12	4.5	9	14.5
F20MF	3.6	14.5	22	8	14.5	21
F25MF	6.3	24.5	65.5	9	24.5	36.3
F30MF	11	34.5	48	13.6	28	42
F40MF	18	57	83	16	49	57
F50MF	24.5	92	141	31	82	107
XLF150	330/520**	500/770**	780/1130**	281	425	663
XLF200	760/1030**	1130/1510**	1720/2200**	646	961	1462
XLF250	1310/1640**	1950/2460**	2870/3540**	1114	1658	2440
XLF300	2150/2620**	3200/3760**	4630/5450**	1828	2720	3936

* PU30°/PU60° / PU60°, **Inner/Outer lip.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
F15	15.7	11	13	1	0.37
F20	22	8	18	1.5	1
F25	27	9	22	1.5	1.1
F30-2	32	10.4	25	2	2
F40-2	42	13	52	2.5	4.8
F50-2	53	17.5	55	3	10

Specifications subject to change without notice.

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
F75	77	13	150	3	20
F110	112	20	250	4	70
F150	152	26.4	500	6	160
F26 FDA	26	23.5	25	1.5	1.6
F33 FDA	33	23.5	35	1.5	2.1
F75P	77	13	150	2	19
F110P	115	20	250	4	60
F15MF	16.5	11	17	1	0.37
F20MF	22	8	18	2	1
F25MF	27	9	23	1.5	1.1
F30MF	32	10	44	1.5	2
F40MF	42	13	60	2	4.8
F50MF	53	17.5	95	2	10
XLF150	153	27	500	8	145
XLF200	204	27	800	8	275
XLF250	250	27	1300	8	435
XLF300	304	27	1900	8	666

Specifications subject to change without notice.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material								MSF
F15	Chloroprene, CR	●				●		●	●
F15	Silicone, SIL	●	●						
F15	Silicone FDA EU, SIL FDA	●	●						
F20	Chloroprene, CR	●				●		●	●
F20	Silicone, SIL	●	●						
F20	Silicone FDA EU, SIL FDA	●	●						
F25	Chloroprene, CR	●				●		●	●
F25	Silicone, SIL	●	●						
F25	Silicone FDA EU, SIL FDA	●	●						
F30-2	Chloroprene, CR	●				●		●	●
F30-2	Silicone, SIL	●	●						
F30-2	Silicone FDA EU, SIL FDA	●	●						
F40-2	Nitrile-PVC, NPV	●				●		●	●
F40-2	Silicone, SIL	●	●						
F40-2	Silicone FDA EU, SIL FDA	●	●						
F50-2	HNBR	●					●	●	
F50-2	Nitrile-PVC, NPV	●				●		●	●
F50-2	Silicone, SIL	●	●						
F50-2	Silicone FDA EU, SIL FDA	●	●						

Cup	Material								MSF
F75	HNBR	●					●	●	
F75	Nitrile-PVC, NPV	●				●		●	●
F75	Silicone, SIL	●	●						
F75	Silicone FDA EU, SIL FDA	●	●						
F110	HNBR	●					●	●	
F110	Nitrile-PVC, NPV	●				●		●	●
F110	Silicone, SIL	●	●						
F110	Silicone FDA EU, SIL FDA	●	●						
F150	Nitrile-PVC, NPV	●				●		●	●
F150	Silicone, SIL	●	●						
F150	Silicone FDA EU, SIL FDA	●	●						
F26 FDA	Silicone FDA EU, SIL FDA	●	●						
F33 FDA	Silicone FDA EU, SIL FDA	●	●						
F75P	PU30°/PU60°	●		●					
F75P	PU60°	●		●	●	●		●	●
F110P	PU30°/PU60°	●		●					
F110P	PU60°	●		●	●	●		●	●
F15MF	Thermoplastic Polyurethane, TPE-U				●			●	
F20MF	Thermoplastic Polyurethane, TPE-U				●			●	
F25MF	Thermoplastic Polyurethane, TPE-U				●			●	

Specifications subject to change without notice.

Cup	Material								MSF
F30MF	Thermoplastic Polyurethane, TPE-U				●			●	
F40MF	Thermoplastic Polyurethane, TPE-U				●			●	
F50MF	Thermoplastic Polyurethane, TPE-U				●			●	
XLF150	Nitrile-PVC, NPV	●				●		●	●
XLF200	Nitrile-PVC, NPV	●				●		●	●
XLF250	Nitrile-PVC, NPV	●				●		●	●
XLF300	Nitrile-PVC, NPV	●				●		●	●

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Dry sheet metal	Bag opening/ thin paper – slip sheets/ film	FDA EU-standard compliant	Glass handling	High/low temp cup (plastic)	Mark free	Plastic injection molded parts
F15	●		●				
F20	●		●				
F25	●		●				
F30-2	●		●				
F40-2	●		●				
F50-2	●		●	●	●	●	●
F75	●		●	●	●	●	●
F110	●		●	●	●	●	●
F150	●		●				

Specifications subject to change without notice.

	Dry sheet metal	Bag opening/ thin paper – slip sheets/ film	FDA EU-standard compliant	Glass handling	High/low temp cup (plastic)	Mark free	Plastic injection molded parts
F26 FDA		●	●				
F33 FDA		●	●				
F75P	●					●	
F110P	●					●	
F15MF						●	
F20MF						●	
F25MF						●	
F30MF						●	
F40MF						●	
F50MF						●	
XLF150	●			●		●	
XLF200	●			●		●	
XLF250	●			●		●	
XLF300	●			●		●	

FITTINGS
For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup F15 Chloroprene	3150125
Suction cup F15 Chloroprene, M5 male	3150014
Suction cup F15 Silicone	3150125S
Suction cup F15 Silicone FCM	0200263
Suction cup F15 Silicone FCM, M5 male	9909623
Suction cup F15 Silicone, M5 male	3150014S
Suction cup F20 Chloroprene	0101129
Suction cup F20 Chloroprene, G1/8" male/M5 female, PA	0110950
Suction cup F20 Chloroprene, M5 female	0101259
Suction cup F20 Chloroprene, G1/8" male, with mesh filter	0101260
Suction cup F20 Chloroprene, 1/8" NPT male, with mesh filter	0101261
Suction cup F20 Chloroprene, G1/8" male/M5 female	0101262
Suction cup F20 Chloroprene, 5xM5 female	0101263
Suction cup F20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101264
Suction cup F20 Chloroprene, M5 female, with dual flow control valve	0101265
Suction cup F20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101266
Suction cup F20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101268
Suction cup F20 Silicone	0101130
Suction cup F20 Silicone, 1/8" NPT male, with dual flow control valve	0101278
Suction cup F20 Silicone, M5 female	0101270
Suction cup F20 Silicone, G1/8" male, with mesh filter	0101271

Specifications subject to change without notice.

Description	Item no.
Suction cup F20 Silicone, 1/8" NPT male, with mesh filter	0101272
Suction cup F20 Silicone, G1/8" male/M5 female	0101273
Suction cup F20 Silicone, 5xM5 female	0101274
Suction cup F20 Silicone, G1/8" male/M5 female, with mesh filter	0101275
Suction cup F20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101277
Suction cup F20 Silicone, G1/8" male/M5 female, PA	0110334
Suction cup F20MF Thermoelastic polyurethane	0101139
Suction cup F20MF Thermoelastic polyurethane, M5 female	0101281
Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101282
Suction cup F20MF Thermoelastic polyurethane, 1/8" NPT male with mesh filter	0101283
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 female	0101284
Suction cup F20MF Thermoelastic polyurethane, 5xM5 female	0101285
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 female, with mesh filter	0101286
Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101288
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 fem., with dual flow control valve	0101290
Suction cup F20MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101291
Suction cup F25 Chloroprene, G1/8" male/M5 female, PA	0109842
Suction cup F25 Silicone FCM	0200439
Suction cup F25 Silicone, M5 female	0101303
Suction cup F25 Silicone, G1/8" male, with mesh filter	0101304
Suction cup F25 Silicone, 1/8" NPT male, with mesh filter	0101305

Specifications subject to change without notice.

Description	Item no.
Suction cup F25 Silicone, G1/8" male/M5 female	0101306
Suction cup F25 Silicone, 5xM5 female	0101307
Suction cup F25 Silicone, G1/8" male/M5 female, with mesh filter	0101308
Suction cup F25 Silicone, 1/8" NPT male, with dual flow control valve	0101311
Suction cup F25 Silicone, G1/8" male/M5 female, with dual flow control valve	0101312
Suction cup F25 Silicone, G1/8" male/M5 female, PA	0110335
Suction cup F25 Silicone FCM, G1/8" male, with mesh filter	9909625
Suction cup F25 Silicone FCM, 1/8" NPT male, with mesh filter	9909667
Suction cup F25 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909711
Suction cup F25MF Thermoelastic polyurethane	0101140
Suction cup F25MF Thermoelastic polyurethane, M5 female	0101314
Suction cup F25MF Thermoelastic polyurethane, M5 female, with dual flow control valve	0101320
Suction cup F25MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101315
Suction cup F25MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101321
Suction cup F25MF Thermoelastic polyurethane, G1/8" male/M5 female, with mesh filter	0101319
Suction cup F25MF Thermoelastic polyurethane, 5xM5 female	0101318
Suction cup F75 HNBR, 1/8" NPSF female, with mesh filter	0108184
Suction cup F75 HNBR, 3/8" NPSF female, with mesh filter	0108186
Suction cup F75 HNBR, G1/2" female, with mesh filter	0108187
Suction cup F75 HNBR, G3/8" female, with mesh filter	0108185
Suction cup F75 Nitrile-PVC	3150131P

Specifications subject to change without notice.

Description	Item no.
Suction cup F75 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101875
Suction cup F75 Nitrile-PVC, G1/2" female, with cone valve	0101879
Suction cup F75 Nitrile-PVC, G1/2" female, with mesh filter	0101876
Suction cup F75 Nitrile-PVC, G3/8" female, with cone valve	0101877
Suction cup F75 Nitrile-PVC, G3/8" female, with mesh filter	0101874
Suction cup F75 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101873
Suction cup F75 Silicone	3150131S
Suction cup F75 Silicone FCM	0200264
Suction cup F75 Silicone FCM, G3/8" female, with mesh filter	0200497
Suction cup F75 Silicone, 1/8" NPSF female, with mesh filter	0101866
Suction cup F75 Silicone, 3/8" NPSF female, with mesh filter	0101868
Suction cup F75 Silicone, G1/2" female, with cone valve	0101872
Suction cup F75 Silicone, G1/2" female, with mesh filter	0101869
Suction cup F75 Silicone, G3/8" female, with cone valve	0101870
Suction cup F75 Silicone, G3/8" female, with mesh filter	0101867
Suction cup F75P Polyurethane 30/60	0104724
Suction cup F75P Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0106349
Suction cup F75P Polyurethane 30/60, 3/8" NPSF female	0108800
Suction cup F75P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106351
Suction cup F75P Polyurethane 30/60, for tread insert	0106829
Suction cup F75P Polyurethane 30/60, G1/2" female, with mesh filter	0106352

Specifications subject to change without notice.

Description	Item no.
Suction cup F75P Polyurethane 30/60, G3/8" female, with cone valve	0129928
Suction cup F75P Polyurethane 30/60, G3/8" female, with mesh filter	0106350
Suction cup F75P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0106830
Suction cup F75P Polyurethane 60	0111584
Suction cup F75P Polyurethane 60, 1/8" NPSF female, with mesh filter	0111585
Suction cup F75P Polyurethane 60, 3/8" NPSF female	0108801
Suction cup F75P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111587
Suction cup F75P Polyurethane 60, for tread insert	0107320
Suction cup F75P Polyurethane 60, G1/2" female, with mesh filter	0111588
Suction cup F75P Polyurethane 60, G3/8" female, with cone valve	0129929
Suction cup F75P Polyurethane 60, G3/8" female, with mesh filter	0111586
Suction cup F75P Polyurethane 60, thread insert G3/8" male, with mesh filter	0107321
Suction cup F110 HNBR	3150132T
Suction cup F110 HNBR, 3/8" NPSF female, with mesh filter	0108189
Suction cup F110 HNBR, G1/2" female, with mesh filter	0108190
Suction cup F110 HNBR, G3/8" female, with mesh filter	0108188
Suction cup F110 Nitrile-PVC	3150132P
Suction cup F110 Nitrile-PVC, 3/8" NPSF female, with mesh filter	0101916
Suction cup F110 Nitrile-PVC, G1/2" female, with cone valve	0101921
Suction cup F110 Nitrile-PVC, G1/2" female, with mesh filter	0101917
Suction cup F110 Nitrile-PVC, G3/8" female, with mesh filter	0101915

Specifications subject to change without notice.

Description	Item no.
Suction cup F110 Silicone	3150132S
Suction cup F110 Silicone FCM	0200302
Suction cup F110 Silicone FCM, G1/2" female, with mesh filter	0200504
Suction cup F110 Silicone, 3/8" NPSF female, with mesh filter	0101909
Suction cup F110 Silicone, G1/2" female, with cone valve	0101914
Suction cup F110 Silicone, G1/2" female, with mesh filter	0101910
Suction cup F110 Silicone, G3/8" female, with mesh filter	0101908
Suction cup F110P Polyurethane 30/60	0104725
Suction cup F110P Polyurethane 30/60, 3/8" NPSF female	0108802
Suction cup F110P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106354
Suction cup F110P Polyurethane 30/60, for thread insert	0106796
Suction cup F110P Polyurethane 30/60, G1/2" female, with cone valve	0129927
Suction cup F110P Polyurethane 30/60, G1/2" female, with mesh filter	0106355
Suction cup F110P Polyurethane 30/60, G3/8" female, with mesh filter	0106353
Suction cup F110P Polyurethane 30/60, thread insert G3/8" with mesh filter	0106798
Suction cup F110P Polyurethane 60	0111593
Suction cup F110P Polyurethane 60, 3/8" NPSF female	0108803
Suction cup F110P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111596
Suction cup F110P Polyurethane 60, for thread insert	0107322
Suction cup F110P Polyurethane 60, G1/2" female, with cone valve	0129930
Suction cup F110P Polyurethane 60, G1/2" female, with mesh filter	0111597

Specifications subject to change without notice.

Description	Item no.
Suction cup F110P Polyurethane 60, G3/8" female, with mesh filter	0111595
Suction cup F110P Polyurethane 60, thread insert G3/8", with mesh filter	0107323
Suction cup F150 Nitrile-PVC	3150133P
Suction cup F150 Nitrile-PVC, G1/2" female, with cone valve	0101941
Suction cup F150 Nitrile-PVC, G1/2" female, with mesh filter	0101938
Suction cup F150 Nitrile-PVC, G3/4" female, with mesh filter	0101939
Suction cup F150 Silicone	3150133S
Suction cup F150 Silicone FCM	0200265
Suction cup F150 Silicone FCM, G1/2" female, with mesh filter	0200507
Suction cup F150 Silicone, G1/2" female, with cone valve	0101937
Suction cup F150 Silicone, G1/2" female, with mesh filter	0101934
Suction cup F150 Silicone, G3/4" female, with mesh filter	0101935
Suction cup F26 Silicone FCM	0201216
Suction cup F26 Silicone FCM, G1/4" male	9914238
Suction cup F26 Silicone FCM, 1/8" NPSF female	9914251
Suction cup F33 Silicone FCM	0200328
Suction cup F33 Silicone FCM, G1/4" male	9914237
Suction cup F33 Silicone FCM, 1/8" NPSF female	9914252
Suction cup F30-2 Chloroprene	0101133
Suction cup F30-2 Chloroprene, 5xM5 female	0101329
Suction cup F30-2 Chloroprene, for fitting with cone valve	3150239

Specifications subject to change without notice.

Description	Item no.
Suction cup F30-2 Chloroprene, G1/8" male, with mesh filter	0101326
Suction cup F30-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101332
Suction cup F30-2 Chloroprene, G1/8" male/M5 female PA	0109846
Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with cone valve	3250039
Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101334
Suction cup F30-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101330
Suction cup F30-2 Chloroprene, M5 female	0101325
Suction cup F30-2 Chloroprene, M5 female, with dual flow control valve	0101331
Suction cup F30-2 Silicone	0101134
Suction cup F30-2 Silicone FCM	0200418
Suction cup F30-2 Silicone FCM, G1/8" male, with mesh filter	9909626
Suction cup F30-2 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909627
Suction cup F30-2 Silicone, 5xM5 female	0101345
Suction cup F30-2 Silicone, G1/8" male, with mesh filter	0101342
Suction cup F30-2 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101348
Suction cup F30-2 Silicone, G1/8" male/M5 female, with cone valve	3250039S
Suction cup F30-2 Silicone, G1/8" male/M5 female, with dual flow control valve	0101350
Suction cup F30-2 Silicone, G1/8" male/M5 female, with mesh filter	0101346
Suction cup F30-2 Silicone, M5 female	0101341
Suction cup F30-2 Silicone, G1/8" male/M5 female PA	0110344
Suction cup F40-2 Nitrile-PVC	0101135

Description	Item no.
Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female	0101566
Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female PA	0109847
Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with cone valve	3150050P
Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101573
Suction cup F40-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101572
Suction cup F40-2 Nitrile-PVC, 5x1/8" NPSF female	0101571
Suction cup F40-2 Nitrile-PVC, G1/4" male, with mesh filter	0101567
Suction cup F40-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101574
Suction cup F40-2 Nitrile-PVC, G3/8" male, with mesh filter	0101569
Suction cup F40-2 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101576
Suction cup F40-2 Silicone	0101136
Suction cup F40-2 Silicone FCM	0200437
Suction cup F40-2 Silicone FCM, 1/4" NPT male, with mesh filter	9909669
Suction cup F40-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909629
Suction cup F40-2 Silicone FCM, G1/4" male, with mesh filter	9909628
Suction cup F40-2 Silicone, 1/8" NPSF female PA	0110345
Suction cup F40-2 Silicone, 1/8" NPSF female, with cone valve	3150050S
Suction cup F40-2 Silicone, 1/8" NPSF female, with mesh filter...	0101553
Suction cup F40-2 Silicone, 5x1/8" NPSF female	0101552
Suction cup F40-2 Silicone, G1/4" male, with mesh filter	0101548
Suction cup F40-2 Silicone, G3/8" male, with mesh filter	0101550

Specifications subject to change without notice.

Description	Item no.
Suction cup F40-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101554
Suction cup F50-2 HNBR	0108166
Suction cup F50-2 HNBR, 1/8" NPSF female	0108181
Suction cup F50-2 HNBR, G1/4" male, with mesh filter	0108182
Suction cup F50-2 HNBR, G3/8" male, with mesh filter	0108183
Suction cup F50-2 Nitrile-PVC	0101137
Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, PA	0110952
Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with cone valve	3150051P
Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101773
Suction cup F50-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101772
Suction cup F50-2 Nitrile-PVC, 5x1/8" NPSF female	0101771
Suction cup F50-2 Nitrile-PVC, 5x1/8" NPSF female, with dual flow control valve	0101778
Suction cup F50-2 Nitrile-PVC, for fitting with cone valve	3150241P
Suction cup F50-2 Nitrile-PVC, G1/4" male, with mesh filter	0101767
Suction cup F50-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	9909458
Suction cup F50-2 Nitrile-PVC, G3/8" male, with mesh filter	0101769
Suction cup F50-2 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101776
Suction cup F50-2 Silicone	0101138
Suction cup F50-2 Silicone FCM	0200438
Suction cup F50-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909631
Suction cup F50-2 Silicone FCM, G1/4" male, with mesh filter	9909630

Description	Item no.
Suction cup F50-2 Silicone, 1/8" NPSF female, PA	0110346
Suction cup F50-2 Silicone, 1/8" NPSF female, with cone valve	3150051S
Suction cup F50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101754
Suction cup F50-2 Silicone, 1/8" NPSF female, with mesh filter	0101753
Suction cup F50-2 Silicone, 5x1/8" NPSF female	0101752
Suction cup F50-2 Silicone, for fitting with cone valve	3150241S
Suction cup F50-2 Silicone, G1/4" male, with mesh filter	0101748
Suction cup F50-2 Silicone, G3/8" male, with mesh filter	0101750
Suction cup F75P Polyurethane 30/60	0104724
Suction cup F75P Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0106349
Suction cup F75P Polyurethane 30/60, 3/8" NPSF female	0108800
Suction cup F75P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106351
Suction cup F75P Polyurethane 30/60, for tread insert	0106829
Suction cup F75P Polyurethane 30/60, G1/2" female, with mesh filter	0106352
Suction cup F75P Polyurethane 30/60, G3/8" female, with cone valve	0129928
Suction cup F75P Polyurethane 30/60, G3/8" female, with mesh filter	0106350
Suction cup F75P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0106830
Suction cup F75P Polyurethane 60	0111584
Suction cup F75P Polyurethane 60, 1/8" NPSF female, with mesh filter	0111585
Suction cup F75P Polyurethane 60, 3/8" NPSF female	0108801
Suction cup F75P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111587

Specifications subject to change without notice.

Description	Item no.
Suction cup F75P Polyurethane 60, for tread insert	0107320
Suction cup F75P Polyurethane 60, G1/2" female, with mesh filter	0111588
Suction cup F75P Polyurethane 60, G3/8" female, with cone valve	0129929
Suction cup F75P Polyurethane 60, G3/8" female, with mesh filter	0111586
Suction cup F75P Polyurethane 60, thread insert G3/8" male, with mesh filter	0107321
Suction cup F110P Polyurethane 30/60	0104725
Suction cup F110P Polyurethane 30/60, 3/8" NPSF female	0108802
Suction cup F110P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106354
Suction cup F110P Polyurethane 30/60, for thread insert	0106796
Suction cup F110P Polyurethane 30/60, G1/2" female, with cone valve	0129927
Suction cup F110P Polyurethane 30/60, G1/2" female, with mesh filter	0106355
Suction cup F110P Polyurethane 30/60, G3/8" female, with mesh filter	0106353
Suction cup F110P Polyurethane 30/60, thread insert G3/8" with mesh filter	0106798
Suction cup F110P Polyurethane 60	0111593
Suction cup F110P Polyurethane 60, 3/8" NPSF female	0108803
Suction cup F110P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111596
Suction cup F110P Polyurethane 60, for thread insert	0107322
Suction cup F110P Polyurethane 60, G1/2" female, with cone valve	0129930
Suction cup F110P Polyurethane 60, G1/2" female, with mesh filter	0111597
Suction cup F110P Polyurethane 60, G3/8" female, with mesh filter	0111595
Suction cup F110P Polyurethane 60, thread insert G3/8", with mesh filter	0107323

Specifications subject to change without notice.

Description	Item no.
Suction cup F15MF Thermoelastic polyurethane	3150269
Suction cup F15MF Thermoelastic polyurethane, M5 male	3250074
Suction cup F20MF Thermoelastic polyurethane	0101139
Suction cup F20MF Thermoelastic polyurethane, M5 female	0101281
Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101282
Suction cup F20MF Thermoelastic polyurethane, 1/8" NPT male with mesh filter	0101283
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 female	0101284
Suction cup F20MF Thermoelastic polyurethane, 5xM5 female	0101285
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 female, with mesh filter	0101286
Suction cup F20MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101288
Suction cup F20MF Thermoelastic polyurethane, G1/8" male / M5 fem., with dual flow control valve	0101290
Suction cup F20MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101291
Suction cup F25MF Thermoelastic polyurethane	0101140
Suction cup F25MF Thermoelastic polyurethane, M5 female	0101314
Suction cup F25MF Thermoelastic polyurethane, M5 female, with dual flow control valve	0101320
Suction cup F25MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101315
Suction cup F25MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101321
Suction cup F25MF Thermoelastic polyurethane, G1/8" male/M5 female, with mesh filter	0101319
Suction cup F25MF Thermoelastic polyurethane, 5xM5 female	0101318
Suction cup F30MF Thermoelastic polyurethane	0101141
Suction cup F30MF Thermoelastic polyurethane, 5xM5 female	0101361

Specifications subject to change without notice.

Description	Item no.
Suction cup F30MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101367
Suction cup F30MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101358
Suction cup F30MF Thermoelastic polyurethane, G1/8" male, with mesh filter and dual flow control valve	0101364
Suction cup F30MF Thermoelastic polyurethane, G1/8" male/M5 female, with mesh filter	0101362
Suction cup F30MF Thermoelastic polyurethane, M5 female	0101357
Suction cup F30MF Thermoelastic polyurethane, M5 female, with dual flow control valve	0101363
Suction cup F40MF Thermoelastic polyurethane	0101142
Suction cup F40MF Thermoelastic polyurethane	0101142
Suction cup F40MF Thermoelastic polyurethane, 1/8" NPSF female, with dual flow control valve	0101592
Suction cup F40MF Thermoelastic polyurethane, 5x1/8" NPSF female	0101590
Suction cup F40MF Thermoelastic polyurethane, G1/4" male, with mesh filter	0101586
Suction cup F40MF Thermoelastic polyurethane, G1/4" male, with mesh filter and dual flow control valve	0101593
Suction cup F40MF Thermoelastic polyurethane, G3/8" male, with mesh filter	0101588
Suction cup F40MF Thermoelastic polyurethane, G3/8" male, with mesh filter and dual flow control valve	0101595
Suction cup F40MF Thermoelastic polyurethane, 1/8" NPSF female	0101591
Suction cup F50MF Thermoelastic polyurethane	0101143
Suction cup F50MF Thermoelastic polyurethane, G1/4" male, with mesh filter	0101786
Suction cup F50MF Thermoelastic polyurethane, G1/4" male, with mesh filter and dual flow control valve	0101793
Suction cup F50MF Thermoelastic polyurethane, G3/8" male, with mesh filter	0101788
Suction cup F50MF Thermoelastic polyurethane, 1/8" NPSF female, with mesh filter	0101791
XLF150 Extra Large Flat cup, G1/2" female	0127131

Description	Item no.
XLF200 Extra Large Flat cup, G1/2" female	0127132
XLF250 Extra Large Flat cup, G1/2" female	0127133
XLF300 Extra Large Flat cup, G1/2" female	0127134

Flat Concave family (FC)



The friction cups in flat concave shape and in the material DURAFLEX® suction cups have been developed to meet the strict demands of the automotive industry and designed for flat and curved surfaces. A typical application is the feeding of sheet metal into a press tool. The FCF-P design is especially suitable for oily surfaces, 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.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
FC20P	4.5	12	16	4.5	9	12
FC25P	8	20	27	9	12	18
FC35P	11/11*	36/34*	51/49*	27/27*	51/41*	62/51*
FC50P	28/28**	77/77**	103/104**	49/52**	82/93**	100/111**
FC75P	73/73**	157/168**	215/225**	107/93**	200/225**	230/255**
FC100P	137/152**	284/328**	377/446**	176/112**	318/264**	420/382**
FC150P	274/284**	647/716**	922/932**	343/215**	765/568**	902/863**
FCF25P	—	19/19***	28/29***	—	7/5***	10/7.2***
FCF35P	—	42/34***	58/50***	—	30/26***	42/32***
FCF50P	—	78/72***	106/101***	—	77/52***	105/70***
FCF75P	—	171/163***	236/228***	—	166/104***	211/139***

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
FCF100P	—	347/236***	490/298***	—	337/139***	484/205***
FCF125P	—	475/405***	650/442***	—	445/194***	602/236***

* PU50°/PU60°, ** PU40°/PU60°, *** Dry metal sheet/Oily metal sheet.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
FC20P	21.8	9.4	25	1.9	1
FC25P	28.5	11	45	4	3
FC35P	35	15	32	5.5	5
FC50P	50	33.5	53	5	10
FC75P	75	24	78	6.5	30
FC100P	100	27	110	10.2	80
FC150P	150	40.5	165	14.2	250
FCF25P	25	28	27	—	5.5
FCF35P	35	29–47.8*	40	2	5
FCF50P	50	31–49.9*	50	3	10
FCF75P	75	31–41*	100	4	30
FCF100P	100	36–45*	150	6	70
FCF125P	126	42–51.2*	150	8	100

* Height range includes fittings.

AVAILABLE MATERIALS AND INDUSTRIES
An explanation of the industry icons is available on the cover fold out.

Cup	Material						MSF
FC20P	PU50°	●	●	●	●	●	●
FC25P	PU50°	●	●	●	●	●	●
FC35P	PU50°	●	●	●	●	●	●
FC50P	PU40°	●	●	●	●	●	●
FC50P	PU60°	●	●	●	●	●	●
FC75P	PU40°	●	●	●	●	●	●
FC75P	PU60°	●	●	●	●	●	●
FC100P	PU40°	●	●	●	●	●	●
FC100P	PU60°	●	●	●	●	●	●
FC150P	PU40°	●	●	●	●	●	●
FC150P	PU60°	●	●	●	●	●	●
FCF25P	PU55°/PU60°		●				●
FCF35P	PU55°/PU60°		●				●
FCF50P	PU55°/PU60°		●				●
FCF75P	PU55°/PU60°		●				●
FCF100P	PU55°/PU60°		●				●
FCF125P	PU55°/PU60°		●				●

MATERIAL RESISTANCE
For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Oily sheet metal	Dry sheet metal	Mark free
FC20P		●	●
FC25P		●	●
FC35P		●	●
FC50P		●	●
FC75P		●	●
FC100P		●	●
FC150P		●	●
FCF25P	●		
FCF35P	●		
FCF50P	●		
FCF75P	●		
FCF100P	●		
FCF125P	●		

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup FC20P Polyurethane 50	0106016
Suction cup FC20P Polyurethane 50, G1/8" male / M5 female, with mesh filter	0106718
Suction cup FC20P Polyurethane 50, G1/8" male, with mesh filter	0106722
Suction cup FC20P Polyurethane 50, M5 female	0106717

Specifications subject to change without notice.

Description	Item no.
Suction cup FC25P Polyurethane 50	0104803
Suction cup FC25P Polyurethane 50, G1/8" male / M5 female, with mesh filter	0106720
Suction cup FC25P Polyurethane 50, G1/8" male, with mesh filter	0106721
Suction cup FC25P Polyurethane 50, M5 female	0106719
Suction cup FC35P Polyurethane 50	0103290
Suction cup FC35P Polyurethane 50, 1/8" NPSF female, with dual flow control valve	0103709
Suction cup FC35P Polyurethane 50, 1/8" NPSF female, with mesh filter	0103705
Suction cup FC35P Polyurethane 50, G1/4" male, with mesh filter	0103711
Suction cup FC35P Polyurethane 50, G1/4" male, with mesh filter and dual flow control valve	0103713
Suction cup FC35P Polyurethane 50, G3/8" male, with mesh filter	0103719
Suction cup FC35P Polyurethane 60	0103291
Suction cup FC35P Polyurethane 60, 1/8" NPSF female, with mesh filter	0103706
Suction cup FC35P Polyurethane 60, 5x1/8" NPSF female	0103728
Suction cup FC35P Polyurethane 60, G1/4" male, with mesh filter	0103712
Suction cup FC35P Polyurethane 60, G3/8" male, with mesh filter	0103720
Suction cup FC35P Polyurethane 60, G3/8" male, with mesh filter and dual flow control valve	0103722
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
Suction cup FC75P Polyurethane 40, 3/8" NPSF female	0108796
Suction cup FC75P Polyurethane 40, for tread insert	0106948
Suction cup FC75P Polyurethane 40, G3/8" male - 1/8" NPSF female	0103294

Specifications subject to change without notice.

Description	Item no.
Suction cup FC75P Polyurethane 40, thread insert G3/8" with mesh filter	0106959
Suction cup FC75P Polyurethane 60, 3/8" NPSF female	0108797
Suction cup FC75P Polyurethane 60, for tread insert	0107302
Suction cup FC75P Polyurethane 60, G3/8" male - 1/8" NPSF female	0103296
Suction cup FC75P Polyurethane 60, thread insert G3/8" with mesh filter	0107303
Suction cup FC100P Polyurethane 40	0103297
Suction cup FC100P Polyurethane 40, 1/8" NPSF female, with mesh filter	0103731
Suction cup FC100P Polyurethane 40, 3/8" NPSF female	0108798
Suction cup FC100P Polyurethane 40, 3/8" NPSF female, with mesh filter	0103737
Suction cup FC100P Polyurethane 40, for tread insert	0106835
Suction cup FC100P Polyurethane 40, G1/2" female, with mesh filter	0103740
Suction cup FC100P Polyurethane 40, thread insert G3/8" male, with mesh filter	0106836
Suction cup FC100P Polyurethane 60	0103299
Suction cup FC100P Polyurethane 60, 1/8" NPSF female, with mesh filter	0103733
Suction cup FC100P Polyurethane 60, 1/8" NPSF female, with mesh filter	0103734
Suction cup FC100P Polyurethane 60, 3/8" NPSF female	0108799
Suction cup FC100P Polyurethane 60, 3/8" NPSF female, with mesh filter	0103739
Suction cup FC100P Polyurethane 60, for tread insert	0107304
Suction cup FC100P Polyurethane 60, G1/2" female, with mesh filter	0103742
Suction cup FC100P Polyurethane 60, G3/8" female, with mesh filter	0103736
Suction cup FC100P Polyurethane 60, thread insert G3/8" male, with mesh filter	0107305

Specifications subject to change without notice.

Description	Item no.
Suction cup FC150P Polyurethane 40	0101946
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 40, G3/8" female, with mesh filter	0103743
Suction cup FC150P Polyurethane 60	0103301
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
Suction cup FC150P Polyurethane 60, G3/8" female, with mesh filter	0103745
Suction cup FCF25P Polyurethane 55/60, 3/8" NPT female	0206916
Suction cup FCF25P Polyurethane 55/60, G1/4" female	0206919
Suction cup FCF25P Polyurethane 55/60, G3/8" female	0206909
Suction cup FCF25P Polyurethane 55/60, G3/8" female plastic	0206895
Suction cup FCF25P Polyurethane 55/60, G3/8" male, 1/8" NPSF female	0201827
Suction cup FCF25P Polyurethane 55/60, T-slot	0206926
Suction cup FCF35P Polyurethane 55/60, 3/8" NPT female	0122282
Suction cup FCF35P Polyurethane 55/60, G1/4" female	0206921
Suction cup FCF35P Polyurethane 55/60, G3/8" female	0118981
Suction cup FCF35P Polyurethane 55/60, G3/8" female plastic	0206893
Suction cup FCF35P Polyurethane 55/60, G3/8" female, 17 mm thread	0200652
Suction cup FCF35P Polyurethane 55/60, G3/8" male, with mesh filter	0119913
Suction cup FCF35P Polyurethane 55/60, M10x1.5 male	0121431

Specifications subject to change without notice.

Description	Item no.
Suction cup FCF35P Polyurethane 55/60, T-slot, with mesh filter	0206927
Suction cup FCF50P Polyurethane 55/60, 3/8" NPT female	0122283
Suction cup FCF50P Polyurethane 55/60, G1/4" female	0206936
Suction cup FCF50P Polyurethane 55/60, G3/8" female	0118986
Suction cup FCF50P Polyurethane 55/60, G3/8" female plastic	0206606
Suction cup FCF50P Polyurethane 55/60, G3/8" female, 17 mm thread	0200685
Suction cup FCF50P Polyurethane 55/60, G3/8" male, with mesh filter	0118985
Suction cup FCF50P Polyurethane 55/60, M10x1.5 male	0121432
Suction cup FCF50P Polyurethane 55/60, T-slot, with mesh filter	0206929
Suction cup FCF75P Polyurethane 55/60, 3/8" NPT female	0122284
Suction cup FCF75P Polyurethane 55/60, G1/4" female	0206937
Suction cup FCF75P Polyurethane 55/60, G3/8" female	0118429
Suction cup FCF75P Polyurethane 55/60, G3/8" female, 17 mm thread	0200687
Suction cup FCF75P Polyurethane 55/60, G3/8" female, plastic thread	0124718
Suction cup FCF75P Polyurethane 55/60, G3/8" male, with mesh filter	0118423
Suction cup FCF75P Polyurethane 55/60, M10x1.5 male	0121433
Suction cup FCF75P Polyurethane 55/60, T-slot, with mesh filter	0206930
Suction cup FCF100P Polyurethane 55/60 G3/8" male, with mesh filter	0118430
Suction cup FCF100P Polyurethane 55/60, 3/8" NPT female	0122285
Suction cup FCF100P Polyurethane 55/60, G1/4" female	0206938
Suction cup FCF100P Polyurethane 55/60, G3/8" female	0118432

Specifications subject to change without notice.

Description	Item no.
Suction cup FCF100P Polyurethane 55/60, G3/8" female, 17 mm thread	0200690
Suction cup FCF100P Polyurethane 55/60, M10x1.5 male	0121385
Suction cup FCF100P Polyurethane 55/60, T-slot, with mesh filter	0206931
Suction cup FCF125P Polyurethane 55/60, 3/8" NPT female	0122286
Suction cup FCF125P Polyurethane 55/60, G1/4" female	0206939
Suction cup FCF125P Polyurethane 55/60, G3/8" female	0118437
Suction cup FCF125P Polyurethane 55/60, G3/8" female, 17 mm thread	0200693
Suction cup FCF125P Polyurethane 55/60, G3/8" female, plastic thread	0124787
Suction cup FCF125P Polyurethane 55/60, G3/8" male, with mesh filter	0118435
Suction cup FCF125P Polyurethane 55/60, M10x1.5 male	0121435
Suction cup FCF125P Polyurethane 55/60, T-slot, with mesh filter	0206932

Specifications subject to change without notice.

Bellows family (B)



The bellows family is suitable for height differences and slightly uneven or curved surfaces. Several short bellows cups in one lifting device can handle objects with height differences and varying shapes. The bellows also provide a slight lifting movement to separate thin items. This family is available, among other material in FDA compliant material, or the durable DURAFLEX® as Mark Free or even for oily surfaces.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
B5	0.3	0.8	1	—	—	—
B8	0.8	1.6	2.5	—	—	—
B10-2	1.5	3.4	4.9	—	—	—
B15-2	2.9	5.9	8.9	—	—	—
B20	5.9	9.8	14	—	—	—
B30	12	22	27	—	—	—
B30-2	12	22	27	—	—	—
B40	22	39	49	—	—	—
B50	33	65	82	—	—	—
B50-2	33	65	82	—	—	—
B75	74	167	226	—	—	—

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
B75-2	74	167	226	—	—	—
B110	137	343	461	—	—	—
B110-2	137	343	461	—	—	—
B150	294	686	883	—	—	—
B75P	61/83*	149/196*	202/255*	44/121*	96/229*	114/298*
B10XP	3.1/2.6*	4.6/3.8*	4.5/5.5*	1/1*	2.5/2*	4/4*
B15XP	6/5*	10/9*	12/121*	2.5/2.5*	5/5*	9/8*
B20XP	8.7/7.8*	19.7/15*	23/20*	7/3.5*	11/7*	15/10*
B25XP	12/9.7*	27/19*	30/22*	10/8*	13/12*	18/15*
B35XP	19/17*	48/39*	66/50*	17/15*	33/30*	50/40*
B52XP	42.5/36*	109/84*	150/102*	39/30*	70/60*	90/85*
B75XP	86/75*	222/176*	307/228*	80/60*	200/150*	230/180*
B110XP	200/190*	440/380*	500/470*	190/170*	380/350*	460/430*
B15MF	4	8	12	4.5	7	10
B20MF	4.5	15.5	21	6.3	11	19
B30MF	12	40	54.5	14.5	32	41
B40MF	18	57	72	13.6	40	47
B50MF	30	93	136	23	63	97
BF80P	73/98**	157/225**	196/294**	54/68**	88/127**	117/166**
BF110P	128/161*	229/334*	225/293*	106/123*	210/231*	246/305*

Specifications subject to change without notice.

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
BFF30P	—	24/23***	27/30***	—	11/5.5***	13.5/7.8***
BFF40P	—	43/45***	56/60***	—	60/35***	81/45***
BFF60P	—	77/82***	112/106***	—	90/76***	122/93***
BFF80P	—	176/174***	236/207***	—	201/110***	240/160***
BFF110P	—	279/284***	377/345***	—	298/235***	346/253***
BFF80TP	—	176/174	236/207	—	201/110	240/160
BFF110TP	—	279/284	377/345	—	298/235	346/253
BFFT50P	—	104/105	145/146	—	61/122	85/155
BFFT70P	—	172/165	220/211	—	176/110	245/148
BFFT90P	—	184/184	228/230	—	273/171	364/232

* PU30°/PU60° / PU60°, ** PU30°/PU50° / PU60°, *** Dry metal sheet/Oily metal sheet.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
B5	5.6	9.2	1.5	1.5	0.05
B8	8.8	11.9	1.9	3.5	0.15
B10-2	11	16.4	4	4.5	0.48
B15-2	15.7	19.8	5	6.5	1.1
B20	22	19	10	10	2.7
B30	34	26	15	15	10
B30-2	34	26.2	15	15	10
B40	43	28	20	12	15

Specifications subject to change without notice.

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
B50	53	35.3	30	19	32
B50-2	53	35.4	30	19	32
B75	78	37.3	40	24	110
B75-2	78	37	40	24	110
B110	115	54.3	60	35	310
B110-2	115	54.3	60	35	310
B150	155	71.3	75	45	650
B75P	79	37.3	90	20	110
B10XP	11	13.9	4/6**	3	0.19
B15XP	16	14.8	5.5/10**	3.4	0.4
B20XP	21	10.4	5.5/9**	4.6	1.04
B25XP	26	13.5	11/9**	5.5	1.63
B35XP	37	18.6	17.5/16**	9.5	4.4
B52XP	53	27	29/25**	11.2	13.3
B75XP	77.5	34.3	60/50**	16	42.8
B110XP	113.7	48.5	90/80**	23.4	123
B15MF	16	19.5	11	2	1.1
B20MF	23	19	11	8	3.7
B30MF	34	26	16.5	12	10
B40MF	43	28	22	11	15
B50MF	57	35	26	13	32

Specifications subject to change without notice.

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
BF80P	84	44	50	15	40
BF110P	115	53	55/70*	24	110
BFF30P	30	30	15	5	5
BFF40P	45	32–51.5***	23	7	10
BFF60P	61	36–55.3***	35	10	20
BFF80P	85	46–55.8***	50	14	50
BFF110P	115	53-72.5***	95	21	110
BFF80TP	85.3	38.5-56***	50	14	—
BFF110TP	115	53–72.5***	95	21	—
BFFT50P	53	29.2–46.7***	85	11	14.8
BFFT70P	73	31.7–44.7***	95	14	36.4
BFFT90P	93	41–60.5	130	21	83.6

* PU30° / PU30°/PU60°, ** PU30°/PU60° / PU60°, *** Height range includes fittings.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material								MSF
B5	Chloroprene, CR	●				●		●	●
B5	Conductive silicone, CSIL				●				
B5	HNBR	●					●	●	
B5	Semi-conductive EPDM				●				
B5	Silicone, SIL	●	●						
B5	Silicone FDA EU, SIL FDA	●	●						

Cup	Material								MSF
B8	Chloroprene, CR	●				●		●	●
B8	Conductive silicone, CSIL				●				
B8	HNBR	●					●	●	
B8	Silicone, SIL	●	●						
B8	Silicone FDA EU, SIL FDA	●	●						
B10-2	Chloroprene, CR	●				●		●	●
B10-2	HNBR	●					●	●	
B10-2	Silicone, SIL	●	●						
B10-2	Silicone FDA EU, SIL FDA	●	●						
B15-2	Chloroprene, CR	●				●		●	●
B15-2	HNBR	●					●	●	
B15-2	Silicone, SIL	●	●						
B15-2	Silicone FDA EU, SIL FDA	●	●						
B20	HNBR	●					●	●	
B20	Silicone FDA EU, SIL FDA	●	●						
B30-2	HNBR	●					●	●	
B30-2	Silicone FDA EU, SIL FDA	●	●						
B40	HNBR	●					●	●	
B40	Silicone FDA EU, SIL FDA	●	●						
B50	HNBR	●					●	●	

Cup	Material								MSF
B50	Silicone FDA EU, SIL FDA	●	●						
B50-2	Silicone FDA EU, SIL FDA	●	●						
B75	HNBR	●					●	●	
B75	Nitrile-PVC, NPV	●				●		●	●
B75	Silicone, SIL	●	●						
B75	Silicone FDA EU, SIL FDA	●	●						
B75-2	Nitrile-PVC, NPV	●				●		●	●
B75-2	Silicone, SIL	●	●						
B75-2	Silicone FDA EU, SIL FDA	●	●						
B110	HNBR	●					●	●	
B110	Nitrile-PVC, NPV	●				●		●	●
B110	Silicone, SIL	●	●						
B110	Silicone FDA EU, SIL FDA	●	●						
B110-2	Nitrile-PVC, NPV	●				●		●	●
B110-2	Silicone, SIL	●	●						
B110-2	Silicone FDA EU, SIL FDA	●	●						
B150	Nitrile-PVC, NPV	●				●		●	●
B150	Silicone, SIL	●	●						
B150	Silicone FDA EU, SIL FDA	●	●						
B75P	PU30°/PU60°	●		●					

Cup	Material								MSF
B75P	PU60°	●		●	●	●		●	●
B10XP	PU30°/PU60°	●		●					
B10XP	PU60°	●		●	●	●		●	●
B15XP	PU30°/PU60°	●		●					
B15XP	PU60°	●		●	●	●		●	●
B20XP	PU30°/PU60°	●		●					
B20XP	PU60°	●		●	●	●		●	●
B25XP	PU30°/PU60°	●		●					
B25XP	PU60°	●		●	●	●		●	●
B35XP	PU30°/PU60°	●		●					
B35XP	PU60°	●		●	●	●		●	●
B52XP	PU30°/PU60°	●		●					
B52XP	PU60°	●		●	●	●		●	●
B75XP	PU30°/PU60°	●		●					
B75XP	PU60°	●		●	●	●		●	●
B110XP	PU30°/PU60°	●		●					
B110XP	PU60°	●		●	●	●		●	●
B15MF	TPE-U				●			●	
B20MF	TPE-U				●			●	
B30MF	TPE-U				●			●	

Specifications subject to change without notice.

Cup	Material								MSF
B40MF	TPE-U				●			●	
B50MF	TPE-U				●			●	
BF80P	PU30°/PU50°	●		●	●	●		●	●
BF80P	PU60°	●		●	●	●		●	●
BF110P	PU30°/PU60°	●		●	●	●		●	●
BF110P	PU60°	●		●	●	●		●	●
BFF30P	PU55°/PU560°			●					●
BFF40P	PU55°/PU560°			●					●
BFF60P	PU55°/PU560°			●					●
BFF80P	PU55°/PU560°			●					●
BFF110P	PU55°/PU560°			●					●
BFF80TP	PU55°/60°/30°			●					●
BFF110TP	PU55°/60°/30°			●					●
BFFT50P	PU60°/60°/30°			●					●
BFFT70P	PU60°/60°/30°			●					●
BFFT90P	PU60°/60°/30°			●					●

MATERIAL RESISTANCE

For more material information go to page 23.

Specifications subject to change without notice.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Oily sheet metal	Dry sheet metal	Corrugated / cardboard	FDA EU-standard compliant	Glass handling	Electronic / semi-conductor	High/low temp cup (plastic)	Mark Free	Plastic injection molded parts
B5		●		●	●	●	●	●	●
B8		●		●	●	●	●	●	●
B20		●		●	●		●	●	●
B30		●							●
B40		●		●	●		●	●	●
B50		●		●	●		●	●	●
B75		●		●	●		●	●	●
B110		●		●				●	
B150		●		●					●
B10-2		●		●	●		●	●	●
B15-2		●		●	●		●	●	●
B30-2		●		●	●		●	●	●
B50-2		●		●					●
B75-2		●		●					●
B110-2		●		●					●
B10XP		●	●		●				●
B15XP		●	●		●				●
B20XP		●	●		●				●

	Oily sheet metal	Dry sheet metal	Corrugated / cardboard	FDA EU-standard compliant	Glass handling	Electronic / semi-conductor	High/low temp cup (plastic)	Mark Free	Plastic injection molded parts
B25XP		●	●		●				●
B35XP		●	●		●				●
B52XP		●	●		●				●
B75XP		●	●		●				●
B110XP		●	●		●				●
B75P		●						●	●
B15MF								●	
B20MF								●	
B30MF								●	
B40MF								●	
B50MF								●	
BF80P		●			●			●	
BF110P		●			●			●	
BFF30P	●								
BFF40P	●								
BFF60P	●								
BFF80P	●								
BFF110P	●								
BFF80TP	●	●						●	

Specifications subject to change without notice.

	Oily sheet metal	Dry sheet metal	Corrugated / cardboard	FDA EU-standard compliant	Glass handling	Electronic / semi-conductor	High/low temp cup (plastic)	Mark Free	Plastic injection molded parts
BFF110TP	●	●						●	
BFFT50P	●	●						●	
BFFT70P	●	●						●	
BFFT90P	●	●						●	

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup B5 Chloroprene	3150286
Suction cup B5 Chloroprene, M5 male	3250082
Suction cup B5 Conductive silicone	3150286SC
Suction cup B5 Conductive silicone, M5 male	3250082SC
Suction cup B5 HNBR	0200893
Suction cup B5 HNBR, M5 male	9912093
Suction cup B5 Semi-conductive EPDM	0129949
Suction cup B5 Semi-conductive EPDM, M5 male	9912097
Suction cup B5 Silicone	3150286S
Suction cup B5 Silicone FCM	0200277
Suction cup B5 Silicone FCM, M5 male	9909604
Suction cup B5 Silicone, M5 male	3250082S

Description	Item no.
Suction cup B8 Chloroprene	3150287
Suction cup B8 Chloroprene, M5 male	3250083
Suction cup B8 Conductive silicone	3150287SC
Suction cup B8 Conductive silicone, M5 male	3250083SC
Suction cup B8 HNBR	0200894
Suction cup B8 HNBR, M5 male	9912094
Suction cup B8 Silicone	3150287S
Suction cup B8 Silicone FCM	0200278
Suction cup B8 Silicone FCM, M5 male	9909605
Suction cup B8 Silicone, M5 male	3250083S
Suction cup B20 Chloroprene	0101101
Suction cup B20 Chloroprene, 1/8" NPT male, with mesh filter	0101162
Suction cup B20 Chloroprene, 5×M5 female	0101164
Suction cup B20 Chloroprene, G1/8" male, with mesh filter	0101161
Suction cup B20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101167
Suction cup B20 Chloroprene, G1/8" male/M5 female, PA	0110949
Suction cup B20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101169
Suction cup B20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101165
Suction cup B20 Chloroprene, M5 female	0101160
Suction cup B20 Chloroprene, M5 female, with dual flow control valve	0101166
Suction cup B20 HNBR	0128712

Specifications subject to change without notice.

Description	Item no.
Suction cup B20 HNBR, 5×M5 female	9906887
Suction cup B20 HNBR, G1/8" male, with mesh filter	9906877
Suction cup B20 HNBR, G1/8" male, with mesh filter and dual flow control valve	9906878
Suction cup B20 HNBR, G1/8" male/M5 female, with dual flow control valve	9906881
Suction cup B20 HNBR, G1/8" male/M5 female, with mesh filter	9906880
Suction cup B20 HNBR, M5 female	9906875
Suction cup B20 HNBR, M5 female, with dual flow control valve	9906876
Suction cup B20 Silicone	0101102
Suction cup B20 Silicone FCM	0200405
Suction cup B20 Silicone FCM, G1/8" male, with mesh filter	9909608
Suction cup B20 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909700
Suction cup B20 Silicone, 5×M5 female	0101175
Suction cup B20 Silicone, 5×M5 female, with dual flow control valve	0101181
Suction cup B20 Silicone, G1/8" male, with mesh filter	0101172
Suction cup B20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101178
Suction cup B20 Silicone, G1/8" male/M5 female, PA	0110336
Suction cup B20 Silicone, G1/8" male/M5 female, with dual flow control valve	0101180
Suction cup B20 Silicone, G1/8" male/M5 female, with mesh filter	0101176
Suction cup B20 Silicone, M5 female	0101171
Suction cup B20 Silicone, M5 female, with dual flow control valve	0101177
Suction cup B40 Chloroprene	0101105

Description	Item no.
Suction cup B40 Chloroprene, 1/8" NPSF female, PA	0109843
Suction cup B40 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101463
Suction cup B40 Chloroprene, 1/8" NPSF female, with mesh filter	0101462
Suction cup B40 Chloroprene, 5×1/8" NPSF female	0101461
Suction cup B40 Chloroprene, G1/4" male, with mesh filter	0101457
Suction cup B40 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101464
Suction cup B40 Chloroprene, G3/8" male, with mesh filter	0101459
Suction cup B40 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101466
Suction cup B40 HNBR	0108081
Suction cup B40 HNBR, 1/8" NPSF female, with mesh filter	0108082
Suction cup B40 HNBR, G1/4" male, with mesh filter	0108169
Suction cup B40 HNBR, G3/8" male, with mesh filter	0108170
Suction cup B40 Silicone	0101106
Suction cup B40 Silicone FCM	0200408
Suction cup B40 Silicone FCM, 1/8" NPSF female, with mesh filter	9909613
Suction cup B40 Silicone FCM, G1/4" male, with mesh filter	9909611
Suction cup B40 Silicone, 1/8" NPSF female PA	0110337
Suction cup B40 Silicone, 1/8" NPSF female, with dual flow control valve	0101476
Suction cup B40 Silicone, 1/8" NPSF female, with mesh filter	0101475
Suction cup B40 Silicone, 5×1/8" NPSF female	0101474
Suction cup B40 Silicone, G1/4" male, with mesh filter	0101470

Specifications subject to change without notice.

Description	Item no.
Suction cup B40 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101477
Suction cup B40 Silicone, G3/8" male, with mesh filter	0101472
Suction cup B50 HNBR	0108165
Suction cup B50 HNBR, 1/8" NPSF female, with mesh filter	0108171
Suction cup B50 HNBR, G1/4" male, with mesh filter	0108172
Suction cup B50 HNBR, G3/8" male, with mesh filter	0108173
Suction cup B50 Nitrile-PVC	0101107
Suction cup B50 Nitrile-PVC, 1/8" NPSF female, PA	0111063
Suction cup B50 Nitrile-PVC, 1/8" NPSF female, with dual flow control valve	0101650
Suction cup B50 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101649
Suction cup B50 Nitrile-PVC, 5×1/8" NPSF female	0101648
Suction cup B50 Nitrile-PVC, G1/4" male, with mesh filter	0101644
Suction cup B50 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101651
Suction cup B50 Nitrile-PVC, G3/8" male, with mesh filter	0101646
Suction cup B50 Nitrile-PVC, G3/8" male, with mesh filter and dual flow control valve	0101653
Suction cup B50 Silicone	0101108
Suction cup B50 Silicone FCM	0200409
Suction cup B50 Silicone FCM, 1/8" NPSF female, with mesh filter	9909709
Suction cup B50 Silicone FCM, G1/4" male, with mesh filter	9909614
Suction cup B50 Silicone, 1/8" NPSF female, with dual flow control valve	0101637
Suction cup B50 Silicone, 1/8" NPSF female, with mesh filter	0101636

Description	Item no.
Suction cup B50 Silicone, 5×1/8" NPSF female	0101635
Suction cup B50 Silicone, G1/4" male, with mesh filter	0101631
Suction cup B50 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101638
Suction cup B50 Silicone, G3/8" male, with mesh filter	0101633
Suction cup B50 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101640
Suction cup B75 HNBR	3150107T
Suction cup B75 HNBR, 1/8" NPSF female, with mesh filter	0108174
Suction cup B75 HNBR, 3/8" NPSF female, with mesh filter	0108176
Suction cup B75 HNBR, G1/2" female, with mesh filter	0108177
Suction cup B75 HNBR, G3/8" female, with mesh filter	0108175
Suction cup B75 Nitrile-PVC	3150107P
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 Nitrile-PVC, G3/8" female, with mesh filter	0101855
Suction cup B75 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101854
Suction cup B75P Polyurethane 30/60	0104723
Suction cup B75P Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0106345
Suction cup B75P Polyurethane 30/60, 3/8" NPSF female	0108790
Suction cup B75P Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0106347
Suction cup B75P Polyurethane 30/60, for thread insert	0106832
Suction cup B75P Polyurethane 30/60, G1/2" female, with mesh filter	0106348

Specifications subject to change without notice.

Description	Item no.
Suction cup B75P Polyurethane 30/60, G3/8" female, with mesh filter	0106346
Suction cup B75P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0106833
Suction cup B75P Polyurethane 60	0111594
Suction cup B75P Polyurethane 60, 1/8" NPSF female, with mesh filter	0111600
Suction cup B75P Polyurethane 60, 3/8" NPSF female	0108791
Suction cup B75P Polyurethane 60, 3/8" NPSF female, with mesh filter	0111602
Suction cup B75P Polyurethane 60, for thread insert	0107318
Suction cup B75P Polyurethane 60, G1/2" female, with mesh filter	0111603
Suction cup B75P Polyurethane 60, G3/8" female, with mesh filter	0111601
Suction cup B75P Polyurethane 60, thread insert G3/8" male with mesh filter	0107319
Suction cup B75 Silicone	3150107S
Suction cup B75 Silicone FCM	0200245
Suction cup B75 Silicone FCM, G3/8" female, with mesh filter	0200546
Suction cup B75 Silicone, 1/8" NPSF female, with mesh filter	0101850
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 Silicone, G3/8" female, with mesh filter	0101851
Suction cup B110 HNBR	3150108T
Suction cup B110 HNBR, 3/8" NPSF female, with mesh filter	0108179
Suction cup B110 HNBR, G1/2" female, with mesh filter	0108180
Suction cup B110 HNBR, G3/8" female, with mesh filter	0108178

Description	Item no.
Suction cup B110 Nitrile-PVC	3150035P
Suction cup B110 Nitrile-PVC	3150108P
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 Nitrile-PVC, G3/8" female, with mesh filter	0101890
Suction cup B110 Silicone	3150035S
Suction cup B110 Silicone	3150108S
Suction cup B110 Silicone FCM	0200246
Suction cup B110 Silicone FCM, G1/2" female, with mesh filter	0200551
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 Silicone, G3/8" female, with mesh filter	0101884
Suction cup B150 Nitrile-PVC	3150036P
Suction cup B150 Nitrile-PVC	3150109P
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	3150036S
Suction cup B150 Silicone	3150109S
Suction cup B150 Silicone FCM	0200247
Suction cup B150 Silicone FCM, G1/2" female, with mesh filter	0200552
Suction cup B150 Silicone, G1/2" female, with mesh filter	0101928

Specifications subject to change without notice.

Description	Item no.
Suction cup B150 Silicone, G3/4" female, with mesh filter	0101929
Suction cup B10-2 Chloroprene	3150101
Suction cup B10-2 Chloroprene, M5 male	3150023
Suction cup B10-2 HNBR	0128692
Suction cup B10-2 HNBR, M5 male	9906865
Suction cup B10-2 Silicone	3150101S
Suction cup B10-2 Silicone FCM	0200241
Suction cup B10-2 Silicone FCM, M5 male	9909606
Suction cup B10-2 Silicone, M5 male	3150023S
Suction cup B15-2 Chloroprene	3150230
Suction cup B15-2 Chloroprene, M5 male	3250037
Suction cup B15-2 HNBR	0128693
Suction cup B15-2 HNBR, M5 male	9906866
Suction cup B15-2 Silicone	3150230S
Suction cup B15-2 Silicone FCM	0200271
Suction cup B15-2 Silicone FCM, M5 male	9909607
Suction cup B15-2 Silicone, M5 male	3250037S
Suction cup B30-2 Chloroprene	0101103
Suction cup B30-2 Chloroprene, 1/8" NPSF female, PA	0109845
Suction cup B30-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101424
Suction cup B30-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101423

Specifications subject to change without notice.

Description	Item no.
Suction cup B30-2 Chloroprene, 5×1/8" NPSF female	0101422
Suction cup B30-2 Chloroprene, G1/4" male, with mesh filter	0101418
Suction cup B30-2 Chloroprene, G1/4" male, with mesh filter dual flow control valve	0101425
Suction cup B30-2 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101427
Suction cup B30-2 Chloroprene, G3/8" male, with mesh filter	0101420
Suction cup B30-2 HNBR	0108077
Suction cup B30-2 HNBR, 1/8" NPSF female, with mesh filter	0108078
Suction cup B30-2 HNBR, G1/4" male, with mesh filter	0108167
Suction cup B30-2 HNBR, G3/8" male, with mesh filter	0108168
Suction cup B30-2 Silicone	0101104
Suction cup B30-2 Silicone FCM	0200407
Suction cup B30-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909610
Suction cup B30-2 Silicone FCM, G1/4" male, with mesh filter	9909609
Suction cup B30-2 Silicone, 1/8" NPSF female, PA	0110343
Suction cup B30-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101437
Suction cup B30-2 Silicone, 1/8" NPSF female, with mesh filter	0101436
Suction cup B30-2 Silicone, 5×1/8" NPSF female	0101435
Suction cup B30-2 Silicone, 5×1/8" NPSF female, with dual flow control valve	0101442
Suction cup B30-2 Silicone, G1/4" male, with mesh filter	0101431
Suction cup B30-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101438
Suction cup B30-2 Silicone, G3/8" male, with mesh filter	0101433

Specifications subject to change without notice.

Description	Item no.
Suction cup B30-2 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101440
Suction cup B50-2 Nitrile-PVC with filter	0101109
Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, PA	0110957
Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, with dual flow control valve	0101676
Suction cup B50-2 Nitrile-PVC with filter, 1/8" NPSF female, with mesh filter	0101675
Suction cup B50-2 Nitrile-PVC with filter, 5×1/8" NPSF female	0101674
Suction cup B50-2 Nitrile-PVC with filter, G1/4" male, with dual flow control valve and mesh filter	0101677
Suction cup B50-2 Nitrile-PVC with filter, G1/4" male, with mesh filter	0101670
Suction cup B50-2 Nitrile-PVC with filter, G3/8" male, with mesh filter	0101672
Suction cup B50-2 Silicone FCM with filter	0200484
Suction cup B50-2 Silicone FCM with filter, 1/8" NPSF female, with mesh filter	9909619
Suction cup B50-2 Silicone FCM with filter, G1/4" male, with mesh filter	9909618
Suction cup B50-2 Silicone with filter	0101110
Suction cup B50-2 Silicone with filter, 1/8" NPSF female, PA	0110347
Suction cup B50-2 Silicone with filter, 1/8" NPSF female, with dual flow control valve	0101663
Suction cup B50-2 Silicone with filter, 1/8" NPSF female, with mesh filter	0101662
Suction cup B50-2 Silicone with filter, 5×1/8" NPSF female	0101661
Suction cup B50-2 Silicone with filter, G1/4" male, with mesh filter	0101657
Suction cup B50-2 Silicone with filter, G3/8" male, with mesh filter	0101659
Suction cup B75-2 Nitrile-PVC with filter	0101942
Suction cup B75-2 Nitrile-PVC with filter, 3/8" NPSF female, with mesh filter	0101864

Description	Item no.
Suction cup B75-2 Nitrile-PVC with filter, G1/2" female, with mesh filter	0101865
Suction cup B75-2 Nitrile-PVC with filter, G3/8" female, with mesh filter	0101863
Suction cup B75-2 Nitrile-PVC with filter, 1/8" NPSF female, with mesh filter	0101862
Suction cup B75-2 Silicone FCM with filter	0200485
Suction cup B75-2 Silicone FCM with filter, G3/8" female, with mesh filter	0200531
Suction cup B75-2 Silicone with filter	0101943
Suction cup B75-2 Silicone with filter, 1/8" NPSF female, with mesh filter	0101858
Suction cup B75-2 Silicone with filter, 3/8" NPSF female, with mesh filter	0101860
Suction cup B75-2 Silicone with filter, G3/8" female, with mesh filter	0101859
Suction cup B75-2 Silicone, G1/2" female, with mesh filter	0101861
Suction cup B110-2 Nitrile-PVC with filter	0101944
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 Nitrile-PVC with filter, G3/8" female, with mesh filter	0101902
Suction cup B110-2 Silicone FCM with filter	0200486
Suction cup B110-2 Silicone FCM with filter, G1/2" female, with mesh filter	0200536
Suction cup B110-2 Silicone with filter	0101945
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
Suction cup B110-2 Silicone with filter, G3/8" female, with mesh filter	0101896
Suction cup B10XP Polyurethane 30/60	0204978

Specifications subject to change without notice.

Description	Item no.
Suction cup B10XP Polyurethane 30/60, M5 male	0204977
Suction cup B10XP Polyurethane 60	0205169
Suction cup B10XP Polyurethane 60, M5 male	0205168
Suction cup B15XP Polyurethane 30/60	0204992
Suction cup B15XP Polyurethane 30/60, M5 male	0204991
Suction cup B15XP Polyurethane 60	0205172
Suction cup B15XP Polyurethane 60, M5 male	0205171
Suction cup B20XP Polyurethane 30/60	0204994
Suction cup B20XP Polyurethane 30/60, 1/8" NPT male with mesh filter	0205047
Suction cup B20XP Polyurethane 30/60, 5xM5 female	0205049
Suction cup B20XP Polyurethane 30/60, G1/8" male / M5 female, with mesh filter	0205048
Suction cup B20XP Polyurethane 30/60, G1/8" male with mesh filter	0205046
Suction cup B20XP Polyurethane 30/60, M5 female	0204993
Suction cup B20XP Polyurethane 60	0205176
Suction cup B20XP Polyurethane 60, 1/8" NPT male with mesh filter	0205180
Suction cup B20XP Polyurethane 60, 5xM5 female	0205183
Suction cup B20XP Polyurethane 60, G1/8" male / M5 female, with mesh filter	0205181
Suction cup B20XP Polyurethane 60, G1/8" male, with mesh filter	0205179
Suction cup B20XP Polyurethane 60, M5 female	0205175
Suction cup B25XP Polyurethane 30/60	0204998
Suction cup B25XP Polyurethane 30/60, 1/8" NPT male with mesh filter	0205095

Specifications subject to change without notice.

Description	Item no.
Suction cup B25XP Polyurethane 30/60, G1/8" male / M5 female with mesh filter	0205097
Suction cup B25XP Polyurethane 30/60, G1/8" male / M5 female with mesh filter	0205096
Suction cup B25XP Polyurethane 30/60, G1/8" male with mesh filter	0205050
Suction cup B25XP Polyurethane 30/60, M5 female	0204997
Suction cup B25XP Polyurethane 60	0205185
Suction cup B25XP Polyurethane 60, 1/8" NPT male with mesh filter	0205188
Suction cup B25XP Polyurethane 60, 5×M5 female	0205189
Suction cup B25XP Polyurethane 60, G1/8" male / M5 female with mesh filter	0205190
Suction cup B25XP Polyurethane 60, G1/8" male, with mesh filter	0205187
Suction cup B25XP Polyurethane 60, M5 female	0205184
Suction cup B35XP Polyurethane 30/60	0205002
Suction cup B35XP Polyurethane 30/60, 1/4" NPT male with mesh filter	0205106
Suction cup B35XP Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0205098
Suction cup B35XP Polyurethane 30/60, 3/8" NPT male with mesh filter	0205108
Suction cup B35XP Polyurethane 30/60, G1/8" male with mesh filter	0205100
Suction cup B35XP Polyurethane 30/60, G3/8" male with mesh filter	0205107
Suction cup B35XP Polyurethane 30/60,G1/4" male with mesh filter	0205105
Suction cup B35XP Polyurethane 60	0205192
Suction cup B35XP Polyurethane 60, 1/4" NPT male with mesh filter	0205196
Suction cup B35XP Polyurethane 60, 1/8" NPSF female, with mesh filter	0205191
Suction cup B35XP Polyurethane 60, 3/8" NPT male with mesh filter	0205198

Specifications subject to change without notice.

Description	Item no.
Suction cup B35XP Polyurethane 60, G1/4" male with mesh filter	0205195
Suction cup B35XP Polyurethane 60, G1/8" male with mesh filter	0205194
Suction cup B35XP Polyurethane 60, G3/8" male with mesh filter	0205197
Suction cup B52XP Polyurethane 30/60	0205007
Suction cup B52XP Polyurethane 30/60, 1/4" NPT male with mesh filter	0205131
Suction cup B52XP Polyurethane 30/60, 1/8" NPSF female, with mesh filter	0205110
Suction cup B52XP Polyurethane 30/60, 3/8" NPT male with mesh filter	0205133
Suction cup B52XP Polyurethane 30/60, 5x1/8" NPSF female	0205134
Suction cup B52XP Polyurethane 30/60, G1/4" male with mesh filter	0205130
Suction cup B52XP Polyurethane 30/60, G1/8" male with mesh filter	0205129
Suction cup B52XP Polyurethane 30/60, G3/8" male with mesh filter	0205132
Suction cup B52XP Polyurethane 60	0205200
Suction cup B52XP Polyurethane 60, 1/4" NPT male with mesh filter	0205204
Suction cup B52XP Polyurethane 60, 1/8" NPSF female, with mesh filter	0205199
Suction cup B52XP Polyurethane 60, 3/8" NPT male with mesh filter	0205206
Suction cup B52XP Polyurethane 60, 5×1/8" NPSF female	0205207
Suction cup B52XP Polyurethane 60, G1/4" male with mesh filter	0205203
Suction cup B52XP Polyurethane 60, G1/8" male with mesh filter	0205202
Suction cup B52XP Polyurethane 60, G3/8" male with mesh filter	0205205
Suction cup B75XP Polyurethane 30/60 , G3/8" male / 1/8" NPSF female	0205010
Suction cup B75XP Polyurethane 30/60 ,thread insert G1/4" male	0205161

Specifications subject to change without notice.

Description	Item no.
Suction cup B75XP Polyurethane 30/60 ,thread insert G1/8" male	0205156
Suction cup B75XP Polyurethane 30/60 ,thread insert G3/8" male	0205162
Suction cup B75XP Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0205868
Suction cup B75XP Polyurethane 30/60, for thread insert	0205157
Suction cup B75XP Polyurethane 60 , G3/8" male / 1/8" NPSF female	0205214
Suction cup B75XP Polyurethane 60 ,thread insert G1/4" male	0205212
Suction cup B75XP Polyurethane 60 ,thread insert G3/8" male	0205213
Suction cup B75XP Polyurethane 60 thread insert G1/8" male	0205208
Suction cup B75XP Polyurethane 60, 3/8" NPSF female, with mesh filter	0205883
Suction cup B75XP Polyurethane 60, for thread insert	0205209
Suction cup B110XP Polyurethane 30/60	0205021
Suction cup B110XP Polyurethane 30/60 ,thread insert G3/8" male	0205019
Suction cup B110XP Polyurethane 30/60, 3/8" NPSF female, with mesh filter	0205884
Suction cup B110XP Polyurethane 60	0205220
Suction cup B110XP Polyurethane 60 ,thread insert G3/8" male	0205219
Suction cup B110XP Polyurethane 60, 3/8" NPSF female, with mesh filter	0205885
Suction cup B15MF Thermoelastic polyurethane	3150264
Suction cup B15MF Thermoelastic polyurethane, M5 male	3250069
Suction cup B20MF Thermoelastic polyurethane	0101111
Suction cup B20MF Thermoelastic polyurethane, 5×M5 female	0101186
Suction cup B20MF Thermoelastic polyurethane, 5xM5 female, with dual flow control valve	0101192

Description	Item no.
Suction cup B20MF Thermoelastic polyurethane, G1/8" male, with dual flow control valve and mesh filter	0101189
Suction cup B20MF Thermoelastic polyurethane, G1/8" male, with mesh filter	0101183
Suction cup B20MF Thermoelastic polyurethane, G1/8" male/M5 fem., with dual flow control valve	0101191
Suction cup B20MF Thermoelastic polyurethane, G1/8" male/M5 female, with mesh filter	0101187
Suction cup B20MF Thermoelastic polyurethane, M5 female	0101182
Suction cup B20MF Thermoelastic polyurethane, M5 female, with dual flow control valve	0101188
Suction cup B30MF Thermoelastic polyurethane	0101112
Suction cup B30MF Thermoelastic polyurethane, 1/8" NPSF female, with dual flow control valve	0101450
Suction cup B30MF Thermoelastic polyurethane, 1/8" NPSF female, with mesh filter	0101449
Suction cup B30MF Thermoelastic polyurethane, 5×1/8" NPSF female	0101448
Suction cup B30MF Thermoelastic polyurethane, G1/4" male, with mesh filter	0101444
Suction cup B30MF Thermoelastic polyurethane, G3/8" male, with mesh filter	0101446
Suction cup B40MF Thermoelastic polyurethane	0101113
Suction cup B40MF Thermoelastic polyurethane, 1/8" NPSF female, with dual flow control valve	0101489
Suction cup B40MF Thermoelastic polyurethane, 1/8" NPSF female, with mesh filter	0101488
Suction cup B40MF Thermoelastic polyurethane, 5×1/8" NPSF female	0101487
Suction cup B40MF Thermoelastic polyurethane, G1/4" male, with mesh filter	0101483
Suction cup B40MF Thermoelastic polyurethane, G1/4" male, with mesh filter and dual flow control valve	0101490
Suction cup B40MF Thermoelastic polyurethane, G3/8" male, with mesh filter	0101485
Suction cup B40MF Thermoelastic polyurethane, G3/8" male, with mesh filter and dual flow control valve	0101492
Suction cup B50MF Thermoelastic polyurethane	0101114

Description	Item no.
Suction cup B50MF Thermoelastic polyurethane, 1/8" NPSF female, with dual flow control valve	0101689
Suction cup B50MF Thermoelastic polyurethane, 1/8" NPSF female, with mesh filter	0101688
Suction cup B50MF Thermoelastic polyurethane, 5×1/8" NPSF female	0101687
Suction cup B50MF Thermoelastic polyurethane, G1/4" male, with dual flow control valve and mesh filter	0101690
Suction cup B50MF Thermoelastic polyurethane, G1/4" male, with mesh filter	0101683
Suction cup B50MF Thermoelastic polyurethane, G3/8" male, with mesh filter	0101685
Suction cup BF80P Polyurethane 30/50, G3/8" female	0102370
Suction cup BF80P Polyurethane 30/50, 3/8" NPSF female	0102371
Suction cup BF80P Polyurethane 60, G3/8" female	0103307
Suction cup BF80P Polyurethane 60, 3/8" NPSF female	0103309
Suction cup BF80P Polyurethane 30/50, G3/8" male	0106985
Suction cup BF80P Polyurethane 30/50, G3/8" male with mesh filter	0107326
Suction cup BF80P Polyurethane 60, G3/8" male with mesh filter	0107327
Suction cup BF80P Polyurethane 60, G3/8" male	0107476
Suction cup BF110P Polyurethane 30/60 with O-ring	0110289
Suction cup BF110P Polyurethane 30/60, 3/8" NPSF female	0110291
Suction cup BF110P Polyurethane 30/60, thread insert G3/8" male with mesh filter	0110290
Suction cup BF110P Polyurethane 60, 3/8" NPSF female	0110288
Suction cup BF110P Polyurethane 60, thread insert G3/8" male with mesh filter	0110287
Suction cup BF110P Polyurethane 60, with O-ring	0110286
Suction cup BFF30P Polyurethane 55/60, 3/8" NPT female	0206915

Specifications subject to change without notice.

Description	Item no.
Suction cup BFF30P Polyurethane 55/60, G1/4" female	0206918
Suction cup BFF30P Polyurethane 55/60, G3/8" female	0206908
Suction cup BFF30P Polyurethane 55/60, G3/8" female plastic	0206599
Suction cup BFF30P Polyurethane 55/60, G3/8" male, 1/8" NPSF female	0201821
Suction cup BFF30P Polyurethane 55/60, T-slot	0206924
Suction cup BFF40P Polyurethane 55/60, 3/8" NPT female	0122278
Suction cup BFF40P Polyurethane 55/60, G1/4" female	0206940
Suction cup BFF40P Polyurethane 55/60, G3/8" female	0118992
Suction cup BFF40P Polyurethane 55/60, G3/8" female, 17 mm thread	0200697
Suction cup BFF40P Polyurethane 55/60, G3/8" female, plastic thread	0205617
Suction cup BFF40P Polyurethane 55/60, G3/8" male, with mesh filter	0118991
Suction cup BFF40P Polyurethane 55/60, M10×1.5 male	0121427
Suction cup BFF40P Polyurethane 55/60, T-slot, with mesh filter	0206925
Suction cup BFF60P Polyurethane 55/60, 3/8" NPT female	0122279
Suction cup BFF60P Polyurethane 55/60, G1/4" female	0206941
Suction cup BFF60P Polyurethane 55/60, G3/8" female	0118995
Suction cup BFF60P Polyurethane 55/60, G3/8" female, 17 mm thread	0200699
Suction cup BFF60P Polyurethane 55/60, G3/8" female, plastic thread	0124742
Suction cup BFF60P Polyurethane 55/60, G3/8" male, with mesh filter	0118994
Suction cup BFF60P Polyurethane 55/60, M10×1.5 male	0121428
Suction cup BFF60P Polyurethane 55/60, T-slot, with mesh filter	0206933

Specifications subject to change without notice.

Description	Item no.
Suction cup BFF80P Polyurethane 55/60 G1/4" female with mesh filter	0207259
Suction cup BFF80P Polyurethane 55/60 G1/4" male with mesh filter	0209104
Suction cup BFF80P Polyurethane 55/60 G3/8" female plastic thread	0207256
Suction cup BFF80P Polyurethane 55/60 G3/8" female with mesh filter	0207255
Suction cup BFF80P Polyurethane 55/60 G3/8" female with mesh filter, 17 mm thread	0207261
Suction cup BFF80P Polyurethane 55/60 G3/8" male, 1/8" NPSF female, with mesh filter	0207257
Suction cup BFF80P Polyurethane 55/60 M10×1,5 male with mesh filter	0207260
Suction cup BFF80P Polyurethane 55/60 T-slot with mesh filter	0207258
Suction cup BFF80P Polyurethane 55/60. 3/8" NPT female with mesh filter	0206882
Suction cup BFF110P Polyurethane 55/60 G1/4" female with mesh filter	0207215
Suction cup BFF110P Polyurethane 55/60 G1/4" male with mesh filter	0209103
Suction cup BFF110P Polyurethane 55/60 G3/8" female plastic thread	0207212
Suction cup BFF110P Polyurethane 55/60 G3/8" female with mesh filter	0207211
Suction cup BFF110P Polyurethane 55/60 G3/8" female with mesh filter, 17 mm thread	0207217
Suction cup BFF110P Polyurethane 55/60 G3/8" male, 1/8" NPSF female, with mesh filter	0207213
Suction cup BFF110P Polyurethane 55/60 M10×1,5 male with mesh filter	0207216
Suction cup BFF110P Polyurethane 55/60 T-slot with mesh filter	0207214
Suction cup BFF110P Polyurethane 55/60. 3/8" NPT female with mesh filter	0206881
Suction cup BFF80TP Polyurethane 55/60/30 G1/4" female with mesh filter	0206694
Suction cup BFF80TP Polyurethane 55/60/30 G1/4" male with mesh filter	0209101
Suction cup BFF80TP Polyurethane 55/60/30 G3/8" female plastic thread	0206691

Specifications subject to change without notice.

Description	Item no.
Suction cup BFF80TP Polyurethane 55/60/30 G3/8" female with mesh filter	0206690
Suction cup BFF80TP Polyurethane 55/60/30 G3/8" female with mesh filter, 17 mm thread	0207263
Suction cup BFF80TP Polyurethane 55/60/30 G3/8" male, 1/8" NPSF female, with mesh filter	0206692
Suction cup BFF80TP Polyurethane 55/60/30 M10×1,5 male with mesh filter	0207262
Suction cup BFF80TP Polyurethane 55/60/30 T-slot with mesh filter	0206693
Suction cup BFF80TP Polyurethane 55/60/30. 3/8" NPT female with mesh filter	0206689
Suction cup BFF110TP Polyurethane 55/60/30 G1/4" female with mesh filter	0206700
Suction cup BFF110TP Polyurethane 55/60/30 G1/4" male with mesh filter	0209102
Suction cup BFF110TP Polyurethane 55/60/30 G3/8" female plastic thread	0206697
Suction cup BFF110TP Polyurethane 55/60/30 G3/8" female with mesh filter	0206696
Suction cup BFF110TP Polyurethane 55/60/30 G3/8" female with mesh filter, 17 mm thread	0207204
Suction cup BFF110TP Polyurethane 55/60/30 G3/8" male, 1/8" NPSF female, with mesh filter	0206698
Suction cup BFF110TP Polyurethane 55/60/30 M10×1,5 male with mesh filter	0207202
Suction cup BFF110TP Polyurethane 55/60/30 T-slot with mesh filter	0206699
Suction cup BFF110TP Polyurethane 55/60/30. 3/8" NPT female with mesh filter	0206695
Suction cup BFFT50P Polyurethane 60/60/30 G1/4" male with mesh filter	0207698
Suction cup BFFT50P Polyurethane 60/60/30 G3/8" female with mesh filter, 17 mm thread	0209190
Suction cup BFFT50P Polyurethane 60/60/30 M10×1,5 male with mesh filter	0207666
Suction cup BFFT50P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206519
Suction cup BFFT50P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206791
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" female plastic	0206523

Description	Item no.
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206522
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206521
Suction cup BFFT50P Polyurethane 60/60/30, T-slot, with mesh filter	0206524
Suction cup BFFT70P Polyurethane 60/60/30 G1/4" male with mesh filter	0207699
Suction cup BFFT70P Polyurethane 60/60/30 G3/8" female with mesh filter 17 mm thread	0209191
Suction cup BFFT70P Polyurethane 60/60/30 M10×1,5 male with mesh filter	0207667
Suction cup BFFT70P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206525
Suction cup BFFT70P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206792
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" female plastic	0206528
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206527
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206526
Suction cup BFFT70P Polyurethane 60/60/30, T-slot, with mesh filter	0206529
Suction cup BFFT90P Polyurethane 60/60/30 G1/4" male with mesh filter	0207700
Suction cup BFFT90P Polyurethane 60/60/30 G3/8" female with mesh filter, 17 mm thread	0209192
Suction cup BFFT90P Polyurethane 60/60/30 M10×1,5 male with mesh filter	0207669
Suction cup BFFT90P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206530
Suction cup BFFT90P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206793
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" female plastic	0206533
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206532
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206531
Suction cup BFFT90P Polyurethane 60/60/30, T-slot, with mesh filter	0206534

Specifications subject to change without notice.

Multibellows family (BX/BL)



This family is designed for height differences, slightly curved planes and uneven surfaces. Applications such as bag handling, cardboard, high temperature or if the need is specifically to touch a food item as they are also available in material that complies with the FDA (FDA 21 CFR 177.2600) and meets EU's regulation EU 1935/2004.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level					Lifting force parallell to the surface, N, at vacuum level				
	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa
BX10P	—	1	—	2.3	3.7	—	—	—	—	—
BX15P	—	2/3[A]	—	4/5[A]	4.5/6[A]	—	—	—	—	—
BX20P	—	4.5/4.8[A]	—	7/7[A]	9.5/11[A]	—	—	—	—	—
BX25P	—	8/9[A]	—	13/14[A]	17/18[A]	—	5/7[A]	—	10/11[A]	12/14[A]
BX35P	—	12/15[A]	—	20/25[A]	28/30[A]	—	11/14[A]	—	19/23[A]	26/28[A]
BX52P	—	32/35[A]	—	56/59[A]	75/80[A]	—	25/27[A]	—	44/49[A]	54/56[A]
BX75P	—	62/70[A]	—	110/120[A]	141/166[A]	—	39/50[A]	—	83/114[A]	116/150[A]
BX110P	—	158/181[A]	—	306/365[A]	346/424[A]	—	140/158[A]	—	230/244[A]	260/293[A]
BXF60P	—	—	—	88/82[D]	122/115[D]	—	—	—	47/43[D]	50/46[D]
BXF75P	—	—	—	115/117[D]	154/153[D]	—	—	—	73/71[D]	79/76[D]
BXF90P	—	—	—	169/168[D]	231/225[D]	—	—	—	84/92[D]	92/103[D]
BXF105P	—	—	—	217/238[D]	282/314[D]	—	—	—	105/125[D]	114/129[D]

	Lifting force vertical to the surface, N, at vacuum level					Lifting force parallell to the surface, N, at vacuum level				
	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa
BL20-2	—	0.32/3.2[B]	—	0.62/6.2[B]	—	—	—	—	—	—
BL30-2	—	0.64/6.4[B]	—	1.6/16[B]	—	—	—	—	—	—
BL40-2	—	1.1/11[B]	—	2.2/22[B]	—	—	—	—	—	—
BL50-2	—	1.7/17[B]	—	4.3/43[B]	—	—	—	—	—	—
BL30-3P	—	10	—	22	28	—	9	—	10	16
BL40-3P	—	20	—	43	55	—	13	—	24	36
BL50-3P	—	24	—	60	75	—	22	—	49	60
BL30-4	—	8[C]	—	—	—	—	—	—	—	—
BL40-4	—	10	—	15	22	—	9	—	16	26
BL50-4	—	8	—	25	—	—	—	—	—	—
BL30-5	—	8	—	9	—	—	—	—	—	—
BL40-5	—	13	—	15	—	—	—	—	—	—
BL50-5	—	8	—	25	—	—	—	—	—	—
B-BL30-2	4.4	7.4	12.3	—	—	3	4.4	8.3	—	—
B-BL40-2	8.4	15.3	25.7	—	—	4.2	9	19.4	—	—
B-BL60-2	10.6	23.7	43.1	—	—	11.9	21.4	47.9	—	—
F-BX10	0.5	0.9	1.5	—	—	1.2	1.3	1.4	—	—
F-BX15	1.3	2.7	4.3	—	—	1.5	2.8	3.6	—	—
F-BX20	1.3	2.7	4.3	—	—	1.5	2.8	3.6	—	—
F-BX25	3.9	6.9	8	—	—	2.9	4.6	7.3	—	—
F-BX35	7.6	12.9	14.2	—	—	7.5	9.1	10.3	—	—

[A] PU30°/PU60° / PU60°, [B] With reinforcement ring, [C] The suction cup is not intended for deeper vacuum levels than 20 -kPa, [D] Dry metal sheet/Oily metal sheet.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
BX10P	11	16.5	4/6*	4.5	0.56
BX15P	16	18.5	5.5/6*	5.5	0.92
BX20P	21	15.2	10/8.5*	7.5	1.16
BX25P	26	19	6/8*	8.5	3
BX35P	37	26.8	10	14	10
BX52P	53	39	32	19	30
BX75P	77.5	51.7	23	26	80
BX110P	113.7	74	55	39	230
BXF60P	60	52.6–72.1**	70	31.7	80
BXF75P	75	66.5–85.8**	110	40.1	105
BXF90P	90	75.9–88.9**	160	46.2	180
BXF105P	105	89.1–108.6**	230	55.5	284
BL20-2	20	22.9	4	13	4
BL30-2	30	32.5	8	20	10
BL40-2	40	42.4	11	33	27
BL50-2	50	53	13	34	53
BL30-3P	30	35.5	6	14	14
BL40-3P	40	42.4	13	21	27
BL50-3P	48	53	16	26	54
BL30-4	30.5	16.5	20	19	4.1

Specifications subject to change without notice.

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
BL40-4	40.1	39.8	15	18	15
BL50-4	50.3	53	30	22	35
BL30-5	30.5	36.5	17	11	8.55
BL40-5	40	40	22	20	14
BL50-5	50	53	30	18	26
B-BL30-2	30	28	10.8	16.8	11
B-BL40-2	42.5	38	15.8	27.9	29.1
B-BL60-2	60	52.6	18.7	43	82.1
F-BX10	10.5	19	3.6	6.8	0.33
F-BX15	16	24	5.5	9.8	1.13
F-BX20	21	30	5.5	9.8	2.9
F-BX25	26	37	9	15.5	5.1
F-BX35	36	37	13.3	20.2	13.6

* PU30°/PU60° / PU60°. ** Height range includes fittings.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material								MSF
BX10P	PU30°/PU60°	●		●					
BX10P	PU60°	●		●	●	●		●	●
BX15P	PU30°/PU60°	●		●					
BX15P	PU60°	●		●	●	●		●	●
BX20P	PU30°/PU60°	●		●					
BX20P	PU60°	●		●	●	●		●	●
BX25P	PU30°/PU60°	●		●					
BX25P	PU60°	●		●	●	●		●	●
BX35P	PU30°/PU60°	●		●					
BX35P	PU60°	●		●	●	●		●	●
BX52P	PU30°/PU60°	●		●					
BX52P	PU60°	●		●	●	●		●	●
BX75P	PU30°/PU60°	●		●					
BX75P	PU60°	●		●	●	●		●	●
BX110P	PU30°/PU60°	●		●					
BX110P	PU60°	●		●	●	●		●	●
BXF60P	PU60°			●					●
BXF75P	PU60°			●					●
BXF90P	PU60°			●					●

Specifications subject to change without notice.

Cup	Material								MSF
BXF105P	PU60°			●					●
BL20-2	Chloroprene, CR	●				●		●	●
BL20-2	HNBR	●					●	●	
BL20-2	Silicone, SIL	●	●						
BL20-2	Silicone FDA EU, SIL FDA	●	●						
BL30-2	Chloroprene, CR	●				●		●	●
BL30-2	Silicone, SIL	●	●						
BL30-2	Silicone FDA EU, SIL FDA	●	●						
BL40-2	Chloroprene, CR	●				●		●	●
BL40-2	Silicone, SIL	●	●						
BL40-2	Silicone FDA EU, SIL FDA	●	●						
BL50-2	Chloroprene, CR	●				●		●	●
BL50-2	Silicone, SIL	●	●						
BL50-2	Silicone FDA EU, SIL FDA	●	●						
BL30-3P	PU30°/PU70°	●		●					
BL40-3P	PU30°/PU70°	●		●					
BL50-3P	PU30°/PU70°	●		●					
BL30-4	Silicone, SIL	●	●						
BL30-4	Silicone FDA EU, SIL FDA	●	●						
BL40-4	Silicone, SIL	●	●						

Specifications subject to change without notice.

Cup	Material								MSF
BL40-4	Silicone FDA EU, SIL FDA	●	●						
BL50-4	Silicone, SIL	●	●						
BL50-4	Silicone FDA EU, SIL FDA	●	●						
BL30-5	Silicone, SIL	●	●						
BL30-5	Silicone FDA EU, SIL FDA	●	●						
BL40-5	Silicone, SIL	●	●						
BL40-5	Silicone FDA EU, SIL FDA	●	●						
BL50-5	Silicone, SIL	●	●						
BL50-5	Silicone FDA EU, SIL FDA	●	●						
B-BL30-2	Silicone FDA EU detectable, SIL FDA DET	●	●						
B-BL40-2	Silicone FDA EU detectable, SIL FDA DET	●	●						
B-BL60-2	Silicone FDA EU detectable, SIL FDA DET	●	●						
F-BX10	Silicone FDA EU detectable, SIL FDA DET	●	●						
F-BX15	Silicone FDA EU detectable, SIL FDA DET	●	●						
F-BX20	Silicone FDA EU detectable, SIL FDA DET	●	●						
F-BX25	Silicone FDA EU detectable, SIL FDA DET	●	●						
F-BX35	Silicone FDA EU detectable, SIL FDA DET	●	●						

MATERIAL RESISTANCE
For more material information go to page 23.

APPLICATIONS
Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

Specifications subject to change without notice.

	Dry sheet metal	Bag handling	Corrugated / cardboard	Food contact materials (FDA & EU), non-detectable	Food contact materials (FDA & EU), detectable	Mark Free	Oily sheet metal	Plastic injection molded parts
BX10P	●		●			●		●
BX15P	●		●			●		●
BX20P	●		●			●		●
BX25P	●		●			●		●
BX35P	●		●			●		●
BX52P	●		●			●		●
BX75P	●		●			●		●
BX110P	●		●			●		●
BXF60P							●	
BXF75P							●	
BXF90P							●	
BXF105P							●	
BL20-2		●		●		●		
BL30-2		●		●				
BL40-2		●		●				
BL50-2		●		●				
BL30-3P		●						
BL40-3P		●						

	Dry sheet metal	Bag handling	Corrugated / cardboard	Food contact materials (FDA & EU), non-detectable	Food contact materials (FDA & EU), detectable	Mark Free	Oily sheet metal	Plastic injection molded parts
BL50-3P		●						
BL30-4		●		●				
BL40-4		●		●				
BL50-4		●		●				
BL30-5		●		●				
BL40-5		●		●				
BL50-5		●		●				
B-BL30-2					●			
B-BL40-2					●			
B-BL60-2					●			
F-BX10					●			
F-BX15					●			
F-BX20					●			
F-BX25					●			
F-BX35					●			

FITTINGS
For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup BX10P Polyurethane 30/60	0118329
Suction cup BX10P Polyurethane 30/60, M5 male	0122869
Suction cup BX10P Polyurethane 60	0122966
Suction cup BX10P Polyurethane 60, M5 male	0122967
Suction cup BX15P Polyurethane 30/60	0118505
Suction cup BX15P Polyurethane 30/60, M5 male	0124344
Suction cup BX15P Polyurethane 60	0124237
Suction cup BX15P Polyurethane 60, M5 male	0124345
Suction cup BX20P Polyurethane 30/60	0118507
Suction cup BX20P Polyurethane 30/60, 5xM5 female	0125107
Suction cup BX20P Polyurethane 30/60, G1/8" male	0125108
Suction cup BX20P Polyurethane 30/60, G1/8" male / M5 female	0125105
Suction cup BX20P Polyurethane 30/60, G1/8" male / M5 female, with dual flow control valve	0125106
Suction cup BX20P Polyurethane 30/60, M5 female	0125104
Suction cup BX20P Polyurethane 60	0124249
Suction cup BX20P Polyurethane 60, 5xM5 female	0125111
Suction cup BX20P Polyurethane 60, G1/8" male	0125112
Suction cup BX20P Polyurethane 60, G1/8" male / M5 female	0125110
Suction cup BX20P Polyurethane 60, M5 female	0125109
Suction cup BX25P Polyurethane 30/60	0109006
Suction cup BX25P Polyurethane 30/60 with filter, 5xM5 female	0109405

Specifications subject to change without notice.

Description	Item no.
Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male / M5 female	0109402
Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male / M5 female, with dual flow control valve	0109403
Suction cup BX25P Polyurethane 30/60 with filter, G1/8" male with mesh filter	0114131
Suction cup BX25P Polyurethane 30/60 with filter, M5 female	0109404
Suction cup BX25P Polyurethane 30/60, with filter	0109312
Suction cup BX25P Polyurethane 60	0108240
Suction cup BX25P Polyurethane 60 with filter, 5xM5 female	0109401
Suction cup BX25P Polyurethane 60 with filter, G1/8" male	0114149
Suction cup BX25P Polyurethane 60 with filter, G1/8" male / M5 female	0109398
Suction cup BX25P Polyurethane 60 with filter, M5 female	0109400
Suction cup BX25P Polyurethane 60, with filter	0109397
Suction cup BX35P, Polyurethane 30/60	0106292
Suction cup BX35P Polyurethane 30/60 with filter, 1/4" NPT male, with dual flow control valve	9909193
Suction cup BX35P Polyurethane 30/60 with filter, 1/4" NPT male, with mesh filter	0107563
Suction cup BX35P Polyurethane 30/60 with filter, 1/8" NPSF female	0106604
Suction cup BX35P Polyurethane 30/60 with filter, 1/8" NPSF female, with dual flow control valve	0106605
Suction cup BX35P Polyurethane 30/60 with filter, 3/8" NPT male, with dual flow control valve	9909194
Suction cup BX35P Polyurethane 30/60 with filter, 3/8" NPT male, with mesh filter	9906975
Suction cup BX35P Polyurethane 30/60 with filter, G1/4" male, with mesh filter	0114449
Suction cup BX35P Polyurethane 30/60 with filter, G1/8" male, with mesh filter	9912151
Suction cup BX35P Polyurethane 30/60 with filter, G3/8" male, mesh filter, dual flow control valve	0107378

Specifications subject to change without notice.

Description	Item no.
Suction cup BX35P Polyurethane 30/60 with filter, G3/8" male, with mesh filter	0107377
Suction cup BX35P Polyurethane 30/60, with filter	0106619
Suction cup BX35P, Polyurethane 60	0107477
Suction cup BX35P Polyurethane 60 with filter, 1/4" NPT male, with dual flow control valve	9909190
Suction cup BX35P Polyurethane 60 with filter, 1/4" NPT male, with mesh filter	0107567
Suction cup BX35P Polyurethane 60 with filter, 1/8" NPSF female	0107561
Suction cup BX35P Polyurethane 60 with filter, 1/8" NPSF female, with dual flow control valve	0107562
Suction cup BX35P Polyurethane 60 with filter, 3/8" NPT male, with dual flow control valve	9909191
Suction cup BX35P Polyurethane 60 with filter, 3/8" NPT male, with mesh filter	9909187
Suction cup BX35P Polyurethane 60 with filter, G1/8" male, with mesh filter	9912152
Suction cup BX35P Polyurethane 60 with filter, G3/8" male, with mesh filter	0107379
Suction cup BX35P Polyurethane 60 with filter, G3/8" male, with mesh filter and dual flow control valve	0107380
Suction cup BX35P Polyurethane 60, with filter	0107376
Suction cup BX52P Polyurethane 30/60	0104529
Suction cup BX52P Polyurethane 30/60 with filter, 1/4" NPT male, with dual flow control valve	9908595
Suction cup BX52P Polyurethane 30/60 with filter, 1/4" NPT male, with mesh filter	0106047
Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female	0104727
Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female, with mesh filter	0106044
Suction cup BX52P Polyurethane 30/60 with filter, 1/8" NPSF female, with dual flow control valve	0106019
Suction cup BX52P Polyurethane 30/60 with filter, 3/8" NPT male, with dual flow control valve	9908596
Suction cup BX52P Polyurethane 30/60 with filter, 3/8" NPT male, with mesh filter	0107515

Specifications subject to change without notice.

Description	Item no.
Suction cup BX52P Polyurethane 30/60 with filter, 5x1/8" NPSF female	0106046
Suction cup BX52P Polyurethane 30/60 with filter, 5x1/8" NPSF female, with dual flow control valve	0106742
Suction cup BX52P Polyurethane 30/60 with filter, G1/4" male, with dual flow control valve	0106739
Suction cup BX52P Polyurethane 30/60 with filter, G1/4" male, with mesh filter	0106045
Suction cup BX52P Polyurethane 30/60 with filter, G1/8" male, with mesh filter	9912153
Suction cup BX52P Polyurethane 30/60 with filter, G3/8" male, with dual flow control valve	0106741
Suction cup BX52P Polyurethane 30/60 with filter, G3/8" male, with mesh filter	0106740
Suction cup BX52P Polyurethane 30/60, with filter	0104729
Suction cup BX52P Polyurethane 60	0107381
Suction cup BX52P Polyurethane 60 with filter, 1/4" NPT male, with dual flow control valve	9908593
Suction cup BX52P Polyurethane 60 with filter, 1/4" NPT male, with mesh filter	0107391
Suction cup BX52P Polyurethane 60 with filter, 1/8" NPSF female	0107383
Suction cup BX52P Polyurethane 60 with filter, 1/8" NPSF female, with mesh filter	0107382
Suction cup BX52P Polyurethane 60 with filter, 3/8" NPT male, with dual flow control valve	9908594
Suction cup BX52P Polyurethane 60 with filter, 3/8" NPT male, with mesh filter	0107516
Suction cup BX52P Polyurethane 60 with filter, 5x1/8" NPSF female	0107389
Suction cup BX52P Polyurethane 60 with filter, 5x1/8" NPSF female, with dual flow control valve	0107390
Suction cup BX52P Polyurethane 60 with filter, G1/4" male, with dual flow control valve	0107386
Suction cup BX52P Polyurethane 60 with filter, G1/4" male, with mesh filter	0107385
Suction cup BX52P Polyurethane 60 with filter, G1/8" male, with mesh filter	9912154
Suction cup BX52P Polyurethane 60 with filter, G3/8" male, with dual flow control valve	0107388

Specifications subject to change without notice.

Description	Item no.
Suction cup BX52P Polyurethane 60 with filter, G3/8" male, with mesh filter	0107387
Suction cup BX52P Polyurethane 60, with filter	0108039
Suction cup BX75P Polyurethane 30/60 with filter, 3/8" NPSF female	0108794
Suction cup BX75P Polyurethane 30/60 with filter, for thread insert	0107145
Suction cup BX75P Polyurethane 30/60 with filter, G3/8" male / 1/8" NPSF female	0106606
Suction cup BX75P Polyurethane 30/60 with filter, thread insert G1/4" male	0201073
Suction cup BX75P Polyurethane 30/60 with filter, thread insert G1/8" male	0201082
Suction cup BX75P Polyurethane 30/60 with filter, thread insert G3/8" male	0107151
Suction cup BX75P Polyurethane 30/60, G3/8" male / 1/8" NPSF female	0106293
Suction cup BX75P Polyurethane 60 with filter, 3/8" NPSF female	0108795
Suction cup BX75P Polyurethane 60 with filter, for thread insert	0107150
Suction cup BX75P Polyurethane 60 with filter, thread insert G1/4" male	0201074
Suction cup BX75P Polyurethane 60 with filter, thread insert G1/8" male	0201083
Suction cup BX75P Polyurethane 60 with filter, thread insert G3/8" male	0107149
Suction cup BX110P Polyurethane 30/60	0107093
Suction cup BX110P Polyurethane 30/60 with filter, 3/8" NPSF female	0108403
Suction cup BX110P Polyurethane 30/60 with filter, thread insert G3/8" male	0108273
Suction cup BX110P Polyurethane 30/60, with filter	0108164
Suction cup BX110P Polyurethane 60 with filter, 3/8" NPSF female	0108404
Suction cup BX110P Polyurethane 60 with filter, thread insert G3/8" male	0108341
Suction cup BX110P Polyurethane 60, with filter	0108340

Specifications subject to change without notice.

Description	Item no.
Suction cup BXF60P Polyurethane 60, 3/8" NPT female with mesh filter	0207750
Suction cup BXF60P Polyurethane 60, G1/4" female with mesh filter	0207751
Suction cup BXF60P Polyurethane 60, G1/4" male with mesh filter	0207752
Suction cup BXF60P Polyurethane 60, G3/8" female plastic thread	0207530
Suction cup BXF60P Polyurethane 60, G3/8" female with mesh filter	0207748
Suction cup BXF60P Polyurethane 60, G3/8" female with mesh filter, 17 mm thread	0209305
Suction cup BXF60P Polyurethane 60, G3/8" male with mesh filter	0207749
Suction cup BXF60P Polyurethane 60, M10×1,5 male with mesh filter	0207753
Suction cup BXF60P Polyurethane 60, T-slot with mesh filter	0207747
Suction cup BXF75P Polyurethane 60, 3/8" NPT female with mesh filter	0209311
Suction cup BXF75P Polyurethane 60, G1/4" female with mesh filter	0209312
Suction cup BXF75P Polyurethane 60, G1/4" male with mesh filter	0209313
Suction cup BXF75P Polyurethane 60, G3/8" female plastic thread	0209307
Suction cup BXF75P Polyurethane 60, G3/8" female with mesh filter	0209308
Suction cup BXF75P Polyurethane 60, G3/8" female with mesh filter, 17 mm thread	0209309
Suction cup BXF75P Polyurethane 60, G3/8" male with mesh filter	0209310
Suction cup BXF75P Polyurethane 60, M10×1,5 male with mesh filter	0209314
Suction cup BXF75P Polyurethane 60, T-slot with mesh filter	0209315
Suction cup BXF90P Polyurethane 60, 3/8" NPT female with mesh filter	0207743
Suction cup BXF90P Polyurethane 60, G1/4" female with mesh filter	0207744
Suction cup BXF90P Polyurethane 60, G1/4" male with mesh filter	0207745

Description	Item no.
Suction cup BXF90P Polyurethane 60, G3/8" female plastic thread	0207531
Suction cup BXF90P Polyurethane 60, G3/8" female with mesh filter	0207741
Suction cup BXF90P Polyurethane 60, G3/8" female with mesh filter, 17 mm thread	0209356
Suction cup BXF90P Polyurethane 60, G3/8" male with mesh filter	0207742
Suction cup BXF90P Polyurethane 60, M10×1,5 male with mesh filter	0207746
Suction cup BXF90P Polyurethane 60, T-slot with mesh filter	0207740
Suction cup BXF105P Polyurethane 60, 3/8" NPT female with mesh filter	0209427
Suction cup BXF105P Polyurethane 60, G1/4" female with mesh filter	0209428
Suction cup BXF105P Polyurethane 60, G1/4" male with mesh filter	0209429
Suction cup BXF105P Polyurethane 60, G3/8" female plastic thread	0209378
Suction cup BXF105P Polyurethane 60, G3/8" female with mesh filter	0209424
Suction cup BXF105P Polyurethane 60, G3/8" female with mesh filter, 17 mm thread	0209425
Suction cup BXF105P Polyurethane 60, G3/8" male with mesh filter	0209426
Suction cup BXF105P Polyurethane 60, M10×1,5 male with mesh filter	0209430
Suction cup BXF105P Polyurethane 60, T-slot with mesh filter	0209431
Suction cup BL20-2 Chloroprene	0101115
Suction cup BL20-2 Chloroprene, 5xM5 female	0101197
Suction cup BL20-2 Chloroprene, G1/8" male, with mesh filter	0101194
Suction cup BL20-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101200
Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, PA	0109844
Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101202

Specifications subject to change without notice.

Description	Item no.
Suction cup BL20-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101198
Suction cup BL20-2 Chloroprene, M5 female	0101193
Suction cup BL20-2 HNBR	0201132
Suction cup BL20-2 HNBR, 5xM5 female	9914282
Suction cup BL20-2 HNBR, 5xM5 female, with dual flow control valve	9914283
Suction cup BL20-2 HNBR, G1/8" male, with mesh filter	9914278
Suction cup BL20-2 HNBR, G1/8" male, with mesh filter and dual flow control valve	9914279
Suction cup BL20-2 HNBR, G1/8" male/M5 female, PA	9914284
Suction cup BL20-2 HNBR, G1/8" male/M5 female, with dual flow control valve	9914281
Suction cup BL20-2 HNBR, G1/8" male/M5 female, with mesh filter	9914280
Suction cup BL20-2 HNBR, M5 female	9914276
Suction cup BL20-2 HNBR, M5 female, with dual flow control valve	9914277
Suction cup BL20-2 Silicone	0101116
Suction cup BL20-2 Silicone FCM	0200412
Suction cup BL20-2 Silicone FCM, G1/8" male, with mesh filter	9909637
Suction cup BL20-2 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909716
Suction cup BL20-2 Silicone, 5xM5 female	0101208
Suction cup BL20-2 Silicone, G1/8" male, with mesh filter	0101205
Suction cup BL20-2 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101211
Suction cup BL20-2 Silicone, G1/8" male/M5 female, PA	0110339
Suction cup BL20-2 Silicone, G1/8" male/M5 female, with mesh filter	0101209

Description	Item no.
Suction cup BL20-2 Silicone, M5 female	0101204
Suction cup BL20-2 Silicone, M5 female, with dual flow control valve	0101210
Suction cup BL30-2 Chloroprene	0101117
Suction cup BL30-2 Chloroprene, 1/8" NPSF female, PA	0110951
Suction cup BL30-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101502
Suction cup BL30-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101501
Suction cup BL30-2 Chloroprene, G1/4" male, with mesh filter	0101496
Suction cup BL30-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101503
Suction cup BL30-2 Chloroprene, G3/8" male, with mesh filter	0101498
Suction cup BL30-2 Silicone	0101118
Suction cup BL30-2 Silicone FCM	0200411
Suction cup BL30-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909641
Suction cup BL30-2 Silicone FCM, G1/4" male, with mesh filter	9909639
Suction cup BL30-2 Silicone, 1/8" NPSF female, PA	0110340
Suction cup BL30-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101515
Suction cup BL30-2 Silicone, 1/8" NPSF female, with mesh filter	0101514
Suction cup BL30-2 Silicone, 5x1/8" NPSF female	0101513
Suction cup BL30-2 Silicone, G1/4" male, with mesh filter	0101509
Suction cup BL30-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101516
Suction cup BL30-2 Silicone, G3/8" male, with mesh filter	0101511
Suction cup BL40-2 Chloroprene	0101119

Specifications subject to change without notice.

Description	Item no.
Suction cup BL40-2 Chloroprene, 1/8" NPSF female, PA	0110946
Suction cup BL40-2 Chloroprene, 5x1/8" NPSF female	0101526
Suction cup BL40-2 Chloroprene, 5x1/8" NPSF female, with dual flow control valve	0101533
Suction cup BL40-2 Chloroprene, G1/4" male, with mesh filter	0101522
Suction cup BL40-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101529
Suction cup BL40-2 Chloroprene, G3/8" male, with mesh filter	0101524
Suction cup BL40-2 Silicone	0101120
Suction cup BL40-2 Silicone FCM	0200415
Suction cup BL40-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909643
Suction cup BL40-2 Silicone FCM, G1/4" male, with mesh filter	9909642
Suction cup BL40-2 Silicone, 1/8" NPSF female, PA	0110341
Suction cup BL40-2 Silicone, 1/8" NPSF female, with mesh filter	0101540
Suction cup BL40-2 Silicone, 5x1/8" NPSF female	0101539
Suction cup BL40-2 Silicone, G1/4" male, with mesh filter	0101535
Suction cup BL40-2 Silicone, G1/4" male, with mesh filter and dual flow control valve	0101542
Suction cup BL40-2 Silicone, G3/8" male, with mesh filter	0101537
Suction cup BL40-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101527
Suction cup BL50-2 Chloroprene	0101121
Suction cup BL50-2 Chloroprene, 1/8" NPSF female, PA	0110958
Suction cup BL50-2 Chloroprene, 1/8" NPSF female, with dual flow control valve	0101702
Suction cup BL50-2 Chloroprene, 1/8" NPSF female, with mesh filter	0101701

Description	Item no.
Suction cup BL50-2 Chloroprene, 5x1/8" NPSF female	0101700
Suction cup BL50-2 Chloroprene, G1/4" male, with mesh filter	0101696
Suction cup BL50-2 Chloroprene, G1/4" male, with mesh filter and dual flow control valve	0101703
Suction cup BL50-2 Chloroprene, G3/8" male, with mesh filter	0101698
Suction cup BL50-2 Chloroprene, G3/8" male, with mesh filter and dual flow control valve	0101705
Suction cup BL50-2 Silicone	0101122
Suction cup BL50-2 Silicone FCM	0200416
Suction cup BL50-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909644
Suction cup BL50-2 Silicone FCM, G1/4" male, with mesh filter	9909616
Suction cup BL50-2 Silicone, 1/8" NPSF female, PA	0110342
Suction cup BL50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101715
Suction cup BL50-2 Silicone, 1/8" NPSF female, with mesh filter	0101714
Suction cup BL50-2 Silicone, G1/4" male, with mesh filter	0101709
Suction cup BL50-2 Silicone, G3/8" male, with mesh filter	0101711
Suction cup BL30-3P Polyurethane 30/70	0110545
Suction cup BL30-3P Polyurethane 30/70, G3/8" male	0113743
Suction cup BL30-3P Polyurethane 30/70, 3/8" NPT male	0113744
Suction cup BL40-3P Polyurethane 30/70	0112667
Suction cup BL40-3P Polyurethane 30/70, 3/8" NPT male	0112693
Suction cup BL40-3P Polyurethane 30/70, G3/8" male	0111791
Suction cup BL50-3P Polyurethane 30/70	0112641

Specifications subject to change without notice.

Description	Item no.
Suction cup BL50-3P Polyurethane 30/70, G1/2" male	0113745
Suction cup BL50-3P Polyurethane 30/70, 1/2" NPT male	0113746
Suction cup BL30-4 Silicone	0116971
Suction cup BL30-4 Silicone, G1/4" male	0118369
Suction cup BL30-4 Silicone, 1/4" NPT male	0118371
Suction cup BL30-4 Silicone FCM	0200436
Suction cup BL30-4 Silicone FCM, G1/4" male	9909645
Suction cup BL30-4 Silicone FCM, 1/4" NPT male	9909646
Suction cup BL40-4 Silicone	0114848
Suction cup BL40-4 Silicone, G3/8" male	0116993
Suction cup BL40-4 Silicone, 3/8" NPT male	0116996
Suction cup BL40-4 Silicone FCM	0200337
Suction cup BL40-4 Silicone FCM, G3/8" male	9909647
Suction cup BL40-4 Silicone FCM, 3/8" NPT male	9909648
Suction cup BL50-4 Silicone, G1/2" male	0120543
Suction cup BL50-4 Silicone, 1/2" NPT male	0120544
Suction cup BL50-4 Silicone FCM	0200238
Suction cup BL50-4 Silicone FCM, G1/2" male	9909649
Suction cup BL50-4 Silicone FCM, 1/2" NPT male	9909650
Suction cup BL30-5 Silicone	0121519
Suction cup BL30-5 Silicone FCM	0200239

Specifications subject to change without notice.

Description	Item no.
Suction cup BL30-5 Silicone FCM, 1/4" NPT male	9909652
Suction cup BL30-5 Silicone FCM, G1/4" male	9909651
Suction cup BL30-5 Silicone, 1/4" NPT male	0124669
Suction cup BL30-5 Silicone, 1/4" NPT male	0124516
Suction cup BL30-5 Silicone, G1/4" male	0124515
Suction cup BL40-5 Silicone	0117611
Suction cup BL40-5 Silicone, G3/8" male	0120576
Suction cup BL40-5 Silicone, 3/8" NPT male	0120577
Suction cup BL40-5 Silicone FCM	0200237
Suction cup BL40-5 Silicone FCM, G3/8" male	9909653
Suction cup BL40-5 Silicone FCM, 3/8" NPT male	9909654
Suction cup BL50-5 Silicone	0121520
Suction cup BL50-5 Silicone FCM	0200240
Suction cup BL50-5 Silicone FCM, 1/2" NPT male	9909656
Suction cup BL50-5 Silicone FCM, G1/2" male	9909655
Suction cup BL50-5 Silicone, 1/2" NPT male	0122962
Suction cup BL50-5 Silicone, G1/2" male	0122961
Suction cup B-BL30-2 Silicone, detectable, FCM	0206373
Suction cup B-BL30-2 Silicone, 1/2" NPT male composite detectable, FCM	0207098
Suction cup B-BL30-2 Silicone, 1/2" NPT male SS detectable, FCM	0207095
Suction cup B-BL30-2 Silicone, 3/8" NPT male composite detectable, FCM	0207099

Specifications subject to change without notice.

Description	Item no.
Suction cup B-BL30-2 Silicone, 3/8" NPT male SS detectable, FCM	0207094
Suction cup B-BL30-2 Silicone, G1/2" male composite detectable, FCM	0207096
Suction cup B-BL30-2 Silicone, G1/2" male SS detectable, FCM	0207093
Suction cup B-BL30-2 Silicone, G3/8" male composite detectable, FCM	0207097
Suction cup B-BL30-2 Silicone, G3/8" male SS detectable, FCM	0207092
Suction cup B-BL30-2 Silicone, with retainer clip, detectable FCM	0207100
Suction cup B-BL40-2 Silicone, detectable, FCM	0202850
Suction cup B-BL40-2 Silicone, 1/2" NPT male composite detectable, FCM	0207108
Suction cup B-BL40-2 Silicone, 1/2" NPT male SS detectable, FCM	0207104
Suction cup B-BL40-2 Silicone, 3/8" NPT male composite detectable, FCM	0207107
Suction cup B-BL40-2 Silicone, 3/8" NPT male SS detectable, FCM	0207103
Suction cup B-BL40-2 Silicone, G1/2" male composite detectable, FCM	0207106
Suction cup B-BL40-2 Silicone, G1/2" male SS detectable, FCM	0207102
Suction cup B-BL40-2 Silicone, G3/8" male composite detectable, FCM	0207105
Suction cup B-BL40-2 Silicone, G3/8" male SS detectable, FCM	0207101
Suction cup B-BL40-2 Silicone, with retainer clip, detectable, FCM	0207109
Suction cup B-BL60-2 Silicone, detectable, FCM	0206374
Suction cup B-BL60-2 Silicone, 1/2" NPT male composite detectable, FCM	0207118
Suction cup B-BL60-2 Silicone, 1/2" NPT male SS detectable, FCM	0207113
Suction cup B-BL60-2 Silicone, 3/8" NPT male composite detectable, FCM	0207117
Suction cup B-BL60-2 Silicone, 3/8" NPT male SS detectable, FCM	0207112

Description	Item no.
Suction cup B-BL60-2 Silicone, G1/2" male SS detectable, FCM	0207111
Suction cup B-BL60-2 Silicone, G1/2" male, composite detectable, FCM	0207115
Suction cup B-BL60-2 Silicone, G3/8" male SS detectable, FCM	0207110
Suction cup B-BL60-2 Silicone, G3/8" male, composite detectable, FCM	0207114
Suction cup B-BL60-2 Silicone, with retainer clip, detectable, FCM	0207119
Suction cup F-BX10 Silicone detectable, FCM	0206202
Suction cup F-BX10 Silicone 1/8" NPT male composite, detectable, FCM	0207054
Suction cup F-BX10 Silicone 1/8" NPT male SS, detectable, FCM	0207051
Suction cup F-BX10 Silicone G1/8" male composite, detectable, FCM	0207053
Suction cup F-BX10 Silicone G1/8" male SS, detectable, FCM	0207050
Suction cup F-BX10 Silicone M5 male composite, detectable, FCM	0207052
Suction cup F-BX10 Silicone M5 male SS, detectable, FCM	0207049
Suction cup F-BX15 Silicone detectable, FCM	0206203
Suction cup F-BX15 Silicone 1/4" NPT male composite, detectable, FCM	0207062
Suction cup F-BX15 Silicone 1/4" NPT male SS, detectable, FCM	0207058
Suction cup F-BX15 Silicone 1/8" NPT male composite, detectable, FCM	0207061
Suction cup F-BX15 Silicone 1/8" NPT male SS, detectable, FCM	0207057
Suction cup F-BX15 Silicone G1/4" male composite, detectable, FCM	0207060
Suction cup F-BX15 Silicone G1/4" male SS, detectable, FCM	0207056
Suction cup F-BX15 Silicone G1/8" male composite, detectable, FCM	0207059
Suction cup F-BX15 Silicone G1/8" male SS, detectable, FCM	0207055

Description	Item no.
Suction cup F-BX20 Silicone detectable, FCM	0206204
Suction cup F-BX20 Silicone 1/4" NPT male composite, detectable, FCM	0207070
Suction cup F-BX20 Silicone 1/4" NPT male SS, detectable, FCM	0207066
Suction cup F-BX20 Silicone 1/8" NPT male composite, detectable, FCM	0207069
Suction cup F-BX20 Silicone 1/8" NPT male SS, detectable, FCM	0207065
Suction cup F-BX20 Silicone G1/4" male composite, detectable, FCM	0207068
Suction cup F-BX20 Silicone G1/4" male SS, detectable, FCM	0207064
Suction cup F-BX20 Silicone G1/8" male composite, detectable, FCM	0207067
Suction cup F-BX20 Silicone G1/8" male SS, detectable, FCM	0207063
Suction cup F-BX25 Silicone detectable, FCM	0206205
Suction cup F-BX25 Silicone 1/4" NPT male composite, detectable, FCM	0207077
Suction cup F-BX25 Silicone 1/4" NPT male SS, detectable, FCM	0207073
Suction cup F-BX25 Silicone 3/8" NPT male composite, detectable, FCM	0207078
Suction cup F-BX25 Silicone 3/8" NPT male SS, detectable, FCM	0207074
Suction cup F-BX25 Silicone G1/4" male composite, detectable, FCM	0207075
Suction cup F-BX25 Silicone G1/4" male SS, detectable, FCM	0207071
Suction cup F-BX25 Silicone G3/8" male composite, detectable, FCM	0207076
Suction cup F-BX25 Silicone G3/8" male SS, detectable, FCM	0207072
Suction cup F-BX35 Silicone detectable, FCM	0206206
Suction cup F-BX35 Silicone 1/4" NPT male composite, detectable, FCM	0207085
Suction cup F-BX35 Silicone 1/4" NPT male SS, detectable, FCM	0207081

Specifications subject to change without notice.

Description	Item no.
Suction cup F-BX35 Silicone 3/8" NPT male composite, detectable, FCM	0207086
Suction cup F-BX35 Silicone 3/8" NPT male SS, detectable, FCM	0207082
Suction cup F-BX35 Silicone G1/4" male composite, detectable, FCM	0207083
Suction cup F-BX35 Silicone G1/4" male SS, detectable, FCM	0207079
Suction cup F-BX35 Silicone G3/8" male composite, detectable, FCM	0207084
Suction cup F-BX35 Silicone G3/8" male SS, detectable, FCM	0207080

Specifications subject to change without notice.

Deep family (D)



This family is designed for curved and irregular surfaces. Can lift even over corners and edges. This product is also available in material that is compliant by FDA (FDA 21 CFR 177.2600) and meets EU's regulation EU 1935/2004.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level					Lifting force parallell to the surface, N, at vacuum level				
	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa
D15-2	—	2.9	—	7.8	11	—	—		—	—
D20-2	—	5.9	—	15	18	—	—		—	—
D30-2	—	14	—	26	31	—	—		—	—
D50	—	36	—	78	98	—	—		—	—
P-D27	3.2	5.5	8.1	—	—	7.6	13.5	21.4	—	—
P-D36	4.5	8.6	19	—	—	12.2	16.8	28.3	—	—

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
D15-2	16	16.6	6	3	0.9
D20-2	22	13.2	8	4.5	2.5
D30-2	32	19.2	13	5	5
D50	53	31.5	25	10	15
P-D27	26.9	31.5	28	–	6.6
P-D36	35.8	41.3	37	–	16.2

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material					MSF
D15-2	Chloroprene, CR	●		●	●	●
D15-2	Silicone, SIL	●	●			
D15-2	Silicone FDA EU, SIL FDA	●	●			
D20-2	Chloroprene, CR	●		●	●	●
D20-2	Silicone, SIL	●	●			
D20-2	Silicone FDA EU, SIL FDA	●	●			
D30-2	Chloroprene, CR	●		●	●	●
D30-2	Silicone, SIL	●	●			
D30-2	Silicone FDA EU, SIL FDA	●	●			
D50	Chloroprene, CR	●		●	●	●
D50	Silicone, SIL	●	●			
D50	Silicone FDA EU, SIL FDA	●	●			

Specifications subject to change without notice.

Cup	Material					MSF
P-D27	Silicone (SIL detectable FCM)	●	●			
P-D36	Silicone (SIL detectable FCM)	●	●			

MATERIAL RESISTANCE
For more material information go to page 23.

APPLICATIONS
Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Dry sheet metal	FDA EU-standard compliant	Plastic injection molded parts
D15-2	●	●	●
D20-2	●	●	●
D30-2	●	●	●
D50	●	●	●
P-D27		●	
P-D36		●	

FITTINGS
For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup D15-2 Chloroprene, M5 male	3150010
Suction cup D15-2 Silicone	3150135S
Suction cup D15-2 Silicone FCM	0200266
Suction cup D15-2 Silicone FCM, M5 male	9909674
Suction cup D15-2 Silicone, M5 male	3150010S
Suction cup D15-2 Silicone	3150135S
Suction cup D20-2 Chloroprene	0101123

Description	Item no.
Suction cup D20-2 Chloroprene, G1/8" male, with mesh filter	0101216
Suction cup D20-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101220
Suction cup D20-2 Chloroprene, M5 female	0101215
Suction cup D20-2 Silicone	0101124
Suction cup D20-2 Silicone FCM	0200444
Suction cup D20-2 Silicone FCM, G1/8" male, with mesh filter	9909712
Suction cup D20-2 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909713
Suction cup D20-2 Silicone, G1/8" male, with mesh filter	0101227
Suction cup D20-2 Silicone, G1/8" male/M5 female, PA	0110331
Suction cup D20-2 Silicone, G1/8" male/M5 female, with mesh filter	0101231
Suction cup D20-2 Silicone, M5 female	0101226
Suction cup D20-2 Silicone, M5 female, with dual flow control valve	0101232
Suction cup D30-2 Chloroprene	0101125
Suction cup D30-2 Chloroprene, G1/8" male, with mesh filter	0101238
Suction cup D30-2 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101244
Suction cup D30-2 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101246
Suction cup D30-2 Chloroprene, G1/8" male/M5 female, with mesh filter	0101242
Suction cup D30-2 Chloroprene, M5 female	0101237
Suction cup D30-2 Silicone	0101126
Suction cup D30-2 Silicone FCM	0200446
Suction cup D30-2 Silicone FCM, G1/8" male, with mesh filter	9909714

Description	Item no.
Suction cup D30-2 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909715
Suction cup D30-2 Silicone, 5xM5 female	0101252
Suction cup D30-2 Silicone, G1/8" male, with mesh filter	0101249
Suction cup D30-2 Silicone, G1/8" male/M5 female, with mesh filter	0101253
Suction cup D30-2 Silicone, M5 female	0101248
Suction cup D30-2 Silicone, G1/8" male/M5 female, PA	0110332
Suction cup D50 Chloroprene	0101127
Suction cup D50 Chloroprene, 1/8" NPSF female, PA	0109841
Suction cup D50 Chloroprene, 1/8" NPSF female, with mesh filter	0101727
Suction cup D50 Chloroprene, G1/4" male, with mesh filter	0101722
Suction cup D50 Chloroprene, G3/8" male, with mesh filter	0101724
Suction cup D50 Silicone	0101128
Suction cup D50 Silicone FCM	0200445
Suction cup D50 Silicone FCM, 1/8" NPSF female, with mesh filter	9909676
Suction cup D50 Silicone FCM, G1/4" male, with mesh filter	9909675
Suction cup D50 Silicone, 1/4" NPT male, with mesh filter	0101736
Suction cup D50 Silicone, 1/8" NPSF female, with mesh filter	0101740
Suction cup D50 Silicone, G1/4" male, with mesh filter	0101735
Suction cup D50 Silicone, G3/8" male, with mesh filter	0101737
Suction cup P-D27 Silicone detectable, FCM	0206371
Suction cup P-D27 Silicone 1/4" NPT male composite, detectable, FCM	0207027

Description	Item no.
Suction cup P-D27 Silicone 1/4" NPT male SS, detectable, FCM	0207023
Suction cup P-D27 Silicone 1/8" NPT male composite, detectable, FCM	0207028
Suction cup P-D27 Silicone 1/8" NPT male SS, detectable, FCM	0207024
Suction cup P-D27 Silicone G1/4" male composite, detectable, FCM	0207025
Suction cup P-D27 Silicone G1/4" male SS, detectable, FCM	0207021
Suction cup P-D27 Silicone G1/8" male composite, detectable, FCM	0207026
Suction cup P-D27 Silicone G1/8" male SS, detectable, FCM	0207022
Suction cup P-D36 Silicone detectable, FCM	0206372
Suction cup P-D36 Silicone 1/4" NPT male composite, detectable, FCM	0207035
Suction cup P-D36 Silicone 1/4" NPT male SS, detectable, FCM	0207031
Suction cup P-D36 Silicone 3/8" NPT male composite, detectable, FCM	0207036
Suction cup P-D36 Silicone 3/8" NPT male SS, detectable, FCM	0207032
Suction cup P-D36 Silicone G1/4" male composite, detectable, FCM	0207033
Suction cup P-D36 Silicone G1/4" male SS, detectable, FCM	0207029
Suction cup P-D36 Silicone G3/8" male SS, detectable, FCM	0207030
Suction cup P-D36 Silicone G3/8" male composite, detectable, FCM	0207034

Specifications subject to change without notice.

Deep family (DC)



This family is designed for flat, convex or concave surfaces, e.g., such as those encountered when handling metal sheets in later stages of a press line. The suction cups have a thin design that easily follows the curved metal sheet. A special inner pattern gives maximum shear force grip even on oily/slippery surfaces. 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 and has a fantastic elastic memory.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallell to the surface, N, at vacuum level	
	60 -kPa	90 -kPa	60 -kPa	90 -kPa
DCF65P	143/141	193/191	146/100	196/134
DCF90P	255/222	311/310	256/183	358/248
DCF110P	315/313	436/433	377/286	573/358

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm*	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
DCF65P	67.5	28.2– 47.7	95	9	23.9
DCF90P	92.5	34.2– 51.7	130	13	57.5
DCF110P	112.5	40.6– 59.8	153	16	110.2

* Height range includes fittings.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material		MSF
DCF65P	PU60°	●	●
DCF90P	PU60°	●	●
DCF110P	PU60°	●	●

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Dry sheet metal	Oily sheet metal	Mark Free
DCF65P	●	●	●
DCF90P	●	●	●
DCF110P	●	●	●

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup DCF65P Polyurethane 60 G1/4" male with mesh filter	0207678
Suction cup DCF65P Polyurethane 60 G3/8" female with mesh filter, 17 mm thread	0209185
Suction cup DCF65P Polyurethane 60 M10x1,5 male with mesh filter	0207654
Suction cup DCF65P Polyurethane 60, 3/8" NPT female, with mesh filter	0206535
Suction cup DCF65P Polyurethane 60, G1/4" female, with mesh filter	0206794
Suction cup DCF65P Polyurethane 60, G3/8" female plastic	0206538
Suction cup DCF65P Polyurethane 60, G3/8" female, with mesh filter	0206537
Suction cup DCF65P Polyurethane 60, G3/8" male, 1/8" NPSF female, with mesh filter	0206536

Specifications subject to change without notice.

Description	Item no.
Suction cup DCF65P Polyurethane 60, T-slot, with mesh filter	0206539
Suction cup DCF90P Polyurethane 60 G1/4" male with mesh filter	0207679
Suction cup DCF90P Polyurethane 60 G3/8" female with mesh filter, 17 mm thread	0209186
Suction cup DCF90P Polyurethane 60 M10x1,5 male with mesh filter	0207655
Suction cup DCF90P Polyurethane 60, 3/8" NPT female, with mesh filter	0206540
Suction cup DCF90P Polyurethane 60, G1/4" female, with mesh filter	0206795
Suction cup DCF90P Polyurethane 60, G3/8" female plastic	0206543
Suction cup DCF90P Polyurethane 60, G3/8" female, with mesh filter	0206542
Suction cup DCF90P Polyurethane 60, G3/8" male, 1/8" NPSF female, with mesh filter	0206541
Suction cup DCF90P Polyurethane 60, T-slot, with mesh filter	0206544
Suction cup DCF110P Polyurethane 60 G1/4" male with mesh filter	0207680
Suction cup DCF110P Polyurethane 60 G3/8" female with mesh filter, 17 mm thread	0209187
Suction cup DCF110P Polyurethane 60 M10x1,5 male with mesh filter	0207660
Suction cup DCF110P Polyurethane 60, 3/8" NPT female, with mesh filter	0206545
Suction cup DCF110P Polyurethane 60, G1/4" female, with mesh filter	0206796
Suction cup DCF110P Polyurethane 60, G3/8" female plastic	0206548
Suction cup DCF110P Polyurethane 60, G3/8" female, with mesh filter	0206547
Suction cup DCF110P Polyurethane 60, G3/8" male, 1/8" NPSF female, with mesh filter	0206546
Suction cup DCF110P Polyurethane 60, T-slot, with mesh filter	0206549

Specifications subject to change without notice.

Universal family (U)



This family is designed for flat or slightly curved surfaces. They are available in a number of different materials such as DURAFLEX®, silicone and also a material that is compliant by FDA (FDA 21 CFR 177.2600) and meets EU's regulation EU 1935/2004.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
U2	0.03	0.1	0.15	—	—	—
U3	0.09	0.42	0.65	—	—	—
U4	0.2	0.9	1.3	0.2	0.8	1
U6	0.5	1.7	2.5	0.5	1.5	2
U8	1	2.9	3.9	1	2.9	3.4
U10	1.5	4.4	6.9	1.5	4.4	4.9
U15	3.5	8.4	11	3.5	5.4	5.9
U20	5.9	12	16	5.9	8.8	9.8
U30	12	25	30	7.8	9.8	11
U40-2	20	39	49	14	22	27
U50-2	35	73	92	20	37	44

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
U15-3	3.5	8.4	11	3.5	5.4	5.9
U20-2P	3/3/3*	10.5/11.5/14*	14/15/21*	1.5/1.5/3*	3/3/6*	6/6/8*

* PU40° / PU50° / PU60°.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
U2	2.6	3.5	4	0.1	0.003
U3	3.8	4.5	5	0.15	0.005
U4	5	6.1	3	0.2	0.03
U6	7	7	5	0.3	0.05
U8	9	7	6	0.5	0.1
U10	11	10.5	8	0.5	0.18
U15	16.5	11.5	8	1.5	0.5
U20	22	8	13	2.5	1
U30	32	9.5	20	3.5	2
U40-2	41	13	30	4.5	5.5
U50-2	51.4	17.5	35	6	12
U15-3	16.5	11.5	8	1.5	0.5
U20-2P	8.7	14	9/9/12*	5	0.7

* PU40° / PU50° / PU60°.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material							MSF
U2	Conductive Silicone, CSIL			●				
U3	Conductive Silicone, CSIL			●				
U4	Chloroprene, CR	●			●		●	●
U4	Silicone, SIL	●	●					
U4	Silicone, SIL FDA EU	●	●					
U6	Chloroprene, CR	●			●		●	●
U6	HNBR	●				●	●	
U6	Silicone, SIL	●	●					
U6	Silicone, SIL FDA EU	●	●					
U8	Chloroprene, CR	●			●		●	●
U8	Silicone, SIL	●	●					
U8	Silicone, SIL FDA EU	●	●					
U10	Chloroprene, CR	●			●		●	●
U10	HNBR	●				●	●	
U10	Silicone, SIL	●	●					
U10	Silicone, SIL FDA EU	●	●					
U15	Chloroprene, CR	●			●		●	●
U15	HNBR	●				●	●	
U15	Silicone, SIL	●	●					

Cup	Material							MSF
U15	Silicone, SIL FDA EU	●	●					
U20	Chloroprene, CR	●			●		●	●
U20	HNBR	●				●	●	
U20	Silicone, SIL	●	●					
U20	Silicone, SIL FDA EU	●	●					
U30	Nitrile-PVC, NPV	●			●		●	●
U30	Silicone, SIL	●	●					
U30	Silicone, SIL FDA EU	●	●					
U40-2	Nitrile-PVC, NPV	●			●		●	●
U40-2	Silicone, SIL	●	●					
U40-2	Silicone, SIL FDA EU	●	●					
U50-2	Nitrile-PVC, NPV	●			●		●	●
U50-2	Silicone, SIL	●	●					
U50-2	Silicone, SIL FDA EU	●	●					
U15-3	Silicone, SIL	●	●					
U20-2P	PU40°	●						
U20-2P	PU50°	●						
U20-2P	PU60°	●						

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Dry sheet metal	FDA EU-standard compliant	Electronic / semicon-ductor	Plastic injection molded parts	Mark Free	High/low temp cup (plastic)	Glass handling	Bag open-ing/thin paper - slip sheets/film
U2			●					
U3			●					
U4	●	●		●				
U6	●	●		●	●			
U8	●	●		●				
U10		●		●	●	●	●	
U15		●		●	●	●	●	
U20		●		●	●	●	●	
U30	●	●		●				
U40-2	●	●		●				
U50-2	●	●		●				
U15-3								●
U20-2P					●			●

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup U2 Conductive silicone	3150284SC
Suction cup U2 Conductive silicone, M2.5 male	3250080SC
Suction cup U3 Conductive silicone	3150285SC

Description	Item no.
Suction cup U3 Conductive silicone, M2.5 male	3250081SC
Suction cup U4 Chloroprene	3150114
Suction cup U4 Chloroprene, M5 male	3150059
Suction cup U4 Silicone	3150114S
Suction cup U4 Silicone FCM	0200254
Suction cup U4 Silicone FCM, M5 male	9909632
Suction cup U4 Silicone, M5 male	3150059S
Suction cup U6 Chloroprene	3150115
Suction cup U6 Chloroprene, M5 male	3150003
Suction cup U6 HNBR	0200888
Suction cup U6 HNBR, M5 male	9914275
Suction cup U6 Silicone	3150115S
Suction cup U6 Silicone FCM	0200255
Suction cup U6 Silicone FCM, M5 male	9909633
Suction cup U6 Silicone, M5 male	3150003S
Suction cup U8 Chloroprene	3150116
Suction cup U8 Chloroprene, M5 male	3150004
Suction cup U8 Silicone	3150116S
Suction cup U8 Silicone FCM	0200256
Suction cup U8 Silicone FCM, M5 male	9909634
Suction cup U8 Silicone, M5 male	3150004S

Specifications subject to change without notice.

Description	Item no.
Suction cup U10 Chloroprene	3150117
Suction cup U10 Chloroprene, M5 male	3150005
Suction cup U10 HNBR	0128689
Suction cup U10 HNBR, M5 male	9906863
Suction cup U10 Silicone	3150117S
Suction cup U10 Silicone FCM	0200257
Suction cup U10 Silicone FCM, M5 male	9909635
Suction cup U10 Silicone, M5 male	3150005S
Suction cup U15 Chloroprene	3150118
Suction cup U15 Chloroprene, M5 male	3150006
Suction cup U15 HNBR	0128690
Suction cup U15 HNBR, M5 male	9906864
Suction cup U15 Silicone	3150118S
Suction cup U15 Silicone FCM	0200258
Suction cup U15 Silicone FCM, M5 male	9909636
Suction cup U15 Silicone, M5 male	3150006S
Suction cup U20 Chloroprene, 5xM5 female	0101377
Suction cup U20 Chloroprene, G1/8" male, with mesh filter	0101374
Suction cup U20 Chloroprene, G1/8" male, with mesh filter and dual flow control valve	0101380
Suction cup U20 Chloroprene, G1/8" male/M5 female, PA	0110956
Suction cup U20 Chloroprene, G1/8" male/M5 female, with dual flow control valve	0101382

Specifications subject to change without notice.

Description	Item no.
Suction cup U20 Chloroprene, G1/8" male/M5 female, with mesh filter	0101378
Suction cup U20 Chloroprene, M5 female	0101373
Suction cup U20 Chloroprene, M5 female, with dual flow control valve	0101379
Suction cup U20 HNBR	0128711
Suction cup U20 HNBR, 5xM5 female	9906890
Suction cup U20 HNBR, 5xM5 female, with dual flow control valve	9906891
Suction cup U20 HNBR, G1/8" male, with mesh filter	9906869
Suction cup U20 HNBR, G1/8" male, with mesh filter and dual flow control valve	9906870
Suction cup U20 HNBR, G1/8" male/M5 female, with dual flow control valve	9906872
Suction cup U20 HNBR, G1/8" male/M5 female, with mesh filter	9907052
Suction cup U20 HNBR, M5 female	9906867
Suction cup U20 HNBR, M5 female, with dual flow control valve	9906868
Suction cup U20 Silicone	0101145
Suction cup U20 Silicone FCM	0200440
Suction cup U20 Silicone FCM, G1/8" male, with mesh filter	9909717
Suction cup U20 Silicone FCM, G1/8" male/M5 female, with mesh filter	9909718
Suction cup U20 Silicone, 5xM5 female	0101388
Suction cup U20 Silicone, 5xM5 female, with dual flow control valve	0101394
Suction cup U20 Silicone, G1/8" male, with mesh filter	0101385
Suction cup U20 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101391
Suction cup U20 Silicone, G1/8" male/M5 female, PA	0110328

Specifications subject to change without notice.

Description	Item no.
Suction cup U20 Silicone, G1/8" male/M5 female, with mesh filter	0101389
Suction cup U20 Silicone, M5 female, with dual flow control valve	0101390
Suction cup U20-2P Polyurethane 40	0119994
Suction cup U20-2P Polyurethane 40, 1/8" Male	0205721
Suction cup U20-2P Polyurethane 50	0119995
Suction cup U20-2P Polyurethane 50, 1/8" Male	0205722
Suction cup U20-2P Polyurethane 60	0119996
Suction cup U20-2P Polyurethane 60, 1/8" Male	0205723
Suction cup U30 Nitrile-PVC	0101146
Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, PA	0109839
Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, with dual flow control valve	0101415
Suction cup U30 Nitrile-PVC, G1/8" male / M5 female, with mesh filter	0101411
Suction cup U30 Nitrile-PVC, G1/8" male, with mesh filter	0101407
Suction cup U30 Nitrile-PVC, G1/8" male, with mesh filter and dual flow control valve	0101413
Suction cup U30 Nitrile-PVC, M5 female	0101406
Suction cup U30 Silicone	0101147
Suction cup U30 Silicone FCM	0200441
Suction cup U30 Silicone FCM, G1/8" male / M5 female, with mesh filter	9909721
Suction cup U30 Silicone FCM, G1/8" male, with mesh filter	9909720
Suction cup U30 Silicone, 5xM5 female, with mesh filter	0101399
Suction cup U30 Silicone, G1/8" male / M5 female, with mesh filter	0101400

Specifications subject to change without notice.

Description	Item no.
Suction cup U30 Silicone, G1/8" male, with mesh filter	0101396
Suction cup U30 Silicone, G1/8" male, with mesh filter and dual flow control valve	0101402
Suction cup U30 Silicone, M5 female, with mesh filter	0101395
Suction cup U40-2 Nitrile-PVC	0101148
Suction cup U40-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101623
Suction cup U40-2 Nitrile-PVC, G1/4" male, with mesh filter	0101618
Suction cup U40-2 Nitrile-PVC, G1/4" male, with mesh filter and dual flow control valve	0101625
Suction cup U40-2 Nitrile-PVC, G3/8" male, with dual flow control valve	0101627
Suction cup U40-2 Silicone	0101149
Suction cup U40-2 Silicone FCM	0200442
Suction cup U40-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909723
Suction cup U40-2 Silicone FCM, G1/4" male, with mesh filter	9909722
Suction cup U40-2 Silicone, 1/8" NPSF female, PA	0110338
Suction cup U40-2 Silicone, 1/8" NPSF female, with mesh filter	0101610
Suction cup U40-2 Silicone, 5x1/8" NPSF female	0101609
Suction cup U40-2 Silicone, G1/4" male, with mesh filter	0101605
Suction cup U40-2 Silicone, G3/8" male, with mesh filter	0101607
Suction cup U50-2 Nitrile-PVC	0101150
Suction cup U50-2 Nitrile-PVC, 1/8" NPSF female, with mesh filter	0101823
Suction cup U50-2 Nitrile-PVC, 5x1/8" NPSF female	0101822
Suction cup U50-2 Nitrile-PVC, G1/4" male, with mesh filter	0101818

Specifications subject to change without notice.

Description	Item no.
Suction cup U50-2 Nitrile-PVC, G3/8" male, with mesh filter	0101820
Suction cup U50-2 Silicone	0101151
Suction cup U50-2 Silicone FCM	0200443
Suction cup U50-2 Silicone FCM, 1/8" NPSF female, with mesh filter	9909726
Suction cup U50-2 Silicone FCM, G1/4" male, with mesh filter	9909725
Suction cup U50-2 Silicone, 1/8" NPSF female, PA	0110330
Suction cup U50-2 Silicone, 1/8" NPSF female, with dual flow control valve	0101811
Suction cup U50-2 Silicone, 1/8" NPSF female, with mesh filter	0101810
Suction cup U50-2 Silicone, G1/4" male, with mesh filter	0101805
Suction cup U50-2 Silicone, G3/8" male, with mesh filter	0101807
Suction cup U50-2 Silicone, G3/8" male, with mesh filter and dual flow control valve	0101814
Suction cup U15-3 Silicone	0114981
Suction cup U15-3 Silicone, M5 male	0117947
Suction cup U20-2P Polyurethane 40	0119994
Suction cup U20-2P Polyurethane 40, 1/8" Male	0205721
Suction cup U20-2P Polyurethane 50	0119995
Suction cup U20-2P Polyurethane 50, 1/8" Male	0205722
Suction cup U20-2P Polyurethane 60	0119996
Suction cup U20-2P Polyurethane 60, 1/8" Male	0205723

Specifications subject to change without notice.

Oval Bellows family (OB)



The oval bellow suction cups are suitable for handling of long and narrow objects and surfaces when maximum lifting force is desired. Oval bellow suction cups are specially suitable for irregular surfaces and when level compensation is desired. The oval bellow suction cup family has characteristics that are specially suited for handling of metal-sheet material.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level					Lifting force parallell to the surface, N, at vacuum level				
	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa
F-OB 10x30	1.4	2.4	5.2	—	—	1.5	2.3	4.6	—	—
F-OB 20x40	3.3	6.9	12	—	—	2.9	6	12.6	—	—
F-OB 30x60	8	17.2	31.1	—	—	8.1	13.4	27.5	—	—
OB20x60P	—	13	—	34	57	—	13	—	37	48
OB35x90P (PU30°/60°)	—	42	—	119	174	—	48	—	73	100
OB35x90P (PU60°)	—	42	—	117	185	—	32	—	85	111
OB50x140P (PU30°/60°)	—	58	—	235	366	—	110	—	260	349
OB50x140P (PU60°)	—	77	—	231	368	—	122	—	292	396
OB65x170P (PU30°/60°)	—	119	—	335	541	—	141	—	379	532
OB65x170P (PU60°)	—	130	—	310	533	—	170	—	440	600

	Lifting force vertical to the surface, N, at vacuum level					Lifting force parallell to the surface, N, at vacuum level				
	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa	10 -kPa	20 -kPa	40 -kPa	60 -kPa	90 -kPa
OBF15×35P H	—	—	—	25/19*	31/24*	—	—	—	21/5*	25/6*
OBF15×35P L	—	—	—	25/19*	31/24*	—	—	—	21/5*	25/6*
OBF15×65P	—	—	—	41/31*	52/41*	—	—	—	31/7*	35/8*
OBF30×60P	—	—	—	60/43*	80/65*	—	—	—	74/32*	99/45
OBF35x90P	—	—	—	140/108*	198/157*	—	—	—	125/105*	179/151*
OBF50x140P	—	—	—	325/246*	438/372*	—	—	—	328/271*	415/347*
OBF65x170P	—	—	—	397/403*	570/502*	—	—	—	437/538*	619/665*
OBL40x90P (PU60°)	—	44	—	105	160	—	40	—	87	121
OBL40x90P (PU70°)	—	49	—	117	178	—	45	—	97	135

* Dry metal sheet/Oily metal sheet.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
F-OB 10x30	11×31	26.2	4	4	1
F-OB 20x40	40.8×20.8	36–41.2	9	7.6	5
F-OB 30x60	62×32	44.8–49.9	9	10.9	17.5
OB20x60P	62×23.5	23.6	7	4.5	24
OB35x90P	95.6×42.4	27.2	30	10.5	38
OB50x140P	146×59	34.5	23/26**	11.3	95
OB65x170P	177×76	41.5	38	16	175
OBF15×35P H	36×15	21.9–28.9	20	2.9	1.8
OBF15×35P L	36×15	37.7–44.8	20	2.9	1.3
OBF15×65P	66×15	21.9–28.9	20	2.9	2.6

Specifications subject to change without notice.

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
OBF30×60P	60×30	32.3–43.6	25	7	9.1
OBF35x90P	105×50	39–47.9*	30	11	36
OBF50x140P	157×67	47–55.8*	50	13	95
OBF65x170P	187×82	54–62.8*	50	15	200
OBL40x90P	92.6×45	63–73*	28	31	105

* Height range includes fittings, ** PU30°/PU60° / PU60°.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material							MSF
F-OB 10x30	Silicone (SIL non-detectable FCM)	●	●					
F-OB 10x30	Silicone (SIL detectable FCM)	●	●					
F-OB 20x40	Silicone (SIL non-detectable FCM)	●	●					
F-OB 20x40	Silicone (SIL detectable FCM)	●	●					
F-OB 30x60	Silicone (SIL non-detectable FCM)	●	●					
F-OB 30x60	Silicone (SIL detectable FCM)	●	●					
OB20x60P	PU60°	●		●	●	●	●	●
OB35x90P	PU30°/PU60°	●		●				
OB35x90P	PU60°	●		●	●	●	●	●
OB50x140P	PU30°/PU60°	●		●				
OB50x140P	PU60°	●		●	●	●	●	●
OB65x170P	PU30°/PU60°	●		●				
OB65x170P	PU60°	●		●	●	●	●	●

Specifications subject to change without notice.

Cup	Material							MSF
OBF15×35P H	PU60°			●				●
OBF15×35P L	PU60°			●				●
OBF15×65P	PU60°			●				●
OBF30×60P	PU60°			●				●
OBF35x90P	PU55°/PU60°			●				●
OBF50x140P	PU55°/PU60°			●				●
OBF65x170P	PU55°/PU60°			●				●
OBL40x90P	PU60°	●		●	●	●	●	●
OBL40x90P	PU70°	●		●	●	●	●	●

MATERIAL RESISTANCE
For more material information go to page 23.

APPLICATIONS
Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	FDA EU-standard compliant	Corrugated / cardboard	Glass handling	Mark Free	Oily sheet metal
F-OB 10x30	●				
F-OB 20x40	●				
F-OB 30x60	●				
OB20x60P				●	
OB35x90P		●		●	
OB50x140P		●		●	
OB65x170P		●		●	
OBF15×35P H				●	●

	FDA EU-standard compliant	Corrugated / cardboard	Glass handling	Mark Free	Oily sheet metal
OBF15×35P L				●	●
OBF15×65P				●	●
OBF30×60P				●	●
OBF35x90P				●	●
OBF50x140P				●	●
OBF65x170P				●	●
OBL40x90P			●	●	●

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup F-OB 10x30 Silicone, G1/8" male SS, detectable, FCM	0205912
Suction cup F-OB 10x30 Silicone, G1/8" male SS, FCM	0207044
Suction cup F-OB 20x40 Silicone, G1/4" male SS, detectable, FCM	0205915
Suction cup F-OB 20x40 Silicone, G1/4" male SS, FCM	0207045
Suction cup F-OB 20x40 Silicone, G1/8" male SS, detectable, FCM	0205918
Suction cup F-OB 20x40 Silicone, G1/8"male SS, FCM	0207046
Suction cup F-OB 30x60 Silicone, G1/4" male SS, detectable FCM	0205923
Suction cup F-OB 30x60 Silicone, G1/4" male SS, FCM	0207048
Suction cup F-OB 30x60 Silicone, G1/8" male SS, detectable, FCM	0205920
Suction cup F-OB 30x60 Silicone, G1/8"male SS, FCM	0207047
Suction cup OB20x60P Polyurethane 60, G1/8" male	0115291

Description	Item no.
Suction cup OB35x90P Polyurethane 30/60	0109913
Suction cup OB35x90P Polyurethane 30/60, 3/8" NPSF female	0109857
Suction cup OB35x90P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109856
Suction cup OB35x90P Polyurethane 60	0109912
Suction cup OB35x90P Polyurethane 60, 3/8" NPSF female	0108672
Suction cup OB35x90P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108673
Suction cup OB50x140P Polyurethane 30/60	0109915
Suction cup OB50x140P Polyurethane 30/60, 3/8" NPSF female	0109859
Suction cup OB50x140P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109858
Suction cup OB50x140P Polyurethane 60	0109914
Suction cup OB50x140P Polyurethane 60, 3/8" NPSF female	0108674
Suction cup OB50x140P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108675
Suction cup OB65x170P Polyurethane 30/60	0109917
Suction cup OB65x170P Polyurethane 30/60, 3/8" NPSF female	0109861
Suction cup OB65x170P Polyurethane 30/60, thread insert G3/8" male, with mesh filter	0109860
Suction cup OB65x170P Polyurethane 60	0109916
Suction cup OB65x170P Polyurethane 60, 3/8" NPSF female	0108676
Suction cup OB65x170P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108677
Suction cup OBF15×35P H Polyurethane 60, G1/4" female	0207579
Suction cup OBF15×35P H Polyurethane 60, G1/4" male	0207581
Suction cup OBF15×35P H Polyurethane 60, G3/8" female	0207577

Specifications subject to change without notice.

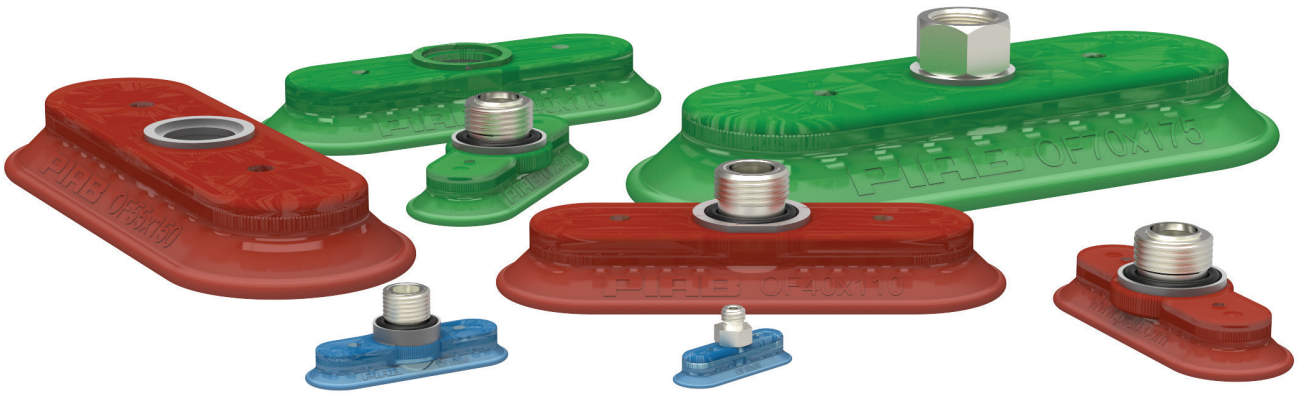
Description	Item no.
Suction cup OBF15×35P H Polyurethane 60, G3/8" female plastic	0207587
Suction cup OBF15×35P H Polyurethane 60, G3/8" male	0207585
Suction cup OBF15×35P H Polyurethane 60, G3/8” female, 17 mm thread	0209500
Suction cup OBF15×35P H Polyurethane 60, M10×1.5 male	0207583
Suction cup OBF15×35P H Polyurethane 60, NPT3/8" female	0207571
Suction cup OBF15×35P H Polyurethane 60, T-slot	0207575
Suction cup OBF15×35P L Polyurethane 60, G1/4" female	0207594
Suction cup OBF15×35P L Polyurethane 60, G1/4" male	0207595
Suction cup OBF15×35P L Polyurethane 60, G3/8" female	0207593
Suction cup OBF15×35P L Polyurethane 60, G3/8" female plastic	0207598
Suction cup OBF15×35P L Polyurethane 60, G3/8" male	0207597
Suction cup OBF15×35P L Polyurethane 60, G3/8” female, 17 mm thread	0209501
Suction cup OBF15×35P L Polyurethane 60, M10×1.5 male	0207596
Suction cup OBF15×35P L Polyurethane 60, NPT3/8" female	0207589
Suction cup OBF15×35P L Polyurethane 60, T-slot	0207592
Suction cup OBF15×65P Polyurethane 60, G1/4" female	0207607
Suction cup OBF15×65P Polyurethane 60, G1/4" male	0207609
Suction cup OBF15×65P Polyurethane 60, G3/8" female	0207605
Suction cup OBF15×65P Polyurethane 60, G3/8" female plastic	0207615
Suction cup OBF15×65P Polyurethane 60, G3/8" male	0207613
Suction cup OBF15×65P Polyurethane 60, G3/8” female, 17 mm thread	0209502

Description	Item no.
Suction cup OBF15×65P Polyurethane 60, M10×1.5 male	0207611
Suction cup OBF15×65P Polyurethane 60, NPT3/8" female	0207599
Suction cup OBF15×65P Polyurethane 60, T-slot	0207603
Suction cup OBF30×60P Polyurethane 55/60/30 G3/8" female with mesh filter, 17 mm thread	0209490
Suction cup OBF30×60P Polyurethane 60, G1/4" female	0207737
Suction cup OBF30×60P Polyurethane 60, G1/4" male	0207738
Suction cup OBF30×60P Polyurethane 60, G3/8" female	0207734
Suction cup OBF30×60P Polyurethane 60, G3/8" female plastic	0207617
Suction cup OBF30×60P Polyurethane 60, G3/8" male	0207735
Suction cup OBF30×60P Polyurethane 60, M10×1.5 male	0207739
Suction cup OBF30×60P Polyurethane 60, NPT3/8" female	0207736
Suction cup OBF30×60P Polyurethane 60, T-slot with mesh filter	0207733
Suction cup OBF35X90P Polyurethane 55/60, 3/8" NPT female	0122287
Suction cup OBF35x90P Polyurethane 55/60, G3/8" female	0119123
Suction cup OBF35x90P Polyurethane 55/60, G3/8" female, 17 mm thread	0200694
Suction cup OBF35x90P Polyurethane 55/60, G3/8" male, with mesh filter	0119121
Suction cup OBF35x90P Polyurethane 55/60, M10x1.5 male	0121436
Suction cup OBF50X140P Polyurethane 55/60, 3/8" NPT female	0122288
Suction cup OBF50x140P Polyurethane 55/60, G3/8" female	0119127
Suction cup OBF50x140P Polyurethane 55/60, G3/8" male, with mesh filter	0119125
Suction cup OBF50x140P Polyurethane 55/60, M10x1.5 male	0121437

Specifications subject to change without notice.

Description	Item no.
Suction cup OBF65X170P Polyurethane 55/60, 3/8" NPT female	0122289
Suction cup OBF65x170P Polyurethane 55/60, G3/8" female	0119131
Suction cup OBF65x170P Polyurethane 55/60, G3/8" male, with mesh filter	0119129
Suction cup OBF65x170P Polyurethane 55/60, M10x1.5 male	0121438
Suction cup OBL40x90P Polyurethane 60, with 3 reinforcement plates and load support	0106697
Suction cup OBL40x90P Polyerethane 70, with 3 reinforcement plates and load support with G3/8" male, filter	0107325

Oval Flat family (OF)



Oval suction cups are specially suitable for long and narrow objects. This program of oval suction cups has characteristics that are specially suited for handling of metal-sheet material.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
OF10x30P	4	11	17	6	12	17
OF15x45P	9	27	41	6	20	34
OF25x70P (PU40°)	24	66	107	46	90	105
OF25x70P (PU60°)	24	77	118	42	127	161
OF40x110P (PU40°)	69	203	293	120	230	296
OF40x110P (PU60°)	74	200	303	98	228	410
OF55x150P (PU40°)	131	366	527	155	350	455
OF55x150P (PU60°)	134	376	558	128	338	477
OF70x175P (PU40°)	190	530	785	170	440	630
OF70x175P (PU60°)	180	570	860	200	555	750

Specifications subject to change without notice.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
OF10x30P	30.8×10.8	14.6	15	1	0.5
OF15x45P	45×15	17.15	30	1	1
OF25x70P	72.3×27.3	23	50	1.9	6
OF40x110P	113×43	17.5	77	3.1	21
OF55x150P	154×59	21	150	3	37
OF70x175P	180×75	25	130	5.7	80

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material						MSF
OF10x30P	PU50°	●	●	●	●	●	●
OF15x45P	PU50°	●	●	●	●	●	●
OF25x70P	PU40°	●	●	●	●	●	●
OF25x70P	PU60°	●	●	●	●	●	●
OF40x110P	PU40°	●	●	●	●	●	●
OF40x110P	PU60°	●	●	●	●	●	●
OF55x150P	PU40°	●	●	●	●	●	●
OF55x150P	PU60°	●	●	●	●	●	●
OF70x175P	PU40°	●	●	●	●	●	●
OF70x175P	PU60°	●	●	●	●	●	●

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Dry sheet metal	Corrugated / cardboard	Mark Free	Plastic injection molded parts
OF10x30P			●	
OF15x45P			●	
OF25x70P	●	●	●	●
OF40x110P	●	●	●	●
OF55x150P	●	●	●	●
OF70x175P	●	●	●	●

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup OF10x30P Polyurethane 50, M5 male	0110084
Suction cup OF15x45P Polyurethane 50, G1/8" male	0115285
Suction cup OF25x70P Polyurethane 40, G3/8" male	0115304
Suction cup OF40x110P Polyurethane 40	0109907
Suction cup OF40x110P Polyurethane 40, 3/8" NPSF female	0109851
Suction cup OF40x110P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109850
Suction cup OF40x110P Polyurethane 60	0109906
Suction cup OF40x110P Polyurethane 60, 3/8" NPSF female	0108265
Suction cup OF40x110P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108263
Suction cup OF55x150P Polyurethane 40	0109909
Suction cup OF55x150P Polyurethane 40, 3/8" NPSF female	0109853

Specifications subject to change without notice.

Description	Item no.
Suction cup OF55x150P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109852
Suction cup OF55x150P Polyurethane 60	0109908
Suction cup OF55x150P Polyurethane 60, 3/8" NPSF female	0108036
Suction cup OF55x150P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108030
Suction cup OF70x175P Polyurethane 40	0109911
Suction cup OF70x175P Polyurethane 40, 3/8" NPSF female	0109855
Suction cup OF70x175P Polyurethane 40, thread insert G3/8" male, with mesh filter	0109854
Suction cup OF70x175P Polyurethane 60	0109910
Suction cup OF70x175P Polyurethane 60, 3/8" NPSF female	0108264
Suction cup OF70x175P Polyurethane 60, thread insert G3/8" male, with mesh filter	0108671

Specifications subject to change without notice.

Oval Concave family (OC)



Suitable for handling long oblong objects with flat or curved surfaces with thick durable lip. Some of these cups have support cleats that prevent thin objects from being disfigured.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
OC60×140	132	373	520	186	373	510
OC35×90P	49/49*	117/132*	171/171*	53/68*	112/161*	147/206*
OCF20×80P	—	75/82*	111/90*	—	78/35*	112/48*
OCF30×90P	—	111/115*	157/159*	—	107/51*	160/74*
OCF40×110P	—	178/185*	245/246*	—	167/54*	232/78*

* PU40° / PU60°.

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
OC60×140	138×61	30	200	7.5	52
OC35×90P	94×37	14.5	—	3	20
OCF20×80P	84×24	27–30.1*	20	3	15
OCF30×90P	92.5×32.5	26.5–29.5*	25	4	17
OCF40×110P	113×43	32.5–35.5*	42	5	34

* Height range includes fittings.

Specifications subject to change without notice.

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material						MSF
OC60×140	Nitrile, NBR	●			●	●	●
OC35×90P	PU40°	●	●				
OC35×90P	PU60°	●	●	●	●	●	●
OCF20×80P	PU55°/ PU60°		●				●
OCF30×90P	PU55°/ PU60°		●				●
OCF40×110P	PU55°/ PU60°		●				●

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Oily metal sheet	Dry metal sheet	Mark Free
OC60×140		●	
OC35×90P			●
OCF20×80P	●		
OCF30×90P	●		
OCF40×110P	●		

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

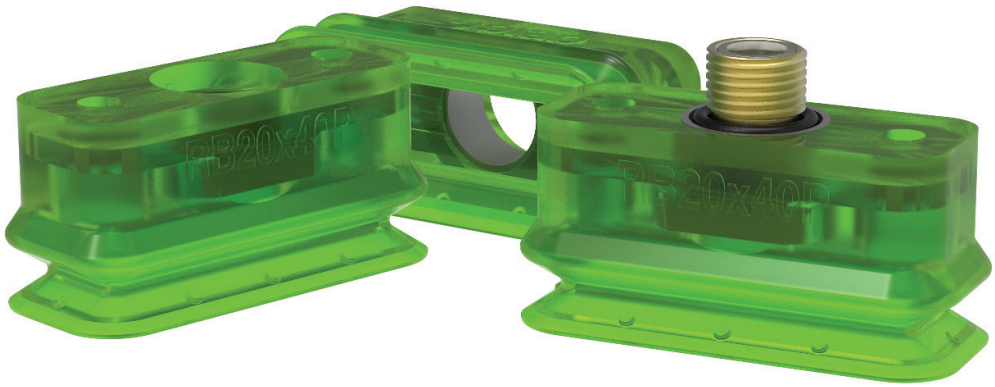
ORDERING INFORMATION

Description	Item no.
Suction cup OC60×140 Nitrile, G3/8" female	3350011
Suction cup OC35×90P Polyurethane 40	0115306
Suction cup OC35×90P Polyurethane 40, 3/8" NPSF female	0102375
Suction cup OC35×90P Polyurethane 40, adjustable thread insert G3/8" male with mesh filter	0115307
Suction cup OC35×90P Polyurethane 40, adjustable thread insert G3/8" male with mesh filter	0115311
Suction cup OC35×90P Polyurethane 40, G3/8" female	0102374
Suction cup OC35×90P Polyurethane 60, 3/8" NPSF female	0103303
Suction cup OC35×90P Polyurethane 60, adjustable thread insert G3/8" male with mesh filter	0115313
Suction cup OC35×90P Polyurethane 60, G3/8" female	0103305
Suction cup OCF20×50 Polyurethane 60, G1/4" female	0207730
Suction cup OCF20×50 Polyurethane 60, G1/4" male	0207731
Suction cup OCF20×50 Polyurethane 60, G3/8" female	0207727
Suction cup OCF20×50 Polyurethane 60, G3/8" female plastic	0207618
Suction cup OCF20×50 Polyurethane 60, G3/8" female, 17 mm thread	0209497
Suction cup OCF20×50 Polyurethane 60, G3/8" male	0207728
Suction cup OCF20×50 Polyurethane 60, M10×1.5 male	0207732
Suction cup OCF20×50 Polyurethane 60, NPT3/8" female	0207729
Suction cup OCF20×50 Polyurethane 60, T-slot with mesh filter	0207726
Suction cup OCF20×80P Polyurethane 55/60, 3/8" NPT female	0121859
Suction cup OCF20×80P Polyurethane 55/60, G3/8" female	0122455
Suction cup OCF20×80P Polyurethane 55/60, G3/8" male	0121847

Specifications subject to change without notice.

Description	Item no.
Suction cup OCF30×90P Polyurethane 55/60, 3/8" NPT female	0122459
Suction cup OCF30×90P Polyurethane 55/60, G3/8" female	0121786
Suction cup OCF30×90P Polyurethane 55/60, G3/8" male	0122456
Suction cup OCF40×110P Polyurethane 55/60, 3/8" NPT female	0121865
Suction cup OCF40×110P Polyurethane 55/60, G3/8" female	0122860
Suction cup OCF40×110P Polyurethane 55/60, G3/8" male	0122457

Rectangular Bellows (RB)



The rectangular suction cups are recommended for handling of long and narrow objects and surfaces when maximum lifting force and grip are desired. They are especially suitable for products in plastic flow packs, such as candy bars. The suction cup material DURAFLEX® features the elasticity of rubber and excellent wear resistance of polyurethane.

LIFTING FORCES

	Lifting force vertical to the surface, N, at vacuum level			Lifting force parallell to the surface, N, at vacuum level		
	20 -kPa	60 -kPa	90 -kPa	20 -kPa	60 -kPa	90 -kPa
RB20x40P	15	26	40	21	33	57

GENERAL SPECIFICATIONS

	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm^3
RB20x40P	45.3×45.3	21,5	15	6	6.1

AVAILABLE MATERIALS AND INDUSTRIES

An explanation of the industry icons is available on the cover fold out.

Cup	Material						MSF
RB20x40P	PU60°	●	●	●	●	●	●

MATERIAL RESISTANCE

For more material information go to page 23.

APPLICATIONS

Table shows typical applications for the suction cup. For more detailed information, please visit **piab.com**.

	Bag opening/thin paper - slip sheets/film
RB20x40P	●

FITTINGS

For a table of possible fittings to use go to pages 198–200, for technical information on all fittings visit **piab.com**.

ORDERING INFORMATION

Description	Item no.
Suction cup RB20x40P Female insert fitting G1/4”	0202975
Suction cup RB20x40P Swivel fitting G1/8” male	0206190

Suction cup accessories



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Selection guide – Accessories

Suction cup accessories	
	Mounting Elements
	Level compensators
	Ball joints
	Suction cup valves
	Fittings
	Other

Features and benefits
The mounting element programme consists of mounting brackets, height adjusters and suction cup extensions. The parts are designed to fit together for different sizes and applications. The parts are easily mounted on several standard extruded profile systems, not just suitable for one brand of profile. All parts of the same size-category fit perfectly together and thereby create an easy-to-use, compact and flexible/adjustable mounting “assembly kit” for cups.
Adjust differences in levels, for example on lifting devices with several suction cups. There is then less demand for exact positioning of vacuum handling device. Level compensators will also provide a certain degree of shock and vibration absorption.
To avoid bending stress, a suction cup can be fitted with a ball joint.
Valves to minimize the energy consumption. Gives a flexibility on number of objects to be handled.
A variety of fittings for suction cups.
Angle adaptors, t-slot adaptors etc.

Mounting Elements



Mounting bracket MB

- Mounting brackets suitable for extruded profile systems.
- Level compensators and height adjusters with external thread in sizes M12, M16, M20 and M25 are ideal for clamping on the mounting brackets.
- Facilitates the installation of a suction cup and positioning in X-direction.
- Long and short versions available.



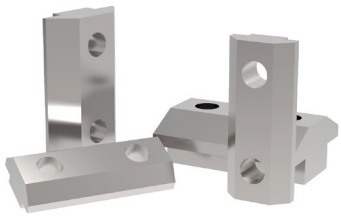
Height adjuster HA

- Facilitates the positioning (y-direction) of a suction cup.
- Provides an adjustable height extension between a mounting bracket (MB) and a suction cup.
- Can be used with a suction cup / rod extension to further elongate the cup position.
- Key handle to avoid rotation when connecting vacuum ports.



Suction cup extension SE

- Solid rod extension with air/vacuum channel.
- For mounting a suction cup.
- Available in several sizes.
- Can be used with a height adjuster (HA) or level compensator (LC).



T-slot nut kit

- T-slot nut fits the most common mounting profiles on the market.
- Adapted to the Piab mounting bracket assortment.

TECHNICAL DATA

Description	Load, vertical, max.	Load, torque, max.	Load, horizontal, max.	Action range/ Stroke
Mounting bracket MB12S, MB16S, MB20S	200 N	7 Nm	–	–
Mounting bracket MB12L, MB16L, MB20L	200 N	7 Nm	–	–
Mounting bracket MB25S, MB25L	300 N	15 Nm	–	–
Height adjuster HA12	44 N	–	31 N	50 mm
Height adjuster HA16	87 N	–	61 N	50 mm
Height adjuster HA20	214 N	–	150 N	50 mm
Suction cup extension 50, G3/8" male x G3/8" female	700 N	–	400 N	–
Suction cup extension SE12	44 N	–	31 N	–
Suction cup extension SE16	87 N	–	61 N	–
Suction cup extension SE20	214 N	–	150 N	–

ORDERING INFORMATION

Description	Item no.
Mounting bracket MB12L	0200455
Mounting bracket MB12S	0200449
Mounting bracket MB16L	0200454
Mounting bracket MB16S	0200450
Mounting bracket MB20L	0200456
Mounting bracket MB20S	0200451
Mounting bracket MB25L	0200457
Mounting bracket MB25S	0200452
Height adjuster HA12	0200461

Specifications subject to change without notice.

Description	Item no.
Height adjuster HA16	0200462
Height adjuster HA20	0200463
Height adjuster HA25	0121122
Suction cup extension SE12	0200458
Suction cup extension SE16	0200459
Suction cup extension SE20	0200460
T-slot nut kit for mounting bracket-6, 8, 10 mm nut	0205794

Level Compensators



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.



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 absorbtion.
- 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.



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 absorbtion.

TECHNICAL DATA

Description	Load, vertical, max.	Spring force	Action range/ Stroke	Thread
Level compensator LC12-F0510 / LC12-M0510	–	1.9–4.1 N	10 mm	M5
Level compensator LC12-F0525 / LC12-M0525	–	2–5 N	25 mm	M5
Level compensator LC16-F1820 / LC16-M1820	–	3.6–9 N	20 mm	G1/8”
Level compensator LC16-F1835 / LC16-M1835	–	4.3–9.5 N	35 mm	G1/8”
Level compensator LC20-F1425 / LC20-M1425	–	4.1–11 N	25 mm	G1/4”
Level compensator LC20-F1450 / LC20-M1450	–	4.3–11.4 N	50 mm	G1/4”

Specifications subject to change without notice.

Description	Load, vertical, max.	Spring force	Action range/ Stroke	Thread
Level compensator LC25-F3840 / LC25-M3840	–	5.6–16.5 N	40 mm	G3/8”
Level compensator LC25-F3880 / LC25-M3880	–	6–17 N	80 mm	G3/8”
Level compensator G1/2” with stiffer spring	490 N	90–150 N	15 mm	G1/2”
Level compensator M5	29.4 N	2–5 N	7 mm	M5
Level compensator G1/8”	245 N	3–9.4 N	20 mm	G1/8”
Level compensator G1/2”	490 N	24–37 N	15 mm	G1/2”
Level compensator LC30	700 N	5–42 N	30 mm	G3/8”

ORDERING INFORMATION

Description	Item no.
Level compensator LC12-F0510, M5 female, stroke 10	0127103
Level compensator LC12-F0525, M5 female, stroke 25	0127105
Level compensator LC12-M0510, M5 male, stroke 10	0127104
Level compensator LC12-M0525, M5 male, stroke 25	0127106
Level compensator LC16-F1820, G1/8" female, stroke 20	0124951
Level compensator LC16-F1835, G1/8" female, stroke 35	0124953
Level compensator LC16-M1820, G1/8" male, stroke 20	0124952
Level compensator LC16-M1835, G1/8" male, stroke 35	0124954
Level compensator LC20-F1425, G1/4" female, stroke 25	0124955
Level compensator LC20-F1450, G1/4" female, stroke 50	0124957
Level compensator LC20-M1425, G1/4" male, stroke 25	0124956
Level compensator LC20-M1450, G1/4" male, stroke 50	0124958

Specifications subject to change without notice.

Description	Item no.
Level compensator LC25-F3840, G3/8" female, stroke 40	0124959
Level compensator LC25-F3880, G3/8" female, stroke 80	0124961
Level compensator LC25-M3840, G3/8" male, stroke 40	0124960
Level compensator LC25-M3880, G3/8" male, stroke 80	0124962
Level compensator LC30	0111552
Level compensator G1/2"	3350071
Level compensator G1/2" with stiffer spring	0114291
Level compensator G1/8"	3350069
Level compensator M5	3350068
Level compensator LC30	0111552



Level compensator LC30 EOAT

- Easy installation with the option of fine adjustments and positioning of the suction cup.
- Conical spring means very low total height in relation to stroke. For example, that can help increase cycle speed in sheet metal press-to-press stamping applications.
- Non-rotational for use with, for example, oval suction cups. Can easily be made rotational.
- Mounting interfaces for standard flexible end-of-arm-tooling (EOAT) systems.
- Developed for use with decentralized vacuum pump/generator units such as VGS™3010 and VGS™3040 or a centralized vacuum pump/generator.
- Quiet and reliable level compensation with load protection and shock absorption.



Level compensator – profile mount

- Compensates for differences in height.
- Provides certain degree of shock absorption.
- Fits on standard size extrusion.



Vactivator V18

- Actuated by vacuum only.
- Automatic extension and retraction.
- Self-adjusting stroke, the piston with a suction cup returns home as soon as it seals off the object.
- Suction cup ordered separately.
- Simple solution for high picking speed.
- Easy installation.
- Designed for millions of cycles under normal industrial conditions.

TECHNICAL DATA

Description	Load, vertical, max.	Action range/Stroke	Thread
Level compensator LC30 EOAT	700 N	30 mm	G3/8" / 1/8"NPSF
Level compensator – profile mount	700 N	50 mm	G3/8" / 3/8" NPT
Vactivator V18/20	4.9 N	20 mm	G1/8"
Vactivator V18/40	4.9 N	40 mm	G1/8"

ORDERING INFORMATION

Description	Item no.
Level compensator LC30 w ball joint LH	0124213
Level compensator LC30 w lock pin 16 LH	0124215
Level compensator LC30 w lock pin 19 LH	0124214
LCS 200 profile mounted level compensator 3/8" NPT female x 3/8" NPT male	0121219
LCS 200 profile mounted level compensator G3/8" female x G3/8" female	0121220
Vactivator V18/20	0129516
Vactivator V18/40	0129517

Specifications subject to change without notice.



Kenos® level compensator – KSPH

- Adjust differences in levels, for example on lifting devices with several suction cups.



Kenos® level compensator – KSPH, non rotating

- Adjust differences in levels, for example on lifting devices with several suction cups.

TECHNICAL DATA

Description	Spring constant	Spring force	Action range/ Stroke	Volume
Level compensator KSPH, G 1/8" male, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	3,4 cm^3
Level compensator KSPH, G 1/8" male, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	4,52 cm^3
Level compensator KSPH, G 1/8" male, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	5,64 cm^3
Level compensator KSPH, G 1/8" female, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	3,7 cm^3
Level compensator KSPH, G 1/8" female, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	4,82 cm^3
Level compensator KSPH, G 1/8" female, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	5,94 cm^3
Level compensator KSPH, G 1/4" female, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	3,8 cm^3
Level compensator KSPH, G 1/4" female, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	4,92 cm^3
Level compensator KSPH, G 1/4" female, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	6,04 cm^3
Level compensator KSPH, G 1/4" male, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	4,18 cm^3
Level compensator KSPH, G 1/4" male, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	5,6 cm^3
Level compensator KSPH, G 1/4" male, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	6,72 cm^3
Level compensator KSPH, G 3/8" female, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	4,48 cm^3
Level compensator KSPH, G 3/8" female, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	5,6 cm^3

Description	Spring constant	Spring force	Action range/ Stroke	Volume
Level compensator KSPH, G 3/8" female, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	6,72 cm^3
Level compensator KSPH, G 3/8" male, stroke 25	0,7 N/mm	6,37–23,87 N	25 mm	5,59 cm^3
Level compensator KSPH, G 3/8" male, stroke 50	0,46 N/mm	2,81–25,81 N	50 mm	6,76 cm^3
Level compensator KSPH, G 3/8" male, stroke 75	0,26 N/mm	4,71–24,21 N	75 mm	7,88 cm^3
Level compensator KSPH, G 1/2" male, stroke 25	3,83 N/mm	19,14–114,83 N	25 mm	9,5 cm^3
Level compensator KSPH, G 1/2" female, stroke 25	3,83 N/mm	19,14–114,83 N	25 mm	9,5 cm^3
Level compensator KSPH, G 1/2" male, stroke 50	2,23 N/mm	11,16–122,8 N	50 mm	4,52 cm^3
Level compensator KSPH, G 1/2" female, stroke 50	2,23 N/mm	11,16–122,8 N	50 mm	4,82 cm^3
Level compensator KSPH, G 1/2" male, stroke 75	1,41 N/mm	7,05–112,82 N	75 mm	5,64 cm^3
Level compensator KSPH, G 1/2" female, stroke 75	1,41 N/mm	7,05–112,82 N	75 mm	5,94 cm^3

ORDERING INFORMATION

Description	Item no.	Item no. (non rotating)
Level compensator KSPH, G 1/8" male, stroke 25	0208900	0208901
Level compensator KSPH, G 1/8" male, stroke 50	0208902	0208903
Level compensator KSPH, G 1/8" male, stroke 75	0208904	0208905
Level compensator KSPH, G 1/8" female, stroke 25	0208906	0208907
Level compensator KSPH, G 1/8" female, stroke 50	0208908	0208909
Level compensator KSPH, G 1/8" female, stroke 75	0208910	0208911
Level compensator KSPH, G 1/4" female, stroke 25	0208912	0208913
Level compensator KSPH, G 1/4" female, stroke 50	0208914	0208915
Level compensator KSPH, G 1/4" female, stroke 75	0208916	0208917

Specifications subject to change without notice.

Description	Item no.	Item no. (non rotating)
Level compensator KSPH, G 1/4" male, stroke 25	0208918	0208919
Level compensator KSPH, G 1/4" male, stroke 50	0208921	0208922
Level compensator KSPH, G 1/4" male, stroke 75	0208923	0208924
Level compensator KSPH, G 3/8" female, stroke 25	0208925	0208926
Level compensator KSPH, G 3/8" female, stroke 50	0208927	0208928
Level compensator KSPH, G 3/8" female, stroke 75	0208929	0208930
Level compensator KSPH, G 3/8" male, stroke 25	0208931	0208932
Level compensator KSPH, G 3/8" male, stroke 50	0208933	0208934
Level compensator KSPH, G 3/8" male, stroke 75	0208935	0208936
Level compensator KSPH, G 1/2" male, stroke 25	0209472	0209478
Level compensator KSPH, G 1/2" female, stroke 25	0209473	0209479
Level compensator KSPH, G 1/2" male, stroke 50	0209474	0209480
Level compensator KSPH, G 1/2" female, stroke 50	0209475	0209481
Level compensator KSPH, G 1/2" male, stroke 75	0209476	0209482
Level compensator KSPH, G 1/2" female, stroke 75	0209477	0209483

Ball Joints





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.

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	Load, max.	Movement, angular
Ball joint G1/8”	25 kg	±12 °
Ball joint G1/2”	50 kg	±12 °
Ball joint G3/4”	150 kg	±12 °
Ball joint fitting G3/8”	–	±20 °
Ball joint fitting G3/8”, locking	–	±20 °
Ball joint fitting G3/8”, limited movement	–	±5 °

ORDERING INFORMATION

Description	Item no.
Ball joint G1/8"	3350065
Ball joint G1/2"	3350066
Ball joint G3/4"	3350067
Ball joint fitting G3/8"	0110635
Ball joint fitting G3/8", locking	0110636
Ball joint fitting G3/8", limited movement	0121177

Specifications subject to change without notice.

Suction Cup Valves





piSAVE® sense

- Vacuum check valves which allows a few suction cups to miss the object(s) and still maintain enough vacuum level in the system with quick response and release times.
- The vacuum check valves shall be used in a centralized vacuum system, one for each suction cup.
- Designing with vacuum check valves will require a smaller vacuum pump and save energy.
- Suitable for handling different size or different number of leaking or sealed objects such as MDF boards, corrugated cardboards or metal sheets with a flexible handling device.
- Also suitable for objects with surface leakage around the lip of the suction cup.
- Available in four sizes with different flow performance/ characteristics to suit different degree of leakage on handled material and different size of cups.
- The smallest sizes are mainly suitable for sealed and smooth materials, such as metal and glass (02/06 for small cups and 03/60 for large cups).
- The valves are supplied separately for integration or mounted in an Al-fitting with female and male threaded connections to facilitate installation.

piSAVE® restrict

- Vacuum flow restrictors which allows a few suction cups to miss the object(s) and still maintain enough vacuum level in the system.
- Suitable for handling different size sealed sheets/objects with the same flexible lifting device.
- The vacuum flow restrictors shall be used in a centralized vacuum system, one for each suction cup.
- Designing with flow restrictors will require a smaller vacuum pump and save energy.
- Available in three sizes with different flow performance/ characteristics to suit different size suction cups.
- The restrictors are integrated in an Al-fittng with female and male threaded connections to faciliate installation.

TECHNICAL DATA

Description	Pump flow/cup min.	Pump flow/cup to close valve	Leakage flow, max.
piSAVE® sense 02/60 (yellow)	0.001 (@ 45 -kPa) Nl/s	0.21 (@ 3 -kPa) Nl/s	–
piSAVE® sense 03/60 (green)	0.06 (@ 45 -kPa) Nl/s	0.37 (@ 3 -kPa) Nl/s	–
piSAVE® sense 04/60 (blue)	0.15 (@ 45 -kPa) Nl/s	0.55 (@ 7 -kPa) Nl/s	–
piSAVE® sense 05/60 (red)	0.25 (@ 45 -kPa) Nl/s	0.72 (@ 11 -kPa) Nl/s	–

Specifications subject to change without notice.

Description	Pump flow/cup min.	Pump flow/cup to close valve	Leakage flow, max.
piSAVE® restrict multiple port fitting 0.7	–	–	0.08 Nl/s
piSAVE® restrict multiple port fitting 1.0	–	–	0.16 Nl/s
piSAVE® restrict multiple port fitting 1.3	–	–	0.27 Nl/s

ORDERING INFORMATION

Description	Item no.
piSAVE® sense 02/60 (yellow), 100p, incl. Assembly tool	0202395
piSAVE® sense 02/60 (yellow),10p, incl. Assembly tool	0202394
piSAVE® sense 03/60 (green), 100p, incl. Assembly tool	0202427
piSAVE® sense 03/60 (green), 10p, incl. Assembly tool	0202424
piSAVE® sense 04/60 (blue), 100p, incl. Assembly tool	0202428
piSAVE® sense 04/60 (blue), 10p, incl. Assembly tool	0202425
piSAVE® sense 05/60 (red), 100p, incl. Assembly tool	0202429
piSAVE® sense 05/60 (red), 10p, incl. Assembly tool	0202426
piSAVE® sense Assembly tool 16mm	0202589
piSAVE® sense Multiple port fitting 02/60 (yellow)	0202396
piSAVE® sense Multiple port fitting 03/60 (green)	0128719
piSAVE® sense Multiple port fitting 04/60 (blue)	0128731
piSAVE® sense Multiple port fitting 05/60 (red)	0128733
piSAVE® restrict multiple port fitting 0.7	0129339
piSAVE® restrict multiple port fitting 1.0	0129340
piSAVE® restrict multiple port fitting 1.3	0129341

Specifications subject to change without notice.



piSAVE® release

- 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 piSAVE® release.



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 pump and AQR.



Blow-off Check Valve

- 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	Flow, atmospheric	Flow rate
piSAVE® release G1/8"	3.85 Nl/s	–
piSAVE® release G1/4"	7.85 Nl/s	–
Atmospheric quick-release valve – AQR	3.3 Nl/s	–
Blow-off Check valve G1/8”	–	1.5–2.8 Nl/s (@ 0.3-0.7 MPa)
Blow-off Check valve G1/4”	–	1.5–2.8 Nl/s (@ 0.3-0.7 MPa)

Specifications subject to change without notice.

ORDERING INFORMATION

Description	Item no.
piSAVE® release G1/4"	0119720
piSAVE® release G1/8"	0119721
Atmospheric quick-release valve – AQR.	0111236
Blow-off Check valve 1/8" NPSF female.	0115314
Blow-off Check valve G1/4" female	0117337

Suction Cup Fittings

	M2,5 Male	M5 Male	M5 Female	5×M5 Female	M10×1,5 Male	G3/4" Female	G1/2" Female	G1/2" Male	G3/8" Female	G3/8" Male	G1/4" Female	G1/4" Male
B		5, 8, 10, 15		20		150	75, 110, 150		75, 110	30, 40, 50		30, 40, 50
BB-L								30, 40, 60		30, 40, 60		
BFF					40, 60, 80, 110				30, 40, 60, 80,110	60, 80, 110	30, 40, 60, 80, 110	80, 110
BFFT					50, 70, 80, 90, 110				50, 70, 80, 90, 110	80, 110	50, 70, 80, 90, 110	50, 70, 80, 90, 110
BL-2				20						30, 40, 50		30, 40, 50
BL-3-P								50		30,40		
BL-4								50		40		30
BL-5								50		40		30
B-MF		15		20						30, 40, 50		30,40,50
B-P							75		75	75		
BXF					60, 75, 90, 105				60, 75, 90, 105	60, 75, 90, 105	60, 75, 90, 105	60, 75, 90, 105
BX-P		10, 15		20, 25						35, 52, 75, 110		25, 35, 52, 75
B-XP				20, 25						35, 52, 75, 110		35, 52, 75
D		15		30						50		50
DCF					65, 90, 110				65, 90, 110		65, 90, 110	65, 90, 110
F				20, 25, 30		150	75, 110, 150		75, 110	40, 50, 75, 110,		26, 33, 40, 50

Specifications subject to change without notice.

G1/8" Male	G1/8" M. / M5 F.	3/8" NPSF Female	1/8" NPSF Female	5×1/8" NPSF F.	3/8" NPT Female	3/8" NPT Male	1/2" NPT Male	1/4" NPT Female	1/4" NPT Male	1/8" NPT Male	G3/8" M. / 1/8" NPSF F.	T-slot
20	20	110	30, 40, 50, 75, 110	30, 40, 50		30, 40, 50	30, 40, 50	75		20		
						30, 40, 60	30, 40, 60					
					30, 40, 60, 80, 110							
			50, 70, 90		50, 70, 80, 90, 110						50, 70, 90	
20	20		30, 40, 50	30, 40, 50		30, 40, 50			30, 40, 50	20		
						30, 40	50					
						40	50		30			
						40	50		30			
20	20		30, 40, 50	30, 40, 50		40, 50			30, 40, 50	20		
		75	75									
					60, 75, 90, 105							
20, 25, 35, 52, 75	20, 25	75, 110	35, 52	52		35, 52			35, 52	20, 25		
20, 25, 35, 52, 75	20, 25	52, 75, 110,	35, 52	52		35, 52			35, 52	20, 25	75	
20,30	20, 30		50						50	20, 30		
					65, 90, 110						65, 90, 110	
20, 25, 30	20, 25, 30	75, 110	40, 50, 75	40, 50		40, 50		75	40,50	20, 25, 30		

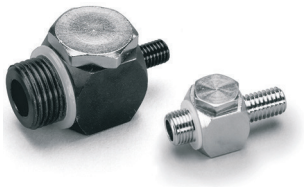
	M2,5 Male	M5 Male	M5 Female	5×M5 Female	M10×1,5 Male	G3/4" Female	G1/2" Female	G1/2" Male	G3/8" Female	G3/8" Male	G1/4" Female	G1/4" Male
F-BX		10								25,35		15, 20, 25, 35
FC				20, 25			100, 150		100, 150	35, 75,100		35
FCF					35, 50, 75, 100, 125				25, 35, 50, 75, 100, 125	35, 50, 75, 100, 125	25, 35, 50, 75, 100, 125	
F-MF			15, 25	20, 30						40,50		40, 50
F-OB												20×40, 30×60
OB										35×90, 50×140, 65×170 35×90, 50×140, 65×170		
OBF					15×35, 15×65, 30×60, 35×90, 50×140, 65×170				15×35,15×65, 30×60, 35×90, 50×140, 65×170	15×35,15×65, 30×60, 35×90, 50×140, 65×170	15×35, 15×65, 30×60	15×35, 15×65, 30×60
OBL										40×90		
OC									60×140			
OCF					20×50				20×80, 30×90, 40×110, 20×50, 20×50	20×80, 30×90, 40×110, 20×50	20×50	20×50
OC-P									35×90, 35×90	35×90		
OF		15×45								15×45		
PD										27		27
RB											20×40	
U	2, 3	4, 6, 8, 10, 15	20, 30	20, 30						40, 50		40, 50
U-P												
XLF							150, 200, 250,300					

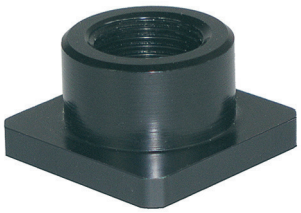
Specifications subject to change without notice.

G1/8" Male	G1/8" M. / M5 F.	3/8" NPSF Female	1/8" NPSF Female	5×1/8" NPSF F.	3/8" NPT Female	3/8" NPT Male	1/2" NPT Male	1/4" NPT Female	1/4" NPT Male	1/8" NPT Male	G3/8" M. / 1/8" NPSF F.	T-slot
10, 15, 20						25, 35			15, 20, 25, 35	10, 15, 20		
25, 25	20, 25	75, 100, 150,	20, 25, 35, 100	35		35			35	20, 25	50, 75	
					25, 35, 50, 75, 100, 125							
20, 30	20, 30		40, 50	40		40,50			40, 50	20, 30		
10×30, 20×40, 30×60												
20×60		35×90, 50×140, 65×170 35×90, 50×140, 65×170										
					15×35, 15×65, 30×60, 35×90, 50×140, 65×170	15×35						15×35, 15×65, 30×60
					60×140							
					20×80, 30×90, 40×110, 20×50							20×50
		35×90										
15×45		15×45										
27						27			27	27		
20×40												
20, 30	20, 30		40, 50	40, 50		50			40, 50	20, 30		
20												

Specifications subject to change without notice.

Other





Angle Adaptors

- Angle adaptors facilitate vacuum connections when space and headroom are limited.
- Can also be used as T-connectors.

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.

ORDERING INFORMATION

Description	Item no.
Angle adapter G1/2"–M8	3150054
Angle adapter G1/8"–M5	3150052
Angle adapter G1/8"–M8	3150053
T-slot adapter 3/8" NPT	0104111
T-slot adapter G1/2" male	0104112
T-slot adapter G1/8" male	0104108
T-slot adapter G3/8" female	0107942
T-slot adapter G3/8" male	0104110

Specifications subject to change without notice.

Vacuum pumps/generators

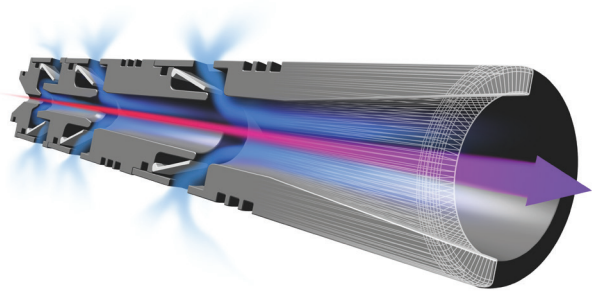


VACUUM PUMPS/GENERATORS	**205**
Vacuum cartridges / custom integration	207
Inline	218
Compact/stackable	228
Combined pump and gripper	247
Standard	260
Extra safety	292
Chemical resistant	300

COAX® technology

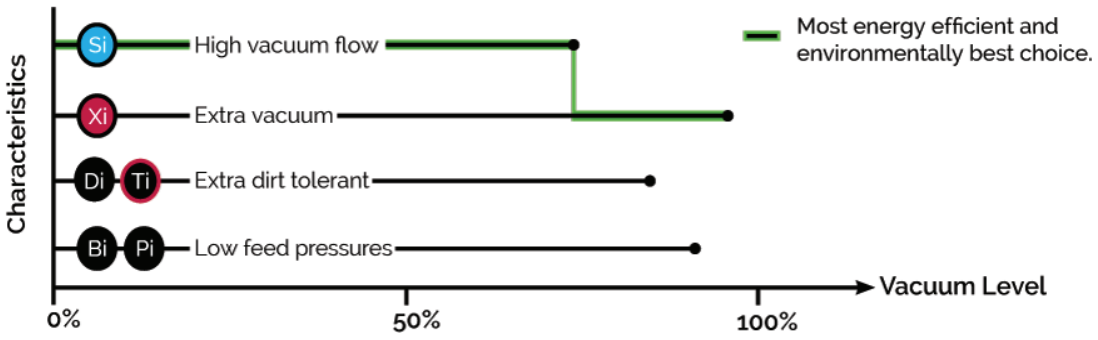
PIAB VACUUM PUMPS/GENERATORS ARE PREDOMINATELY BASED ON THE PATENTED COAX® TECHNOLOGY.

COAX® is an advanced solution for creating vacuum with compressed air. Based on Piab's multistage technology, COAX® cartridges are smaller, more efficient and more reliable than conventional ejectors, which allow for the design of a flexible, modular and efficient vacuum system. 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. COAX® cartridges exist in several sizes (MIDI, MINI & MICRO) and models (Bi, Pi, Si, Ti, Xi and Di), making them suitable for every application. The technology ensures excellent performance at both low and high feed pressures. Pumps based on COAX® technology can operate within the feed pressure range of 0.17 to 0.60 MPa.



CUSTOM INTEGRATION

- The two-stage COAX® cartridge MICRO is probably the world's smallest multistage vacuum ejector. Its low weight makes it suitable to integrate close to the suction point in high speed pick and-place applications of small objects.
- The two-stage COAX® cartridge MINI has small mounting dimensions and the three-stage COAX® cartridge MINI has high initial vacuum flow.
- The two-stage COAX® cartridge MIDI has small mounting dimensions and the three-stage COAX® cartridge MIDI has high initial vacuum flow. The MIDI cartridges are efficient generators of blow-air and are also suitable for fast evacuation of large volumes.



COAX® MICRO family



MICRO Bi03-2



MICRO Si02-2



MICRO Ti05-2



MICRO Xi2.5-2

The two-stage COAX® cartridge MICRO is probably the world's smallest multistage vacuum ejector. Its low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.

VACUUM FLOW

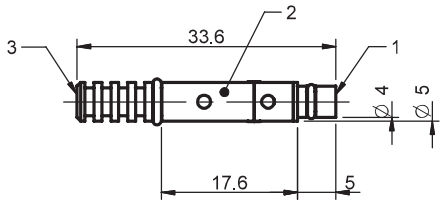
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.23	0.15	0.06	0.04	0.035	0.023	0.013	0.006	—	83
MICRO Si02-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75
MICRO Ti05-2	0.4	0.27	0.32	0.28	0.23	0.17	0.1	0.07	0.04	0.02	0.004	84
MICRO Xi2.5-2	0.5	0.13	0.24	0.17	0.1	0.06	0.04	0.03	0.02	0.01	0.01	92

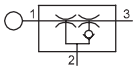
EVACUATION TIMES

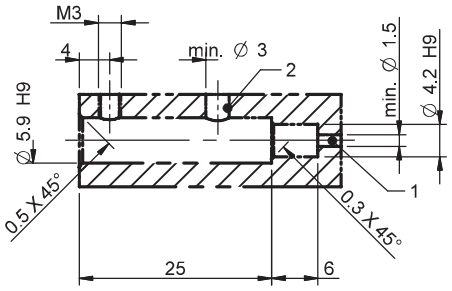
COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.5	1.4	3.9	6.4	10	16	28	51	83
MICRO Si02-2	0.6	0.12	0.41	1.01	2.01	3.3	4.9	6.9	10.2	—	75
MICRO Ti05-2	0.4	0.27	0.33	0.73	1.2	2	3.1	5	8.3	16.6	84
MICRO Xi2.5-2	0.5	0.13	0.49	1.23	2.48	4.5	7.3	11.3	18	28	92

Specifications subject to change without notice.

DIMENSIONAL DRAWING







ORDERING INFORMATION

Description	Item No.
COAX® cartridge MICRO Bi03-2	0106966
COAX® cartridge MICRO Bi03-2, holding cap	0106968
COAX® cartridge MICRO Si02-2	0113591
COAX® cartridge MICRO Si02-2, holding cap	0113593
COAX® cartridge MICRO Ti05-2	0123098
COAX® cartridge MICRO Ti05-2, holding cap	0125794
COAX® cartridge MICRO Xi2.5-2	0120297
COAX® cartridge MICRO Xi2.5-2, holding cap	0120283

COAX® MINI family


MINI Di16-2


MINI Pi12-2


MINI Pi12-3


MINI Pi12-3 FS


MINI Si08-2


MINI Si08-3 FS


MINI Si08-3


MINI Xi10-2


MINI Xi10-3


MINI Xi10-3 FS

The two-stage COAX® cartridge MINI has small mounting dimensions and the three-stage COAX® cartridge MINI has high initial vacuum flow.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Di16-2	0.6	0.75	0.64	0.57	0.49	0.41	0.35	0.29	0.18	0.04	—	—	73
MINI Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Pi12-3	0.32	0.44	1.4	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Pi12-3 FS	0.32	0.44	1.4	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Si08-2	0.6	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	—	—	75
MINI Si08-3	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75

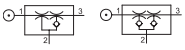
Specifications subject to change without notice.

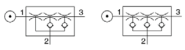
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Si08-3 FS	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
MINI Xi10-2	0.5	0.46	0.75	0.63	0.49	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
MINI Xi10-3	0.5	0.46	1.43	0.7	0.5	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94
MINI Xi10-3 FS	0.5	0.46	1.43	0.7	0.5	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94

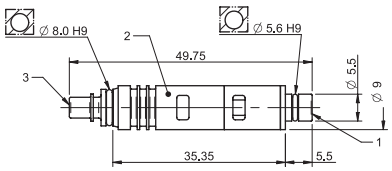
EVACUATION TIMES

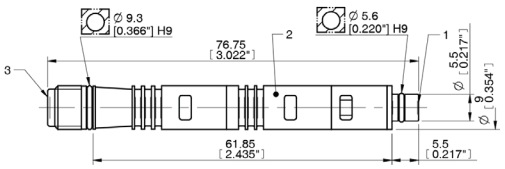
COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80		-kPa
MINI Di16-2	0.6	0.75	0.17	0.35	0.58	0.84	1.15	1.58	2.49	—	—	73
MINI Pi12-2	0.32	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4	6.4	—	90
MINI Pi12-3	0.32	0.44	0.08	0.23	0.49	1	1.7	2.6	3.9	6.3	—	90
MINI Pi12-3 FS	0.32	0.44	0.08	0.23	0.49	1	1.7	2.6	3.9	6.3	—	90
MINI Si08-2	0.6	0.44	0.14	0.31	0.55	0.9	1.4	2.1	3.1	—	—	75
MINI Si08-3	0.6	0.44	0.1	0.25	0.48	0.8	1.3	2	2.9	—	—	75
MINI Si08-3 FS	0.6	0.44	0.1	0.25	0.48	0.8	1.3	2	2.9	—	—	75
MINI Xi10-2	0.5	0.46	0.14	0.3	0.6	1	1.6	2.3	3.5	5.3	8.9	94
MINI Xi10-3	0.5	0.46	0.09	0.26	0.5	0.9	1.5	2.2	3.4	5.2	8.8	94
MINI Xi10-3 FS	0.5	0.46	0.09	0.26	0.5	0.9	1.5	2.2	3.4	5.2	8.8	94

DIMENSIONAL DRAWING









ORDERING INFORMATION

Description	Item No.
COAX® cartridge MINI Di16-2	0204917
COAX® cartridge MINI Di16-2, holding cap	0204918
COAX® cartridge MINI Pi12-2	0106922
COAX® cartridge MINI Pi12-2, extra non-return valve	0106963
COAX® cartridge MINI Pi12-2, holding cap	0106924
COAX® cartridge MINI Pi12-2, holding cap, extra non-return valve	0106964
COAX® cartridge MINI Pi12-3	0106895
COAX® cartridge MINI Pi12-3, extra non-return valve	0106956
COAX® cartridge MINI Pi12-3, extra non-return valve, holding cap silencer, vacuum filter	0106676
COAX® cartridge MINI Pi12-3, holding cap	0106923
COAX® cartridge MINI Pi12-3, holding cap silencer, vacuum filter	0104265
COAX® cartridge MINI Pi12-3, holding cap, extra non-return valve	0106957
COAX® cartridge MINI Si08-2	0113583
COAX® cartridge MINI Si08-2, extra non-return valve	0113587
COAX® cartridge MINI Si08-2, holding cap	0113585
COAX® cartridge MINI Si08-2, holding cap, extra non-return valve	0113589
COAX® cartridge MINI Si08-3	0113214
COAX® cartridge MINI Si08-3, extra non-return valve	0113575
COAX® cartridge MINI Si08-3, extra non-return valve, holding cap silencer, vacuum filter	0113581
COAX® cartridge MINI Si08-3, holding cap	0113572
COAX® cartridge MINI Si08-3, holding cap silencer, vacuum filter	0113579

Specifications subject to change without notice.

Description	Item No.
COAX® cartridge MINI Si08-3, holding cap, extra non-return valve	0113577
COAX® cartridge MINI Xi10-2	0120284
COAX® cartridge MINI Xi10-2, extra non-return valve	0120280
COAX® cartridge MINI Xi10-2, holding cap	0120294
COAX® cartridge MINI Xi10-2, holding cap, extra non-return valve	0120300
COAX® cartridge MINI Xi10-3	0120286
COAX® cartridge MINI Xi10-3, extra non-return valve	0120289
COAX® cartridge MINI Xi10-3, extra non-return valve, holding cap silencer, vacuum filter	0120776
COAX® cartridge MINI Xi10-3, holding cap	0120299
COAX® cartridge MINI Xi10-3, holding cap silencer, vacuum filter	0120775
COAX® cartridge MINI Xi10-3, holding cap, extra non-return valve	0120298

COAX® MIDI family


MIDI Pi48-2


MIDI Pi48-3


MIDI Si32-2


MIDI Si32-3


MIDI Xi40-2


MIDI Xi40-3

The two-stage COAX® cartridge MIDI has small mounting dimensions and the three-stage COAX® cartridge MIDI has high initial vacuum flow. The MIDI cartridges are efficient generators of blow-air and are also suitable for fast evacuation of large volumes.

VACUUM FLOW

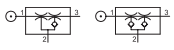
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-2	0.31	2	2.8	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Pi48-3	0.31	2	5.6	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Si32-2	0.6	1.75	3.3	3	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Si32-3	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Xi40-2	0.45	1.83	2.8	2.3	1.6	1	0.73	0.58	0.43	0.32	0.18	0.03	95
MIDI Xi40-3	0.45	1.83	5.9	3	2	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95

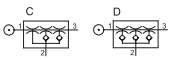
EVACUATION TIMES

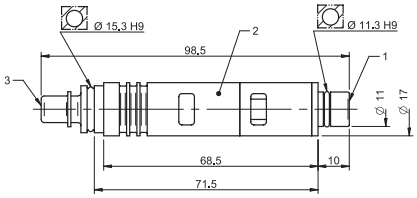
COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-2	0.31	2	0.03	0.07	0.13	0.26	0.46	0.7	1	1.6	4	90
MIDI Pi48-3	0.31	2	0.02	0.06	0.12	0.25	0.45	0.7	1	1.6	4	90
MIDI Si32-2	0.6	1.75	0.03	0.07	0.1	0.18	0.33	0.53	0.8	—	—	75
MIDI Si32-3	0.6	1.75	0.02	0.05	0.1	0.18	0.33	0.53	0.8	—	—	75
MIDI Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.9	1.3	2.3	95
MIDI 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

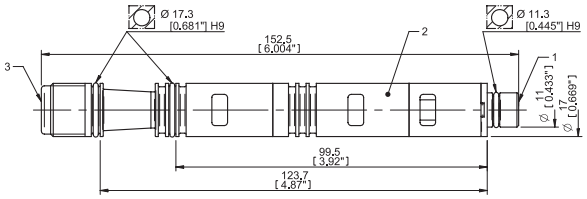
Specifications subject to change without notice.

DIMENSIONAL DRAWING









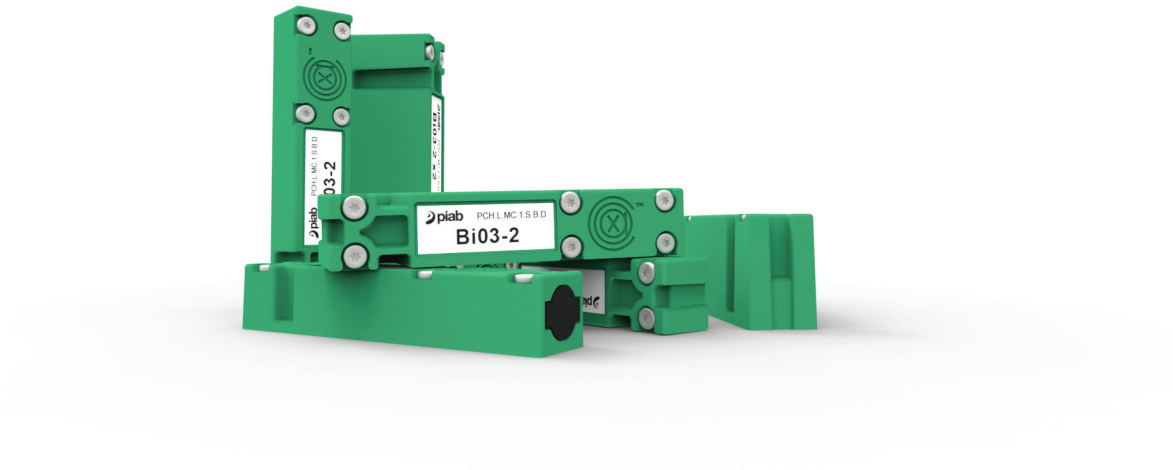
ORDERING INFORMATION

Description	Item No.
COAX® cartridge MIDI Pi48-2	0107125
COAX® cartridge MIDI Pi48-2, extra non-return valve	0107710
COAX® cartridge MIDI Pi48-2, holding cap	0107127
COAX® cartridge MIDI Pi48-2, holding cap, extra non-return valve	0107712
COAX® cartridge MIDI Pi48-3	0106639
COAX® cartridge MIDI Pi48-3, extra non-return valve	0107714
COAX® cartridge MIDI Pi48-3, extra non-return valve, sealings in Viton®	0124806
COAX® cartridge MIDI Pi48-3, holding cap	0107129
COAX® cartridge MIDI Pi48-3, holding cap, extra non-return valve	0107716
COAX® cartridge MIDI Pi48-3, sealings in Viton®	0117286
COAX® cartridge MIDI Si32-2	0107124
COAX® cartridge MIDI Si32-2, extra non-return valve	0107709
COAX® cartridge MIDI Si32-2, holding cap	0107126
COAX® cartridge MIDI Si32-2, holding cap, extra non-return valve	0107711
COAX® cartridge MIDI Si32-3	0107053

Description	Item No.
COAX® cartridge MIDI Si32-3, extra non-return valve	0107713
COAX® cartridge MIDI Si32-3, extra non-return valve, sealings in Viton®	0122176
COAX® cartridge MIDI Si32-3, holding cap	0107128
COAX® cartridge MIDI Si32-3, holding cap, extra non-return valve	0107715
COAX® cartridge MIDI Si32-3, sealings in Viton®	0114989
COAX® cartridge MIDI Xi40-2	0118747
COAX® cartridge MIDI Xi40-2, extra non-return valve	0118748
COAX® cartridge MIDI Xi40-2, holding cap	0118757
COAX® cartridge MIDI Xi40-2, holding cap, extra non-return valve	0118758
COAX® cartridge MIDI Xi40-3	0118724
COAX® cartridge MIDI Xi40-3, extra non-return valve	0118725
COAX® cartridge MIDI Xi40-3, extra non-return valve, sealings in Viton®	0124796
COAX® cartridge MIDI Xi40-3, holding cap	0118759
COAX® cartridge MIDI Xi40-3, holding cap, extra non-return valve	0118760
COAX® cartridge MIDI Xi40-3, sealings in Viton®	0124794

Specifications subject to change without notice.

piCHIP10X family



The lightweight piCHIP10X unit is a small vacuum pump which is optimized for integration. It is flexible enough to surface mount quickly on a variety of materials. With its almost silent operation, the piCHIP10X is ideal for clean room operations. Medical and electronic industries are best suited to use this product in their vacuum applications. Because COAX® cartridges are up to twice as fast as other cartridges and provide three times more flow than a conventional ejector with the same air consumption, the piCHIP10X is able to provide a high performance even at low or fluctuating feed pressures (0.1-0.6 MPa).

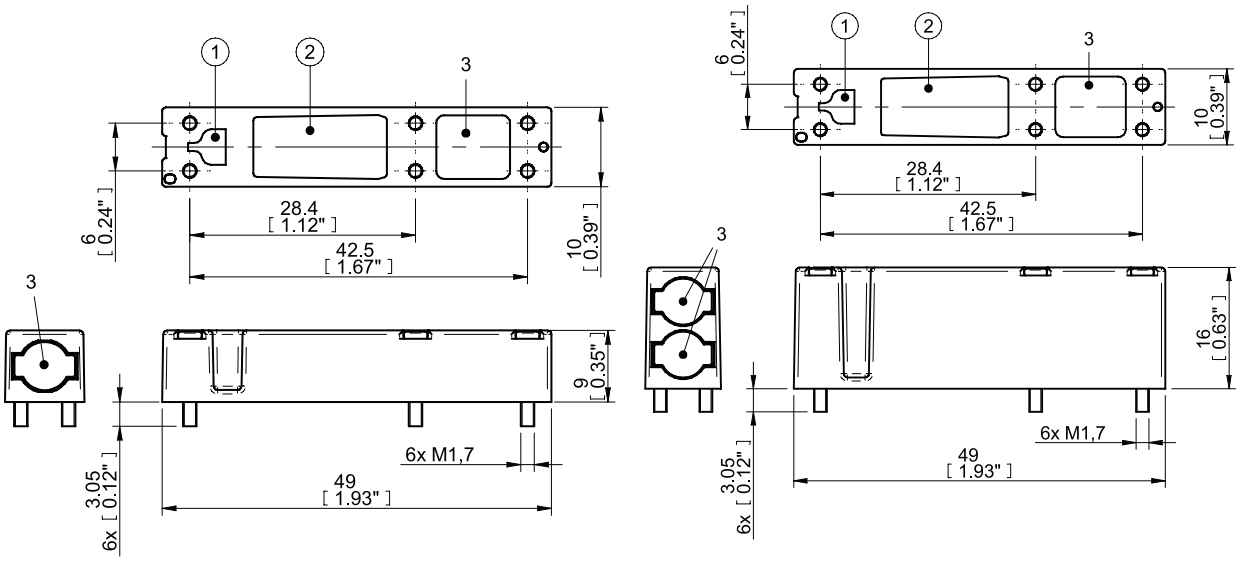
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.23	0.15	0.06	0.04	0.035	0.023	0.013	0.006	—	83
MICRO Si02-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75
MICRO Ti05-2	0.4	0.27	0.32	0.28	0.23	0.17	0.1	0.07	0.04	0.02	0.004	84
MICRO Xi2.5-2	0.5	0.13	0.24	0.17	0.1	0.06	0.04	0.03	0.02	0.01	0.01	92

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.5	1.4	3.9	6.4	10	16	28	51	83
MICRO Si02-2	0.6	0.12	0.41	1.01	2.01	3.3	4.9	6.9	10.2	—	75
MICRO Ti05-2	0.4	0.27	0.33	0.73	1.2	2	3.1	5	8.3	16.6	84
MICRO Xi2.5-2	0.5	0.13	0.49	1.23	2.48	4.5	7.3	11.3	18	28	92

DIMENSIONAL DRAWING



ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings. CAD-drawings and much more. Register and get full access to all resources available.

piCHIP10X – CUSTOMER CODE

piCHIP Code
PCH

Code	Vacuum characteristics
L	Low feed pressure
S	High vacuum flow
X	Extra vacuum level
T	Extra high vacuum flow (micro)

Code	Nozzle model
MC	MICRO (14-19 Nl/min)

Code	Nozzle rows
1	Single
2	Double

PCH . L . MC . 1 . S . B . C

Code	Chemical resistance
S	Standard

Code	Additional functions
B	Without non-return valve

Code	Options
C	Central exhaust
D	Direct exhaust

piINLINE® MICRO family



piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting).

The COAX® Cartridge Si/Ti for extra vacuum flow, Bi cartridge for reliability at low feed pressures. And Ti/Xi cartridge when high flow and deep vacuum is needed. The Ti cartridges are also extra dirt tolerant.

VACUUM FLOW

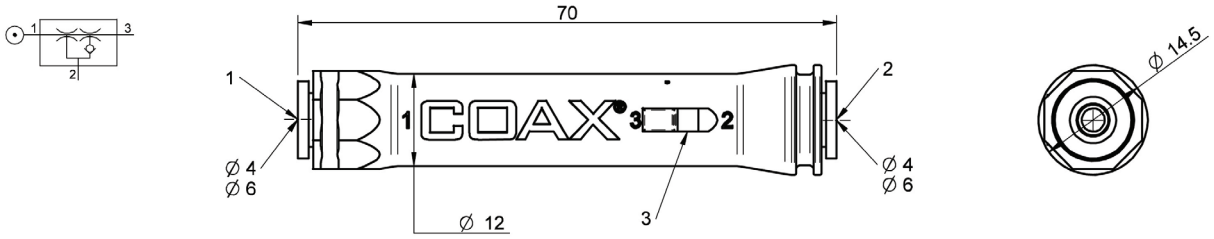
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.23	0.15	0.06	0.04	0.035	0.023	0.013	0.006	—	83
MICRO Si02-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75
MICRO Ti05-2	0.4	0.27	0.32	0.28	0.23	0.17	0.1	0.07	0.04	0.02	0.004	84
MICRO Ti05-2	0.6	0.37	0.31	0.27	0.24	0.2	0.15	0.09	0.04	0.01	—	75
MICRO Xi2.5-2	0.5	0.13	0.24	0.17	0.1	0.06	0.04	0.03	0.02	0.01	0.01	92

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.5	1.4	3.9	6.4	10	16	28	51	83
MICRO Si02-2	0.6	0.12	0.41	1.01	2.01	3.3	4.9	6.9	10.2	—	75
MICRO Ti05-2	0.4	0.27	0.33	0.73	1.2	2	3.1	5	8.3	16.6	84
MICRO Ti05-2	0.6	0.37	0.3	0.7	1.2	1.8	2.6	4.2	8.43	—	75
MICRO Xi2.5-2	0.5	0.13	0.49	1.23	2.48	4.5	7.3	11.3	18	28	92

Specifications subject to change without notice.

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
piINLINE® vacuum generator MICRO Bi, 4-4 mm	0122880
piINLINE® vacuum generator MICRO Bi, 6-6 mm	0122883
piINLINE® vacuum generator MICRO Si, 6-6 mm	0122882
piINLINE® vacuum generator MICRO Ti, 6-6 mm	0122022
piINLINE® vacuum generator MICRO Xi, 4-4 mm	0122881
piINLINE® vacuum generator MICRO Xi, 6-6 mm	0122884

piINLINE® MINI family



piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting).

The COAX® Cartridge Si cartridge for extra vacuum flow, the Pi cartridge for high performance at low feed pressures. And the Xi cartridge when high flow and deep vacuum is needed.

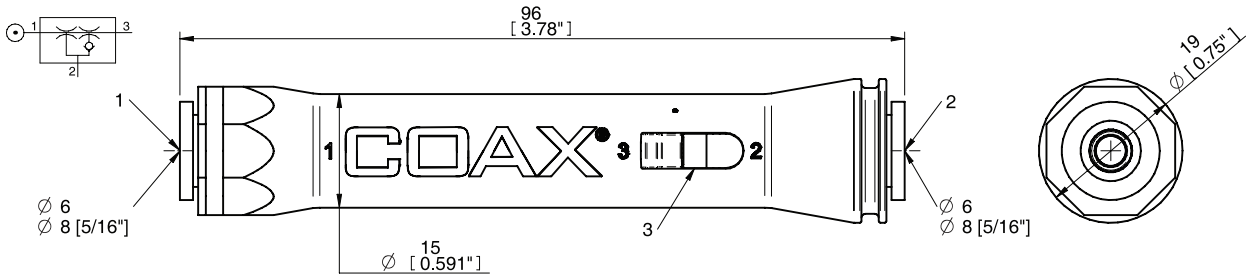
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Si08-2	0.6	0.44	0.69	0.55	0.42	0.28	0.23	0.16	0.12	0.08	—	—	75
MINI Pi12-2	0.32	0.44	0.57	0.44	0.31	0.23	0.19	0.14	0.1	0.06	0.03	—	90
MINI Xi10-2	0.5	0.46	0.62	0.5	0.37	0.27	0.19	0.15	0.11	0.07	0.045	0.011	94

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Si08-2	0.6	0.44	0.16	0.37	0.66	1.1	1.4	2.1	3.1	—	—	75
MINI Pi12-2	0.32	0.44	0.2	0.46	0.83	1.1	1.8	2.7	4	6.4	—	90
MINI Xi10-2	0.5	0.46	0.18	0.41	0.72	1	1.6	2.3	3.5	5.3	8.9	94

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
piINLINE® vacuum generator MINI Pi, 6-6 mm	0122894
piINLINE® vacuum generator MINI Pi, 8-8 mm	0122897
piINLINE® vacuum generator MINI Si, 6-6 mm	0122025
piINLINE® vacuum generator MINI Si, 8-8 mm	0122896
piINLINE® vacuum generator MINI Xi, 1/4"-1/4"	0205550
piINLINE® vacuum generator MINI Xi, 6-6 mm	0122895
piINLINE® vacuum generator MINI Xi, 8-8 mm	0122898

piINLINE® MIDI family



piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting).

The COAX® Cartridge Si cartridge for extra vacuum flow the Pi cartridge for high performance at low feed pressures. And the Xi cartridge when high flow and deep vacuum is needed.

VACUUM FLOW

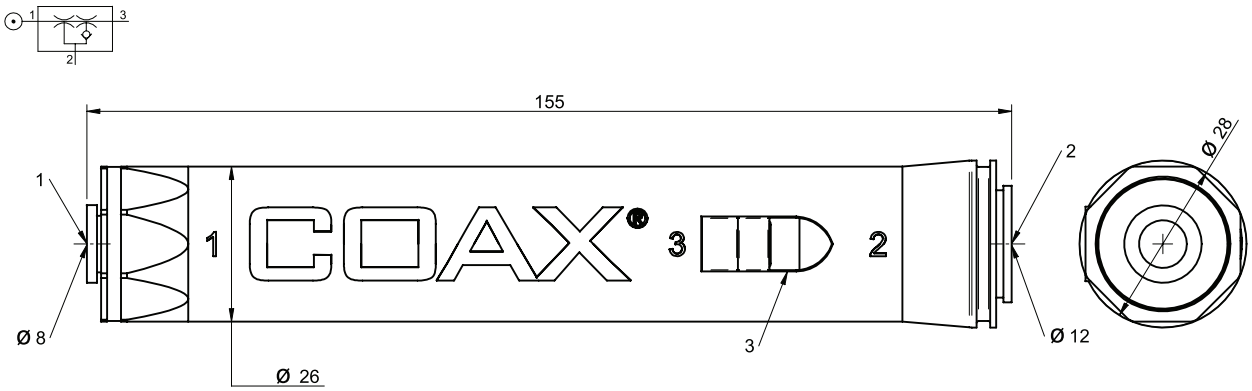
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-2	0.6	1.75	3.1	2.5	1.9	1.2	0.7	0.6	0.5	0.35	—	—	75
MIDI Pi48-2	0.31	2	2.7	2.2	1.5	0.93	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Xi40-2	0.45	1.83	2.8	2.3	1.6	1	0.73	0.58	0.43	0.32	0.18	0.03	95

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-2	0.6	1.75	3.1	2.5	1.9	1.2	0.7	0.6	0.5	0.35	—	75
MIDI Pi48-2	0.31	2	0.04	0.1	0.18	0.3	0.48	0.71	1.05	1.85	4	90
MIDI Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.9	1.3	2.3	95

Specifications subject to change without notice.

DIMENSIONAL DRAWING



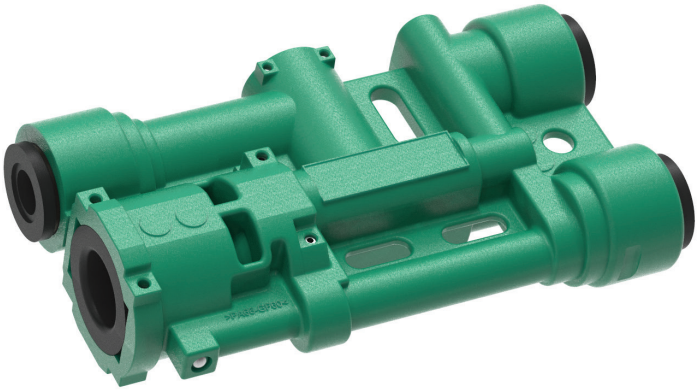
ORDERING INFORMATION

Description	Item No.
piINLINE® vacuum generator MIDI Pi, 8-12 mm	0122899
piINLINE® vacuum generator MIDI Si, 8-12 mm	0122032
piINLINE® vacuum generator MIDI Xi, 8-12 mm	0122900

Specifications subject to change without notice.

piINLINE® Plus family





The ultra-lightweight vacuum ejectors feature a unique and integrated automatic release mechanism, and come in compact, minimised packages. Tailor-made for automotive press-shop automation, piINLINE® plus generators utilise the COAX® technology, ensuring low air consumption (typically 25 percent lower than competing technology), excellent suction capacity, and fast evacuation. Generators can be configured with either one or two MICRO COAX® cartridges; two cartridges for larger suction cups in high speed applications, or one cartridge for smaller suction cups or for reduced air consumption when high speed is not essential.

The integrated release function is available in two optional designs – the easily controllable Atmospheric Quick Release (AQR), which requires no extra compressed air hose, and the very fast performing Exhaust Block Release (EBR).

VACUUM FLOW

COAX® cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Ti05-2	0.5	0.64	0.62	0.56	0.48	0.38	0.26	0.14	0.06	0.02	0.004	81

EVACUATION TIMES

COAX® cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Ti05-2	0.5	0.64	0.17	0.36	0.6	0.9	1.4	2.4	4.9	13.3	81

ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

piINLINE®PLUS – CUSTOMER CODE

piINLINE®plus Code
PIL

Code	Model
A	AQR
B	EBR

Code	Nozzle
T	Ti05-2 Extra high vacuum flow

Code	Nozzle rows
1	Single
2	Double

Code	Air connection:
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)
8	ø8 push-in connector(s)

Code	EBR-Pilot air connection
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)
8	ø8 push-in connector(s)
X	No pilot air connection

PIL . A . T . 2 . 8X . 10 . X . XXX

Code	Vacuum connection
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)
8	ø8 (5/18 (5/16)) push-in connector(s)
10	ø1/4" push-in connector(s)
38	ø3/8" push-in connector(s)

Code	Sensing port connection
X	No
6	Yes 6mm
14	Yes 1/4" mm

Code	Suction cup holder
X	No holder
I	Ball-Joint
C	Lock-pin

Code	Holder mounting direction
X	No holder
LH	Left handed
RH	Right handed
U	Up

Code	Holder thread
X	No holder
G38F	G3/8" female
G38M	G3/8" male
NT38M	3/8" NPT male

piSTAMP



piSTAMP offers easy retrofitting in the automotive press shop tooling. The ultra-lightweight vacuum generator features a unique and integrated release mechanism, and comes in a compact, minimised package. A fully decentralised design with compressed air ports at the side and vacuum port underneath, piSTAMP will fit perfectly in generic suction cup holders found in standard press shop tooling systems. piSTAMP utilises COAX® technology, typically 25 percent lower than competing technology, excellent suction capacity, and fast evacuation. The generator is normally supplied with two MICRO COAX® cartridges, supporting large suction cups in high speed applications. A one cartridge option is available for additional air consumption saving when used with smaller cups or at slower cycle speeds.

The integrated release function, the very fast acting Exhaust Block Release (EBR), is based on a durable polyurethane membrane which is not sensitive to dust. This ensures highly reliable production systems with improved uptime.

VACUUM FLOW

COAX® cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Ti05-2	0.5	0.64	0.62	0.56	0.48	0.38	0.26	0.14	0.06	0.02	0.004	81

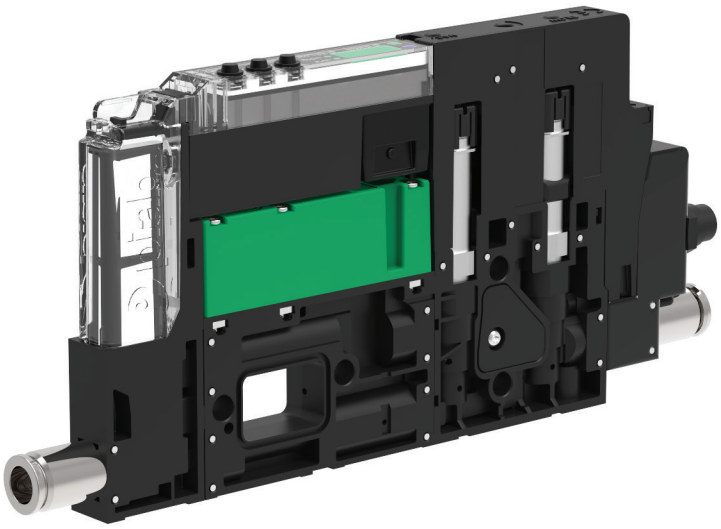
EVACUATION TIMES

COAX® cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Ti05-2	0.5	0.64	0.17	0.36	0.6	0.9	1.4	2.4	4.9	13.3	81

ORDERING INFORMATION

Name	Item No.
piSTAMP STX0785x2, 6-6 mm	0208767
piSTAMP STX0785x2, 8-8mm	0208766
piSTAMP STX0785x2, 1/4''-1/4''	0208768
piSTAMP COAX® MICRO Ti05-2x2, 6-6 mm	0207771
piSTAMP COAX® MICRO Ti05-2x2, 8-8 mm	0207770
piSTAMP COAX® MICRO Ti05-2x2, 1/4''-1/4''	0207772

piCOMPACT®10X



piCOMPACT® is an ejector family with integrated controls, so called compact or ”all-in-one” ejector unit. It is a stackable platform with the possibility to mount several units in the same manifold and have common pneumatic and electrical connections. The focus during development has been on the most significant “key criteria” for these types of pumps, reliability and speed, as well as introducing some brand new attractive features/functions. That in combination with our state-of-the-art vacuum engine, COAX®, the product is outstanding. By working at low feed pressure and maximizing the utilization rate of the compressed air, the COAX® ejectors reduce energy consumption for manufacturers while increasing productivity and reliability. Its vacuum response to 50–60 -kPa is typically 30–50% faster compared to single stage technology. The piCOMPACT® is only 10 mm wide with a large 6 mm vacuum connection for maximum performance.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	-kPa
MICRO Bi03-2	0.22/0.2*	0.14	0.21	0.14	0.063	0.021	0.016	0.014	0.007	0.004	82
MICRO Si02-2	0.604/0.6*	0.11	0.26	0.18	0.095	0.053	0.045	0.038	0.027	0.019	75
MICRO Ti05-2	0.43/0.4*	0.23	0.31	0.28	0.22	0.16	0.088	0.063	0.045	0.023	84
MICRO Xi2.5-2	0.51/0.5*	0.13	0.23	0.15	0.079	0.044	0.036	0.03	0.023	0.013	91

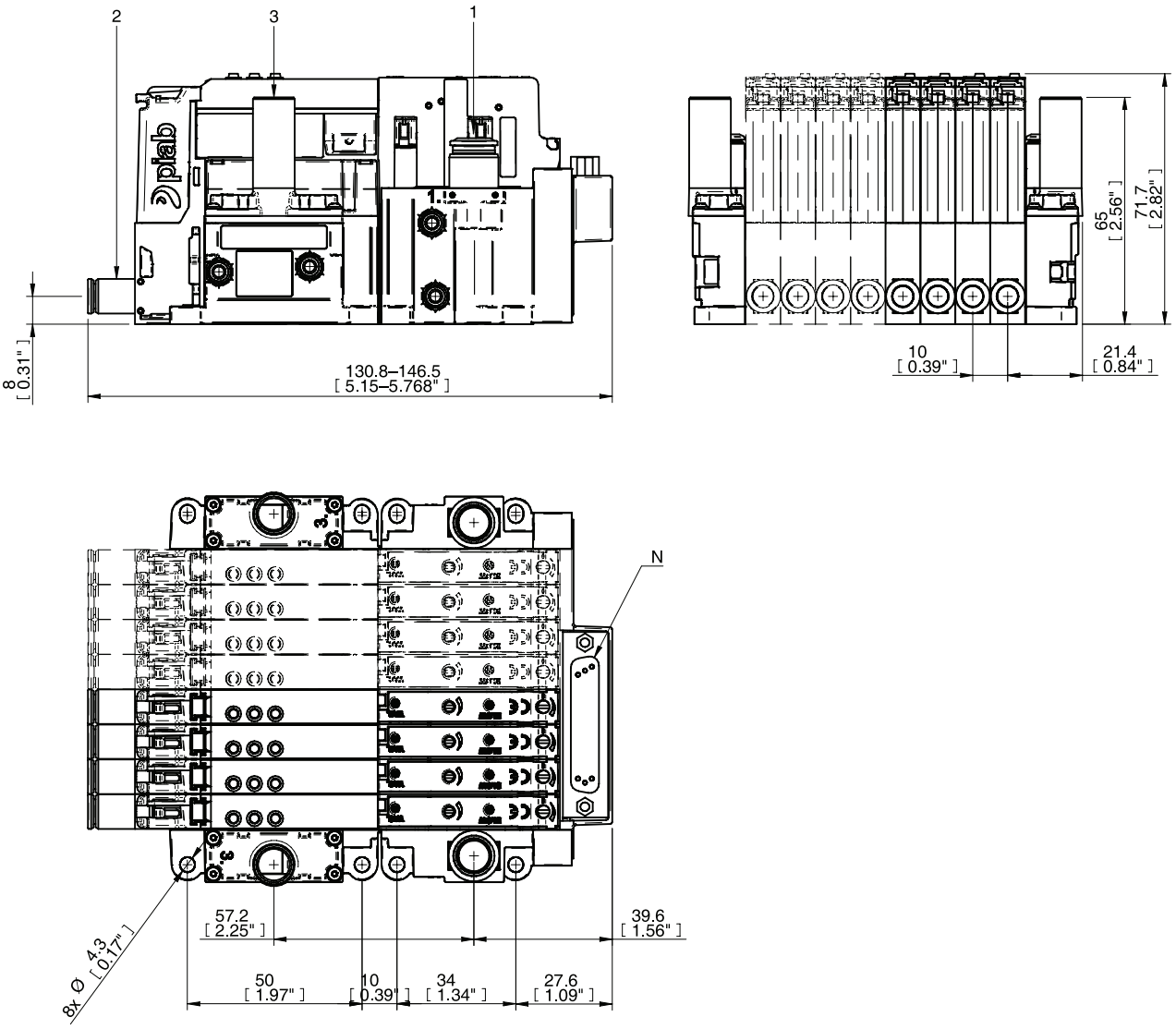
* Pump/nozzle.

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (ms) of 5 ml to reach different vacuum levels (-kPa)											Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	75	80	90	Max	-kPa
MICRO Bi03-2	0.22/0.2*	0.14	5	9.9	20.4	53	99	153	228	354	—	552	—	652**	82
MICRO Si02-2	0.604/0.6*	0.11	5	8.9	16.2	31	48	68	95	136	185	—	—	185**	75
MICRO Ti05-2	0.43/0.4*	0.23	5	6.7	10.2	14.8	23	35	50	70	—	114	—	159**	84
MICRO Xi2.5-2	0.51/0.5*	0.13	5.1	8.9	16.2	35	59	87	121	169	—	250	421	464**	91

* Pump/nozzle, ** Evacuation time (ms) to max vacuum level (-kPa).

DIMENSIONAL DRAWING



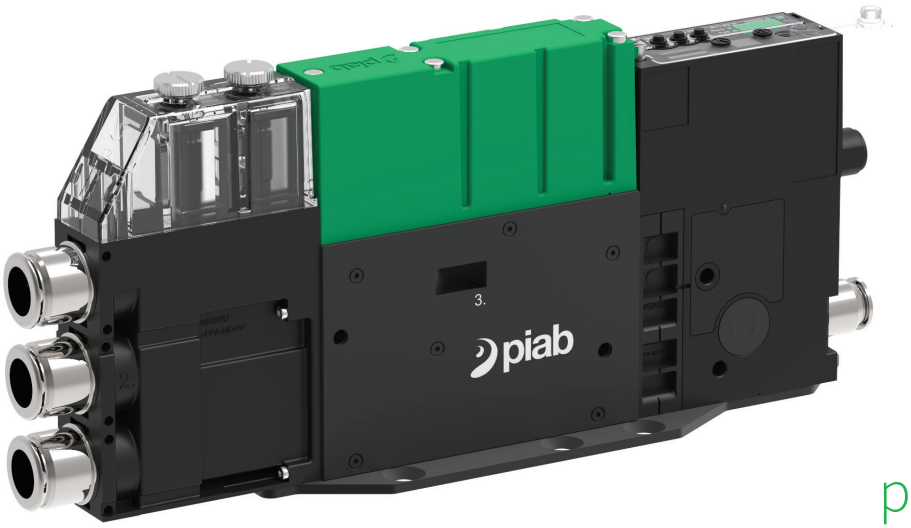
ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

CUSTOMER CODE

For the configuration tables of piCOMPACT®10X go to page 232.

piCOMPACT®23



piSMART®

piCOMPACT® is an ejector family with integrated controls, so called compact or ”all-in-one” ejector unit. It is a stackable platform with the possibility to mount several units in the same manifold and have common pneumatic and electrical connections. The focus during development has been on the most significant “key criteria” for these types of pumps, reliability and speed, as well as introducing some brand new attractive features/functions. That in combination with our state-of-the-art vacuum engine, COAX®, the product is outstanding. By working at low feed pressure and maximizing the utilization rate of the compressed air, the COAX® ejectors reduce energy consumption for manufacturers while increasing productivity and reliability.Its vacuum response to 50–60 -kPa is typically 30–50% faster compared to single stage technology.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
SX12	0.504/0.5*	0.72	1.22	1.03	0.78	0.52	0.27	0.21	0.15	0.09	0.03	85
SX42	0.47/0.43*	2.21	3.46	3.02	2.41	1.7	1.02	0.61	0.47	0.28	0.1	90

* Pump/nozzle.

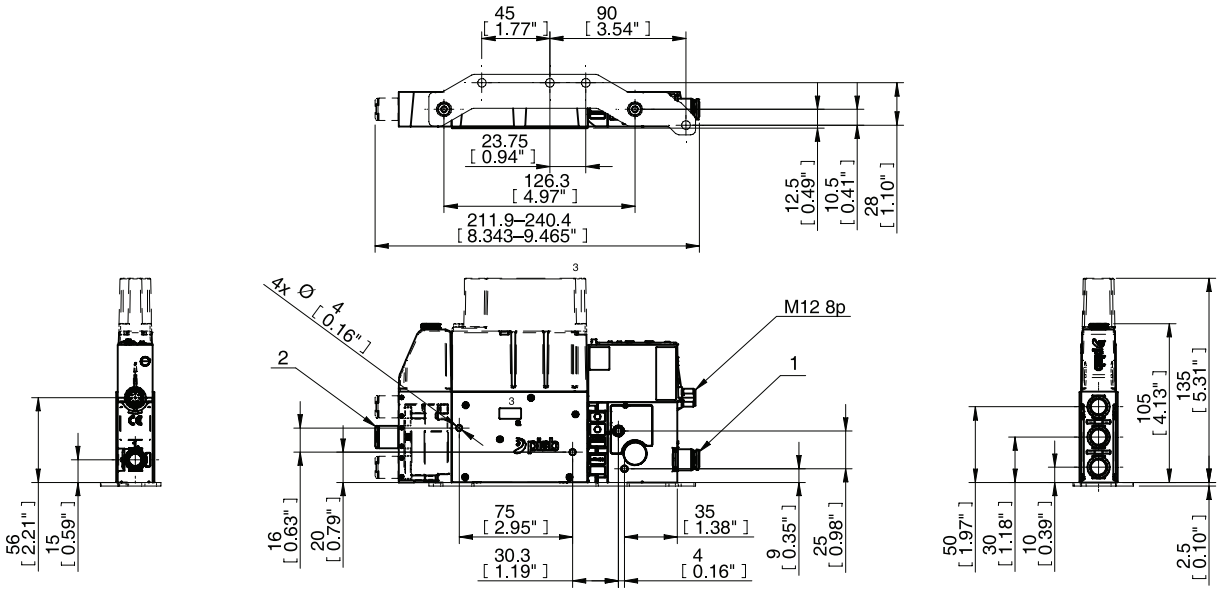
EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
SX12	0.504/0.5*	0.72	0.082	0.201	0.374	0.674	1.216	1.914	2.978	6.187	85
SX42	0.47/0.43*	2.21	0.038	0.074	0.123	0.204	0.356	0.577	0.879	1.718	90

* Pump/nozzle.

Specifications subject to change without notice.

DIMENSIONAL DRAWING



ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

piSMART®

For more information on piSMART® and how Piab helps shape the industry of tomorrow go to page 409.

CUSTOMER CODE

For the configuration tables of piCOMPACT®23 go to page 234.

piCOMPACT®10X – CUSTOMER CODE

piCOMPACT®
Code
PC

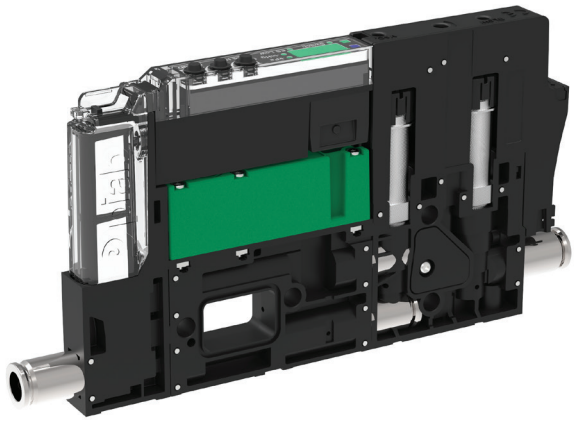


Ejector performance	
Code	Vacuum characteristics
L	Low feed pressure
S	High vacuum flow
X	Extra vacuum level
T	Extra high vacuum flow



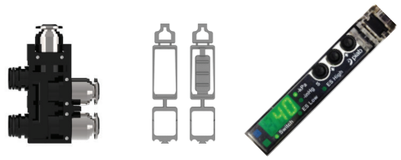
Ejector performance	
Code	Nozzle model
MC	MICRO (14–19 Nl/min)
Code	**Nozzle rows**
1	Single
2	Double

Working enviroment	
Code	Chemical resistance
S	Standard



PC . S . MC2 . S . AAA . S16 . 1X . 6 . EI . CCP6

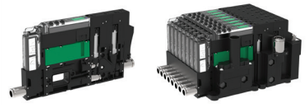
PC . S . MC2 . S . AAA . S16 . 1X . 6 . EI . CCP6



Functionality	
Code	**Control functions**
A	Electrical ES, vac and blow off
B	Electrical ES, vac and automatic blow off
C	Vac and blow off
D	Vac and automatic blow off (ATBO)
E	Vacuum on/off (vac)
Code	**Non-return valve**
B	Without non-return valve
A	With non-return valve
Code	**Vacuum sensing**
A	Display, analog and digital output
X	No vacuum sensing



Vacuum connect module	
Code	**Vacuum filter**
S	Vacuum filter 50 µm
X	No vacuum filter
Code	**Vacuum port(s)/channel**
1	1 vacuum port
2	2 vacuum ports
3	3 vacuum ports
Code	**Vacuum connection(s)**
4	Ø4 (5/32") push-in connector(s)
6	Ø6 push-in connector(s)
14	Ø1/4" push-in connector(s)



Single unit or manifold mount	
Code	**Number of channels**
1	1 channel
2	2 channels
3	3 channels
4	4 channels
5	5 channels
6	6 channels
7	7 channels
8	8 channels
Code	**Split control from vacuum**
X	No split
A	Split Ø4
B	Split Ø6
C	Split Ø1/4"



Air supply	
Code	**Air connections**
4	Ø4 (5/32") push-in connector
6	Ø6 push-in connector
14	Ø1/4" push-in connector
8	Ø8 (5/16") push-in connector
26	2 x Ø6 push-in connectors
214	2 x Ø1/4" push-in connectors
28	2 x Ø8 (5/16") push-in connectors



Mounting	
Code	**Options**
EC	Ejectors stacked with central exhaust
EN	Ejectors stacked with central silencer
EI	Ejector(s) for individual mounts



Electrical properties	
Code	**Valve configuration**
CC	NC vacuum + NC blow off
OC	NO vacuum + NC blow off
RC	NC 2/2 vacuum + NC 2/2 blow off
C	NC vacuum
O	NO vacuum
R	NC 2/2 vacuum
Code	**Electrical input/output**
P	PNP
N	NPN
Code	**Electrical interface**
6	6p connector(s)
A	M8 6p connector(s)
26	HD D-sub 26p connector
44	HD D-sub 44p connector

piCOMPACT®23 – CUSTOMER CODE

piCOMPACT®
Code
PC

Functionality	
Code	Vacuum characteristics
F	High vacuum performance



Functionality	
Code	Nozzle model
12	SX12 (73–146 Nl/min)
42	SX42 (207–415 Nl/min)
Code	**Nozzle rows**
1	Single
2	Double

Working enviroment	
Code	Chemical resistance
S	Standard



Functionality	
Code	Control functions
A	Electrical ES, vac and blow-off
B	Electrical ES, vac and automatic timer based blow-off (ATBO)
F	Electrical ES, vac, intelligent blow-off (IBO)
C	Vac and blow-off
D	Vac, automatic timer based blow-off (ATBO)
G	Vac and intelligent blow off (IBO)
E	Vacuum on/off (vac)
H	IO-Link pre-configured

Code	Additional vacuum functions
	No extra vacuum control
Z	Self adhesion control (SAC)

Code	Internal check valves
B	Without non-return valve
A	With non-return valve
C	Amplified blow-off, without vacuum non-return valve (ABO)
D	Amplified blow-off, with vacuum non-return valve (ABO)
E	Pre-vacuum hovering, without vacuum non-return valve (PVH)
F	Pre-vacuum hovering, with vacuum non-return valve (PVH)
Code	**Vacuum sensing**
A	Display, analog and digital output
B	Display, 2× digital outputs
C	Display, leakage warning and digital output
D	IO-Link display
X	No vacuum sensing

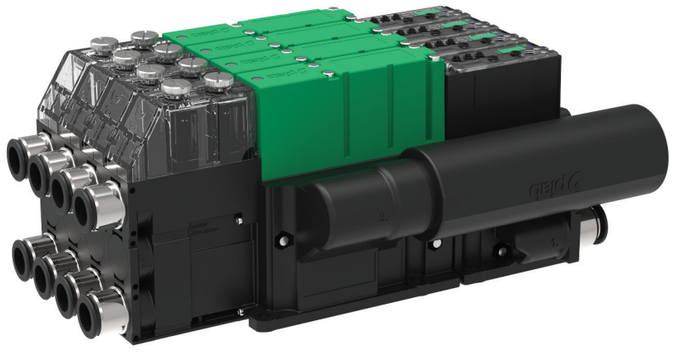


Vacuum connect module	
Code	Vacuum filter
S	Vacuum filter 50 µm
F	2× Vacuum filter 50 µm
X	No vacuum filter
Z	No vacuum filter including sensing port
Code	**Vacuum ports(s) / channel**
1	1 vacuum port
2	2 vacuum ports
3	3 vacuum ports
Code	**Vacuum connection(s)**
8	Ø8(5/16) push-in connector(s)
P1	Ø10 push-in connector(s)
P2	Ø3/8" push-in connector(s)
P3	Ø12 push-in connector(s)
P4	Ø1/2" push-in connector(s)
H1	12mm / 1/2" I.D. barb connector



Single unit or manifold mount	
Code	Number of channels
1	1 channel
2	2 channels
3	3 channels
4	4 channels
Code	**Split control from vacuum**
X	No split
B	Split Ø6
C	Split Ø1/4"
D	Split Ø8
E	Split Ø10
F	Split Ø3/8"

Code	IO-Link Energy saving type
1	ES pre-set on 75 -kPa
2	ES Automatic level determination (ALD)
3	ES pre-set on 75 -kPa with ALD backup
0	No ES
Code	**IO-Link Blow-off type**
1	Automatic timer based blow-off (ATBO)
2	Intelligent blow off (IBO)
0	External control
Code	**IO-Link Additional functions**
1	Self adhesion control (SAC)
0	No IO-Link additional functions

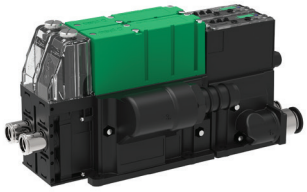


PC . F . 422 . S . AAA . F18 . 4X . 2P1 . EN . CCAB

PC . F . 122 . S . H111AD . S1P1 . 1X . 8 . EJ . CCCC



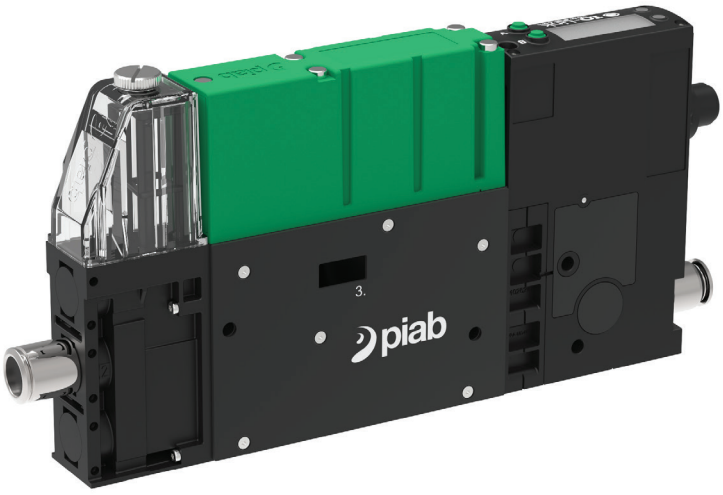
Air supply	
Code	**Air connections**
6	Ø6 push-in connector
14	Ø1/4" push-in connector
8	Ø8(5/16") push-in connector
P1	Ø10 push-in connector
P2	Ø3/8" push-in connector
P3	Ø12 push-in connector(s)
P4	Ø1/2" push-in connector(s)
2P1	2× Ø10 push-in connector(s)
2P2	2× Ø3/8" push-in connector(s)
2P3	2× Ø12 push-in connector(s)
2P4	2× Ø1/2" push-in connector(s)



Mounting	
Code	**Ejector options**
EC	Ejectors stacked with central exhaust
EN	Ejectors stacked with central silencer
EJ	Ejector(s) for individual mounts, integrated silencer
EK	Ejector(s) for individual mounts, top mounted silencer
EL	Ejector(s) for individual mounts, central exhaust
EM	Ejector(s) for individual mounts, central silencer

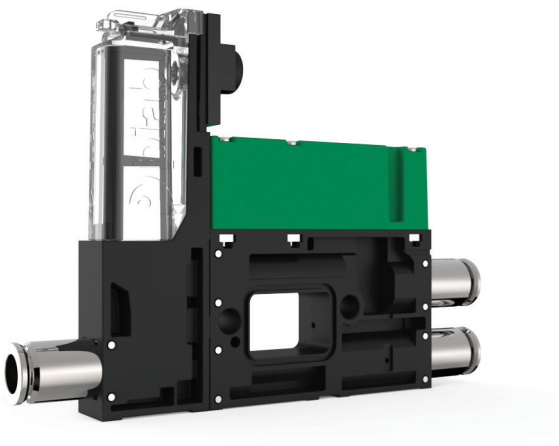


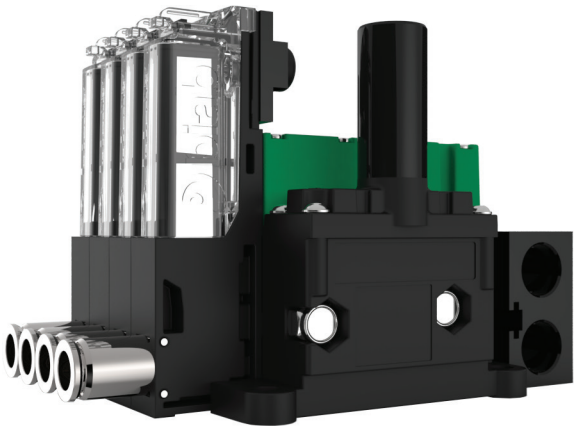
Electrical properties	
Code	**Valve configuration**
CC	NC vacuum + NC blow off
FC	NC vacuum (power off - NO) + NC blow off
OC	NO vacuum + NC blow off
C	NC vacuum
O	NO vacuum
AC	Bi-stable vacuum valve + NC blow off
Code	**Electrical input/output**
A	PNP/PNP or NPN/NPN
B	Mixed mode
C	IO-Link, PNP/PNP
Code	**Electrical interface**
B	M12 8p connector(s)
C	M12 4p connector(s)



PC . F . 122 . S . H111AD . S1P1 . 1X . 8 . EJ . CCCC

piPUMP10X





Compact/stackable vacuum pumps are air-driven multistage ejector families, based on COAX® technology, It provides a high operational reliability, in case of fluctuating or low compressed-air pressure. Excellent performance when a quick response time when deep vacuum is needed. There is also a quick vacuum non-return valve as an option.

VACUUM FLOW

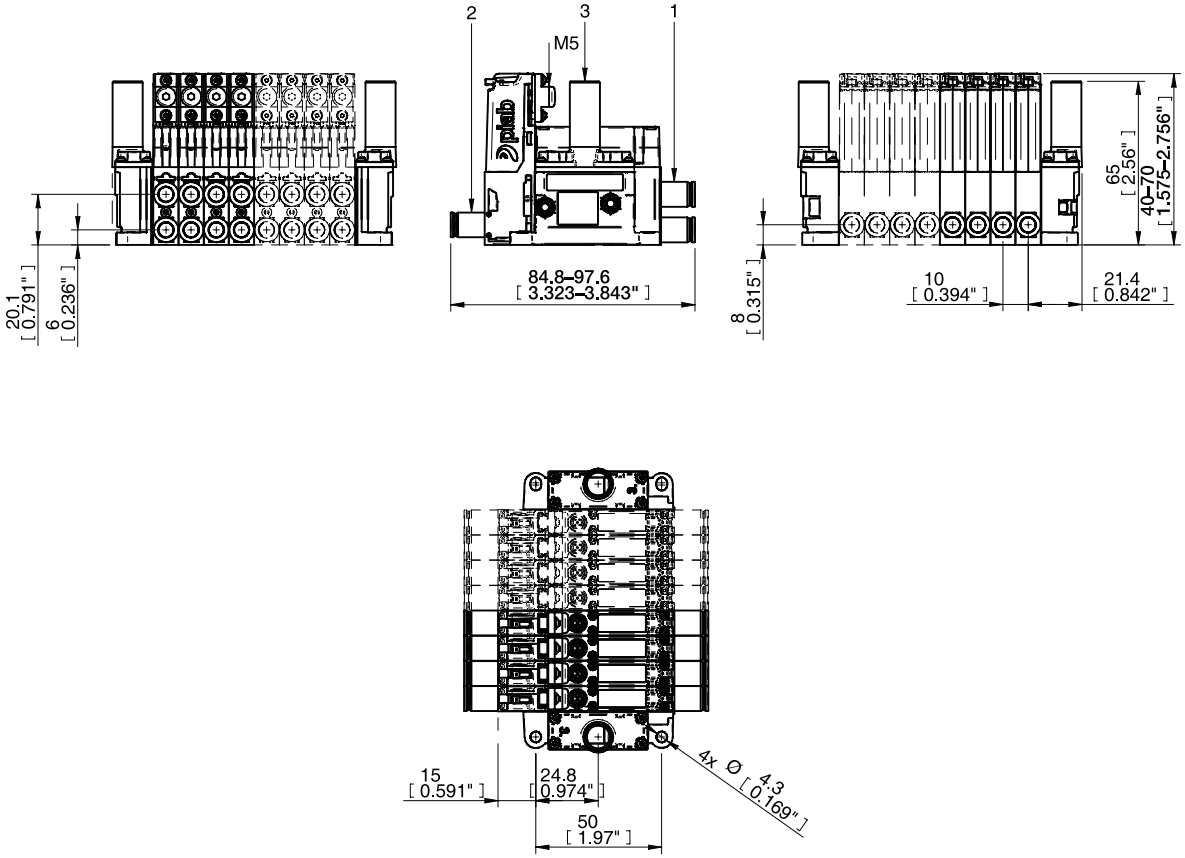
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	-kPa
MICRO Bi03-2	0.2	0.14	0.21	0.14	0.063	0.021	0.016	0.014	0.007	0.004	82
MICRO Si02-2	0.6	0.11	0.26	0.18	0.095	0.053	0.045	0.038	0.027	0.019	75
MICRO Ti05-2	0.4	0.23	0.31	0.28	0.22	0.16	0.088	0.063	0.045	0.023	84
MICRO Xi2.5-2	0.5	0.13	0.23	0.15	0.079	0.044	0.036	0.03	0.023	0.013	91

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)											Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	Max	-kPa
MICRO Bi03-2	0.2	0.14	5	9.9	20.4	53	99	153	228	354	552	—	652*	82
MICRO Si02-2	0.6	0.11	5	8.9	16.2	31	48	68	95	136	—	—	185*	75
MICRO Ti05-2	0.4	0.23	5	6.7	10.2	14.8	23	35	50	70	114	—	159*	84
MICRO Xi2.5-2	0.5	0.13	5.1	8.9	16.2	35	59	87	121	169	250	421	464*	91

* Evacuation time (ms) at max vacuum level (-kPa).

DIMENSIONAL DRAWING



ORDERING INFORMATION

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piPUMP10X – CUSTOMER CODE

piPUMP® Code
PP

Code	Vacuum characteristics
L	Low feed pressure
S	High vacuum flow
T	Extra vacuum level
X	Extra high vacuum flow (micro)

Code	Nozzle model
MC	MICRO (14-19 Nl/min)

Code	Nozzle rows
1	Single
2	Double

Code	Chemical resistance
S	Standard

PP . L . MC1 . S . A . S14 . 1 . 4 . EC . CV

Code	Air connections
4	ø4 (5/32”) push-in connector(s)
6	ø6 push-in connector(s)
14	ø1/4” push-in connector(s)
18	1/8” NPSF Common feed

Code	Options
EC	Ejectors stacked with central exhaust
EX	Ejectors stacked without central exhaust
EN	Ejectors stacked with central silencer
X	No option

Code	Release functions
CV	Blow off check valve

Code	Additional function
A	With non-return valve
B	Without non-return valve

Code	Vacuum filter
S	Vacuum filter 50 µm
X	No vacuum filter
Code	**Vacuum port(s)/channel**
1	1 vacuum port
2	2 vacuum ports
3	3 vacuum ports
Code	**Vacuum connection(s)**
4	ø4 (5/32") push-in connector(s)
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)

Code	Number of channels
1	1 channel
2	2 channels
3	3 channels
4	4 channels
5	5 channels
6	6 channels
7	7 channels
8	8 channels

P3010 family



Compact/stackable vacuum pumps are air-driven multistage ejector families, based on COAX® technology, they are equipped with integrated controls and special functions, such as on/off valve, blow-off valve, vacuum switch, energy saving function etc. They are configurable platforms, making it easy to specify the exact control functions needed for the system.

It is 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. The P3010 includes a flow-through silencer and a built-in vacuum filter for harsh environments. It is suitable for fast and reliable evacuation in sealed systems.

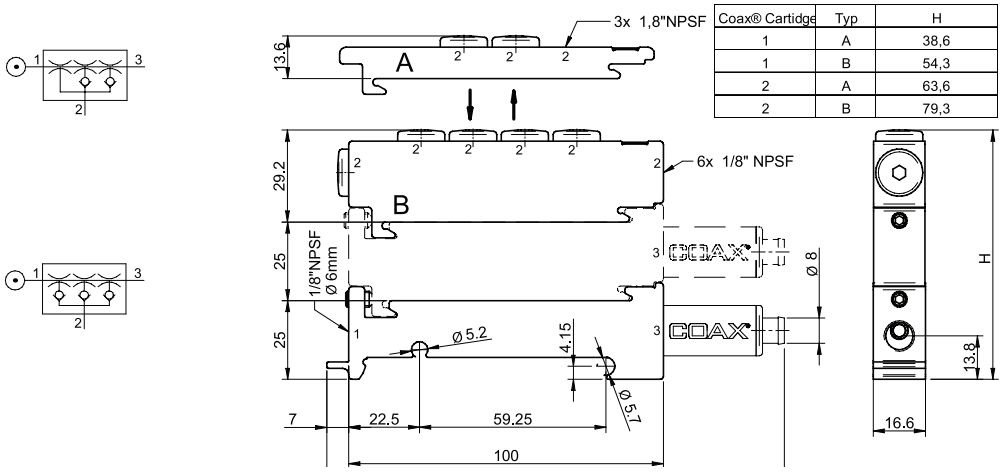
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Pi12-3	0.32	0.44	1.40	0.60	0.44	0.27	0.19	0.14	0.10	0.060	0.030	—	90
MINI Si08-3	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
MINI 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

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Pi12-3	0.32	0.44	0.08	0.23	0.49	1.00	1.70	2.60	3.90	6.30	—	90
MINI Si08-3	0.6	0.44	0.10	0.25	0.48	0.80	1.30	2.30	4.60	—	—	75
MINI 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

DIMENSIONAL DRAWING



Coax® Cartidge	Typ	H
1	A	38,6
1	B	54,3
2	A	63,6
2	B	79,3

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ACCESSORY DESCRIPTIONS



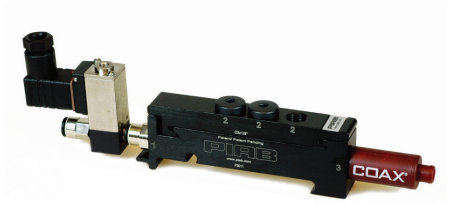
P3010 Quick release

The quick release function has a volume of 3–60 cm^3. Quick release is done by accumulating and utilising the feed-air pressure as a boost. The ON/OFF is activated simultaneously with the P3010



P3010 ES

The P3010 has an integrated air-saving function (piSAVE® onoff) that minimises 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. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.



Solenoid Valve

The solenoid valve is an electric 3/2 valve with a possibility for manual override. As it has push in connections it is quick and easy to mount. The body has three M5 ports. It is suitable for compressed air with a filtration of 40 µm.



Vacuum switch

A vacuum switch can be used for many different applications. It converts a vacuum signal into a electric or pneumatic signal. Vacuum switches are available in many different versions, from very small electro-mechanicals with pre-set settings to pneumatics or programmable fully electronics. Some switches are design to fit directly into the P3010 with an Ø 6 mm push-in.



AVM™2

The AVM™2 unit has built-in control and monitoring functions. The integrated energy saving function (ES) minimises the air consumption in sealed systems. It has valves for vacuum on/off and blow-off with electrical power failsafe function. The AVM™ has digital outputs, 16 pre-set combinations of vacuum levels, digital vacuum level display and a mechanical valve for blow-off flow adjustment.



CU

The CU has electric valves for vacuum on/off and blow-off and a mechanical valve for blow-off flow adjustment. It also has a special M12 4-pin cable assembly with LED for status of valve signal.

P3010 – CUSTOMER CODE

P3010 Code
P3010

Code	Connection interface
00	Housing connection Ø6 mm
01	Housing connection 1/8”

Code	COAX® Cartridge module
AA	COAX® Cartridge module Si08-3 FS ×1
AB	COAX® Cartridge module Si08-3 AFS* ×1
AC	COAX® Cartridge module Si08-3 FS ×2
AD	COAX® Cartridge module Si08-3 AFS* ×2
AE	COAX® Cartridge module Pi12-3 FS ×1
AF	COAX® Cartridge module Pi12-3 AFS* ×1
AG	COAX® Cartridge module Pi12-3 FS ×2
AH	COAX® Cartridge module Pi12-3 AFS* ×2
AI	COAX® Cartridge module Xi10-3 FS ×1
AJ	COAX® Cartridge module Xi10-3 AFS* ×1
AK	COAX® Cartridge module Xi10-3 FS ×2
AL	COAX® Cartridge module ×10-3 AFS* ×2

* AFS option has a non-return valve

P3010 . 00 . AA . 01 . AA . 00

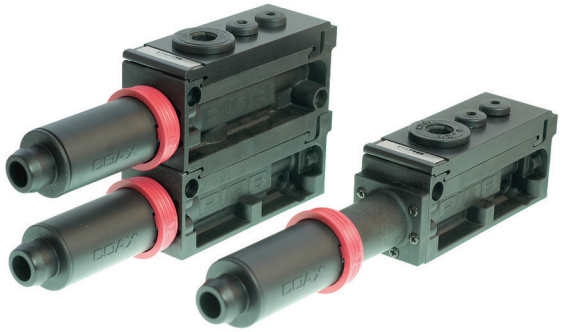
Code	Connection modules / function
01	Connection module high 6×1/8”
02	Connection module low 3×1/8”
04	Function Quick-release module 10/6 - 3
05	Function Quick-release module 8/6 - 30
06	Function Quick-release module 8/6 - 60
07	Function Quick-release module 10/6 - 30
08	Function Quick-release module 10/6 - 60
09	Function Quick-release module 1/4”/6 - 3 (NPSF)
10	Function Quick-release module 1/4”/6-30 (NPSF)
11	Function Quick-release module 1/4”/6-60 (NPSF)
12	Function Quick-release module 8/6-3
27	Function AVM™2 NO
28	Function AVM™2 NC (power off - NO)
29	Function CU NC
30	Function AVM™2 NO auto blow-off (1 sec)
31	Function AVM™2 NC auto blow-off (1 sec)
32	Function AVM™2 NC 2 (power off - NC)
33	Function CU NO

Code	Energy saving
AA	No energy saving (included in AVM™2)
AB	Solenoid valve DS23
AC	piSAVE® onoff 2/2 NO large hysteres
AD	piSAVE® onoff 2/2 NO small hysteres

Code	Vacuum sensing
00	No vacuum sensing (included in AVM™2)
01	Vacuum switch PNP NO MM8
02	Vacuum switch NPN NO MM8
05	Vacuum switch PNP NO LM8
09	Vacuum switch PNP NO DM8
10	Vacuum switch NPN NO DM8
11	Vacuum switch Inductive, adj. Knob
18	Vacuum switch VS4015 30 -kPa
19	Vacuum switch VS4015 50 -kPa
20	Vacuum switch VS4015 70 -kPa
21	Vacuum switch VS4016 30 -kPa
22	Vacuum switch VS4016 50 -kPa
23	Vacuum switch VS4016 70 -kPa

Specifications subject to change without notice.

P5010 family



Compact/stackable vacuum pumps are air-driven multistage ejector families. based on COAX® technology. they are equipped with integrated controls and special functions. such as on/off valve. blow-off valve. vacuum switch. energy saving function etc. They are configurable platforms. making it easy to specify the exact control functions needed for the system.

It has a patented COAX® push-in technology that allows insertion and removal of the cartridge without tools. It is available 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. The P5010 has an integrated flow-through silencer that is unaffected by dust and dirt. It provides substantially lower air-consumption as compared to conventional ejectors of similar sizes.

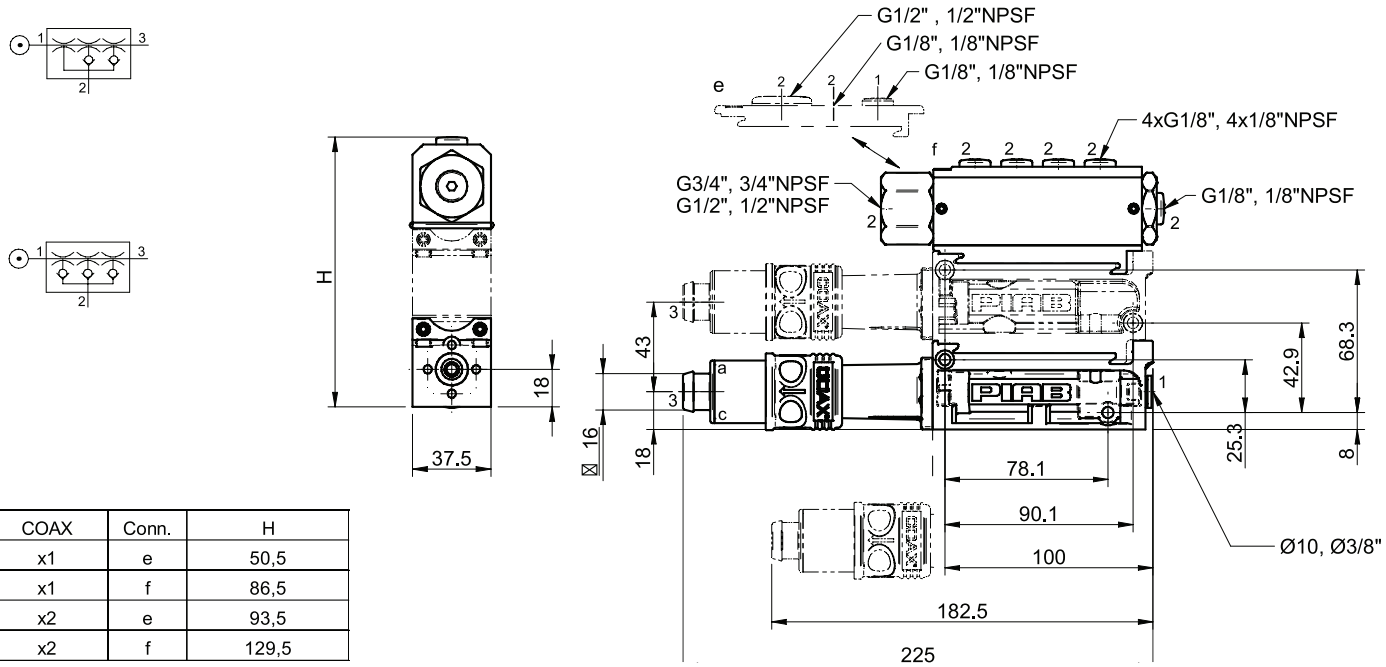
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
Pi48-2	0.31	2	2.8	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
Pi48-3	0.31	2	5.6	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
Si32-2	0.6	1.75	3.3	3	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
Si32-3	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
Xi40-2	0.45	1.83	2.8	2.3	1.6	1	0.73	0.58	0.43	0.32	0.18	0.03	95
Xi40-3	0.45	1.83	5.9	3	2	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
Pi48-2	0.31	2	0.03	0.07	0.13	0.26	0.46	0.7	1	1.6	4	90
Pi48-3	0.31	2	0.02	0.06	0.12	0.25	0.45	0.7	1	1.6	4	90
Si32-2	0.6	1.75	0.03	0.07	0.1	0.18	0.33	0.53	0.8	—	—	75
Si32-3	0.6	1.75	0.02	0.05	0.1	0.18	0.33	0.53	0.8	—	—	75
Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.9	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

DIMENSIONAL DRAWING



COAX	Conn.	H
x1	e	50,5
x1	f	86,5
x2	e	93,5
x2	f	129,5

ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

ACCESSORY DESCRIPTIONS



AVM™2

The AVM™2 unit has built-in control and monitoring functions. The integrated energy saving function (ES) minimises the air consumption in sealed systems. It has valves for vacuum on/off and blow-off with electrical power failsafe function. The AVM™ has digital outputs, 16 pre-set combinations of vacuum levels, digital vacuum level display and a mechanical valve for blow-off flow adjustment.



CU

The CU has electric valves for vacuum on/off and blow-off and a mechanical valve for blow-off flow adjustment. It also has a special M12 4-pin cable assembly with LED for status of valve signal.



P5010 ES

The P5010 has an integrated air-saving function (piSAVE® onoff) that minimises 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. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.

Specifications subject to change without notice.

P5010 – CUSTOMER CODE

P5010
Code
P5010

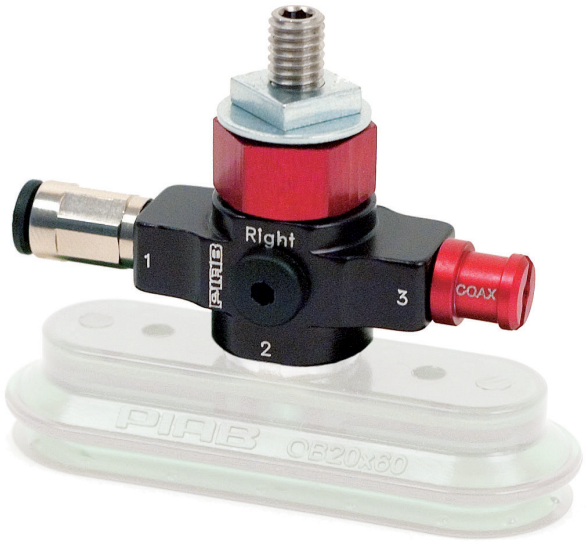
Code	Connection interface
00	Housing, connection Ø 10 mm
01	Housing, connection Ø 3/8"

P5010 . 00 . AA . 01

Code	COAX® Push-in
AA	COAX® push-in module Si32-2X1
AB	COAX® push-in module Si32-3X1
AC	COAX® push-in module Si32-2X1, non-return valve
AD	COAX® push-in module Si32-3X1, non-return valve
AE	COAX® push-in module Si32-2X2
AF	COAX® push-in module Si32-3X2
AG	COAX® push-in module Si32-2X2, non-return valve
AH	COAX® push-in module Si32-3X2, non-return valve
AI	COAX® push-in module Pi48-2X1
AJ	COAX® push-in module Pi48-3X1
AK	COAX® push-in module Pi48-2X1, non-return valve
AL	COAX® push-in module Pi48-3X1, non-return valve
AM	COAX® push-in module Pi48-2X2
AN	COAX® push-in module Pi48-3X2
AO	COAX® push-in module Pi48-2X2, non-return valve
AP	COAX® push-in module Pi48-3X2, non-return valve
AQ	COAX® push-in module Xi40-2X1
AR	COAX® push-in module Xi40-3X1
AS	COAX® push-in module Xi40-2X1, non-return valve
AT	COAX® push-in module Xi40-3X1, non-return valve
AU	COAX® push-in module Xi40-2X2
AV	COAX® push-in module Xi40-3X2
AW	COAX® push-in module Xi40-2X2, non-return valve
AX	COAX® push-in module Xi40-3X2, non-return valve

Code	Connection modules/function
01	Connection module low, G connection
02	Connection module high, G connection
03	Connection module low, NPSF connection
04	Connection module high, NPSF connection
05	Function AVM™2 NO, G connection
06	Function AVM™2 NC (power off - NO), G connection
07	Function AVM™2 NO, NPSF connection
08	Function AVM™2 NC (power off - NO), NPSF connection
09	Function CU NC, G connection
10	Function CU NC, NPSF connection
11	Function ES Vacustat 2/2 NO large hysteres
12	Function ES Vacustat 2/2 NO small hysteres
13	Function AVM™2 NO, automatic blow-off (1 sec), G connection
14	Function AVM™2 NC, automatic blow-off (1 sec), G connection
15	Function AVM™2 NC 2 (power off - NC), G connection
16	Function AVM™2 NO, automatic blow-off (1 sec), NPSF connection
17	Function AVM™2 NC, automatic blow-off (1 sec), NPSF connection
18	Function AVM™2 NC 2 (power off - NC), NPSF connection

VGS™2010 family



Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The "vacuum gripper" 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 decentralized vacuum system. It has a low weight at 25–39 g.

It is available with a two-stage COAX® cartridge MICRO. Choose Bi for low feed pressure, Si for high vacuum flow, Xi for extra vacuum and Ti at 0,4/0,6 MPa for extra capacity/dirt tolerance. This VGS™ is compatible with any suction cup with G1/8" male fitting.

VACUUM FLOW

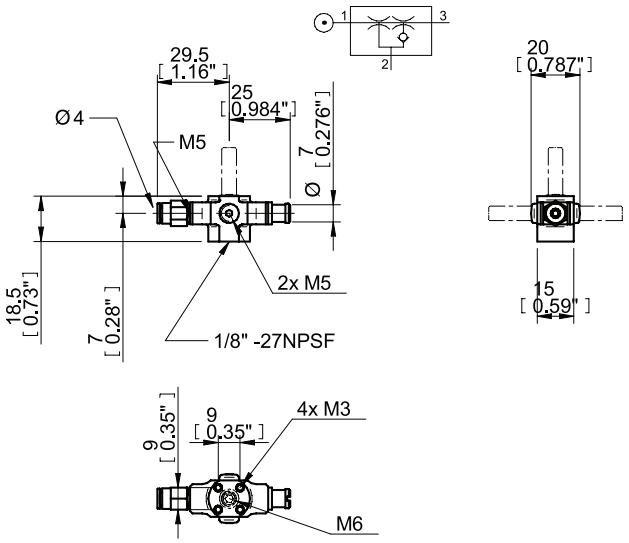
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	-kPa
MICRO Bi03-2	0.2	0.14	0.23	0.15	0.06	0.04	0.035	0.023	0.013	0.006	83
MICRO Si02-2	0.5	0.10	0.27	0.19	0.09	0.08	0.07	0.05	0.02	—	70
MICRO Ti05-2	0.4	0.09	0.25	0.15	0.08	0.07	0.05	0.03	—	—	60
MICRO Ti05-2	0.5	0.10	0.27	0.19	0.09	0.08	0.07	0.05	0.02	—	70
MICRO Xi2.5-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	75

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.2	0.14	0.5	1.4	3.9	6.4	10	16	28	51	83
MICRO Si02-2	0.6	0.12	0.41	1.01	2.01	3.3	4.9	6.9	10.2	—	75
MICRO Ti05-2	0.4	0.27	0.33	0.73	1.2	2	3.1	5	8.3	16.6	84
MICRO Ti05-2	0.6	0.37	0.3	0.7	1.2	1.8	2.6	4.2	8.43	—	75
MICRO Xi2.5-2	0.5	0.13	0.49	1.23	2.48	4.5	7.3	11.3	18	28	92

Specifications subject to change without notice.

DIMENSIONAL DRAWING



ORDERING INFORMATION

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VGS™ 2010 – CUSTOMER CODE

VGS2010 . AB . 01 . BA

VGS2010 Code
VGS2010

Code	COAX®
AA	No COAX® cartridge (slave unit)
AB	COAX® cartridge MICRO Bi03-2
AF	COAX® cartridge MICRO Si02-2
AJ	COAX® cartridge MICRO Xi2.5-2
AN	COAX® cartridge MICRO Ti05-2

Code	Mounting orientation
00	4x M3 top, flush mount
01	M6 19 mm top, profile kit
02	M6 19 mm right, profile kit
03	M6 19 mm left, profile kit

Code	Suction cup
BA	No suction cup
DA	BX25P 30°/60° Shore A
DB	BX25P 60° Shore A
DC	FC20P 50° Shore A
DD	F25CP 50° Shore A
DE	OB20x60P 60° Shore A
DF	OF10x30P 50° Shore A
DG	OF15x45P 50° Shore A

VGS™3010 family



Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The “vacuum gripper” 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 decentralized vacuum system. It has a low weight at 111–340 g.

It is available with two- or three-stage COAX® cartridge MINI. Choose a Di cartridge, for very harsh environments, combining high dust and high humidity levels, 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. The three-stage cartridge will give extra high initial vacuum flow, which is suitable in high speed applications. The VGS™ is compatible with any suction cup with G3/8” male fitting.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Di16-2	0.6	0.75	0.64	0.57	0.49	0.41	0.35	0.29	0.18	0.04	—	—	73
MINI Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Pi12-3	0.32	0.44	1.4	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Si08-2	0.6	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	—	—	75
MINI Si08-3	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
MINI Xi10-2	0.5	0.46	0.75	0.63	0.49	0.33	0.19	0.15	0.11	0.07	0.04	0.011	94
MINI Xi10-3	0.5	0.46	1.43	0.7	0.5	0.33	0.19	0.15	0.11	0.07	0.04	0.011	94

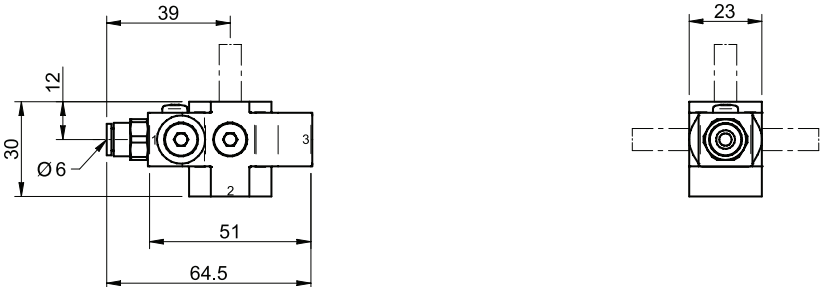
EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Di16-2	0.6	0.75	0.17	0.35	0.58	0.84	1.15	1.58	2.49	—	—	73
MINI Pi12-2	0.32	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4.0	6.4	—	90
MINI Pi12-3	0.32	0.44	0.08	0.23	0.49	1	1.7	2.6	3.9	6.3	—	90

Specifications subject to change without notice.

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Si08-2	0.6	0.44	0.14	0.31	0.55	0.9	1.4	2.1	3.1	—	—	75
MINI Si08-3	0.6	0.44	0.1	0.25	0.48	0.8	1.3	2	2.9	—	—	75
MINI Xi10-2	0.5	0.46	0.14	0.3	0.6	1	1.6	2.3	3.5	5.3	8.9	94
MINI Xi10-3	0.5	0.46	0.09	0.26	0.5	0.9	1.5	2.2	3.4	5.2	8.8	94

DIMENSIONAL DRAWING



ORDERING INFORMATION

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VGS™3010 – CUSTOMER CODE

VGS3010 . AB . 01 . 38

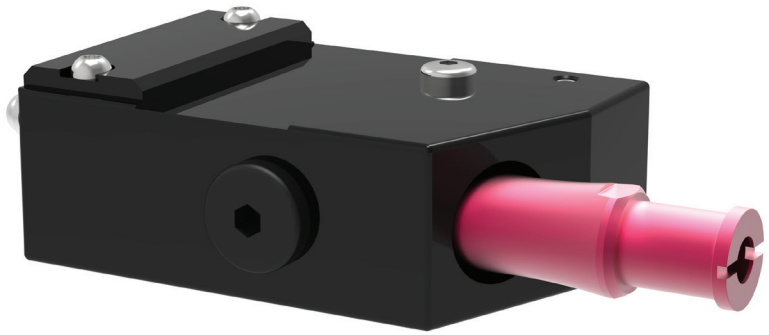
VGS3010 Code
VGS3010

Code	COAX®
AA	No COAX® cartridge (slave unit)
AB	MINI Pi12-2
AC	MINI Pi12-3
AD	MINI Pi12-2, non-return valve
AE	MINI Pi12-3, non-return valve
AF	MINI Si08-2
AG	MINI Si08-3
AH	MINI Si08-2, non-return valve
AI	MINI Si08-3, non-return valve
AJ	MINI Xi10-2
AK	MINI Xi10-3
AL	MINI Xi10-2, non-return valve
AM	MINI Xi10-3, non-return valve
AN	MINI Di16-2

Code	Mounting orientation
00	4x M4 top, flush mount
01	M8 16 mm top
02	M8 16 mm right
03	M8 16 mm left
04	M8 27 mm top, profile kit
05	M8 27 mm right, profile kit
06	M8 27 mm left, profile kit
07	M6 22 mm top, profile kit
08	M6 22 mm right, profile kit
09	M6 22 mm left, profile kit
11	Ball joint VGS™3010 right
12	Ball joint VGS™3010 left
13	Lock-pin VGS™3010 right
14	Lock-pin VGS™3010 left
15	Level compensator LC30

Suction cup
Visit **piab.com** for the full range of suction cups available for VGS™3010

VGS™3040 family



This is a product design where different suction cups can be integrated with vacuum cartridges based on the patented COAX® technology. The "vacuum gripper" 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 decentralized vacuum system. The VGS™ is compatible with any suction cup with G3/8" male fitting. It has a low weight at 204–340 g.

It is available with two- or three-stage COAX® cartridge MINI. Choose a Di cartridge, for very harsh environments, combining high dust and high humidity levels, 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. The three-stage cartridge will give extra high initial vacuum flow, which is suitable in high speed applications.

It is available in lockpin 16, 19 or balljoint mountings, industry standard as well as level compensator to compensate for differences in level of object. It can also be fitted with different functions as energy saving, release or blow off.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Pi12-3	0.32	0.44	1.4	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	—	90
MINI Si08-2	0.6	0.44	0.77	0.67	0.51	0.33	0.23	0.16	0.12	0.08	—	—	75
MINI Si08-3	0.6	0.44	1.34	0.73	0.55	0.35	0.23	0.17	0.13	0.08	—	—	75
MINI 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
MINI Xi10-3	0.5	0.46	1.43	0.7	0.5	0.33	0.19	0.15	0.11	0.07	0.045	0.011	94

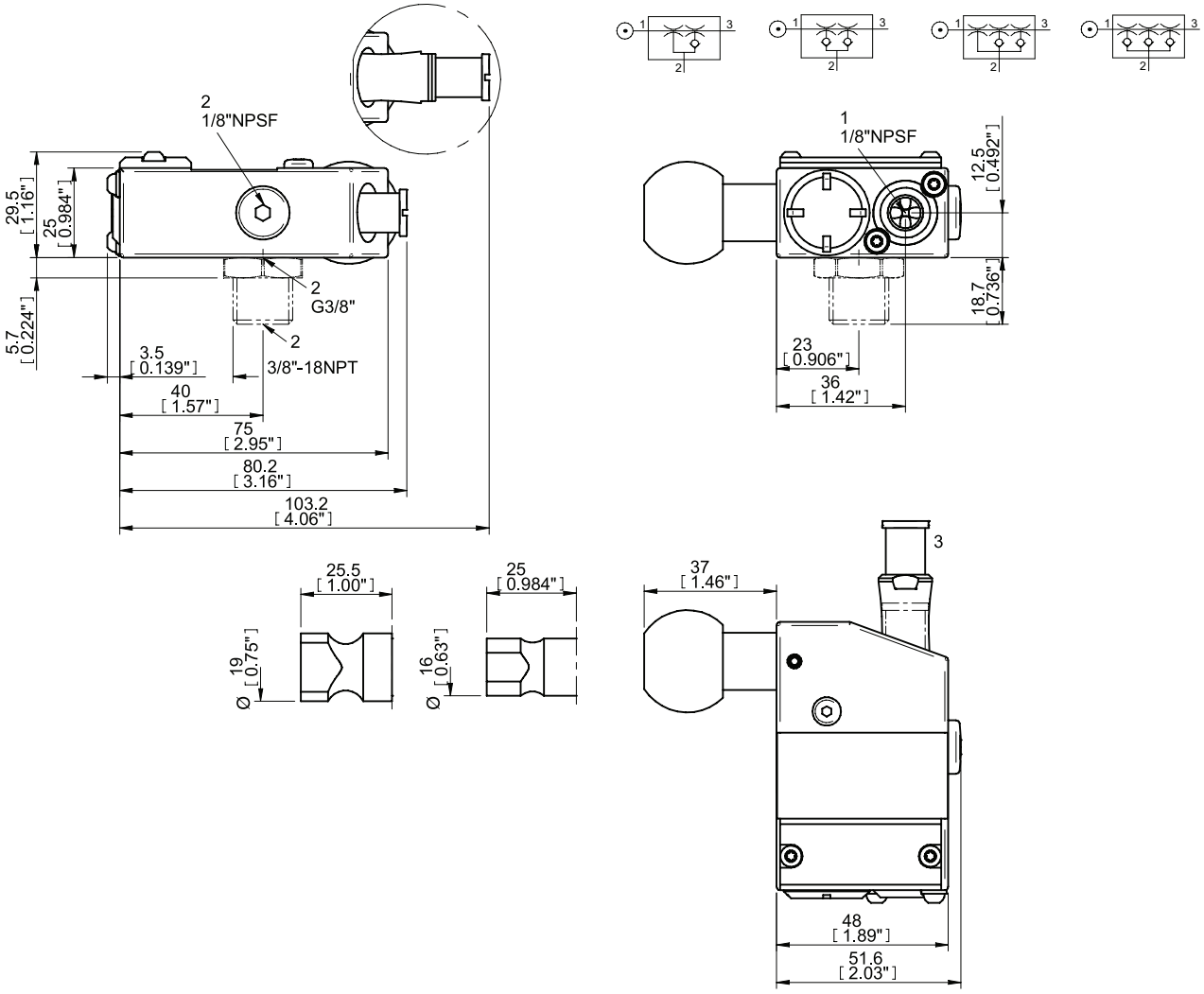
EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Pi12-2	0.32	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4	6.4	—	90
MINI Pi12-3	0.32	0.44	0.08	0.23	0.49	1	1.7	2.6	3.9	6.3	—	90

Specifications subject to change without notice.

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Si08-2	0.6	0.44	0.14	0.31	0.55	0.9	1.4	2.1	3.1	—	—	75
MINI Si08-3	0.6	0.44	0.1	0.25	0.48	0.8	1.3	2	2.9	—	—	75
MINI Xi10-2	0.5	0.46	0.14	0.3	0.6	1	1.6	2.3	3.5	5.3	8.9	94
MINI Xi10-3	0.5	0.46	0.09	0.26	0.5	0.9	1.5	2.2	3.4	5.2	8.8	94

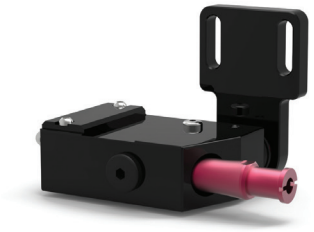
DIMENSIONAL DRAWING



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ACCESSORY DESCRIPTIONS



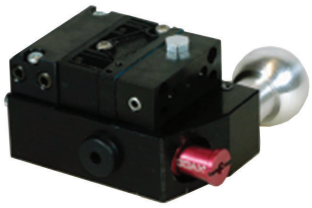
VGS™3040 with profile mount

It makes the attachment easy to a standard extrusion and profile systems with an adjustable position. This will give a quick setup and changeover.



VGS™3040 with level compensator

It is available with level compensator to compensate for differences in level of object.



VGS™3040 with piSAVE® onoff

It has an integrated energy-saving device, piSAVE® onoff, results in very low air consumption in sealed applications. The built-in blow off check valve will provide a fast release of the object It has an adjustable vacuum controlled 2/2 NO valve and is available with large hysteresis for object handling and small hysteresis for process applications.



VGS™3040 with piSAVE® release

It has a built-in quick release for fast release of object. It works with an internal or separate feed of air. It equalises pressure in the suction cups to provide fast release of the product. The piSAVE® release will provide an extra fast release by accumulating and utilising the feed-air pressure as a boost. It has an ON/OFF activated simultaneously with the ejector and no additional controls required — use a single 3/2 control valve for the ejector and piSAVE® release.



VGS™3040 with blow off

It has a built-in blow off check valve for fast release of object. Prevents vacuum from being pulled through the blow-off lines, which means faster response time and completely independent vacuum units.

VGS™3040 – CUSTOMER CODE

VGS 3040 Code
VGS3040

Code	COAX® cartridge
AB	COAX® cartridge MINI Pi12-2
AC	COAX® cartridge MINI Pi12-3
AD	COAX® cartridge MINI Pi12-2, non-return valve
AE	COAX® cartridge MINI Pi12-3, non-return valve
AF	COAX® cartridge MINI Si08-2
AG	COAX® cartridge MINI Si08-3
AH	COAX® cartridge MINI Si08-2, non-return valve
AI	COAX® cartridge MINI Si08-3, non-return valve
AJ	COAX® cartridge MINI Xi10-2
AK	COAX® cartridge MINI Xi10-3
AL	COAX® cartridge MINI Xi10-2, non-return valve
AM	COAX® cartridge MINI Xi10-3, non-return valve

Code	Mounting style
00	No mounting style
01	Mounting Lock pin 16 mm
02	Mounting Lock pin 19 mm
03	Mounting Ball joint
04	Mounting Lock pin 16 mm level compensator
05	Mounting Lock pin 19 mm level compensator
06	Mounting Ball joint level compensator
07	Mounting Extrusion mount level compensator
08	Mounting Profile mount
09	Mounting Profile mount

VGS3040 . AB . 01 . AA . 01 . AA

Code	Energy saving
AA	No energy saving
AB	piSAVE® onoff 65 -kPa
AC	piSAVE® onoff, Adjustable (factory set at 45 -kPa)

Code	Release function
01	Release Blow-off
02	piSAVE® release internal
03	piSAVE® release external

Code	Vacuum connection
AA	G3/8" female
AB	G3/8" male - 3/8" NPT male adapter

VGS™5010 family



Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The "vacuum gripper" 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 decentralized vacuum system. It has a low weight at 413–679 g.

The VGS™5010 is specially designed for handling larger parts, such as car body sheets as it is compatible with any suction cup with G1/2" male fitting. It is also 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. The three-stage cartridge will give extra high initial vacuum flow, suitable in high speed applications.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-2	0.31	2	2.8	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Pi48-3	0.31	2	5.6	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Si32-2	0.6	1.75	3.3	3	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Si32-3	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Xi40-2	0.45	1.83	2.8	2.3	1.6	1	0.73	0.58	0.43	0.32	0.18	0.03	95
MIDI Xi40-3	0.45	1.83	5.9	3	2	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95

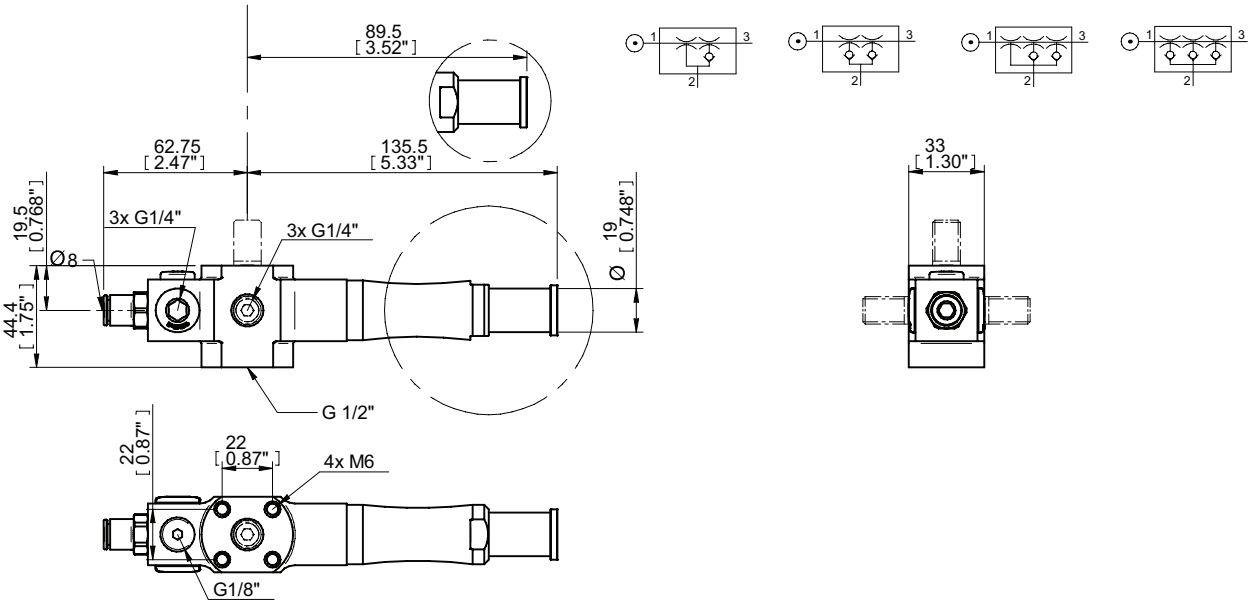
EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-2	0.31	2	0.03	0.07	0.13	0.26	0.46	0.7	1	1.6	4	90
MIDI Pi48-3	0.31	2	0.02	0.06	0.12	0.25	0.45	0.7	1	1.6	4	90
MIDI Si32-2	0.6	1.75	0.03	0.07	0.1	0.18	0.33	0.53	0.8	—	—	75
MIDI Si32-3	0.6	1.75	0.02	0.05	0.1	0.18	0.33	0.53	0.8	—	—	75

Specifications subject to change without notice.

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Xi40-2	0.45	1.83	0.04	0.09	0.17	0.28	0.44	0.63	0.9	1.3	2.3	95
MIDI 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

DIMENSIONAL DRAWING



ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

VGS™5010 – CUSTOMER CODE

VGS 5010 Code
VGS5010

Code	COAX® cartridge
AA	No COAX® cartridge (slave unit)
AB	COAX® cartridge MIDI Pi48-2
AC	COAX® cartridge MIDI Pi48-3
AD	COAX® cartridge MIDI Pi48-2, non-return valve
AE	COAX® cartridge MIDI Pi48-3, non-return valve
AF	COAX® cartridge MIDI Si32-2
AG	COAX® cartridge MIDI Si32-3
AH	COAX® cartridge MIDI Si32-2, non-return valve
AI	COAX® cartridge MIDI Si32-3, non-return valve
AJ	COAX® cartridge MIDI Xi40-2
AK	COAX® cartridge MIDI Xi40-3
AL	COAX® cartridge MIDI Xi40-2, non-return valve
AM	COAX® cartridge MIDI Xi40-3, non-return valve

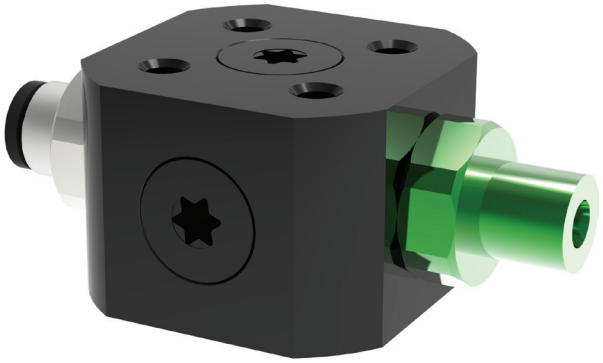
Code	Mounting style
00	4×M6 top, flush mount
01	4×M6 top, angle bracket
02	M12 20 mm top
03	M12 20 mm right
04	M12 20 mm left
05	M12 20 mm top, angle bracket
06	M12 20 mm right, angle bracket
07	M12 20 mm left, angle bracket

VGS5010 . AB . 00 . BA

Code	Suction cup
BA	No suction cup
CO	BF110P 30°/60° Shore A
CP	BF110P 60° Shore A
CQ	BX110P 30°/60° Shore A
CR	BX110P 60° Shore A
CS	F110P 30°/60° Shore A
CT	F110P 60° Shore A
CU	OB65x170P 30°/60° Shore A
CV	OB65x170P 60° Shore A
CX	BL50-3P 30°/70° Shore A
CY	BX75P 30°/60° Shore A
CZ	BX75P 60° Shore A

Specifications subject to change without notice.

COAX® in piGRIP®



This is a fully decentralized vacuum unit based on patented COAX® technology. It provides the quickest response time and very high energy efficiency. The COAX® in piGRIP® is available with a variation of two stage COAX® MICRO cartridges. The COAX® in piGRIP® is compatible with any suction cup with G1/8" male fitting.

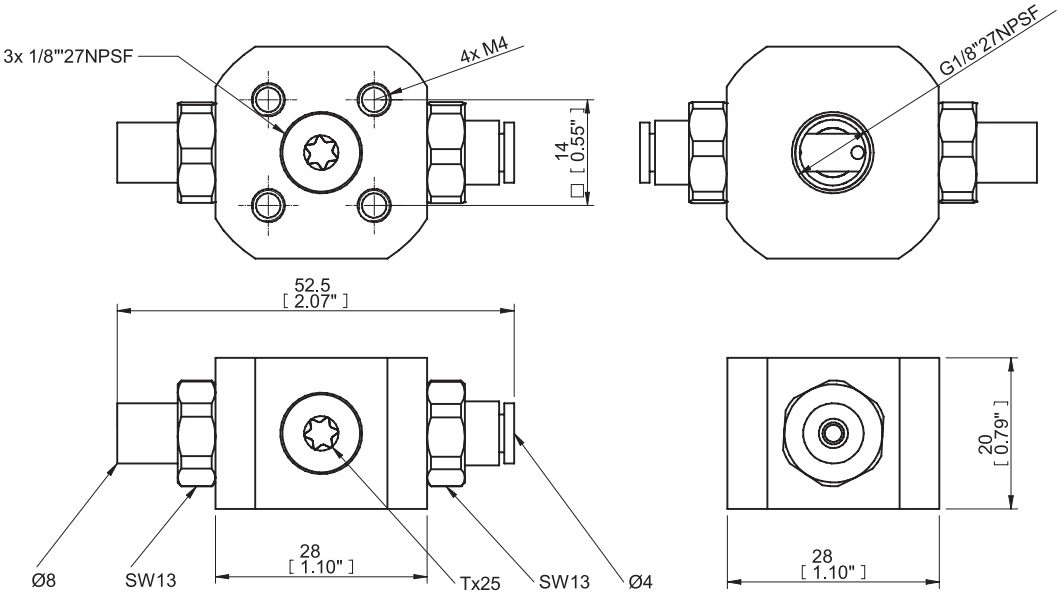
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.23	0.15	0.06	0.04	0.035	0.023	0.013	0.006	—	83
MICRO Si02-2	0.6	0.12	0.28	0.21	0.12	0.08	0.07	0.06	0.04	0.02	—	75
MICRO Ti05-2	0.4	0.27	0.32	0.28	0.23	0.17	0.1	0.07	0.04	0.02	0.004	84
MICRO Xi2.5-2	0.5	0.13	0.24	0.17	0.1	0.06	0.04	0.03	0.02	0.01	0.01	92

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MICRO Bi03-2	0.18	0.14	0.5	1.4	3.9	6.4	10	16	28	51	83
MICRO Si02-2	0.6	0.12	0.41	1.01	2.01	3.3	4.9	6.9	10.2	—	75
MICRO Ti05-2	0.4	0.27	0.33	0.73	1.2	2	3.1	5	8.3	16.6	84
MICRO Xi2.5-2	0.5	0.13	0.49	1.23	2.48	4.5	7.3	11.3	18	28	92

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
COAX® in piGRIP® Bi	0201096
COAX® in piGRIP® Si	0200345
COAX® in piGRIP® Ti	0200346
COAX® in piGRIP® Xi	0200344

piCLASSIC



It is 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. This pump has a substantially lower air consumption compare to competition, it is compact with no moving parts. It can be configured with 1–6 cartridges. This pump can easily be upgraded with more capacity if needed. And it is also easy to disassemble for maintenance.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 x1	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Si32-3 x2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75
MIDI Si32-3 x3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.1	—	—	75
MIDI Si32-3 x4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75
MIDI Si32-3 x5	0.6	8.75	25.5	15.8	12.4	8.5	4.5	3	2.5	2.1	—	—	75
MIDI Si32-3 x6	0.6	10.5	28.8	17.9	14.8	10.2	5.4	3.6	3	2.2	—	—	75
MIDI Pi48-3 x1	0.31	2	5.6	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
MIDI Pi48-3 x2	0.31	4	11.2	5	3.6	2.2	1.3	1	0.7	0.5	0.2	—	90
MIDI Pi48-3 x3	0.31	6	16.8	7.5	5.4	3.3	1.95	1.5	1.05	0.75	0.3	—	90
MIDI Pi48-3 x4	0.31	8	22.4	10	7.2	4.4	2.6	2	1.4	1	0.4	—	90
MIDI Pi48-3 x5	0.31	10	23.8	11.3	8.6	5.5	3.25	2.5	1.75	1.25	0.5	—	90
MIDI Pi48-3 x6	0.31	12	26.9	12.8	10.3	6.6	3.9	3	2.1	1.5	0.6	—	90
MIDI Xi40-3 x1	0.45	1.83	5.9	3	2	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95
MIDI Xi40-3 x2	0.45	3.66	11.8	6	4	2.6	1.46	1.16	0.86	0.64	0.36	0.06	95

Specifications subject to change without notice.

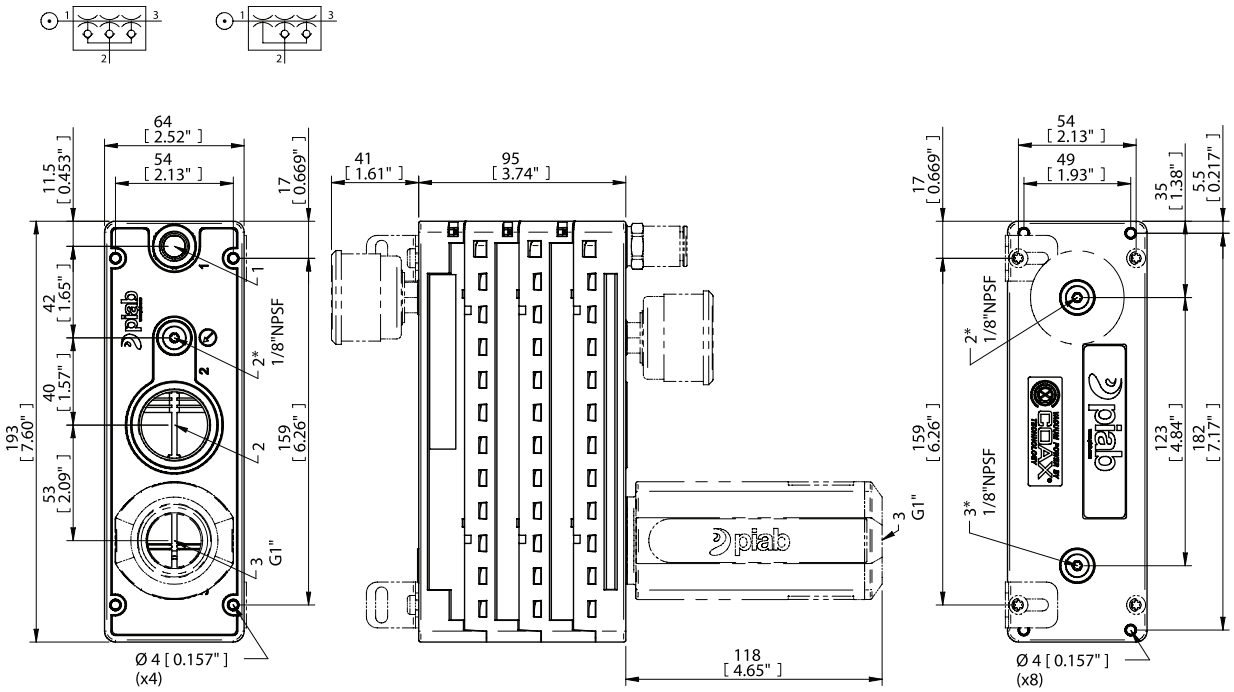
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Xi40-3 x3	0.45	5.49	17.7	9	6	3.9	2.19	1.74	1.29	0.96	0.54	0.09	95
MIDI Xi40-3 x4	0.45	7.32	23.6	12	8	5.2	2.92	2.32	1.72	1.28	0.72	0.12	95
MIDI Xi40-3 x5	0.45	9.15	25.1	13.5	9.5	6.5	3.65	2.9	2.15	1.6	0.9	0.15	95
MIDI Xi40-3 x6	0.45	11	28.3	15.3	11.4	7.8	4.38	3.44	2.58	1.92	1.08	0.18	95

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 x1	0.6	1.75	0.02	0.05	0.1	0.18	0.33	0.53	0.8	—	—	75
MIDI Si32-3 x2	0.6	3.5	0.01	0.025	0.05	0.09	0.17	0.27	0.4	—	—	75
MIDI Si32-3 x3	0.6	5.25	0.007	0.017	0.033	0.06	0.11	0.18	0.27	—	—	75
MIDI Si32-3 x4	0.6	7	0.005	0.013	0.025	0.045	0.083	0.13	0.2	—	—	75
MIDI Si32-3 x5	0.6	8.75	0.005	0.012	0.022	0.036	0.066	0.11	0.16	—	—	75
MIDI Si32-3 x6	0.6	10.5	0.004	0.01	0.018	0.03	0.055	0.09	0.13	—	—	75
MIDI Pi48-3 x1	0.31	2	0.02	0.06	0.12	0.25	0.45	0.7	1	1.6	4	90
MIDI Pi48-3 x2	0.31	4	0.01	0.03	0.06	0.13	0.23	0.35	0.5	0.8	2	90
MIDI Pi48-3 x3	0.31	6	0.007	0.02	0.04	0.08	0.15	0.23	0.33	0.53	1.33	90
MIDI Pi48-3 x4	0.31	8	0.005	0.015	0.03	0.06	0.11	0.18	0.25	0.4	1	90
MIDI Pi48-3 x5	0.31	10	0.005	0.014	0.028	0.05	0.09	0.14	0.2	0.32	0.8	90
MIDI Pi48-3 x6	0.31	12	0.004	0.013	0.025	0.04	0.08	0.12	0.17	0.27	0.67	90
MIDI Xi40-3 x1	0.45	1.83	0.022	0.062	0.12	0.22	0.37	0.57	0.84	1.2	2.2	95
MIDI Xi40-3 x2	0.45	3.66	0.011	0.031	0.06	0.11	0.19	0.29	0.42	0.6	1.1	95
MIDI Xi40-3 x3	0.45	5.49	0.007	0.021	0.04	0.07	0.12	0.19	0.28	0.4	0.73	95
MIDI Xi40-3 x4	0.45	7.32	0.006	0.016	0.03	0.055	0.09	0.14	0.21	0.3	0.55	95
MIDI Xi40-3 x5	0.45	9.15	0.005	0.014	0.026	0.044	0.07	0.11	0.17	0.24	0.44	95
MIDI Xi40-3 x6	0.45	11	0.005	0.012	0.022	0.04	0.06	0.1	0.14	0.2	0.37	95

Specifications subject to change without notice.

DIMENSIONAL DRAWING



*) Sensing port

PCL.XXXX.S. AB

	1	2
AB	G1/4"	G1"
12B	Ø12	G1"

ORDERING INFORMATION

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ACCESSORY DESCRIPTIONS



piCLASSIC Energy saving

piCLASSIC has an integrated air-saving function (piSAVE® onoff) that minimises 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. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.



piCLASSIC piSAVE® optimize

The piSAVE® optimize is a vacuum controlled proportional pressure regulator, a fully pneumatic device suitable for air-driven ejectors/pumps. The feed pressure to the vacuum pump/ejector is automatically regulated and controlled to maintain the set vacuum level. Air/energy usage is kept to a minimum for the application (optimized). It is recommended for leaking and sealed applications to save energy and secure the right vacuum level.

piCLASSIC – CUSTOMER CODE

piCLASSIC Code
PCL

Code	COAX® Cartridge module
S	COAX® cartridge Si32-3, high vacuum flow
X	COAX® cartridge Xi40-3, extra vacuum level
P	COAX® cartridge Pi48-3, low feed pressure
Code	**Number of COAX®**
1	×1
2	×2
3	×3
4	×4
5	×5
6	×6
Code	**COAX® valve configuration**
B	Standard
A	Non-return valve
Code	**Sealing material**
N	Nitrile
V	Viton

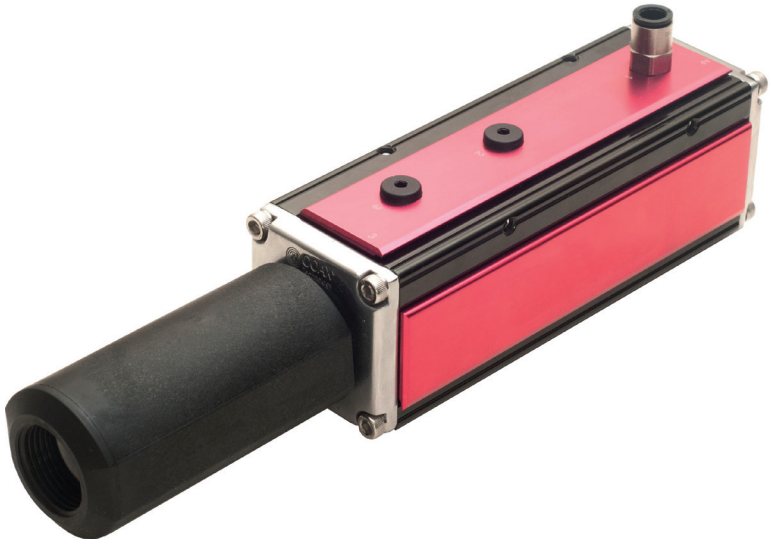
Code	Function
S	No function
F	Energy saving system (ES)
O	piSAVE® optimize

PCL . X2BN . S . AD . SV

Code	Compressed air connection
A	G1/4" female
E	1/4" NPT female
D	1/8" NPSF (G) female
08	Push-in Ø 8 mm [5/16"]
10	Push-in Ø 10 mm
12	Push-in Ø 12 mm
Code	**Vacuum connection**
D	G3/4" female
E	3/4" NPT female
B	G1" female

Code	COAX® valve configuration
S	Silencer G1" male
SV	Silencer G1" male & vacuum gauge
V	Vacuum gauge
X	No accessory

P6010



As with the majority of our pumps, it is available with the patented COAX® technology and 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. The P6010 consumes substantially less air compared to conventional ejectors. It also has quicker evacuation times and a low noise level. It is available with multiple connection alternatives. It can be configured with 1–4 cartridges.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
Pi48-3	0.31	2	5.6	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1	—	90
Pi48-3 ×2	0.31	4	11.2	5	3.6	2.2	1.3	1	0.7	0.5	0.2	—	90
Pi48-3 ×3	0.31	6	16.8	7.5	5.4	3.3	1.95	1.5	1.05	0.75	0.3	—	90
Pi48-3 ×4	0.31	8	22.4	10	7.2	4.4	2.6	2	1.4	1	0.4	—	90
Si32-3	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75/52*
Si32-3 ×2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75/52*
Si32-3 ×3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.05	—	—	75/52*
Si32-3 ×4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75/52*
Xi40-3	0.45	1.83	5.9	3	2	1.3	0.73	0.58	0.43	0.32	0.18	0.03	95/51*
Xi40-3 ×2	0.45	3.66	11.8	6	4	2.6	1.46	1.16	0.86	0.64	0.36	0.06	95/51*
Xi40-3 ×3	0.45	5.49	17.7	9	6	3.9	2.19	1.74	1.29	0.96	0.54	0.09	95/51*
Xi40-3 ×4	0.45	7.32	23.6	12	8	5.2	2.92	2.32	1.72	1.28	0.72	0.12	95/51*

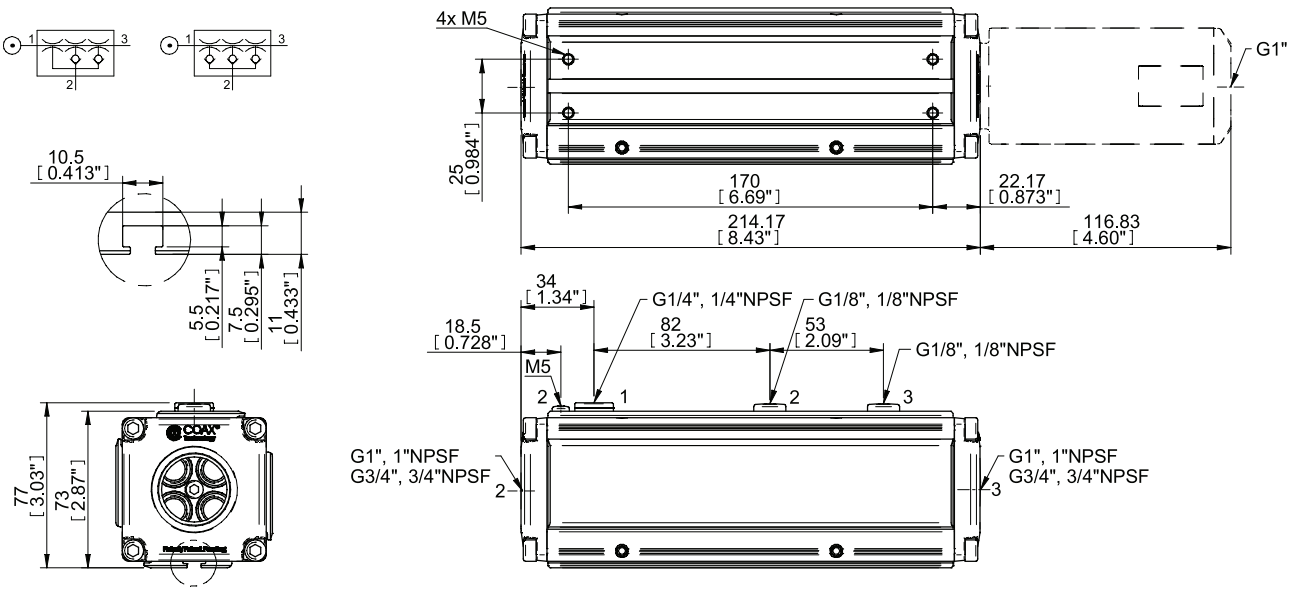
* With 1x flap valve.

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
Pi48-3	0.31	2	0.02	0.06	0.12	0.25	0.45	0.7	1	1.6	4	90
Pi48-3 ×2	0.31	4	0.01	0.03	0.06	0.125	0.23	0.35	0.5	0.8	2	90
Pi48-3 ×3	0.31	6	0.0067	0.02	0.04	0.083	0.15	0.23	0.33	0.53	1.33	90
Pi48-3 ×4	0.31	8	0.005	0.015	0.03	0.063	0.11	0.175	0.25	0.4	1	90
Si32-3	0.6	1.75	0.02	0.05	0.1	0.18	0.33	0.53	0.8	—	—	75/52*
Si32-3 ×2	0.6	3.5	0.01	0.025	0.05	0.09	0.17	0.27	0.4	—	—	75/52*
Si32-3 ×3	0.6	5.25	0.0067	0.017	0.033	0.06	0.11	0.17	0.27	—	—	75/52*
Si32-3 ×4	0.6	7	0.005	0.0125	0.025	0.045	0.083	0.13	0.2	—	—	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*
Xi40-3 ×2	0.45	3.66	0.011	0.031	0.06	0.11	0.19	0.29	0.42	0.6	1.1	95/51*
Xi40-3 ×3	0.45	5.49	0.0073	0.021	0.04	0.073	0.12	0.19	0.28	0.4	0.73	95/51*
Xi40-3 ×4	0.45	7.32	0.0055	0.0155	0.03	0.055	0.093	0.14	0.21	0.3	0.55	95/51*

* With 1x flap valve.

DIMENSIONAL DRAWING



ORDERING INFORMATION

For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

ACCESSORY DESCRIPTIONS



P6010 Classic

Very similar to the P6010 with the patented COAX® technology. The connections can be made on the long side of the ejector and is retro-compatible with Piab's Classic model in regard to mounting.



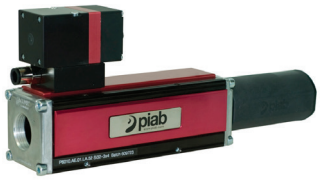
P6010 AVM™2

The AVM™2 unit has built-in control and monitoring functions. The integrated energy saving function (ES) minimises the air consumption in sealed systems. It has valves for vacuum on/off and blow-off with electrical power failsafe function. The AVM™ has digital outputs, 16 pre-set combinations of vacuum levels, digital vacuum level display and a mechanical valve for blow-off flow adjustment.



P6010 CU

The CU has electric valves for vacuum on/off and blow-off and a mechanical valve for blow-off flow adjustment. It also has a with special M12 4-pin cable assembly with LED for status of valve signal.



P6010 PCC

Different vacuum pumps need different feed pressure for optimum performance. The PCC is programmable for constant vacuum level, as the input signal regulates the feed pressure to maintain a constant vacuum level. It has an integrated analogue vacuum sensor.

P6010 – CUSTOMER CODE

P6010
Code
P6010

Code	COAX® Cartridge module
AA	COAX® Cartridge module Blind ×4
AB	COAX® Cartridge module Si32-3×1
AC	COAX® Cartridge module Si32-3×2
AD	COAX® Cartridge module Si32-3×3
AE	COAX® Cartridge module Si32-3×4
AF	COAX® Cartridge module Si32-3×1, non-return valve
AG	COAX® Cartridge module Si32-3×2, non-return valve
AH	COAX® Cartridge module Si32-3×3, non-return valve
AI	COAX® Cartridge module Si32-3×4, non-return valve
BB	COAX® Cartridge module Si32-3×1, 1× flap valve
BC	COAX® Cartridge module Si32-3×2, 1× flap valve
BD	COAX® Cartridge module Si32-3×3, 1× flap valve
BE	COAX® Cartridge module Si32-3×4, 1× flap valve
AJ	COAX® Cartridge module Pi48-3×1
AK	COAX® Cartridge module Pi48-3×2
AL	COAX® Cartridge module Pi48-3×3
AM	COAX® Cartridge module Pi48-3×4
AN	COAX® Cartridge module Pi48-3×1, non-return valve
AO	COAX® Cartridge module Pi48-3×2, non-return valve
AP	COAX® Cartridge module Pi48-3×3, non-return valve
AQ	COAX® Cartridge module Pi48-3×4, non-return valve
AR	COAX® Cartridge module Xi40-3×1
AS	COAX® Cartridge module Xi40-3×2
AT	COAX® Cartridge module Xi40-3×3
AU	COAX® Cartridge module Xi40-3×4
AV	COAX® Cartridge module Xi40-3×1, non-return valve
AW	COAX® Cartridge module Xi40-3×2, non-return valve
AX	COAX® Cartridge module Xi40-3×3, non-return valve
AY	COAX® Cartridge module Xi40-3×4, non-return valve
BJ	COAX® Cartridge module Xi40-3×1, 1× flap valve
BK	COAX® Cartridge module Xi40-3×2, 1× flap valve
BL	COAX® Cartridge module Xi40-3×3, 1× flap valve
BM	COAX® Cartridge module Xi40-3×4, 1× flap valve

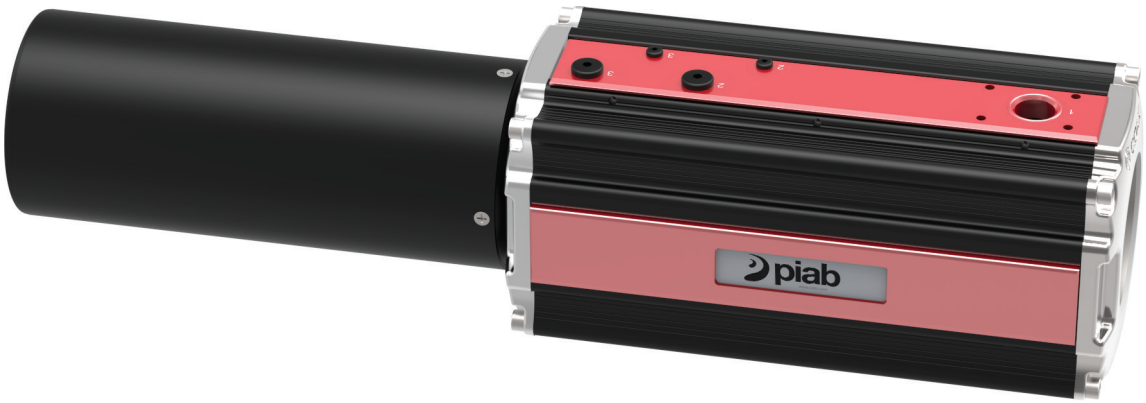
Code	Mounting
01	Mounting T-slot, Cover plate PIAB label

P6010 . AA . 01 . LA . 51

Code	Cover/Function plates
LA	Cover plate G thread connections, Cover plate plain
LB	Function PCC Vacuum, Cover plate G thread connections
LI	Cover plate Classic G thread connections, Cover plate plain
LJ	Cover plate NPSF thread connections, Cover plate plain
LK	Cover plate Classic NPSF thread connections, Cover plate plain
LT	Function PCC Vacuum, Cover plate NPSF thread connections
LU	Function AVM™2 NO, Cover plate G thread connections
LV	Function AVM™2 NC, Cover plate G thread connections
LW	Function AVM™2 NO, Cover plate NPSF thread connections
LX	Function AVM™2 NC, Cover plate NPSF thread connections
LY	Function CU NC, Cover plate G thread connections
LZ	Function CU NC, Cover plate NPSF thread connections
MA	Function AVM™2 NO, Cover plate G thread connections SB
MB	Function AVM™2 NC, Cover plate G thread connections SB
MC	Function AVM™2 N0, Cover plate NPSF thread connections SB
MD	Function AVM™2 NC, Cover plate NPSF thread connections SB
ME	Function CU NC, Cover plate G thread connections SB
MF	Function CU NC, Cover plate NPSF thread connections SB

Code	Cover/Function plates
51	Connections 2x G1"
52	Connections 2x G1", silencer 1"
53	Connections 2x G3/4"
54	Connections 2x G3/4", silencer 3/4"
55	Connections 2x 1" NPSF
56	Connections 2x 1" NPSF, silencer 1"
57	Connections 2x 3/4" NPSF
58	Connections 2x 3/4" NPSF, silencer 3/4"

P6040



The P6040 comes with the patented COAX® technology. It is 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. This pump has a substantially lower air consumption compare to competition, it is compact with no moving parts. It can be configured with 5–16 cartridges.

VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-3 ×5	0.3	10	28	12.5	9	5.5	3.25	2.5	1.75	1.25	0.5	—	90
MIDI Pi48-3 ×6	0.3	12	33.6	15	10.8	6.6	3.9	3	2.1	1.5	0.6	—	90
MIDI Pi48-3 ×7	0.3	14	39.2	17.5	12.6	7.7	4.55	3.5	2.45	1.75	0.7	—	90
MIDI Pi48-3 ×8	0.3	16	44.8	20	14.4	8.8	5.2	4	2.8	2	0.8	—	90
MIDI Pi48-3 ×9	0.3	18	50.4	22.5	16.2	9.9	5.85	4.5	3.15	2.25	0.9	—	90
MIDI Pi48-3 ×10	0.3	20	56	25	18	11	6.5	5	3.5	2.5	1	—	90
MIDI Pi48-3 ×11	0.3	22	61.6	27.5	19.8	12.1	7.15	5.5	3.85	2.75	1.1	—	90
MIDI Pi48-3 ×12	0.3	24	67.2	30	21.6	13.2	7.8	6	4.2	3	1.2	—	90
MIDI Pi48-3 ×13	0.3	26	72.8	32.5	23.4	14.3	8.45	6.5	4.55	3.25	1.3	—	90
MIDI Pi48-3 ×14	0.3	28	78.4	35	25.2	15.4	9.1	7	4.9	3.5	1.4	—	90
MIDI Pi48-3 ×15	0.3	30	84	37.5	27	16.5	9.75	7.5	5.25	3.75	1.5	—	90
MIDI Pi48-3 ×16	0.3	32	89.6	40	28.8	17.6	10.4	8	5.6	4	1.6	—	90
MIDI Si32-3 ×5	0.6	8.75	30	17.5	13	8.5	4.5	3	2.5	1.75	—	—	75/52*
MIDI Si32-3 ×6	0.6	10.5	36	21	15.6	10.2	5.4	3.6	3	2.1	—	—	75/52*

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 ×7	0.6	12.25	42	24.5	18.2	11.9	6.3	4.2	3.5	2.45	—	—	75/52*
MIDI Si32-3 ×8	0.6	14	48	28	20.8	13.6	7.2	4.8	4	2.8	—	—	75/52*
MIDI Si32-3 ×9	0.6	15.75	54	31.5	23.4	15.3	8.1	5.4	4.5	3.15	—	—	75/52*
MIDI Si32-3 ×10	0.6	17.5	60	35	26	17	9	6	5	3.5	—	—	75/52*
MIDI Si32-3 ×11	0.6	19.25	66	38.5	28.6	18.7	9.9	6.6	5.5	3.85	—	—	75/52*
MIDI Si32-3 ×12	0.6	21	72	42	31.2	20.4	10.8	7.2	6	4.2	—	—	75/52*
MIDI Si32-3 ×13	0.6	22.75	78	45.5	33.8	22.1	11.7	7.8	6.5	4.55	—	—	75/52*
MIDI Si32-3 ×14	0.6	24.5	84	49	36.4	23.8	12.6	8.4	7	4.9	—	—	75/52*
MIDI Si32-3 ×15	0.6	26.25	90	52.5	39	25.5	13.5	9	7.5	5.25	—	—	75/52*
MIDI Si32-3 ×16	0.6	28	96	56	41.6	27.2	14.4	9.6	8	5.6	—	—	75/52*
MIDI Xi40-3 ×5	0.45	9.15	29.5	15	10	6.5	3.65	2.9	2.15	1.6	0.9	0.15	95/51*
MIDI Xi40-3 ×6	0.45	10.98	35.4	18	12	7.8	4.38	3.48	2.58	1.92	1.08	0.18	95/51*
MIDI Xi40-3 ×7	0.45	12.81	41.3	21	14	9.1	5.11	4.06	3.01	2.24	1.26	0.21	95/51*
MIDI Xi40-3 ×8	0.45	14.64	47.2	24	16	10.4	5.84	4.64	3.44	2.56	1.44	0.24	95/51*
MIDI Xi40-3 ×9	0.45	16.47	53.1	27	18	11.7	6.57	5.22	3.87	2.88	1.62	0.27	95/51*
MIDI Xi40-3 ×10	0.45	18.3	59	30	20	13	7.3	5.8	4.3	3.2	1.8	0.3	95/51*
MIDI Xi40-3 ×11	0.45	20.13	64.9	33	22	14.3	8.03	6.38	4.73	3.52	1.98	0.33	95/51*
MIDI Xi40-3 ×12	0.45	21.96	70.8	36	24	15.6	8.76	6.96	5.16	3.84	2.16	0.36	95/51*
MIDI Xi40-3 ×13	0.45	23.79	76.7	39	26	16.9	9.49	7.54	5.59	4.16	2.34	0.39	95/51*
MIDI Xi40-3 ×14	0.45	25.62	82.6	42	28	18.2	10.22	8.12	6.02	4.48	2.52	0.42	95/51*
MIDI Xi40-3 ×15	0.45	27.45	88.5	45	30	19.5	10.95	8.7	6.45	4.8	2.7	0.45	95/51*
MIDI Xi40-3 ×16	0.45	29.28	94.4	48	32	20.8	11.68	9.28	6.88	5.12	2.88	0.48	95/51*

* With 1x flap valve.

Specifications subject to change without notice.

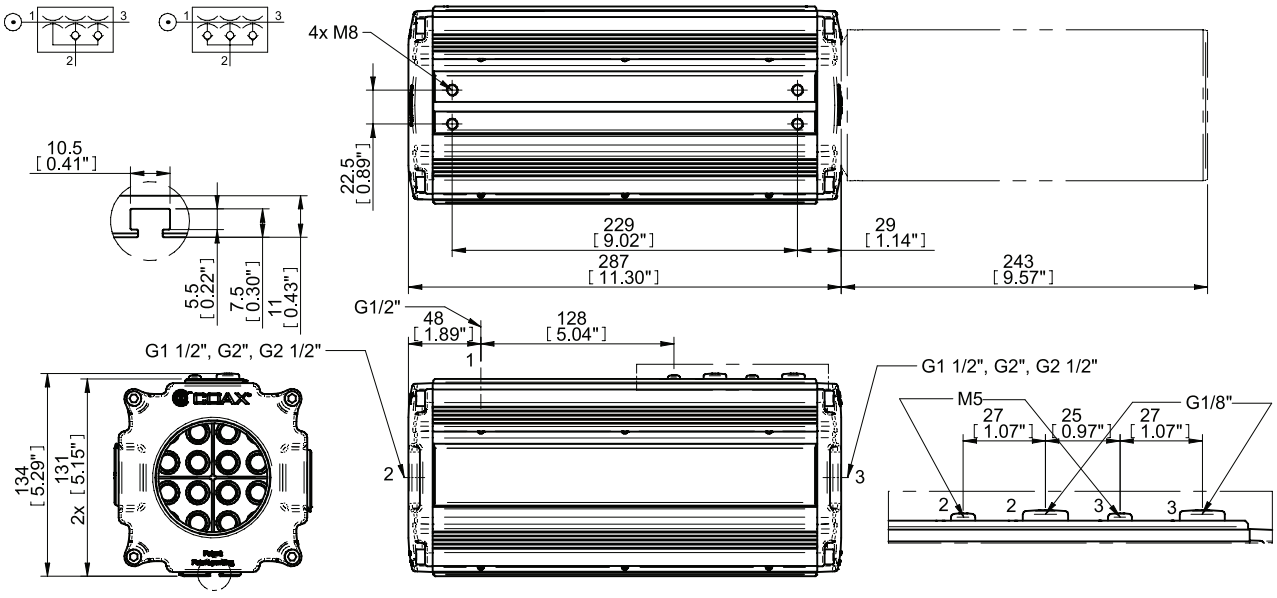
EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Pi48-3 ×5	0.3	10	0.004	0.012	0.024	0.05	0.09	0.14	0.2	0.32	0.8	90
MIDI Pi48-3 ×6	0.3	12	0.0033	0.01	0.02	0.042	0.075	0.12	0.17	0.27	0.67	90
MIDI Pi48-3 ×7	0.3	14	0.0029	0.0086	0.017	0.036	0.064	0.1	0.14	0.23	0.57	90
MIDI Pi48-3 ×8	0.3	16	0.0025	0.0075	0.015	0.031	0.056	0.088	0.13	0.2	0.5	90
MIDI Pi48-3 ×9	0.3	18	0.0022	0.0067	0.013	0.028	0.05	0.078	0.11	0.18	0.44	90
MIDI Pi48-3 ×10	0.3	20	0.002	0.006	0.012	0.025	0.045	0.07	0.1	0.16	0.4	90
MIDI Pi48-3 ×11	0.3	22	0.0018	0.0055	0.011	0.023	0.041	0.064	0.091	0.15	0.36	90
MIDI Pi48-3 ×12	0.3	24	0.0017	0.005	0.01	0.021	0.038	0.058	0.083	0.13	0.33	90
MIDI Pi48-3 ×13	0.3	26	0.0015	0.0046	0.0092	0.019	0.035	0.054	0.077	0.12	0.31	90
MIDI Pi48-3 ×14	0.3	28	0.0014	0.0043	0.0086	0.018	0.032	0.05	0.071	0.11	0.29	90
MIDI Pi48-3 ×15	0.3	30	0.0013	0.004	0.008	0.017	0.03	0.047	0.067	0.11	0.27	90
MIDI Pi48-3 ×16	0.3	32	0.0013	0.0038	0.0075	0.016	0.029	0.044	0.063	0.1	0.25	90
MIDI Si32-3 ×5	0.6	8.75	0.004	0.01	0.02	0.036	0.066	0.11	0.16	—	—	75/52*
MIDI Si32-3 ×6	0.6	10.5	0.0033	0.0083	0.017	0.03	0.055	0.088	0.13	—	—	75/52*
MIDI Si32-3 ×7	0.6	12.25	0.0029	0.0071	0.014	0.026	0.047	0.076	0.11	—	—	75/52*
MIDI Si32-3 ×8	0.6	14	0.0025	0.0063	0.013	0.023	0.041	0.066	0.1	—	—	75/52*
MIDI Si32-3 ×9	0.6	15.75	0.0022	0.0056	0.011	0.02	0.037	0.059	0.089	—	—	75/52*
MIDI Si32-3 ×10	0.6	17.5	0.002	0.005	0.01	0.018	0.033	0.053	0.08	—	—	75/52*
MIDI Si32-3 ×11	0.6	19.25	0.0018	0.0045	0.0091	0.016	0.03	0.048	0.073	—	—	75/52*
MIDI Si32-3 ×12	0.6	21	0.0017	0.0042	0.0083	0.015	0.028	0.044	0.067	—	—	75/52*
MIDI Si32-3 ×13	0.6	22.75	0.0015	0.0038	0.0077	0.014	0.025	0.041	0.062	—	—	75/52*
MIDI Si32-3 ×14	0.6	24.5	0.0014	0.0036	0.0071	0.013	0.024	0.038	0.057	—	—	75/52*
MIDI Si32-3 ×15	0.6	26.25	0.0013	0.0033	0.0067	0.012	0.022	0.035	0.053	—	—	75/52*
MIDI Si32-3 ×16	0.6	28	0.0013	0.0031	0.0063	0.011	0.021	0.033	0.05	—	—	75/52*
MIDI Xi40-3 ×5	0.45	9.15	0.0044	0.012	0.024	0.044	0.074	0.11	0.17	0.24	0.44	95/51*
MIDI Xi40-3 ×6	0.45	10.98	0.0037	0.01	0.02	0.037	0.062	0.095	0.14	0.2	0.37	95/51*

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MIDI Xi40-3 ×7	0.45	12.81	0.0031	0.0089	0.017	0.031	0.053	0.081	0.12	0.17	0.31	95/51*
MIDI Xi40-3 ×8	0.45	14.64	0.0028	0.0078	0.015	0.028	0.046	0.071	0.11	0.15	0.28	95/51*
MIDI Xi40-3 ×9	0.45	16.47	0.0024	0.0069	0.013	0.024	0.041	0.063	0.093	0.13	0.24	95/51*
MIDI Xi40-3 ×10	0.45	18.3	0.0022	0.0062	0.012	0.022	0.037	0.057	0.084	0.12	0.22	95/51*
MIDI Xi40-3 ×11	0.45	20.13	0.002	0.0056	0.011	0.02	0.034	0.052	0.076	0.11	0.2	95/51*
MIDI Xi40-3 ×12	0.45	21.96	0.0018	0.0052	0.01	0.018	0.031	0.048	0.07	0.1	0.18	95/51*
MIDI Xi40-3 ×13	0.45	23.79	0.0017	0.0048	0.0092	0.017	0.029	0.044	0.065	0.092	0.17	95/51*
MIDI Xi40-3 ×14	0.45	25.62	0.0016	0.0044	0.0086	0.016	0.027	0.041	0.06	0.086	0.16	95/51*
MIDI Xi40-3 ×15	0.45	27.45	0.0015	0.0041	0.008	0.015	0.025	0.038	0.056	0.08	0.15	95/51*
MIDI Xi40-3 ×16	0.45	29.28	0.0014	0.0039	0.0075	0.014	0.023	0.036	0.053	0.075	0.14	95/51*

* With 1x flap valve.

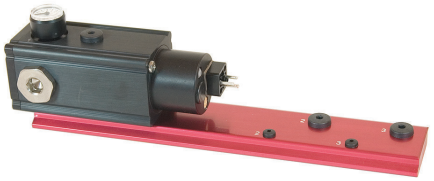
DIMENSIONAL DRAWING



ORDERING INFORMATION

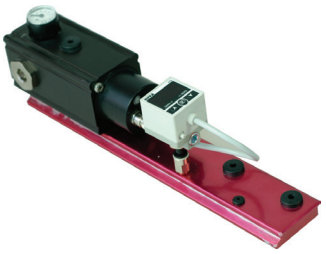
For a complete list of available pumps and combinations with further information visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

ACCESSORY DESCRIPTIONS



P6040 V30

Piab P6040 multi stage ejector with Si, Pi or Xi COAX® technology. Modular design for flexible performance. Compact and durable with no moving parts. Electric 3/2 valve for on/off. Manometer for feed pressure control



P6040 ES Vacuum

Piab P6040 multi stage ejector with Si, Pi or Xi COAX® technology. Modular design for flexible performance. Compact and durable with no moving parts. Electrically operated air-saving device. Adjustable vacuum controlled 2/2 NO valve. Manometer for feed pressure control. Recommended for non-leaking system.

P6040 – CUSTOMER CODE

P6040
Code
P6040

Code	Application type
V	Vacuum
B	Blow

Code	Mounting
00	Mounting T-slot

Code	Cover/Function plates
AA	Connection G1/2"
AB	Connection 4x G1/2"
AC	Function Valve v30
AD	Function ES-Vacuum

P6040 . V . AA . 00 . AA . 00

Code	Connections for vacuum and exhaust
00	Connections G 1 1/2"
01	Connections G 2"
02	Connections G 2 1/2"
03	Connection G 1 1/2", silencer
04	Connection G 2", silencer
05	Connection G 2 1/2", silencer
06	Connection G 1 1/2", inlet silencer
07	Connection G 2", inlet silencer
08	Connection G 2 1/2", inlet silencer

Code												COAX® Cartridge module
×5	×6	×7	×8	×9	×10	×11	×12	×13	×14	×15	×16	
AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	COAX® Cartridge module Pi48-3
AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	COAX® Cartridge module Pi48-3, 1x flap valve
AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	COAX® Cartridge module Pi48-3, non-return valve
BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	COAX® Cartridge module Si32-3
CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	COAX® Cartridge module Si32-3, 1x flap valve
BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	COAX® Cartridge module Si32-3, non-return valve
CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	COAX® Cartridge module Xi40-3
DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	COAX® Cartridge module Xi40-3, 1x flap valve
DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	COAX® Cartridge module Xi40-3, non-return valve

Specifications subject to change without notice.

Round pump



This round pump is available with the energy efficient COAX® cartridges. It designed for high vacuum flow with 6x COAX® Si MIDI cartridges. Still it is small, compact and lightweight (1.6 kg). Easy to mount and install with integrated hose connectors.

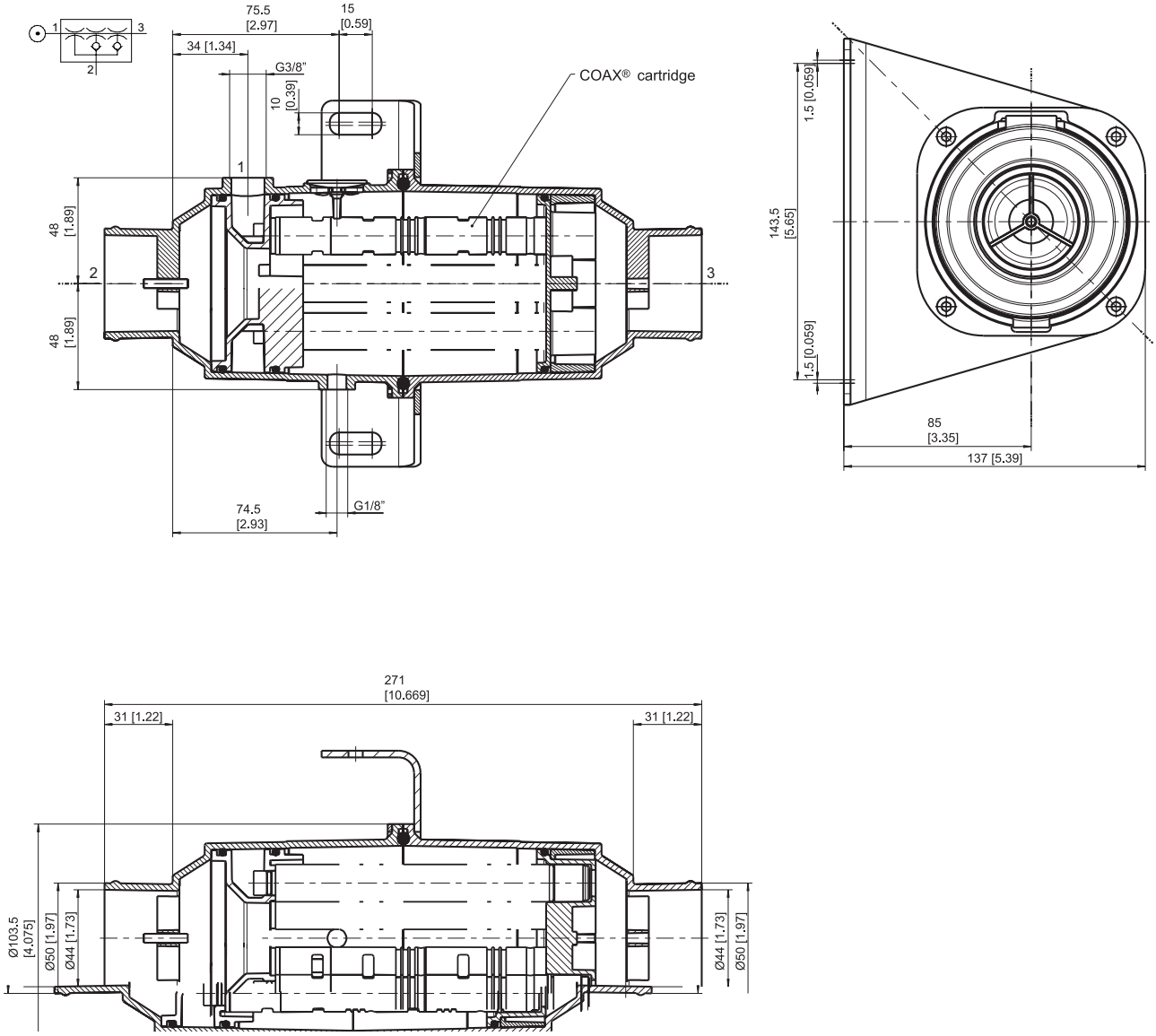
VACUUM FLOW

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	-kPa
MIDI Si32-3 ×6	0.4	7.5	30	17.4	11.4	7.2	4.8	2.4	0.6	—	60
MIDI Si32-3 ×6	0.5	9	34.2	19.8	13.2	8.4	5.1	3.72	2.1	1.08	70
MIDI Si32-3 ×6	0.6	10.5	36	21	15.6	10.2	5.4	3.6	3	2.1	75

EVACUATION TIMES

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	-kPa
MIDI Si32-3 ×6	0.4	7.5	0.005	0.012	0.023	0.04	0.07	0.167	—	60
MIDI Si32-3 ×6	0.5	9	0.003	0.01	0.018	0.035	0.058	0.1	0.167	70
MIDI Si32-3 ×6	0.6	10.5	0.003	0.008	0.017	0.03	0.055	0.088	0.133	75

DIMENSIONAL DRAWING

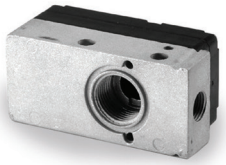


ORDERING INFORMATION

Description	Item No.
Round pump COAX® 6×Si32-3	0121632

MINI L pumps family








This family of pumps provides a large vacuum flow even though they are very small in size and lightweight. Vacuum level to 75 -kPa. Some pumps in this family are available with connection plate in aluminium or composite PA. These are recommended to use when the handled product is made of porous material such as cardboard, wood or paper.

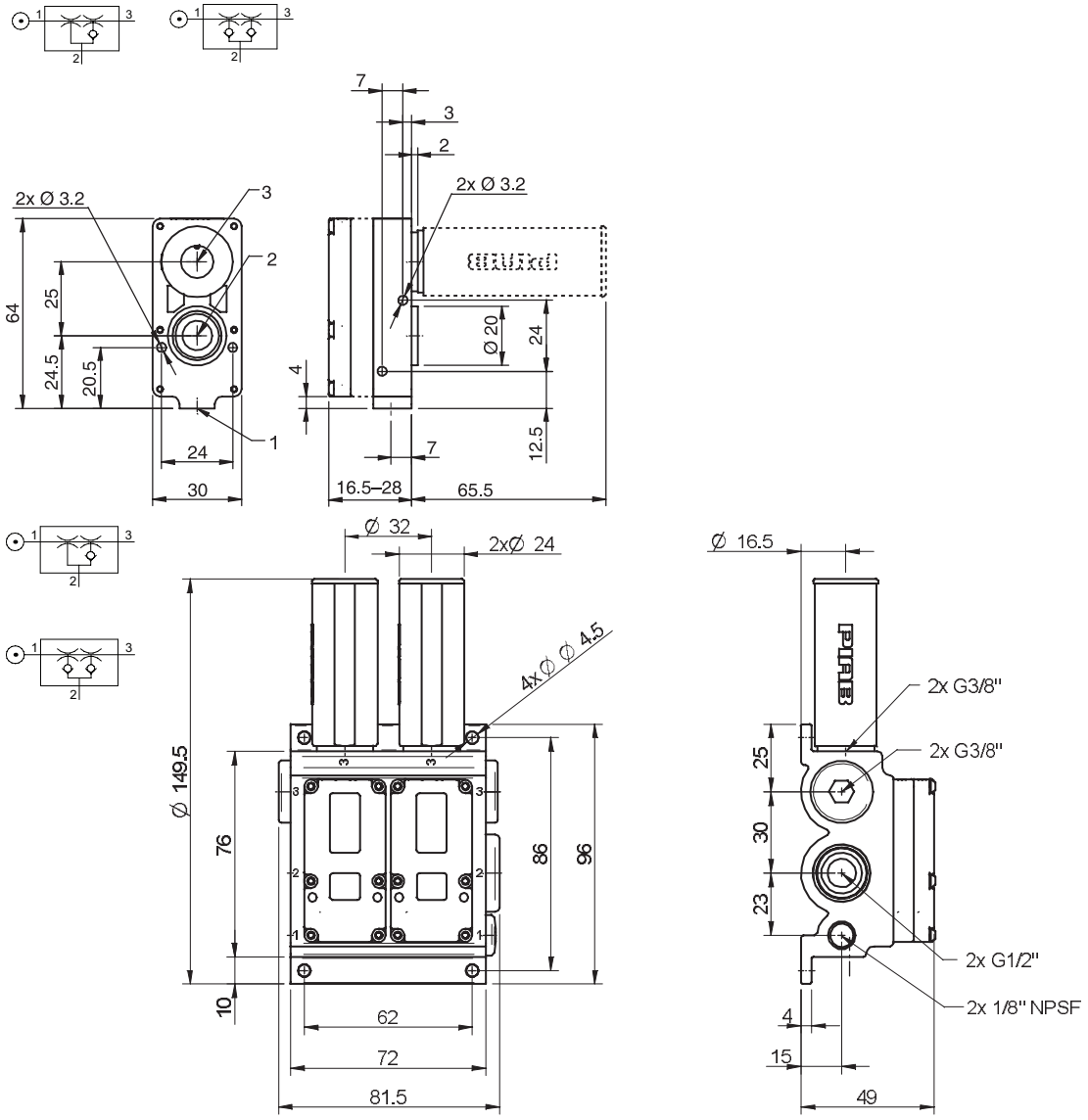
VACUUM FLOW

Pump name	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	-kPa
L7	0.6	0.49	0.72	0.49	0.29	0.25	0.2	0.16	0.1	0.067	75
L14	0.6	0.98	1.5	1	0.57	0.45	0.39	0.32	0.24	0.13	75
L28	0.6	2	2.6	1.7	1.1	0.89	0.74	0.55	0.36	0.17	75
L56	0.6	4	5.1	3.5	2	1.7	1.4	1.1	0.81	0.43	75

EVACUATION TIMES

Pump name	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)							Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	-kPa
L7	0.6	0.49	0.093	0.31	0.72	1.2	1.8	2.6	3.8	75
L14	0.6	0.98	0.064	0.17	0.36	0.59	0.88	1.3	1.8	75
L28	0.6	2	0.047	0.11	0.2	0.32	0.46	0.69	1.1	75
L56	0.6	4	0.023	0.053	0.1	0.16	0.23	0.33	0.5	75

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Vacuum pump MINI L7, conn. A, NBR sealings	0102853
Vacuum pump MINI L14, conn. C, NBR sealings	0102743
Vacuum pump MINI L14, conn. B1, NBR sealings	0102831
Vacuum pump MINI L14, conn. B1, NBR sealings, non-return valve	0102832
Vacuum pump MINI L14, conn. B, NBR sealings	0103055
Vacuum pump MINI L28, conn. C, NBR sealings	0102749
Vacuum pump MINI L28, conn. C, NBR sealings, non-return valve	0102750
Vacuum pump MINI L28, conn. B1, NBR sealings	0102833
Vacuum pump MINI L28, conn. B1, NBR sealings, non-return valve	0102834
Vacuum pump MINI L28, conn. B, NBR sealings	0103061
Vacuum pump MINI L28, conn. B, NBR sealings, non-return valve	0103062
Vacuum pump MINI L56, conn. K, NBR sealings	0102797
Vacuum pump MINI L56, conn. K, NBR sealings, non-return valve	0102798

MINI M-L pumps family








This pump family with its very small size and low weight provide extra vacuum level to 84 -kPa. Some models are available with the connection plate in aluminium or composite PA. These are recommended to use when the handled product is made of a sealed material or a non-porous material such as plastic, metal or glass.

VACUUM FLOW

Pump name	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
M5L	0.38	0.38	0.58	0.3	0.22	0.18	0.14	0.1	0.08	0.04	0.01	81
M5L	0.6	0.55	0.73	0.5	0.26	0.14	0.12	0.1	0.08	0.05	0.02	84
M10L	0.38	0.76	1.1	0.57	0.39	0.35	0.3	0.21	0.12	0.06	0.02	81
M10L	0.6	1.1	1.3	0.91	0.48	0.29	0.26	0.21	0.13	0.09	0.03	84
M20L	0.38	1.5	2	1.2	0.76	0.67	0.53	0.41	0.33	0.19	0.02	81
M20L	0.6	2.2	2.4	1.7	0.95	0.57	0.48	0.38	0.29	0.19	0.06	84
M40L	0.38	3	4	2.2	1.4	1.2	1	0.71	0.43	0.19	0.05	81
M40L	0.6	4.4	4.8	3.1	1.7	1.1	0.93	0.74	0.57	0.36	0.11	84

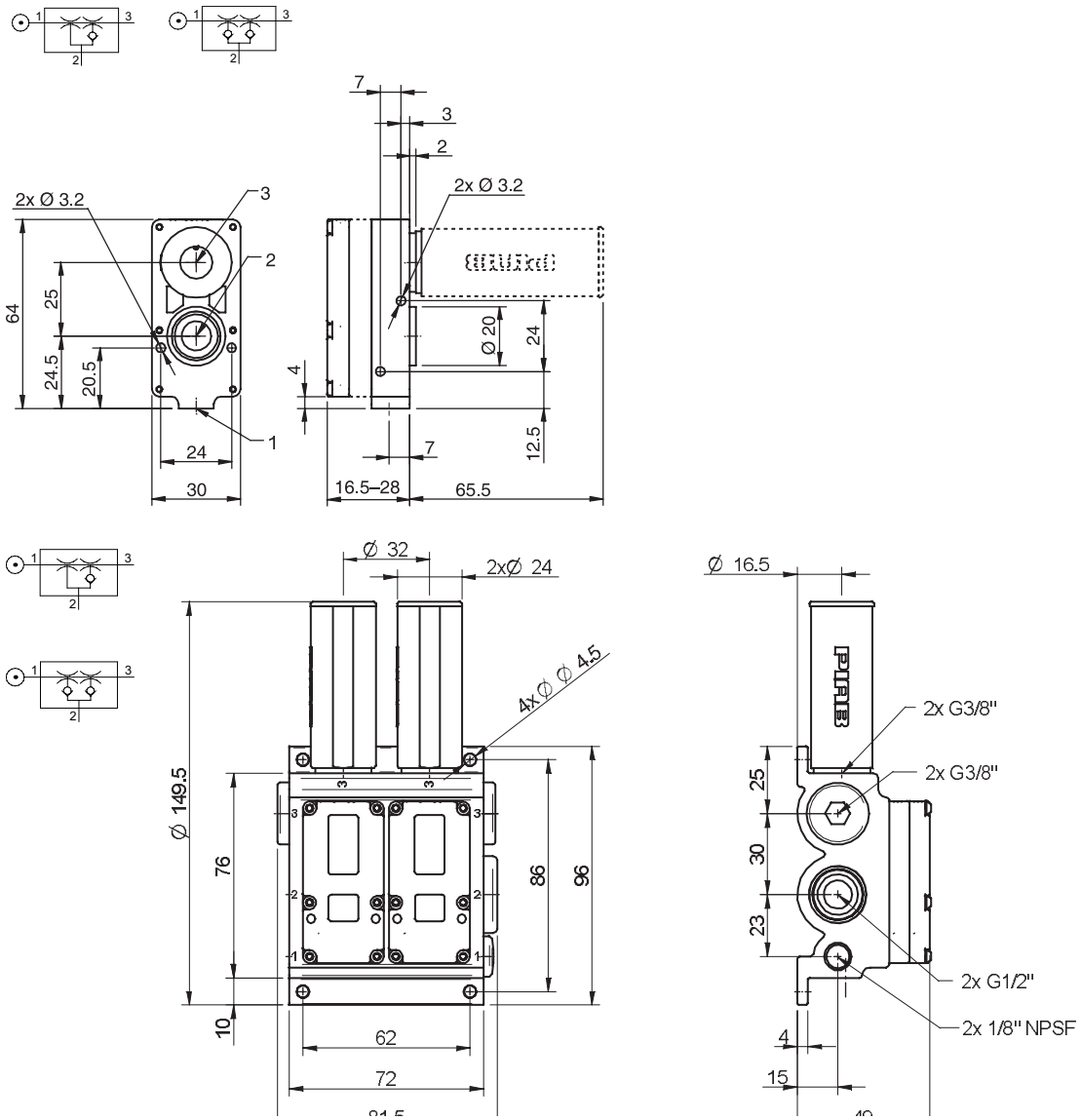
EVACUATION TIMES

Pump name	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
M5L	0.38	0.38	0.2	0.61	1.2	1.8	2.6	3.8	5.9	11.1	81
M5L	0.6	0.55	0.13	0.36	1	1.8	2.8	4	5.7	9.4	84
M10L	0.38	0.76	0.13	0.31	0.57	0.9	1.3	2	3.2	7.1	81
M10L	0.6	1.1	0.079	0.2	0.5	0.92	1.4	2.1	3	5	84

Specifications subject to change without notice.

Pump name	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
M20L	0.38	1.5	0.052	0.14	0.26	0.42	0.64	1	1.7	3.7	81
M20L	0.6	2.2	0.038	0.1	0.24	0.43	0.68	1	1.5	2.5	84
M40L	0.38	3	0.03	0.074	0.13	0.21	0.32	0.5	0.95	1.6	81
M40L	0.6	4.4	0.031	0.064	0.13	0.22	0.34	0.5	0.7	1.3	84

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Vacuum pump MINI M5L, conn. A, NBR sealings	0102865
Vacuum pump MINI M5L, conn. A, NBR sealings, non-return valve	0102866
Vacuum pump MINI M10L, conn. A, NBR sealings	0102871
Vacuum pump MINI M10L, conn. A, NBR sealings, non-return valve	0102872
Vacuum pump MINI M20L, conn. B, NBR sealings	0103079
Vacuum pump MINI M20L, conn. B, NBR sealings, non-return valve	0103080
Vacuum pump MINI M20L, conn. B1, NBR sealings	0102839
Vacuum pump MINI M20L, conn. B1, NBR sealings, non-return valve	0102840
Vacuum pump MINI M20L, conn. C, NBR sealings	0102767
Vacuum pump MINI M20L, conn. C, NBR sealings, non-return valve	0102768
Vacuum pump MINI M40L, conn. K, NBR sealings	0102805
Vacuum pump MINI M40L, conn. K, NBR sealings, non-return valve	0102806

Specifications subject to change without notice.

MINI X-L pumps family









This pump family with its very small size and low weight provide extra vacuum level to 93 -kPa. Some models are available with the connection plate in aluminium or composite PA. These are recommended to use when the handled product is made of a sealed material or a non-porous material such as plastic. metal or glass.

VACUUM FLOW

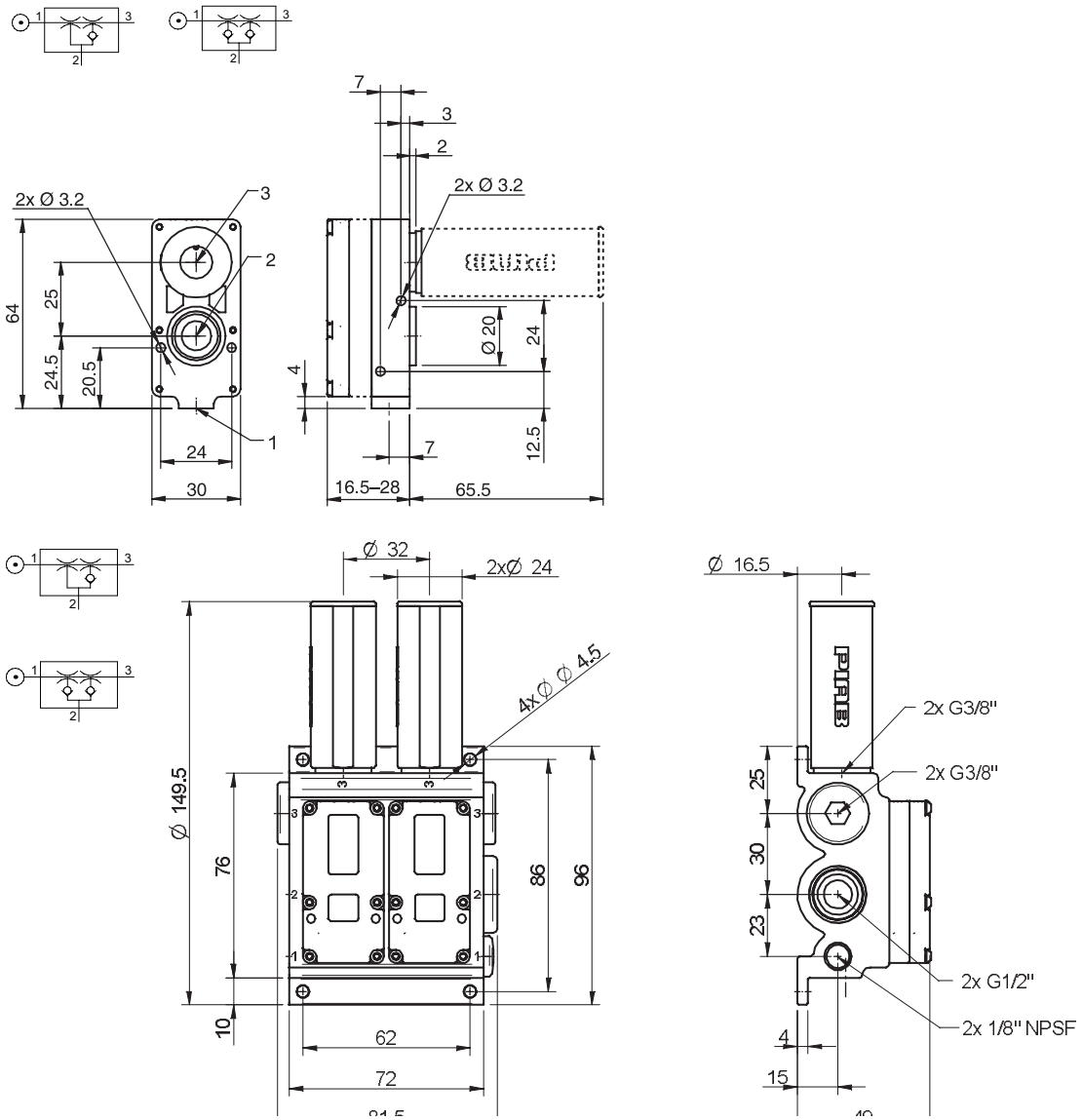
Pump name	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
X5L	0.4	0.39	0.48	0.24	0.12	0.11	0.1	0.086	0.071	0.057	0.03	0.006	93
X10L	0.4	0.79	0.76	0.35	0.24	0.21	0.16	0.13	0.1	0.07	0.04	0.01	93
X20L	0.4	1.6	1.9	1	0.5	0.44	0.38	0.3	0.25	0.17	0.1	0.02	93
X40L	0.4	3.1	3.2	1.5	1	0.9	0.7	0.6	0.5	0.4	0.17	0.038	93

EVACUATION TIMES

Pump name	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
X5L	0.4	0.39	0.17	0.82	1.7	2.7	3.9	5.4	7.4	10.6	22.5	93
X10L	0.4	0.79	0.11	0.47	0.94	1.5	2.2	3.1	4.3	6.6	14	93
X20L	0.4	1.6	0.055	0.2	0.4	0.65	0.97	1.4	1.9	2.7	5.1	93
X40L	0.4	3.1	0.038	0.12	0.22	0.33	0.48	0.68	1.2	2.2	3.2	93

Specifications subject to change without notice.

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Vacuum pump MINI X5L, conn. A, NBR sealings	3222127
Vacuum pump MINI X5L, conn. A, NBR sealings, non-return valve	3222127A
Vacuum pump MINI X10L, conn. A, NBR sealings	3222157
Vacuum pump MINI X10L, conn. A, NBR sealings, non-return valve	3222157A
Vacuum pump MINI X20L, conn. B, NBR sealings	3222278
Vacuum pump MINI X20L, conn. B, NBR sealings, non-return valve	3222278A
Vacuum pump MINI X20L, conn. B1, NBR sealings	0103203
Vacuum pump MINI X20L, conn. B1, NBR sealings, non-return valve	0103204
Vacuum pump MINI X20L, conn. C, NBR sealings	3222279
Vacuum pump MINI X20L, conn. C, NBR sealings, non-return valve	3222279A
Vacuum pump MINI X40L, conn. K, NBR sealings	0100423
Vacuum pump MINI X40L, conn. K, NBR sealings, non-return valve	0100425

MAXI MLL pumps family



MLL 200/400



MLL800



MLL1200

This is probably the largest compressed-air driven pump in the market. Some of the models have an optional energy saving feature.

VACUUM FLOW

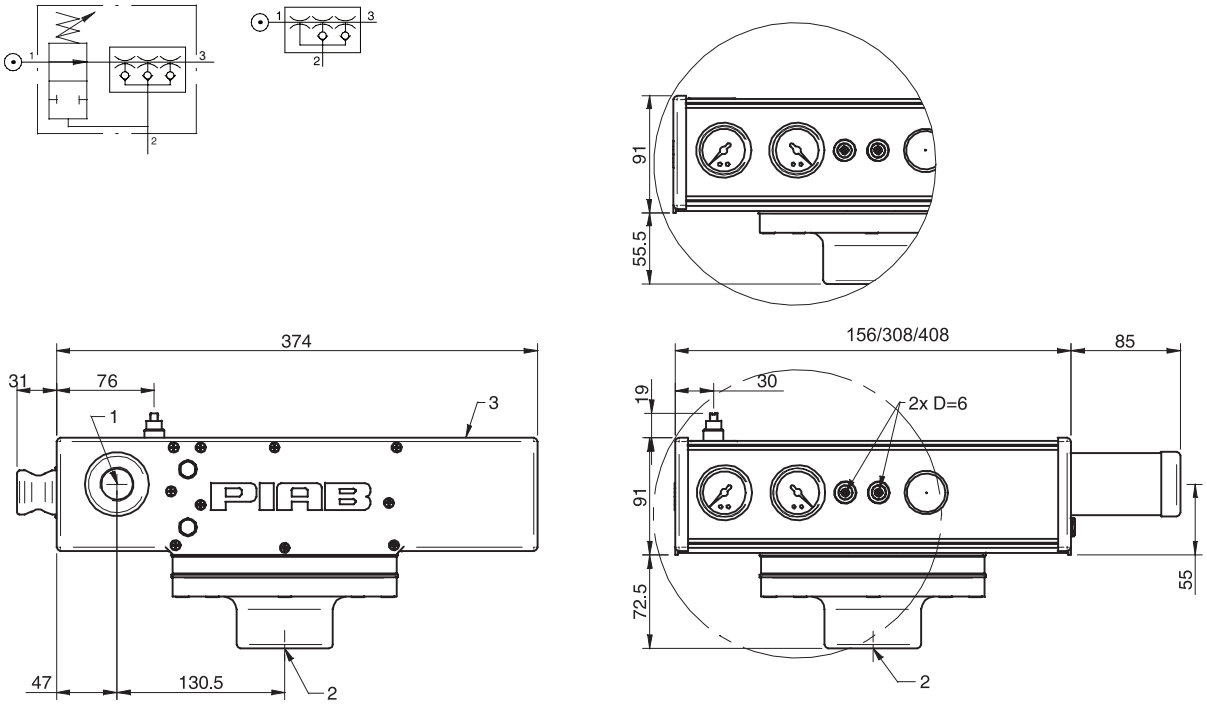
Pump name	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MLL200	0.6	14	48	27	18.1	9.5	4.8	3.3	2.4	1.1	0.48	0.01	91
MLL400	0.6	28	92	52	35	18.4	9.2	6.4	4.6	2.2	0.92	0.02	91
MLL800	0.6	56	176	99	67	35	17.6	12.3	8.8	4.2	1.8	0.04	91
MLL1200	0.6	84	255	143	97	51	26	17.9	12.8	6.1	2.6	0.05	91

EVACUATION TIMES

Pump name	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MLL200	0.6	14	0.003	0.008	0.014	0.03	0.06	0.1	0.16	0.29	0.82	91
MLL400	0.6	28	0.0015	0.004	0.007	0.015	0.03	0.05	0.08	0.15	0.41	91
MLL800	0.6	56	0.0008	0.0018	0.0035	0.008	0.014	0.024	0.04	0.072	0.2	91
MLL1200	0.6	84	0.0005	0.0012	0.0023	0.0052	0.009	0.016	0.027	0.048	0.14	91

Specifications subject to change without notice.

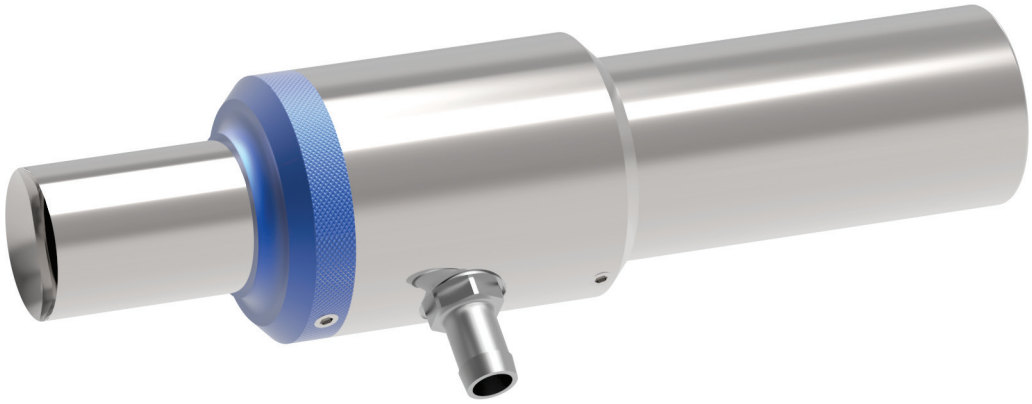
DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Vacuum pump MAXI MLL200, NBR sealings, G 1 1/2"	3101056
Vacuum pump MAXI MLL400, NBR sealings	3101057
Vacuum pump MAXI MLL400, NBR sealings, ES	0100742
Vacuum pump MAXI MLL800, NBR sealings, ES	0100743
Vacuum pump MAXI MLL800, NBR sealings	3101058
Vacuum pump MAXI MLL1200, NBR sealings	3101059
Vacuum pump MAXI MLL1200, NBR sealings, ES	0100744

Ejector 300

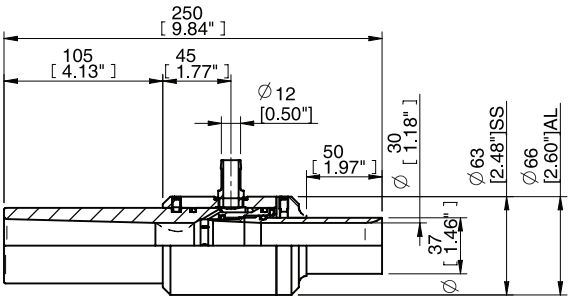


This is a compact ejector pump which is normally used when a large flow with low vacuum is desired. The air consumption and capacity can be adjusted. Small amounts of material and contaminants can be conveyed. This product is available in stainless steel or aluminium. When it is fitted with an insert, the ejector changes characteristics providing higher vacuum at lower flow. It is delivered with a 3/8" hose nipple for the compressed air connection.

VACUUM FLOW

Feed pressure	Air consumption	Vacuum flow (Nl/s) at 0 -kPa		Max vacuum (-kPa)	
MPa	Nl/s	Ejector 300	With insert	Ejector 300	With insert
0.1	8.3	55	32	3.5	5
0.2	13.3	85	47	6	11
0.3	18.3	110	59	8	16
0.4	23.3	126	64	10.5	20
0.5	28.3	141	64	12	21.5
0.6	33.3	152	59	12.5	21.8

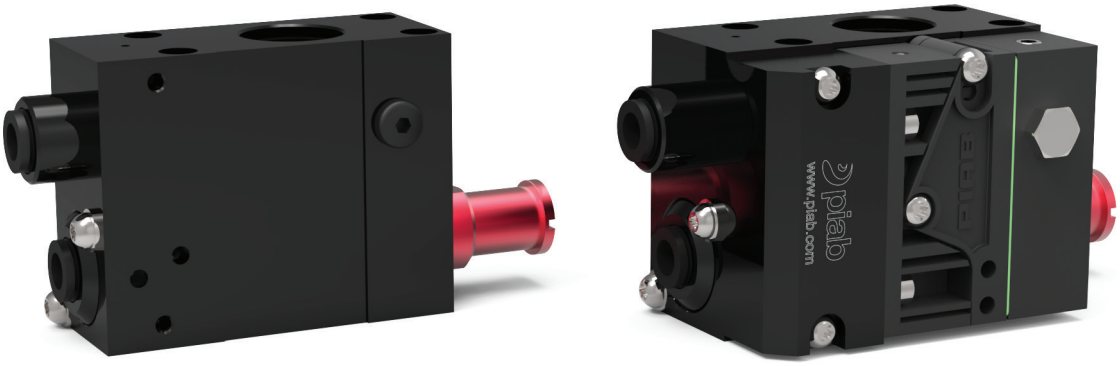
DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Ejector 300 Aluminium	3108001
Ejector 300 Stainless steel	3108002
Insert 200 Aluminium cpl.	3108003
Insert 200 Stainless steel cpl.	3108004

piSECURE



This vacuum pump combines high security and the most energy-efficient solution for sealed material, COAX® technology with automatic air-saving function. It has a check valve that traps vacuum in sealed applications and an integrated energy saving device that results in virtually no energy consumption. It is an excellent product when working with vacuum handling devices that have to comply and fulfil legislated lifting norms for handling devices, for example (DIN/SS) – EN 13155, ASME Standard B30.20, etc.

As the piSECURE uses the two stage COAX® MINI Xi10-2 ejector it will provide a fast evacuation to 94 -kPa. It is suitable to use as decentralized (one per cup) for maximum safety. It also has an integrated blow-off release valve for fast and reliable release of object. The optional air saving function (piSECURE ES) can save up to 99% of consumption.

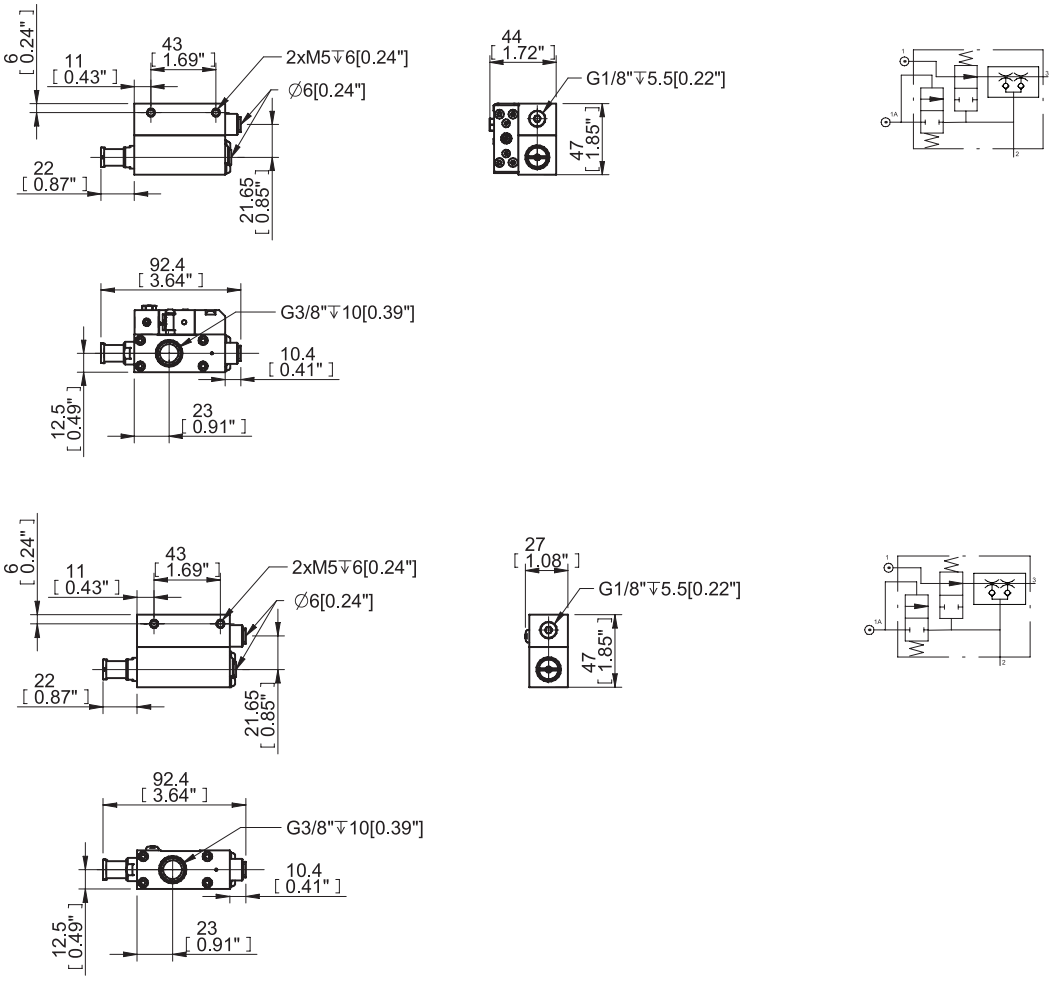
VACUUM FLOW

COAX® cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MINI Xi10-2	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
MINI 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
MINI Xi10-2	0.6	0.54	0.74	0.63	0.53	0.42	0.3	0.16	0.11	0.08	0.041	0.01	93

EVACUATION TIMES

COAX® cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	90	-kPa
MINI Xi10-2	0.45	0.42	0.15	0.3	0.6	1.1	1.6	2.3	3.5	5.3	9.6	92
MINI Xi10-2	0.5	0.46	0.14	0.3	0.6	1	1.6	2.3	3.5	5.3	8.9	94
MINI Xi10-2	0.6	0.54	0.15	0.3	0.5	0.8	1.3	2	3.1	4.8	8.7	93

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
piSECURE COAX® X10-2 ES	0200984
piSECURE COAX® X10-2	0200986

Vacuum Check Valve VT-1H with COAX®



This vacuum pump combines high security and the most energy-efficient solution for sealed material, COAX® technology with automatic air-saving function. It has a check valve that traps vacuum in sealed applications and an integrated energy saving device that results in virtually no energy consumption. It is an excellent product when working with vacuum handling devices that have to comply and fulfil legislated lifting norms for handling devices, for example (DIN/SS) – EN 13155, ASME Standard B30.20, etc.

It has the two-stage COAX® cartridge MINI Pi12-2 integrated and is available in lock pin 16, 19 or ball joint mountings, industry standard. It is also available with level compensator to compensate for differences in level of object.

VACUUM FLOW

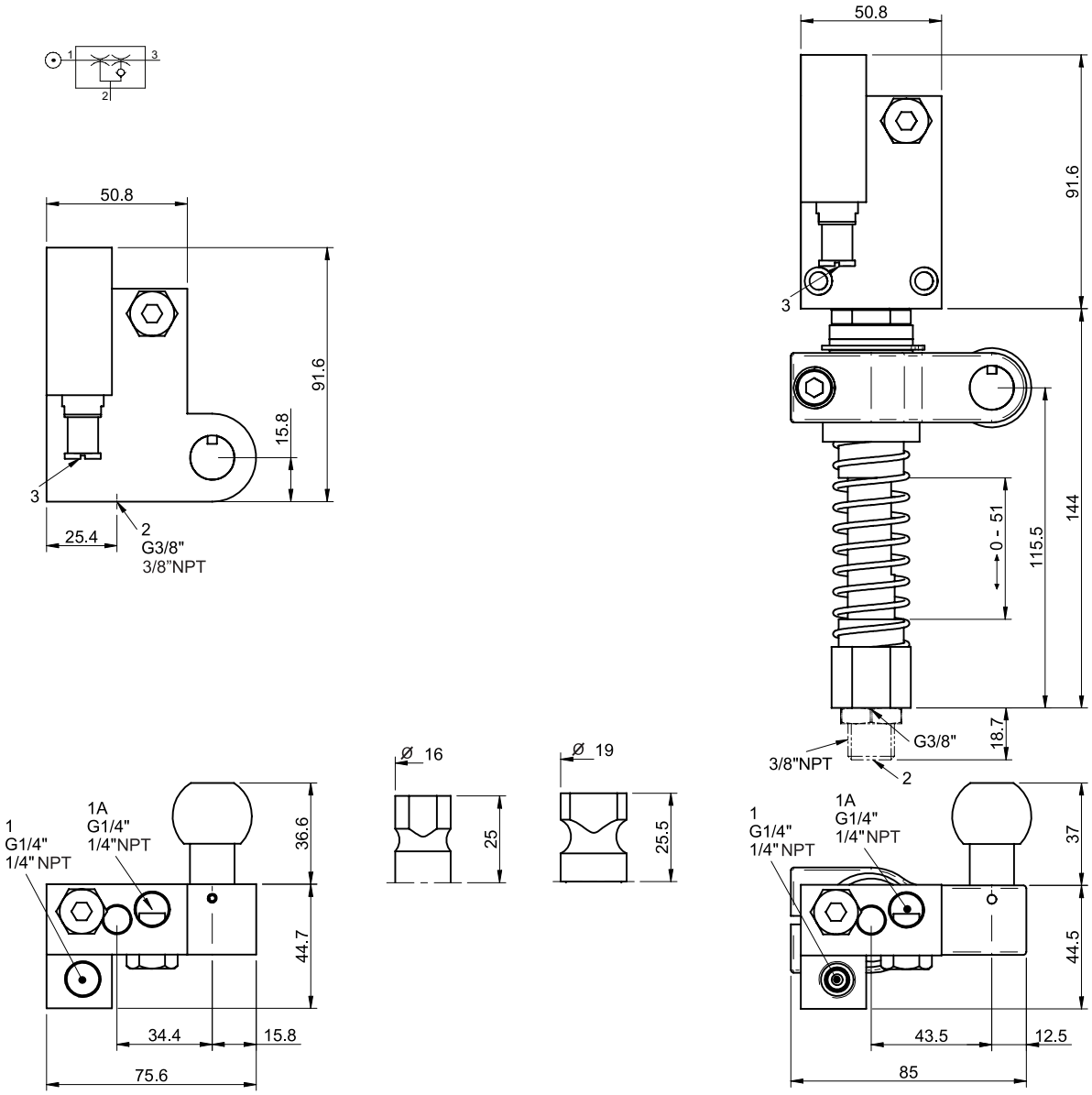
COAX® cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MINI Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	90

EVACUATION TIMES

COAX® cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MINI Pi12-2	0.32	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4	6.4	90

Specifications subject to change without notice.

DIMENSIONAL DRAWING



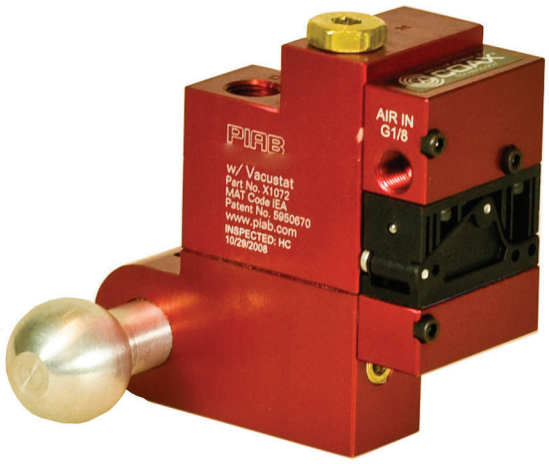
ORDERING INFORMATION

Description	Item No.
Vacuum Check Valve VT-1H COAX®, G threads, Ball joint, Left hand connection	0110435
Vacuum Check Valve VT-1H COAX®, G threads, Ball joint, Right hand connection	0121018
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 16, Left hand connection	0109276
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 16, Right hand connection	0121007

Specifications subject to change without notice.

Description	Item No.
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 19, Left hand connection	0111147
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 19, Right hand connection	0119573
Vacuum Check Valve VT-1H COAX®, NPT threads, Ball joint, Left hand connection	0121056
Vacuum Check Valve VT-1H COAX®, NPT threads, Ball joint, Right hand connection	0121057
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 16, Left hand connection	0121026
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 16, Right hand connection	0121025
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 19, Left hand connection	0121038
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 19, Right hand connection	0121039
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Ball joint, Left hand connection	0120990
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Ball joint, Right hand connection	0121021
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Left hand connection	0109278
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Right hand connection	0121010
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Left hand connection	0120991
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Right hand connection	0121015
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Left hand connection	0121062
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Right hand connection	0121063
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Left hand connection	0121032
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Right hand connection	0121031
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Left hand connection	0121044
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Right hand connection	0121045

Vacuum Check Valve VT-1H Vacustat with COAX®



This vacuum pump combines high security and the most energy-efficient solution for sealed material, COAX® technology with automatic air-saving function. It has a check valve that traps vacuum in sealed applications and an integrated energy saving device that results in virtually no energy consumption. It is an excellent product when working with vacuum handling devices that have to comply and fulfil legislated lifting norms for handling devices, for example (DIN/SS) – EN 13155, ASME Standard B30.20, etc.

It has the two-stage COAX® cartridge MINI Pi12-2 integrated and is available in lock pin 16, 19 or ball joint mountings, industry standard. It is also available with level compensator to compensate for differences in level of object. This pump has an integrated energy-saving device, Vacustat that results in virtually no air consumption in sealed applications.

VACUUM FLOW

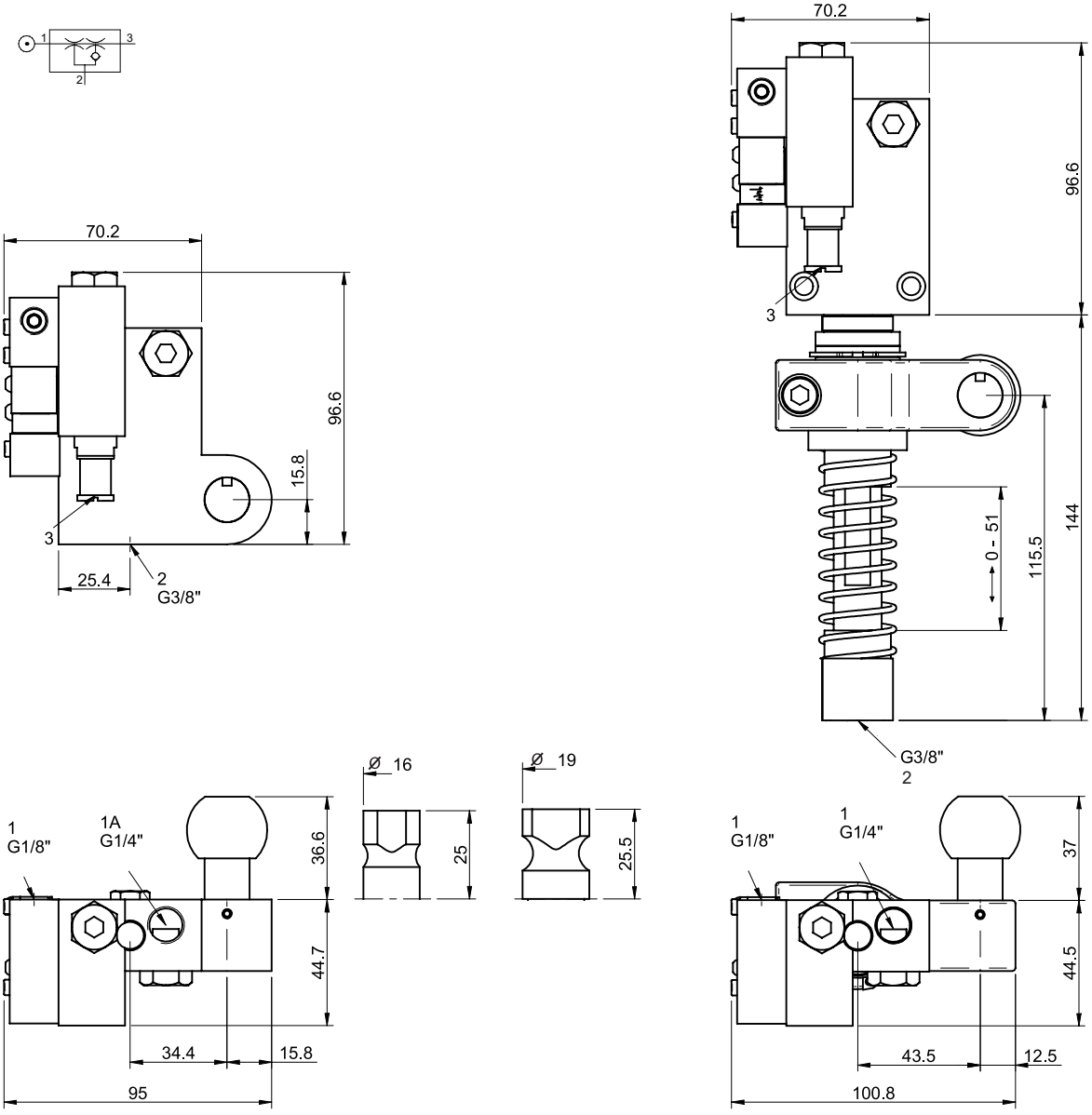
COAX® cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)									Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	-kPa
MINI Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27	0.19	0.14	0.1	0.06	0.03	90

EVACUATION TIMES

COAX® cartridge	Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)								Max vacuum
	MPa	Nl/s	10	20	30	40	50	60	70	80	-kPa
MINI Pi12-2	0.32	0.44	0.17	0.32	0.58	1.1	1.8	2.7	4	6.4	90

Specifications subject to change without notice.

DIMENSIONAL DRAWING



ORDERING INFORMATION

Description	Item No.
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Ball joint, Left hand connection	0119676
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Ball joint, Right hand connection	0121019
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 16, Left hand connection	0120994
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 16, Right hand connection	0121008

Description	Item No.
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 19, Left hand connection	0120995
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 19, Right hand connection	0121013
Vacuum Check Valve VT-1H Vacustat with COAX®, NPT threads, Ball joint, Left hand connection	0127836
Vacuum Check Valve VT-1H Vacustat with COAX®, NPT threads, Ball joint, Right hand connection	0127837
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Ball joint, Left hand connection	0120997
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Ball joint, Right hand connection	0121022
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 16, Left hand connection	0120996
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 16, Right hand connection	0121011
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 19, Left hand connection	0120998
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 19, Right hand connection	0121016
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Left hand connection	0109278
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Right hand connection	0121010
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Left hand connection	0120991
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Right hand connection	0121015
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Left hand connection	0121062
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Right hand connection	0121063
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Left hand connection	0121032
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Right hand connection	0121031
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Left hand connection	0121044
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Right hand connection	0121045

Classic H40



A traditional Piab vacuum pump developed to be used within the chemical industry or in chemically aggressive environments. It can achieve higher vacuum levels, even down to 99.8 -kPa. Vacuum pump Classic H40 is constructed of composite PPS. We recommend it to be used with practically zero leakage present and in nonporous applications.

VACUUM FLOW

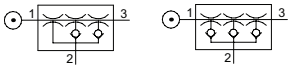
Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)												Max vacuum
MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	95	99	-kPa
0.6	2.6	2.8	2.1	1.5	0.9	0.4	0.3	0.2	0.14	0.1	0.095	0.019	0.005	99.8

EVACUATION TIMES

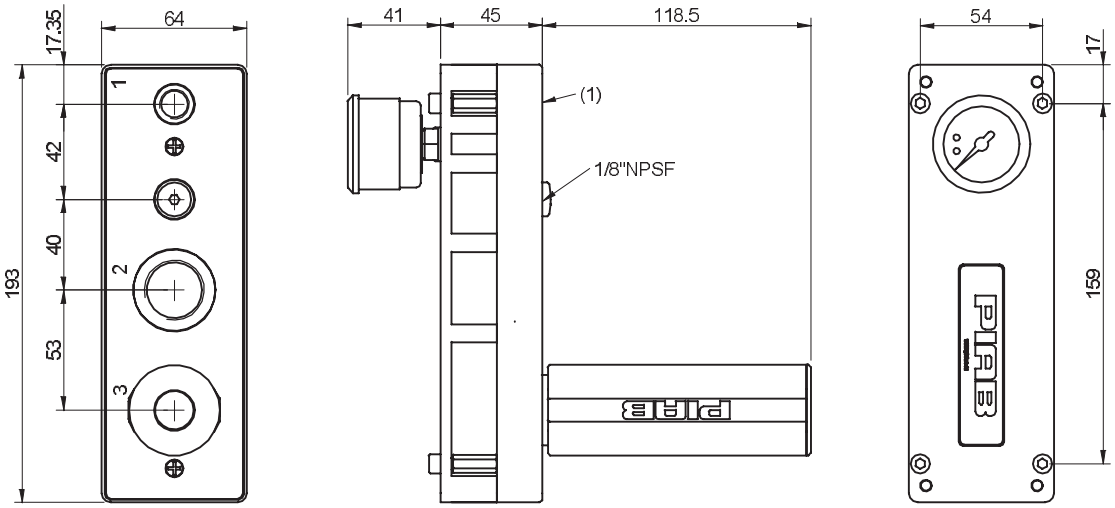
Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)												Max vacuum
MPa	Nl/s	10	20	30	40	50	60	70	80	90	95	99	99,5	-kPa
0.6	2.6	0.032	0.075	0.15	0.32	0.64	1.1	1.7	2.6	3.9	5.5	9.8	12	99.8

Specifications subject to change without notice.

DIMENSIONAL DRAWING



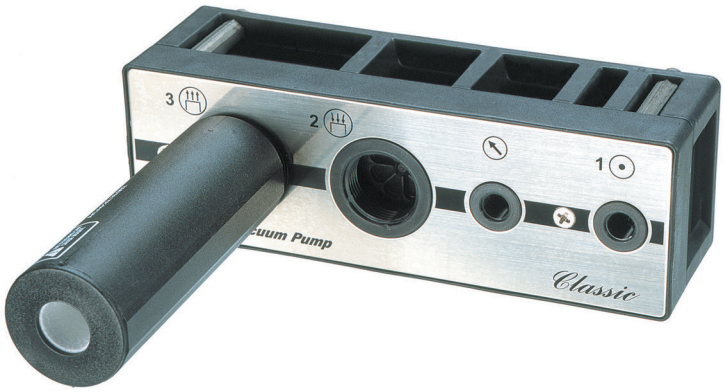
	1	2	3
D	1/8"NPSF	G3/4"	G3/4"
AD	G1/4"	G3/4"	G3/4"
E	1/4"NPT	3/4"NPT	3/4"NPT



ORDERING INFORMATION

Description	Item No.
Vacuum pump CLASSIC H40, composite PPS(D), Viton® sealings	0100194

Classic H120



A traditional Piab vacuum pump developed to be used within the chemical industry or in chemically aggressive environments. It can achieve higher vacuum levels, even down to 100.8 -kPa. It is available with connection plate in composite PPS or aluminium. We recommend it to be used with practically zero leakage present and in nonporous applications.

VACUUM FLOW

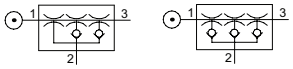
Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)												Max vacuum
MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	95	99	-kPa
0.6	7.6	8.4	6.6	4.7	2.7	1.5	1.2	0.86	0.62	0.43	0.1	0.05	0.01	100.8

EVACUATION TIMES

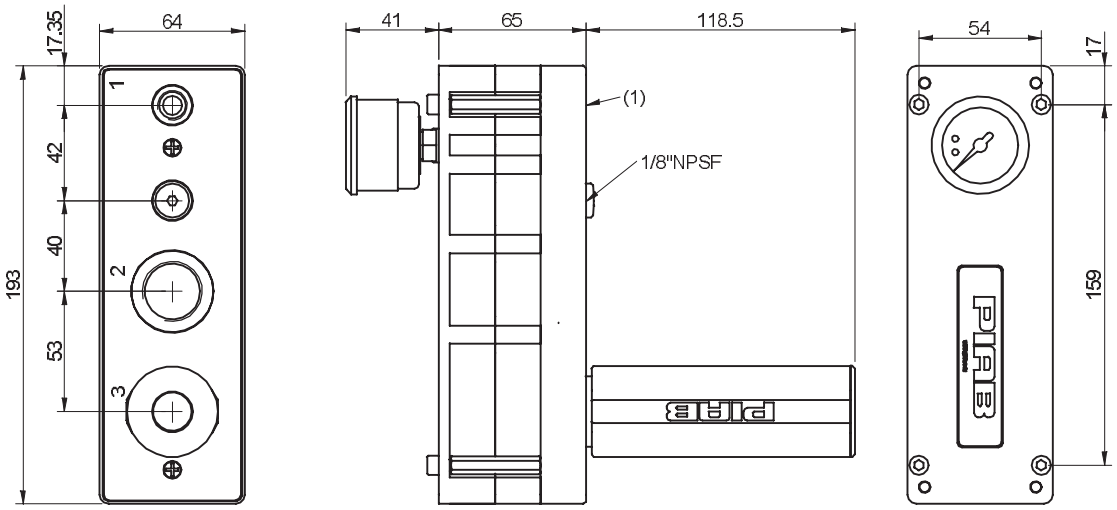
Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)												Max vacuum
MPa	Nl/s	10	20	30	40	50	60	70	80	90	95	99	99,5	100,3	-kPa
0.6	7.6	0.018	0.033	0.06	0.11	0.18	0.27	0.42	0.62	1.3	2.1	4.2	5.4	8.3	100.8

Specifications subject to change without notice.

DIMENSIONAL DRAWING



	1	2	3
D	1/8"NPSF	G3/4"	G3/4"
AD	G1/4"	G3/4"	G3/4"
E	1/4"NPT	3/4"NPT	3/4"NPT



ORDERING INFORMATION

Description	Item No.
Vacuum pump CLASSIC H120, connection plate composite PPS(D), Viton® sealings	0100212
Vacuum pump CLASSIC H120, conn. AD, NBR sealings	0102131

Lab Vac LVH40



This vacuum pump is tailor-made for laboratory applications, such as degassing, vacuum filtering, gel drying and rotation evaporation. It can achieve high vacuum levels to 20 mbar abs. with a maximum vacuum flow of 9 m^3/h. There is no risk for "back draft" which can cause damaged test samples. Its low noise level, easy installation and maintenance is widely appreciated.

It has a high chemical resistance, with an option to have with Kalrez sealing material which normally makes the chemical resistance unsurpassed.

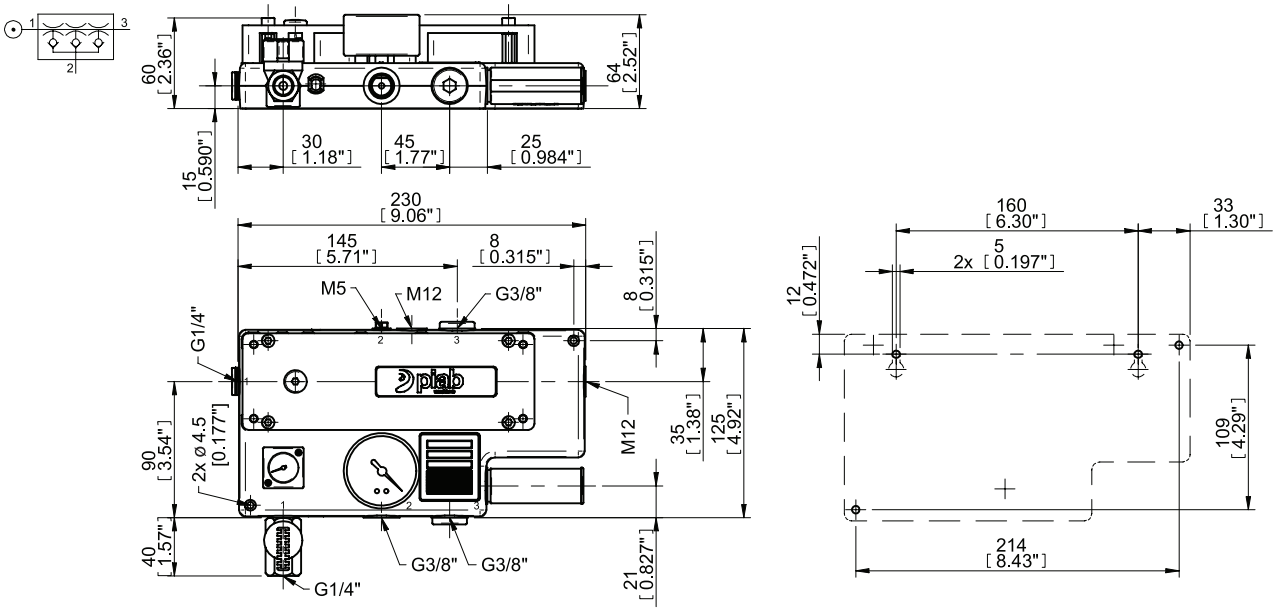
VACUUM FLOW

Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)											Max vacuum
MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	95	-kPa
0.60	2.6	2.5	1.8	1.3	0.7	0.53	0.35	0.24	0.16	0.12	0.06	0.02	98

EVACUATION TIMES

Feed pressure	Air consumption	Evacuation time (s/l) to reach different vacuum levels (-kPa)										Max vacuum
MPa	Nl/s	10	20	30	40	50	60	70	80	90	95	-kPa
0.60	2.6	0.04	0.09	0.18	0.41	0.71	1.09	1.65	2.48	3.91	6.01	98

DIMENSIONAL DRAWING



ORDERING INFORMATION

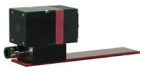
Description	Item No.
Lab Vac LVH40K6, Viton® sealings, Kalrez flap valves	0103684
Lab Vac LVH40K6, EPDM sealings, Kalrez flap valves	0124540

Pump accessories



PUMP ACCESSORIES	**307**
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Vacuum Pump Accessories	309
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Silencers	326
Vacuum Filters	328
Other	330

Selection guide – Accessories

	Vacuum pump accessories		Features and benefits
1		Vacuum switches	Our line includes inductive universal, electro-mechanical and pneumatic vacuum switches that are pre-set or adjustable.
2		Valves	Choose between solenoid, electrically or vacuum-controlled valves. The vacuum controlled valve (Vacustat) shuts off the flow of compressed air to the pump when the pre-set level is reached, and consequently the consumption of compressed air is minimised.
3		Regulators	Different vacuum pumps need different feed pressure for optimum performance. A filter regulator can easily be manually set to a desired pressure level, and be used to eliminate particles from the compressed air. A pilot regulator can be used to automatically set the feed pressure according to your needs.
4		Silencers	Reduce noise from exhaust with a flow-through design.
5		Vacuum filters	To filter dust and other small particles from the vacuum flow. Reduces the risk of operation breakdown or stoppage in the pump.
6		Other	Body for COAX® cartridges, vacuum gauge, manometer etc.

Vacuum Pump Accessories

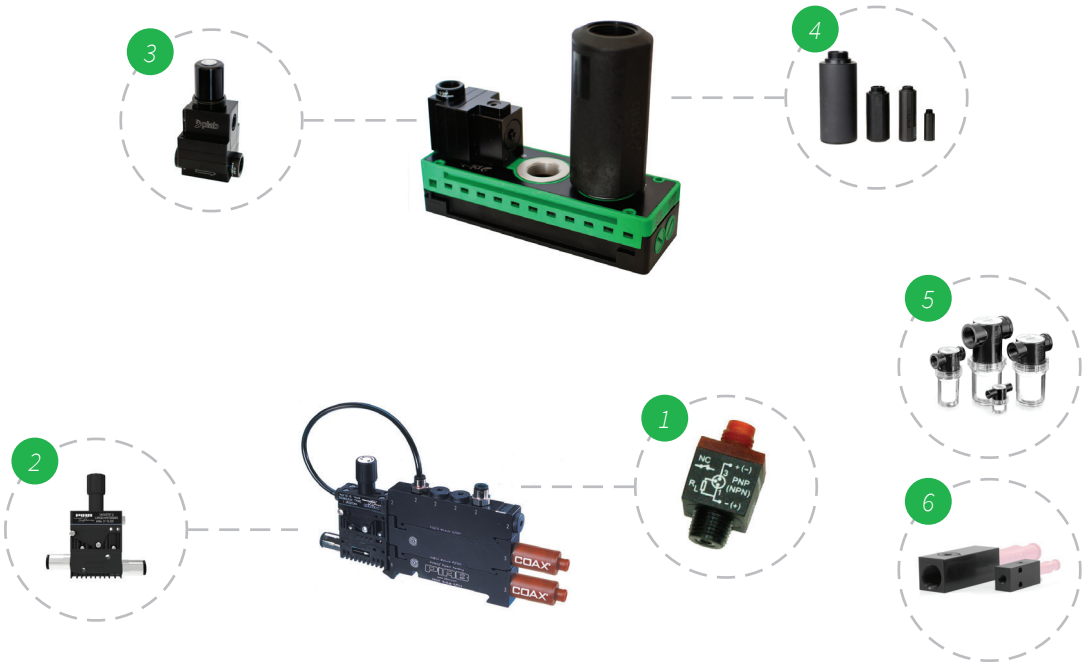
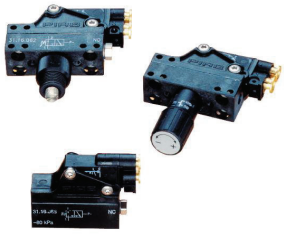


Image only to serve as an example.

1. *Vacuum switches*
2. *Valves*
3. *Regulators*
4. *Silencers*
5. *Vacuum filters*
6. *Other*

Vacuum switches



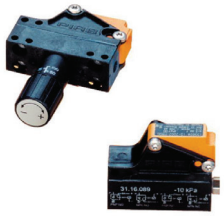
Vacuum switches, pneumatic

- Converts a vacuum level to a pneumatic signal.
- Vacuum-actuated membrane linked to a pneumatic switch.
- Available preset or with adjustable vacuum level.



Vacuum switches, electromechanical

- 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.



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	Hysteresis	Signal range
Vacuum switch, pneumatic, adjustable with screw and knob (NO)	3 kPa	10–95 -kPa
Vacuum switch, pneumatic, adjustable with screw and knob (NC)	12 kPa	15–95 -kPa
Vacuum switch, pneumatic, preset (NO 25 -kPa)	3 kPa	21–29 -kPa
Vacuum switch, pneumatic, preset (NO 65 -kPa)	3 kPa	57–73 -kPa
Vacuum switch, pneumatic, preset (NC 30 -kPa)	12 kPa	25–35 -kPa
Vacuum switch, pneumatic, preset (NC 70 -kPa)	12 kPa	60–80 -kPa
Vacuum switch, electro-mechanical, adjustable with screw & knob	10 kPa	15–95 -kPa
Vacuum switch, electro-mechanical, preset (Signal range 25 -kPa)	10 kPa	20–30 -kPa
Vacuum switch, inductive universal, adjustable with knob Ø6	2 kPa	10–95 -kPa

Specifications subject to change without notice.

Description	Hysteresis	Signal range
Vacuum switch, inductive universal, adjustable with knob	2 kPa	10–95 -kPa
Vacuum switch, inductive universal, preset (Signal range 10 -kPa)	2 kPa	9–11 -kPa
Vacuum switch, inductive universal, preset (Signal range 30 -kPa)	2 kPa	27–33 -kPa

ORDERING INFORMATION

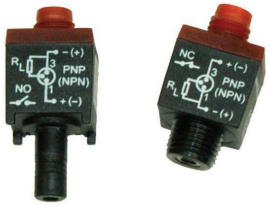
Description	Item No.
Vacuum switch, pneumatic, adjustable with screw and knob (NO)	3116062
Vacuum switch, pneumatic, adjustable with screw and knob (NC)	3116063
Vacuum switch, pneumatic, preset (NO 25 -kPa)	3116084
Vacuum switch, pneumatic, preset (NO 65 -kPa)	3116085
Vacuum switch, pneumatic, preset (NC 30 -kPa)	3116087
Vacuum switch, pneumatic, preset (NC 70 -kPa)	3116088
Vacuum switch, electro-mechanical, adjustable with screw and knob	3116061
Vacuum switch, electro-mechanical, preset (Signal range 25 -kPa)	3116095
Vacuum switch, inductive universal, adjustable with knob Ø6	0104350
Vacuum switch, inductive universal, adjustable with knob	3116064
Vacuum switch, inductive universal, preset (Signal range 10 -kPa)	3116089
Vacuum switch, inductive universal, preset (Signal range 30 -kPa)	3116090

Specifications subject to change without notice.



Vacuum switches Mini 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).



Vacuum switches Mini 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	Hysteresis	Signal range
Vacuum Switch VS4128 30 -kPa, M12 PNP NO	8 kPa	26–34 -kPa
Vacuum Switch VS4128 50 -kPa, M12 PNP NO	8 kPa	46–54 -kPa
Vacuum Switch VS4118 30 -kPa, M8 PNP/NPN NO/NC	8 kPa	26–34 -kPa
Vacuum Switch VS4118 50 -kPa, M8 PNP/NPN NO/NC	8 kPa	46–54 -kPa
Vacuum Switch VS4118 70 -kPa, M8 PNP/NPN NO/NC	8 kPa	66–74 -kPa
Vacuum Switch VS4128 50 -kPa, M12 NPN NO	8 kPa	46–54 -kPa
Vacuum switch VS4015, Ø6, 30 -kPa	5–7 kPa	27–35 -kPa
Vacuum switch VS4015, Ø6, 50 -kPa	5–7 kPa	47–55 -kPa
Vacuum switch VS4015, Ø6, 70 -kPa	5–7 kPa	67–75 -kPa
Vacuum switch VS4016, G1/8” male, 30 -kPa	5–7 kPa	27–35 -kPa

Specifications subject to change without notice.

Description	Hysteresis	Signal range
Vacuum switch VS4016, G1/8” male, 50 -kPa	5–7 kPa	47–55 -kPa
Vacuum switch VS4016, G1/8” male, 70 -kPa	5–7 kPa	67–75 -kPa

ORDERING INFORMATION

Description	Item No.
Vacuum switch VS4015, Ø6, 30 -kPa	0110245
Vacuum switch VS4015, Ø6, 50 -kPa	0110246
Vacuum switch VS4015, Ø6, 70 -kPa	0110247
Vacuum switch VS4016, G1/8" male, 30 -kPa	0110248
Vacuum switch VS4016, G1/8" male, 50 -kPa	0110249
Vacuum switch VS4016, G1/8" male, 70 -kPa	0110250
Vacuum Switch VS4118 30 -kPa, M8 PNP/NPN NO/NC	0110730
Vacuum Switch VS4118 50 -kPa, M8 PNP/NPN NO/NC	0110731
Vacuum Switch VS4118 70 -kPa, M8 PNP/NPN NO/NC	0110732
Vacuum Switch VS4128 30 -kPa, M12 PNP NO	0110630
Vacuum Switch VS4128 50 -kPa, M12 NPN NO	0124450
Vacuum Switch VS4128 50 -kPa, M12 PNP NO	0110631

Specifications subject to change without notice.



Vacuum switch 3-colour digital display M8

- 2 PNP outputs, NO or NC. Independently selectable for each output.
- 3-colour LCD display, easy readout.
- 7 programmable vacuum units, for example kPa, inHg, mmHg, etc.
- Dual display allows actual and set value to be displayed at the same time.
- Selectable ”Key-Lock mode” with display indicator to avoid unauthorized changes.
- Selectable ”Power-Save mode” with display indicator.
- Mounting brackets included.



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	Hysteresis	Signal range
Vacuum switch 3-colour digital display M8	Adjustable, 1–8 kPa	0–101.3 -kPa
Vacuum switch, MM8	1–5 % F.S.	0–100 -kPa

ORDERING INFORMATION

Description	Item No.
Vacuum switch 3-colour digital display M8	0126934
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.



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.



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	Hysteresis	Signal range
Vacuum switch, DM8	2 % F.S.	0–100 -kPa
Vacuum switch, LM8	2 % F.S.	0–100 -kPa
Vacuum switch, M5	2 % F.S.	-100–300 -kPa

ORDERING INFORMATION

Description	Item No.
Vacuum switch, adjustable, PNP NO LM8	0107731
Vacuum switch PNP M5	0110358
Vacuum switch NPN M5	0110359
Vacuum switch, adjustable, PNP NO DM8	0107732
Vacuum switch, adjustable, NPN NO DM8	0107733

Specifications subject to change without notice.

Valves



piSAVE® release

- 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 piSAVE® release.



AQR

- 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 pump and AQR.



QR

- 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	Flow, atmospheric	Volume (Quick-Release)
piSAVE® release G1/8"	3.85 Nl/s	–
piSAVE® release G1/4"	7.85 Nl/s	–
Atmospheric quick-release valve – AQR	3.3 Nl/s	–
Quick-Release module P3010	–	3 cm^3
Quick-Release tank module P3010	–	30 cm^3
Quick-Release tank module P3010	–	60 cm^3

ORDERING INFORMATION

Description	Item No.
piSAVE® release G1/4"	0119720
piSAVE® release G1/8"	0119721
Atmospheric quick-release valve – AQR.	0111236
Quick-Release tank module P3010, 30 cm^3	0104272
Quick-Release tank module P3010, 60 cm^3	0104273

Specifications subject to change without notice.





piSAVE® sense

- Vacuum check valves which allows a few suction cups to miss the object(s) and still maintain enough vacuum level in the system with quick response and release times.
- The vacuum check valves shall be used in a centralized vacuum system, one for each suction cup.
- Designing with vacuum check valves will require a smaller vacuum pump and save energy.
- Suitable for handling different size or different number of leaking or sealed objects such as MDF boards, corrugated cardboards or metal sheets with a flexible handling device.
- Also suitable for objects with surface leakage around the lip of the suction cup.
- Available in four sizes with different flow performance/ characteristics to suit different degree of leakage on handled material and different size of cups.
- The smallest sizes are mainly suitable for sealed and smooth materials, such as metal and glass (02/06 for small cups and 03/60 for large cups).
- The valves are supplied separately for integration or mounted in an Al-fitting with female and male threaded connections to facilitate installation.

piSAVE® restrict

- Vacuum flow restrictors which allows a few suction cups to miss the object(s) and still maintain enough vacuum level in the system.
- Suitable for handling different size sealed sheets/objects with the same flexible lifting device.
- The vacuum flow restrictors shall be used in a centralized vacuum system, one for each suction cup.
- Designing with flow restrictors will require a smaller vacuum pump and save energy.
- Available in three sizes with different flow performance/ characteristics to suit different size suction cups.
- The restrictors are integrated in an Al-fittng with female and male threaded connections to faciliate installation.

TECHNICAL DATA

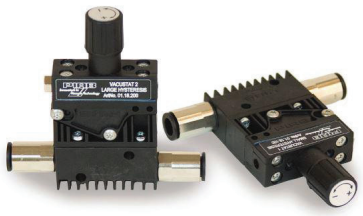
Description	Pump flow/cup min.	Pump flow/cup to close valve	Leakage flow, max.
piSAVE® sense 02/60 (yellow)	0.001 (@ 45 -kPa) Nl/s	0.21 (@ 3 -kPa) Nl/s	–
piSAVE® sense 03/60 (green)	0.06 (@ 45 -kPa) Nl/s	0.37 (@ 3 -kPa) Nl/s	–
piSAVE® sense 04/60 (blue)	0.15 (@ 45 -kPa) Nl/s	0.55 (@ 7 -kPa) Nl/s	–
piSAVE® sense 05/60 (red)	0.25 (@ 45 -kPa) Nl/s	0.72 (@ 11 -kPa) Nl/s	–
piSAVE® restrict multiple port fitting 0.7	–	–	0.08 Nl/s

Specifications subject to change without notice.

Description	Pump flow/cup min.	Pump flow/cup to close valve	Leakage flow, max.
piSAVE® restrict multiple port fitting 1.0	–	–	0.16 Nl/s
piSAVE® restrict multiple port fitting 1.3	–	–	0.27 Nl/s

ORDERING INFORMATION

Description	Item No.
piSAVE® sense 02/60 (yellow), 100p, incl. Assembly tool	0202395
piSAVE® sense 02/60 (yellow),10p, incl. Assembly tool	0202394
piSAVE® sense 03/60 (green), 100p, incl. Assembly tool	0202427
piSAVE® sense 03/60 (green), 10p, incl. Assembly tool	0202424
piSAVE® sense 04/60 (blue), 100p, incl. Assembly tool	0202428
piSAVE® sense 04/60 (blue), 10p, incl. Assembly tool	0202425
piSAVE® sense 05/60 (red), 100p, incl. Assembly tool	0202429
piSAVE® sense 05/60 (red), 10p, incl. Assembly tool	0202426
piSAVE® sense Assembly tool 16mm	0202589
piSAVE® sense Multiple port fitting 02/60 (yellow)	0202396
piSAVE® sense Multiple port fitting 03/60 (green)	0128719
piSAVE® sense Multiple port fitting 04/60 (blue)	0128731
piSAVE® sense Multiple port fitting 05/60 (red)	0128733
piSAVE® restrict multiple port fitting 0.7	0129339
piSAVE® restrict multiple port fitting 1.0	0129340
piSAVE® restrict multiple port fitting 1.3	0129341



piSAVE® onoff

- 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.



Blow-off Check valve

- 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	Flow	Flow rate
piSAVE® onoff	7.3 Nl/s (@ P1=6 bar & Δp=0.5 bar)	–
Blow-off Check valve	–	1.5–2.8 Nl/s (@ 0.3-0.7 MPa)

ORDERING INFORMATION

Description	Item No.
piSAVE® onoff with small hysteresis	0118100
piSAVE® onoff with large hysteresis	0118200
Blow-off Check valve 1/8" NPSF female.	0115314
Blow-off Check valve G1/4" female	0117337

Specifications subject to change without notice.

Valves – Vacuum check valves



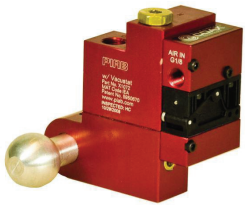
Vacuum Check Valve VT-1H

- Check valve that traps vacuum in sealed applications for safe operation.
- 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.



Vacuum Check Valve VT-1H with COAX®

- Two-stage COAX® cartridge MINI Pi12-2 integrated.
- Check valve that traps vacuum in sealed applications for safe operation.
- 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.



Vacuum Check Valve VT-1H Vacustat with COAX®

- Two-stage COAX® cartridge MINI Pi12-2 integrated.
- Check valve that traps vacuum in sealed applications for safe operation.
- Built-in blow off check valve for fast release of object.
- Integrated energy-saving device, Vacustat results in virtually no air consumption in sealed applications.
- 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	Vacuum flow, max.
Vacuum Check Valve VT-1H	0.68 Nl/s
Vacuum Check Valve VT-1H with COAX®	0.68 Nl/s
Vacuum Check Valve VT-1H Vacustat with COAX®	0.68 Nl/s

Specifications subject to change without notice.

ORDERING INFORMATION

Description	Item No.
Vacuum Check Valve VT-1H, NPT threads, Lock pin 19, Right hand connection	0125579
Vacuum Check Valve VT-1H, NPT threads, Lock pin 19, Left hand connection	0125580
Vacuum Check Valve VT-1H, NPT threads, Lock pin 16, Right hand connection	0125581
Vacuum Check Valve VT-1H, NPT threads, Lock pin 16, Left hand connection	0125582
Vacuum Check Valve VT-1H, NPT threads, Ball joint, Right hand connection	0125583
Vacuum Check Valve VT-1H, NPT threads, Ball joint, Left hand connection	0125584
Vacuum Check Valve VT-1H, G threads, Lock pin 19, Right hand connection	0125573
Vacuum Check Valve VT-1H, G threads, Lock pin 19, Left hand connection	0125574
Vacuum Check Valve VT-1H, G threads, Lock pin 16, Right hand connection	0125575
Vacuum Check Valve VT-1H, G threads, Lock pin 16, Left hand connection	0125576
Vacuum Check Valve VT-1H, G threads, Ball joint, Right hand connection	0125577
Vacuum Check Valve VT-1H, G threads, Ball joint, Left hand connection	0125578
Vacuum Check Valve VT-1H with level compensator, NPT threads, Lock pin 19, Right hand connection	0121043
Vacuum Check Valve VT-1H with level compensator, NPT threads, Lock pin 19, Left hand connection	0121042
Vacuum Check Valve VT-1H with level compensator, NPT threads, Lock pin 16, Right hand connection	0121029
Vacuum Check Valve VT-1H with level compensator, NPT threads, Lock pin 16, Left hand connection	0121030
Vacuum Check Valve VT-1H with level compensator, NPT threads, Ball joint, Right hand connection	0121061
Vacuum Check Valve VT-1H with level compensator, NPT threads, Ball joint, Left hand connection	0121060
Vacuum Check Valve VT-1H with level compensator, G threads, Lock pin 19, Right hand connection	0121014
Vacuum Check Valve VT-1H with level compensator, G threads, Lock pin 19, Left hand connection	0120992
Vacuum Check Valve VT-1H with level compensator, G threads, Lock pin 16, Right hand connection	0121009

Specifications subject to change without notice.

Description	Item No.
Vacuum Check Valve VT-1H with level compensator, G threads, Lock pin 16, Left hand connection	0109231
Vacuum Check Valve VT-1H with level compensator, G threads, Ball joint, Right hand connection	0121020
Vacuum Check Valve VT-1H with level compensator, G threads, Ball joint, Left hand connection	0120993
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 19, Right hand connection	0121039
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 19, Left hand connection	0121038
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 16, Right hand connection	0121025
Vacuum Check Valve VT-1H COAX®, NPT threads, Lock pin 16, Left hand connection	0121026
Vacuum Check Valve VT-1H COAX®, NPT threads, Ball joint, Right hand connection	0121057
Vacuum Check Valve VT-1H COAX®, NPT threads, Ball joint, Left hand connection	0121056
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 19, Right hand connection	0119573
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 19, Left hand connection	0111147
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 16, Right hand connection	0121007
Vacuum Check Valve VT-1H COAX®, G threads, Lock pin 16, Left hand connection	0109276
Vacuum Check Valve VT-1H COAX®, G threads, Ball joint, Right hand connection	0121018
Vacuum Check Valve VT-1H COAX®, G threads, Ball joint, Left hand connection	0110435
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Right hand connection	0121045
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 19, Left hand connection	0121044
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Right hand connection	0121031
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Lock pin 16, Left hand connection	0121032
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Right hand connection	0121063
Vacuum Check Valve VT-1H COAX® with level compensator, NPT threads, Ball joint, Left hand connection	0121062

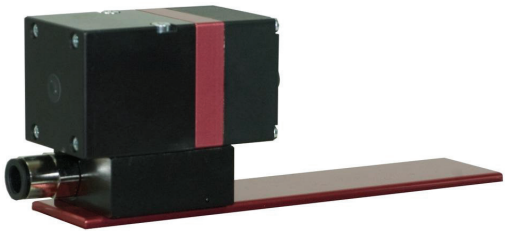
Description	Item No.
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Right hand connection	0121015
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 19, Left hand connection	0120991
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Right hand connection	0121010
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Lock pin 16, Left hand connection	0109278
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Ball joint, Right hand connection	0121021
Vacuum Check Valve VT-1H COAX® with level compensator, G threads, Ball joint, Left hand connection	0120990
Vacuum Check Valve VT-1H Vacustat with COAX®, NPT threads, Ball joint, Right hand connection	0127837
Vacuum Check Valve VT-1H Vacustat with COAX®, NPT threads, Ball joint, Left hand connection	0127836
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 19, Right hand connection	0121013
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 19, Left hand connection	0120995
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 16, Right hand connection	0121008
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Lock pin 16, Left hand connection	0120994
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Ball joint, Right hand connection	0121019
Vacuum Check Valve VT-1H Vacustat with COAX®, G threads, Ball joint, Left hand connection	0119676
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 19, Right hand connection	0121016
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 19, Left hand connection	0120998
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 16, Right hand connection	0121011
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Lock pin 16, Left hand connection	0120996
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Ball joint, Right hand connection	0121022
Vacuum Check Valve VT-1H Vacustat with COAX® with level compensator, G threads, Ball joint, Left hand connection	0120997

Regulators



piSAVE® optimize

- Vacuum controlled proportional pressure regulator, a fully pneumatic device suitable for air-driven ejectors/pumps.
- The feed pressure to the vacuum pump/ejector is automatically regulated and controlled to maintain the set vacuum level. Air/energy usage is kept to a minimum for the application (optimized).
- Recommended for leaking and sealed applications to save energy and secure the right vacuum level.
- Extra port for Vacuum gauge.
- Air ventilation port with filter.
- Swivel compressed air connections.
- piSAVE® optimize gives maximum feed pressure/flow to vacuum pump/ejector until vacuum level starts to build up.
- Separate mounting bracket kit.
- Upgrade kit - available as an integrated module for piCLASSIC and Classic vacuum pumps.



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	Vacuum flow
piSAVE® optimize	1.67–15 Nl/s
PCC (Piab Cruise Control)	0–18.3 Nl/s

ORDERING INFORMATION

Description	Item No.
piSAVE® optimize stand-alone 25-70 -kPa G3/8"	0128999
piSAVE® optimize standalone 25-70 -kPa 3/8" NPT	0129000
piSAVE® optimize upgrade kit piCLASSIC/Classic	0129002
PCC (Piab Cruise Control)	PCC (Piab Cruise Control)

Specifications subject to change without notice.



Pilot regulator

- Pilot-operated pressure regulator with secondary pressure relief and flow compensation.
- Suitable for remote control.



Regulator

- Regulator for optimising feed pressure to vacuum pumps or smaller vacuum systems.
- Manometer for feed pressure control.

TECHNICAL DATA

Description	Flow
Pressure regulator, pilot operated, G1/4”	9 Nl/s (@ P1=0.7 & P2=0.6 MPa)
Regulator 1/4”, manometer	9 Nl/s (@ P1=0.8 & P2=0.7 MPa)

ORDERING INFORMATION

Description	Item No.
Pressure regulator, pilot operated, G1/4"	0114283
Regulator 1/4", manometer	0113123

Specifications subject to change without notice.

Silencers







Silencer MINI/MIDI

- Reduces noise from exhaust on MINI/MIDI piINLINE®.

Silencers

- Reduce noise from exhaust.
- Flow-through design.

Silencer COAX®

- Reduces noise from the exhaust.
- Compatible with aluminium holders for MINI and MIDI COAX® 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	Noise level, reduction
Silencer piINLINE® MINI	10 dBA
Silencer piINLINE® MIDI	15 dBA
Silencer	10 dBA
Silencer COAX®	> 10 dBA

ORDERING INFORMATION

Description	Item No.
Silencer piINLINE® MINI	0125466
Silencer piINLINE® MIDI	0123031
Silencer 1" NPSF	0113003
Silencer G1"	0112499
Silencer G1½"	0103224
Silencer G2½"	0117782
Silencer G3/4" with thread insert 1" - 3/4"	0126362
Silencer G3/8"	3216009
Silencer G3/4"	3216002
Silencer COAX® MINI	0111977
Silencer COAX® MIDI	0111976

Specifications subject to change without notice.

Vacuum Filters







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.

Vacuum filters S

- To filter dust and other small particles from the vacuum flow.
- Reduces the risk of operation breakdown or stoppage in the pump.

In-line filters

- Translucent, inert polypropylene housing allows for visual inspection.
- These miniature filters can be used on compressed air lines or vacuum lines to protect vacuum pumps, vacuum switches and valves from contamination.
- Filter is constructed of chemically inert porous polyethylene and has a recommended working pressure up to 0.45 MPa.

TECHNICAL DATA

Description	Pressure	Removal efficiency	Flow, nominal
Vacuum filter G1/2” (5 µm) & G3/4” (5 µm)	-0.1–0 MPa	5 µm	5.8 Nl/s
Vacuum filter G1½” (5 µm)	-0.1–0 MPa	5 µm	9 Nl/s
Vacuum filter G1/8”, 1/8” NPT & 1/4” NPT	-0.1–0 MPa	10 µm	1.4 Nl/s
Vacuum filter G3/8” & 3/8” NPT	-0.1–0 MPa	10 µm	2.5 Nl/s
Vacuum filter G1/2”, G3/4”, 1/2” NPT & 3/4” NPT	-0.1–0 MPa	10 µm	15 Nl/s
Vacuum filter G1”, G1½”, 1” NPT & 1 1/2” NPT	-0.1–0 MPa	10 µm	42 Nl/s
Vacuum filter 2 1/2”, steel	-0.1–0 MPa	5 µm	100 Nl/s
Vacuum filter 1 1/2”, steel	-0.1–0 MPa	5 µm	37.7 Nl/s
Vacuum filter 1”, steel	-0.1–0 MPa	5 µm	16.5 Nl/s
Vacuum filter 2”, steel	-0.1–0 MPa	5 µm	82.6 Nl/s
In-line filter	0.45 MPa (max)	25 µm	0.5 Nl/s

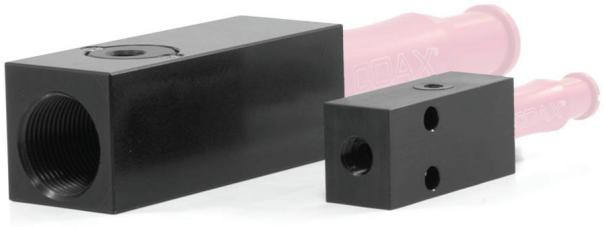
Specifications subject to change without notice.

ORDERING INFORMATION

Description	Item No.
Vacuum filter G1" (10 µm)	3116672
Vacuum filter G1/2" (10 µm)	3116651
Vacuum filter G1/2" (5 µm)	0110521
Vacuum filter G1/8" (10 µm)	3116670
Vacuum filter G1½" (10 µm)	3116653
Vacuum filter G1½" (5 µm)	0110523
Vacuum filter G3/4" (10 µm)	3116652
Vacuum filter G3/4" (5 µm)	0110522
Vacuum filter G3/8" (10 µm)	3116671
Vacuum filter 1 1/2", steel	3116654
Vacuum filter 1", steel	3116709
Vacuum filter 2 1/2", steel	0111311
Vacuum filter G2", steel	3116710
Vacuum filter, 2 1/2" NPT steel	0128460
In-line filter 25 micron, barbed	3116705
In-line filter 25 micron, luer	3116706
In-line filter 10 micron, barbed	X7438
In-line filter 10 micron, luer	X6621

Specifications subject to change without notice.

Other





Body for COAX® cartridge

- Aluminium bodies for COAX® MINI and MIDI cartridges.
- All 2-stage and 3-stage cartridges, equipped with a red aluminium holder, will fit.
- The mini body has a stackable design with extra port for sensing or blow-off.
- The midi body has a special vacuum-exhaust inline design, which minimizes the influence of dust on the cartridge.
- Cartridge has to be ordered separately.

Vacuum gauge and manometers

- Analogue indicator, springjoint – lever system.
- The instruments include nut for installation on a panel.

TECHNICAL DATA

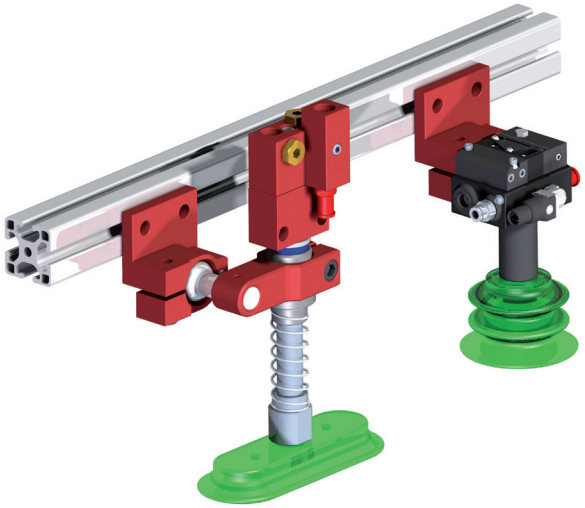
Description	Signal range
Vacuum gauge 100 -kPa, with nut / -30 inHg	0–100 -kPa
Manometer 250 kPa	0–250 -kPa
Manometer 1 MPa	0–1000 -kPa

ORDERING INFORMATION

Description	Item No.
Body for COAX® MIDI cartridge Inline	0119309
Body for COAX® MINI cartridge 2x1/8" V	0129473
Manometer 150 psi/1 MPa	3101603
Manometer 36.25 psi/250 kPa	3101626
Vacuum gauge 100 -kPa, with nut / -30 inHg	3101602

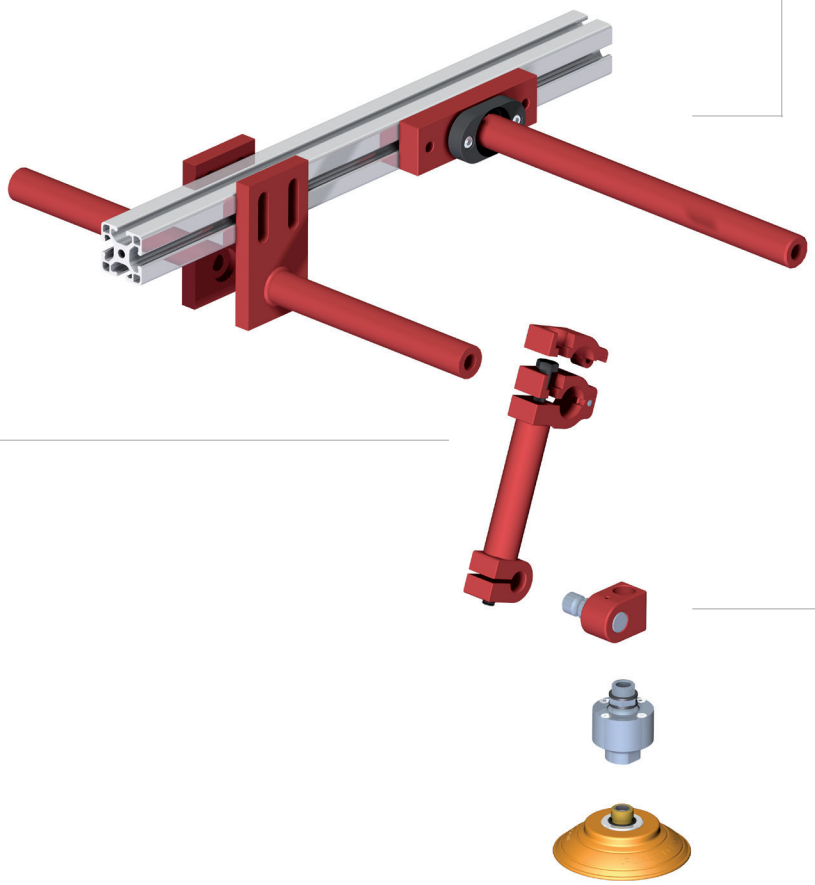
Specifications subject to change without notice.

PMAT – Piab Modular Automation Tooling



PMAT	**333**
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PMAT – Piab Modular Automation Tooling



CONNECTIONS TO MAIN FRAME/ STRUCTURE OF THE END-EFFECTOR
Durable mounting bars, clamp blocks with tubes and special parts that will all fit to any type of welded frames or extrusions.

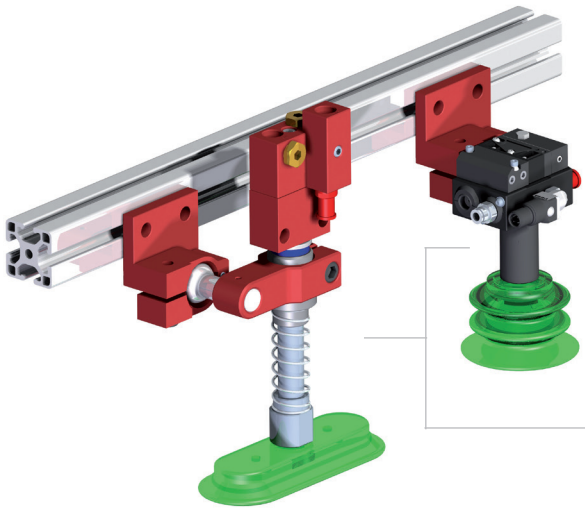
They form the structure of the PMAT end-effector and interfaces nicely with the swivel arms and in some cases directly with a function attachment.

CENTRALISED VACUUM CONNECTION
Connect your PMAT system to a centralised vacuum pump.

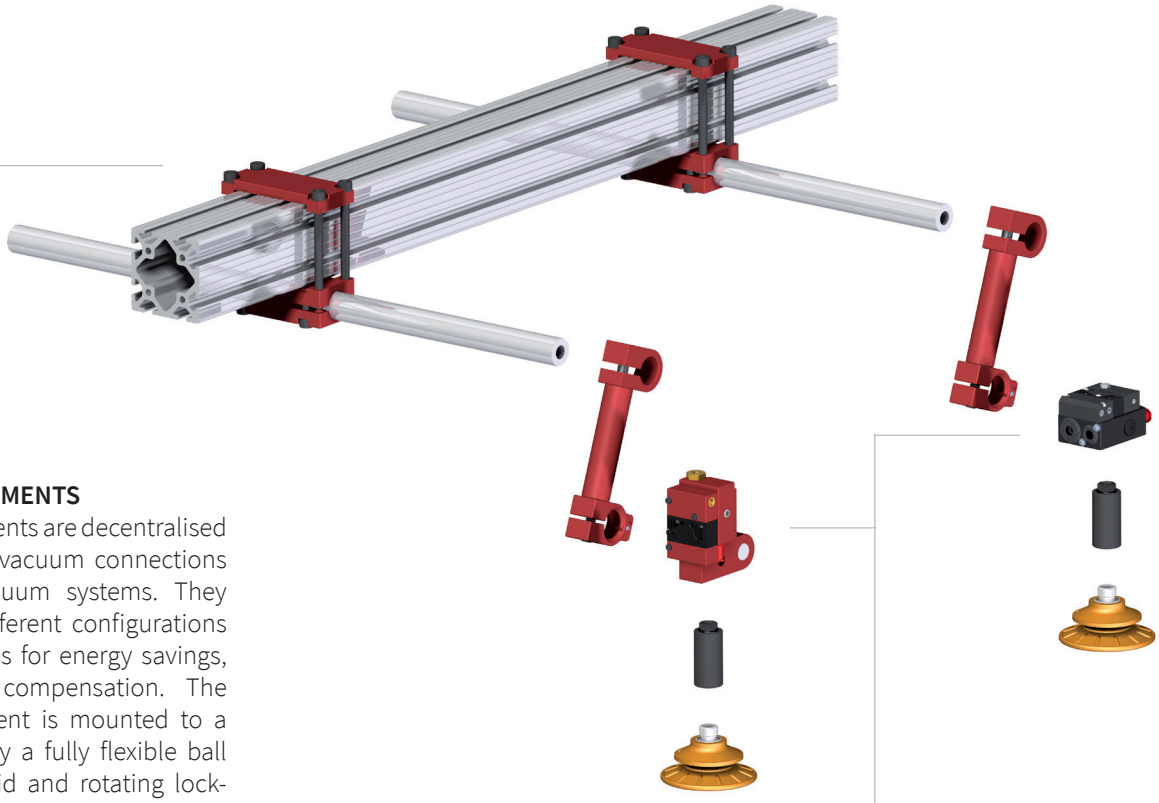
BALL JOINT

SWIVEL ARMS
The swivel arm is the part which allows for unlimited positioning of the suction cup. A single-bolt on the swivel arm will tighten the entire assembly of arm, function attachment and cup in the right position. Swivel arms are available in different lengths for increased flexibility and they can be mounted to a rod/bar by a slide-on function or be clamped to the rod/bar.

PIAB SUCTION CUPS
Piab suction cups are available in a variety of sizes and materials to efficiently handle your application. To prevent damage to the surface of metal sheets common in automotive and large appliance applications, Piab's DURAFLEX® cups feature a dual-hardness design and soft cup body. Lower vacuum force is needed to seal the cups to part surfaces for gentler handling. The soft lip of Piab's DURAFLEX® cups also molds easily to curved surfaces for less vacuum leakage and stronger grip.



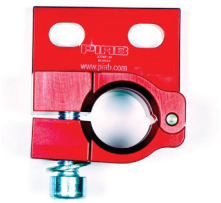
ACCESSORIES FOR SUCTION CUPS
The PMAT offers a wide range of suction cup accessories to optimize and facilitate the installation. For instance, the accessories can help to avoid bending stress on the suction cup when lifting heavy objects, extend the cup to reach areas in cramped spaces or simply height adjust the cup to the right level.



FUNCTION ATTACHMENTS
Functional attachments are decentralised vacuum pumps or vacuum connections for centralised vacuum systems. They come in several different configurations with special features for energy savings, safety and level compensation. The functional attachment is mounted to a PMAT swivel arm by a fully flexible ball joint or a more rigid and rotating lock-pin. The suction cup or the suction cup accessory have a matching interface for the function attachment.

Connections to main frame of the end-effector





Mounting bar – welded

- Rigid mounting with low deflection.
- Slotted mounting for adjustability.
- 100–600 mm (4”-24”) lengths.

Profile mount ball clamp

- Fits on standard size extrusion.
- Used with any Ball joint style function attachment.

TECHNICAL DATA

Description	Torsional twist	Load, vertical, max.	Load, torque, max.
Mounting bar welded L=100	1 °	–	–
Mounting bar welded L=150	1.2 °	–	–
Mounting bar welded L=200	1.6 °	–	–
Mounting bar welded L=300	2.5 °	–	–
Mounting bar welded L=600	4.6 °	–	–
Profile mount ball clamp, left hand	–	800 N	40 Nm
Profile mount ball clamp, right hand	–	800 N	40 Nm

ORDERING INFORMATION

Description	Item No.
Mounting bar welded L=100 mm	0119784
Mounting bar welded L=150 mm	0119785
Mounting bar welded L=200 mm	0119786
Mounting bar welded L=300 mm	0119787
Mounting bar welded L=600 mm	0119788
Profile mount ball clamp, left hand	0110641
Profile mount ball clamp, right hand	0110648

Specifications subject to change without notice.

Swivel arms



Swivel arm – clamp on

- Standard mounting to 25 mm and 1” bars, easily removable connection.
- Easy single screw adjustment.
- Available in lock pin 16, 19 or ball joint mountings, industry standard.



Swivel arm – slide on

- Standard mounting to 25 mm or 1” bars.
- Easy single screw adjustment.
- Available in lock pin 16, 19 or ball joint mountings, industry standard.

TECHNICAL DATA

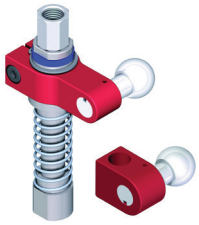
Description	Load, vertical, max.	Load, torque, max.
Swivel arm – clamp on	400 N	40 Nm
Swivel arm – slide on	400 N	40 Nm

ORDERING INFORMATION

For a complete list of available PMAT products visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

Specifications subject to change without notice.

Function attachments



Centralized vacuum connection

- Connects centralized vacuum to suction cup.
- Available in lock pin 16, 19 or ball joint mountings, industry standard.
- Available with level compensator to compensate for differences in level of object.



Vacuum Check Valve VT-1H

- Check valve that traps vacuum in sealed applications for safe operation.
- 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.

ORDERING INFORMATION

Description	Item No.
Centralized vacuum connection with level compensator, G threads, Ball joint, Left hand connection	0121002
Centralized vacuum connection with level compensator, NPT threads, Ball joint, Left hand connection	0121070
Centralized vacuum connection with level compensator, G threads, Ball joint, Right hand connection	0121210
Centralized vacuum connection with level compensator, NPT threads, Ball joint, Right hand connection	0121211
Centralized vacuum connection with level compensator, G threads, Lock pin 16, Left hand connection	0109230
Centralized vacuum connection with level compensator, NPT threads, Lock pin 16, Left hand connection	0121067
Centralized vacuum connection with level compensato, G threads, Lock pin 16, Right hand connection	0121212
Centralized vacuum connection with level compensator, NPT threads, Lock pin 16, Right hand connection	0121213
Centralized vacuum connection with level compensator, G threads, Lock pin 19, Left hand connection	0121001
Centralized vacuum connection with level compensator, NPT threads, Lock pin 19, Left hand connection	0121069
Centralized vacuum connection with level compensator, G threads, Lock pin 19, Right hand connection	0121208
Centralized vacuum connection with level compensator, NPT threads, Lock pin 19, Right hand connection	0121209

Specifications subject to change without notice.

Description	Item No.
Centralized vacuum connection, G threads, Ball joint, Left or Right hand connection	0110433
Centralized vacuum connection, NPT threads, Ball joint, Left or Right hand connection	0120716
Centralized vacuum connection, G threads, Lock pin 16, Left or Right hand connection	0119498
Centralized vacuum connection, NPT threads, Lock pin 16, Left or Right hand connection	0121066
Centralized vacuum connection, G threads, Lock pin 19, Left or Right hand connection	0110434
Centralized vacuum connection, NPT threads, Lock pin 19, Left or Right hand connection	0121068



Vacuum Check Valve VT-1H with COAX®

- Two-stage COAX® cartridge MINI Pi12-2 integrated.
- Check valve that traps vacuum in sealed applications for safe operation.
- 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.



Vacuum Check Valve VT-1H Vacustat with COAX®

- Two-stage COAX® cartridge MINI Pi12-2 integrated.
- Check valve that traps vacuum in sealed applications for safe operation.
- Built-in blow off check valve for fast release of object.
- Integrated energy-saving device, Vacustat results in virtually no air consumption in sealed applications.
- 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	Vacuum flow, max.
Vacuum Check Valve VT-1H	0.68 Nl/s
Vacuum Check Valve VT-1H with COAX®	0.68 Nl/s
Vacuum Check Valve VT-1H Vacustat with COAX®	0.68 Nl/s

ORDERING INFORMATION

For a complete list of available PMAT products visit **piab.com**. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

Accessories



Cross connector

- Connects 25 mm bars at any angle.
- Can be used with a Suction cup extension.



Level compensator – profile mount

- Compensates for differences in height.
- Provides certain degree of shock absorption.
- Fits on standard size extrusion.



Proximity mounting bracket

- For mounting of sensors or visions systems.
- Multiple interfaces.

TECHNICAL DATA

Description	Load, vertical, max.	Load, torque, max.	Load, horizontal, max.
Cross connector 25-25/65	400 N	120 Nm	–
Level compensator – profile mount	698 N	–	698 N

ORDERING INFORMATION

Description	Item No.
Cross connector 25-25/65	0121170
LCS 200 profile mounted level compensator G3/8” female x G3/8” female	0121220
LCS 200 profile mounted level compensator 3/8” NPT female x 3/8” NPT male	0121219
Proximity mounting bracket	0121176

Specifications subject to change without notice.

PMAT Configurable Products

Facilitate the selection of our great assortment of function attachments and swivel arm options by using the combined swivel arm and function attachment code configurator. Note that all function attachments are not presented in the code.

Select rod extension	PMAT code
Rod extension 50	AA
Rod extension 100	AB
Rod extension 150	AC

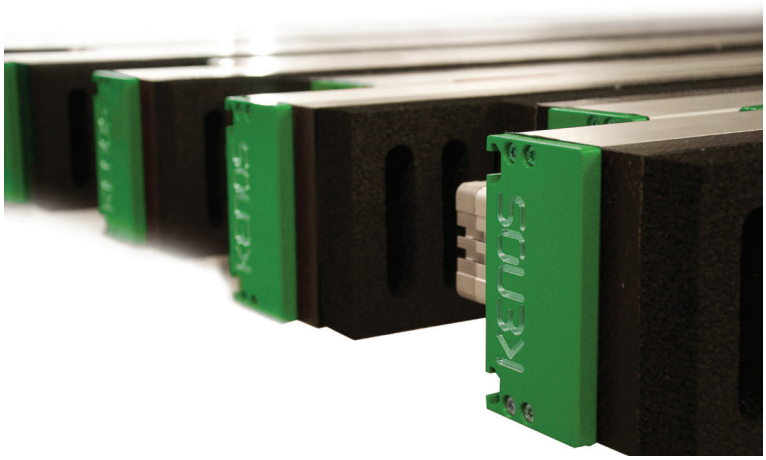
Bar mounting style	PMAT code
Bar clamp, clamp-on 25	00
Bar clamp, slide-on 25	01
Bar clamp, slide-on 1", pin 16	02
Bar clamp, slide-on 1", pin 19	14
Bar clamp, slide-on 1", ball joint	04

Swivel style	PMAT code
Swivel style pin 16	P
Swivel style pin 19	C
Swivel style ball joint	I

Function attachment	PMAT code			
No attachment	00			
	Left hand		Right hand	
		LCS *		LCS *
Centralised vacuum connection, G	XX1	XX2	XX1RH	XX2RH
Centralised vacuum connection, NPT	X1	X2	X1RH	X2RH
Vacuum Check Valve VT-1H, G	XAB	XAM	XABRH	XAMRH
Vacuum Check Valve VT-1H, NPT	AB	AM	ABRH	AMRH
Vacuum Check Valve VT-1H COAX® cartridge MINI Pi12-2, G	XAA	XAL	XAARH	XALRH
Vacuum Check Valve VT-1H COAX® cartridge MINI Pi12-2, NPT	AA	AL	AARH	ALRH
Vacuum Check Valve VT-1H Vacustat COAX® cartridge MINI Pi12-2, G	XEA	XBTF	XEARH	XBTFRH
Vacuum Check Valve VT-1H Vacustat COAX® cartridge MINI Pi12-2, NPT	EA	BTF	EARH	BTFRH

* With level compensator, LCS.

Kenos®



KENOS®	**345**
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KVG 60 family



KVG series represents a flexible solution for the handling manipulation of several products with different shapes, dimensions and compactness due to the double technology available. Check valves or flow reducers can fullfill the needs of many industrial sector applications. The KVG gripping system can be equipped with integrated vacuum generation or suitable for separated vacuum generation(Pump or Side channel blower). The integrated vacuum generator is a modular multi-stage COAX® ejector of easy maintenance. The multi-stage COAX® ejector used offers the possibility to be simply increased even after the installation if necessary. The mat of the KVG gripping system is made of a technical foam (FDA mat approved available), with different pitch holes and thickness or pads.

LIFTING FORCES

Theoretic gripping force on rigid and stable surface with completely covered module, without safety factor (N).

Type	Foam step	Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
KVG200	1–2 (fine or medium)	94	126	157	188	220
KVG300	1–2 (fine or medium)	141	188	236	283	330
KVG400	1–2 (fine or medium)	188	251	314	377	440
KVG500	1–2 (fine or medium)	236	314	393	471	550
KVG600	1–2 (fine or medium)	283	377	471	565	660
KVG700	1–2 (fine or medium)	330	440	550	660	770
KVG800	1–2 (fine or medium)	377	503	628	754	880
KVG900	1–2 (fine or medium)	424	565	707	848	990
KVG1000	1–2 (fine or medium)	471	628	785	942	1100
KVG1100	1–2 (fine or medium)	518	691	864	1037	1210
KVG1200	1–2 (fine or medium)	565	754	942	1131	1319
KVG1300	1–2 (fine or medium)	613	817	1021	1225	1429
KVG1400	1–2 (fine or medium)	660	880	1100	1319	1539
KVG1600	1–2 (fine or medium)	754	1005	1257	1508	1759
KVG1800	1–2 (fine or medium)	848	1131	1414	1696	1979

Type	Foam step	Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
KVG2000	1–2 (fine or medium)	942	1257	1571	1885	2199
KVG200	3 (medium oval)	132	177	221	265	309
KVG300	3 (medium oval)	199	265	331	397	463
KVG400	3 (medium oval)	265	353	441	530	618
KVG500	3 (medium oval)	331	441	552	662	772
KVG600	3 (medium oval)	397	530	662	794	927
KVG700	3 (medium oval)	463	618	772	927	1081
KVG800	3 (medium oval)	530	706	883	1059	1236
KVG900	3 (medium oval)	596	794	993	1192	1390
KVG1000	3 (medium oval)	662	883	1103	1324	1545
KVG1100	3 (medium oval)	728	971	1214	1457	1699
KVG1200	3 (medium oval)	794	1059	1324	1589	1854
KVG1300	3 (medium oval)	861	1148	1434	1721	2008
KVG1400	3 (medium oval)	927	1236	1545	1854	2163
KVG1600	3 (medium oval)	1059	1412	1765	2119	2472
KVG1800	3 (medium oval)	1192	1589	1986	2383	2781
KVG2000	3 (medium oval)	1324	1765	2207	2648	3090
KVG200	6 (extra fine)	75	101	126	151	176
KVG300	6 (extra fine)	113	151	189	226	264
KVG400	6 (extra fine)	151	201	251	302	352
KVG500	6 (extra fine)	189	251	314	377	440
KVG600	6 (extra fine)	226	302	377	452	528
KVG700	6 (extra fine)	264	352	440	528	616
KVG800	6 (extra fine)	302	402	503	603	704
KVG900	6 (extra fine)	339	452	566	679	792

Specifications subject to change without notice.

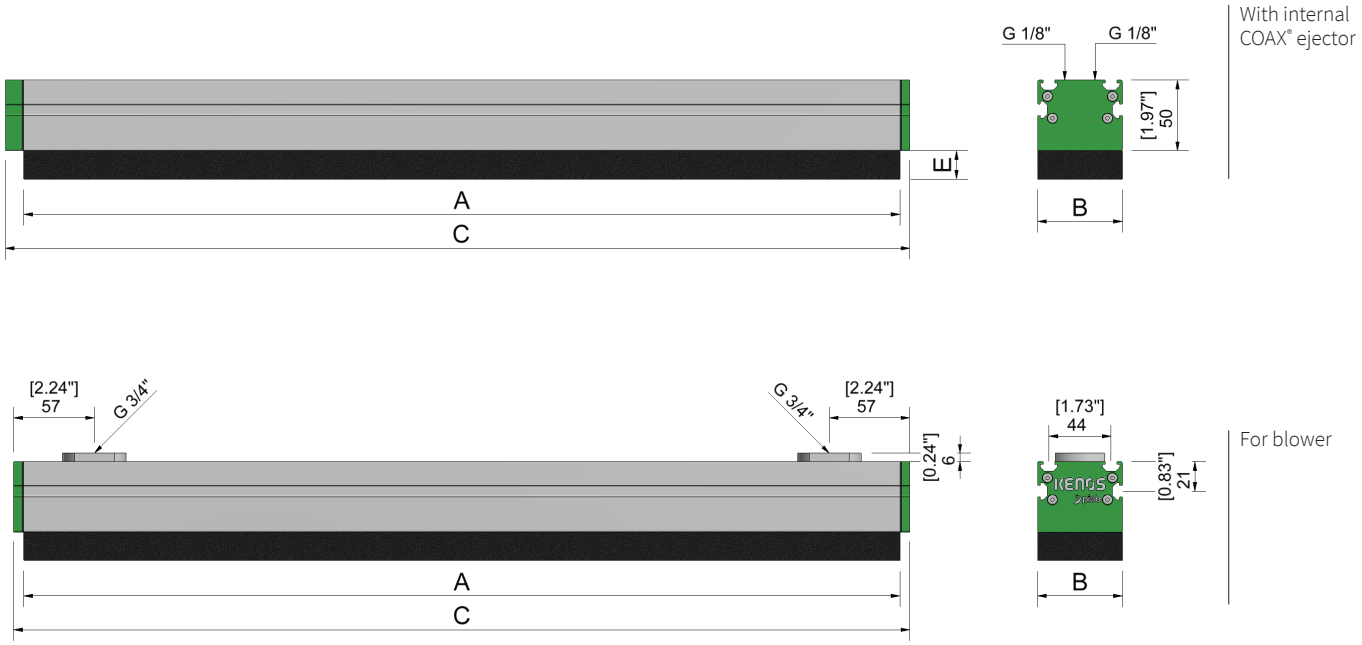
Type	Foam step	Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
KVG1000	6 (extra fine)	377	503	628	754	880
KVG1100	6 (extra fine)	415	553	691	829	968
KVG1200	6 (extra fine)	452	603	754	905	1056
KVG1300	6 (extra fine)	490	654	817	980	1144
KVG1400	6 (extra fine)	528	704	880	1056	1232
KVG1600	6 (extra fine)	603	804	1005	1206	1408
KVG1800	6 (extra fine)	679	905	1131	1357	1584
KVG2000	6 (extra fine)	754	1005	1257	1508	1759

VACUUM FLOW

Air consumption/vacuum flow data related to number of COAX® ejectors.

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 ×1	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Si32-3 ×2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75
MIDI Si32-3 ×4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75

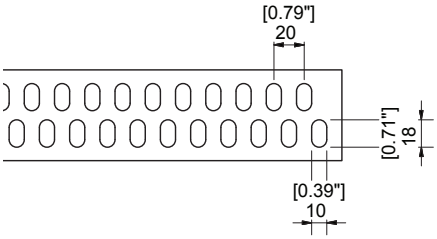
DIMENSIONS FOR KVG 60 WITH FOAM



Length (mm)	A (mm)	C COAX® ejector (mm)	C Blower (mm)	E (mm)	Weight (kg) COAX® ejector CV	COAX® ejector FR	blower CV	blower FR
KVG200	220	240	234	10/20	1.1	0.9	0.9	0.7
KVG300	320	340	334	10/20	1.4	1.2	1.1	1.0
KVG400	420	440	434	10/20	1.7	1.4	1.6	1.2
KVG500	520	540	534	10/20	2.1	1.7	1.9	1.5
KVG600	620	640	634	10/20	2.4	1.9	2.2	1.7
KVG700	720	740	734	10/20	2.7	2.2	2.6	2.0
KVG800	820	840	834	10/20	3.1	2.4	2.9	2.2
KVG900	920	940	934	10/20	3.4	2.7	3.2	2.5
KVG1000	1020	1040	1034	10/20	3,8	3.0	3.6	2.8
KVG1100	1120	1140	1134	10/20	4.1	3.2	3.9	3.0
KVG1200	1220	1240	1234	10/20	4.4	3.5	4.2	3.3
KVG1300	1320	1340	1334	10/20	4.8	3.7	4.6	3.5
KVG1400	1420	1440	1434	10/20	5.1	4.0	4.9	3.8
KVG1600	1620	1640	1634	10/20	5.8	4.5	5.6	4.3
KVG1800	1820	1840	1834	10/20	6.4	5.0	6.2	4.8
KVG2000	2020	2040	2034	10/20	7.1	5.5	6.9	5.3

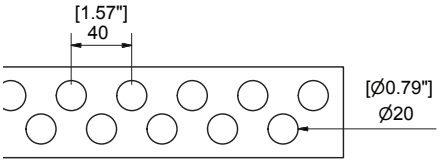
ATTENTION: for foam step 6 (extra fine), dimensions A, B and C are 10 mm shorter.

KVG 60 FOAM DESCRIPTIONS



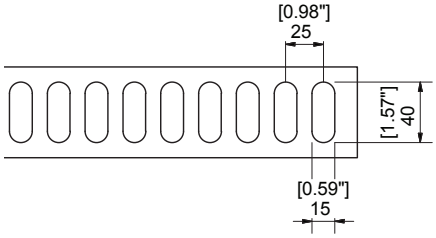
Fine (step 1)

Suitable for narrow parts like strips of wood, metal, plastic.



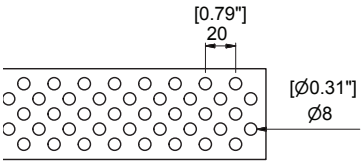
Medium (step 2)

Suitable for general purpose, typical application for panels.



Medium oval (step 3)

Suitable for general purpose, typical application for heavier panels.



Extra fine (step 6)

Suitable for small pieces larger than 25 mm like very narrow strips of wood.

KVG 60 – CUSTOMER CODE

KVG . 400 . 60 . N211 . CVL . S1

Code	Model
KVG	KVG

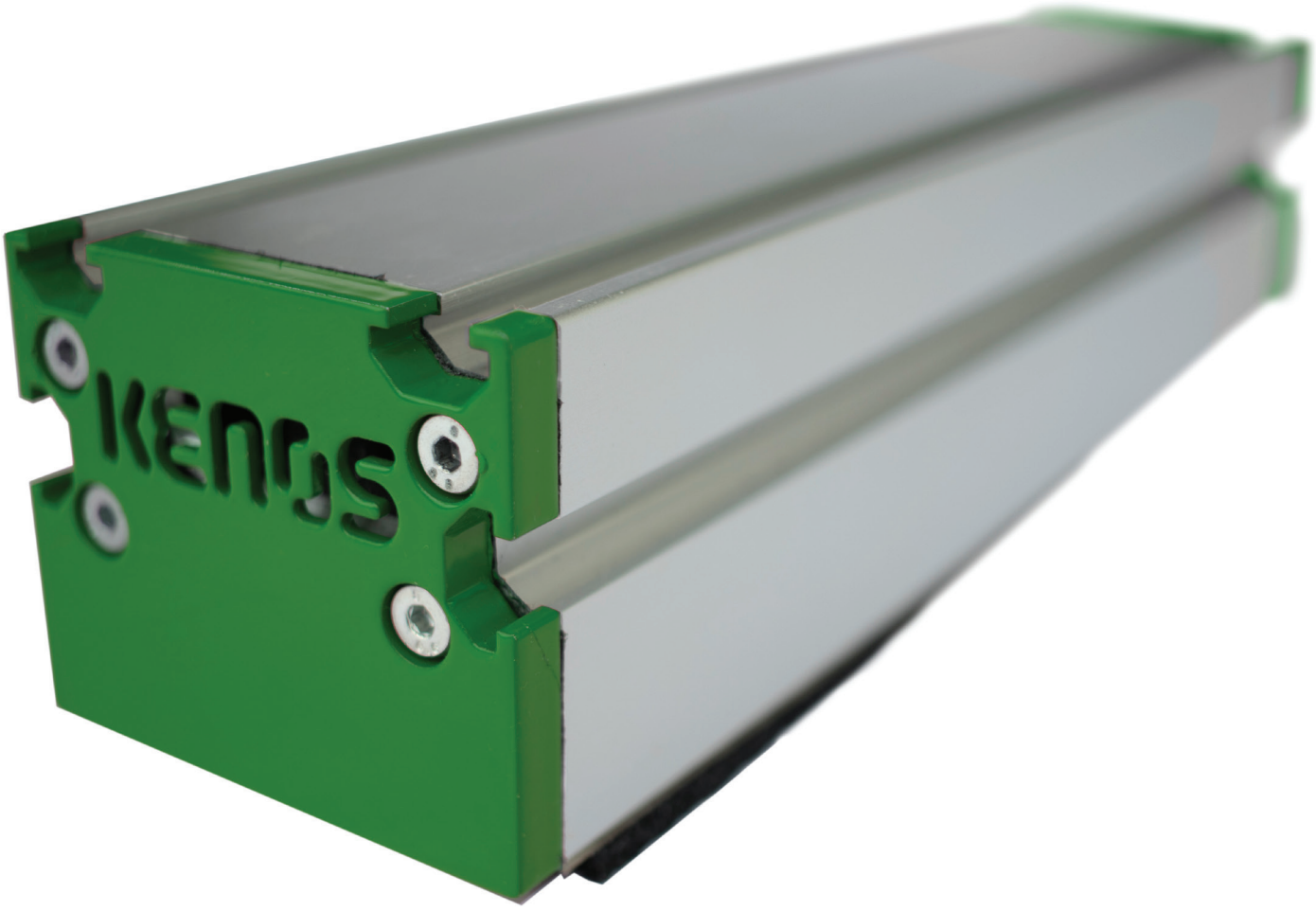
Code	Length
200	200 mm
300	300 mm
400	400 mm
500	500 mm
600	600 mm
700	700 mm
800	800 mm
900	900 mm
1000	1000 mm
1100	1100 mm
1200	1200 mm
1300	1300 mm
1400	1400 mm
1600	1600 mm
1800	1800 mm
2000	2000 mm

Code	Width
60	60 mm

Code	Type
N	Foam
Code	**Thickness**
2	Foam 20 mm
1	Foam 10 mm
Code	**Filter**
0	Without filter
1	With filter
Code	**Step**
1	Fine step
2	Medium step
3	Medium oval step
6	Extra fine step

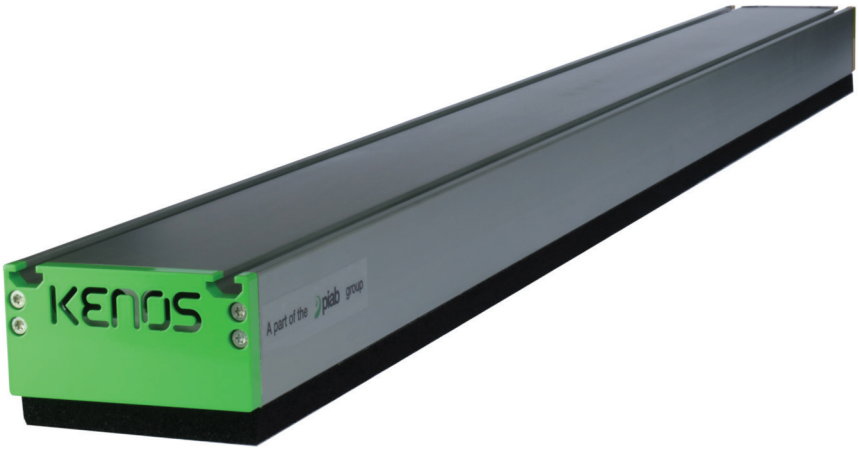
Code	Technology
CVL	Check Valves Low flow
CVM	Check Valves Medium flow
CVH	Check Valves High flow
CV19	piSAVE® Sense 02/60
FR5	Flow Reduction 0,5 mm
FR6	Flow Reduction 0,6 mm
FR8	Flow Reduction 0,8 mm

Code	Vacuum generator
S1	×1 cartridge Si32-3
S2	×2 cartridge Si32-3
S4	×4 cartridge Si32-3
BL	Blower connection



Specifications subject to change without notice.

KVG 120 family



KVG series represents a flexible solution for the handling manipulation of several products with different shapes, dimensions and compactness due to the double technology available. Check valves or flow reducers can fullfill the needs of many industrial sector applications. The KVG gripping system can be equipped with integrated vacuum generation or suitable for separated vacuum generation(Pump or Side channel blower). The integrated vacuum generator is a modular multi-stage COAX® ejector of easy maintenance. The multi-stage COAX® ejector used offers the possibility to be simply increased even after the installation if necessary. The mat of the KVG gripping system is made of a technical foam (FDA mat approved available), with different pitch holes and thickness or pads.

LIFTING FORCES

Theoretic gripping force on rigid and stable surface with completely covered module, without safety factor (N).

Type	Foam step	Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
KVG200	1–2 (fine or medium)	170	226	283	339	396
KVG300	1–2 (fine or medium)	264	352	440	528	615
KVG400	1–2 (fine or medium)	358	477	597	716	835
KVG500	1–2 (fine or medium)	452	603	754	904	1055
KVG600	1–2 (fine or medium)	546	728	911	1093	1275
KVG700	1–2 (fine or medium)	641	854	1068	1281	1495
KVG800	1–2 (fine or medium)	735	980	1225	1470	1714
KVG900	1–2 (fine or medium)	829	1105	1382	1658	1934
KVG1000	1–2 (fine or medium)	923	1231	1539	1846	2154
KVG1100	1–2 (fine or medium)	1017	1356	1696	2035	2374
KVG1200	1–2 (fine or medium)	1112	1482	1853	2223	2594
KVG1300	1–2 (fine or medium)	1206	1608	2010	2412	2813
KVG1400	1–2 (fine or medium)	1300	1733	2167	2600	3033
KVG1600	1–2 (fine or medium)	1488	1984	2481	2977	3473
KVG1800	1–2 (fine or medium)	1677	2236	2795	3354	3912

Type	Foam step	Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
KVG2000	1–2 (fine or medium)	1865	2487	3109	3730	4352
KVG200	6 (extra fine)	166	221	276	332	387
KVG300	6 (extra fine)	249	332	414	497	580
KVG400	6 (extra fine)	332	442	553	663	774
KVG500	6 (extra fine)	414	553	691	829	967
KVG600	6 (extra fine)	497	663	829	995	1161
KVG700	6 (extra fine)	580	774	967	1161	1354
KVG800	6 (extra fine)	663	884	1105	1326	1547
KVG900	6 (extra fine)	746	995	1243	1492	1741
KVG1000	6 (extra fine)	829	1105	1382	1658	1934
KVG1100	6 (extra fine)	912	1216	1520	1824	2128
KVG1200	6 (extra fine)	995	1326	1658	1990	2321
KVG1300	6 (extra fine)	1078	1437	1796	2155	2515
KVG1400	6 (extra fine)	1161	1547	1934	2321	2708
KVG1600	6 (extra fine)	1326	1768	2211	2653	3095
KVG1800	6 (extra fine)	1492	1990	2487	2984	3482
KVG2000	6 (extra fine)	1658	2211	2763	3316	3868

Theoretic gripping force on rigid and stable surface with completely covered module, without safety factor (N). Gripping forces at 30%, 40%, 50% and 70% were obtained from theoretical calculations based on the declared values (gripping force at 20%, 60% and 90%), with the exception of values for VL60BX.

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG200 with B35XP PU60	304	438	560	670	768	859
KVG300 with B35XP PU60	456	657	840	1005	1152	1288
KVG400 with B35XP PU60	608	876	1120	1340	1536	1717
KVG500 with B35XP PU60	760	1095	1400	1675	1920	2147
KVG600 with B35XP PU60	912	1314	1680	2010	2304	2576
KVG700 with B35XP PU60	1064	1533	1960	2345	2688	3006

Specifications subject to change without notice.

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG800 with B35XP PU60	1216	1752	2240	2680	3072	3435
KVG900 with B35XP PU60	1368	1971	2520	3015	3456	3864
KVG1000 with B35XP PU60	1520	2190	2800	3350	3840	4294
KVG1100 with B35XP PU60	1672	2409	3080	3685	4224	4723
KVG1200 with B35XP PU60	1824	2628	3360	4020	4608	5152
KVG1300 with B35XP PU60	1976	2848	3640	4356	4992	5582
KVG1400 with B35XP PU60	2128	3067	3920	4691	5376	6011
KVG1600 with B35XP PU60	2432	3505	4480	5361	6144	6870
KVG1800 with B35XP PU60	2736	3943	5040	6031	6912	7728
KVG2000 with B35XP PU60	3040	4381	5600	6701	7680	8587
KVG200 with B35XP PU30/60	272	384	480	560	624	675
KVG300 with B35XP PU30/60	408	576	720	840	936	1013
KVG400 with B35XP PU30/60	544	768	960	1120	1248	1350
KVG500 with B35XP PU30/60	680	960	1200	1400	1560	1688
KVG600 with B35XP PU30/60	816	1152	1440	1680	1872	2026
KVG700 with B35XP PU30/60	952	1344	1680	1960	2184	2363
KVG800 with B35XP PU30/60	1088	1536	1920	2240	2496	2701
KVG900 with B35XP PU30/60	1224	1728	2160	2520	2808	3038
KVG1000 with B35XP PU30/60	1360	1920	2400	2800	3120	3376
KVG1100 with B35XP PU30/60	1496	2112	2640	3080	3432	3714
KVG1200 with B35XP PU30/60	1632	2304	2880	3360	3744	4051
KVG1300 with B35XP PU30/60	1768	2496	3120	3640	4056	4389
KVG1400 with B35XP PU30/60	1904	2688	3360	3920	4368	4726
KVG1600 with B35XP PU30/60	2176	3072	3840	4480	4992	5402
KVG1800 with B35XP PU30/60	2448	3456	4320	5040	5616	6077
KVG2000 with B35XP PU30/60	2720	3840	4800	5600	6240	6752
KVG200 with BX35P PU60	240	320	373	384	400	420

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG300 with BX35P PU60	360	480	560	576	600	630
KVG400 with BX35P PU60	480	640	747	768	800	840
KVG500 with BX35P PU60	600	800	934	960	1000	1050
KVG600 with BX35P PU60	720	960	1120	1152	1200	1260
KVG700 with BX35P PU60	840	1121	1307	1344	1400	1470
KVG800 with BX35P PU60	960	1281	1494	1536	1600	1680
KVG900 with BX35P PU60	1080	1441	1680	1728	1800	1890
KVG1000 with BX35P PU60	1200	1601	1867	1920	2000	2100
KVG1100 with BX35P PU60	1320	1761	2054	2112	2200	2310
KVG1200 with BX35P PU60	1440	1921	2241	2304	2400	2520
KVG1300 with BX35P PU60	1560	2081	2427	2496	2600	2730
KVG1400 with BX35P PU60	1680	2241	2614	2688	2800	2940
KVG1600 with BX35P PU60	1920	2561	2988	3072	3200	3360
KVG1800 with BX35P PU60	2160	2881	3361	3456	3600	3780
KVG2000 with BX35P PU60	2400	3202	3734	3840	4000	4200
KVG200 with BX35P PU30/60	192	256	299	304	320	361
KVG300 with BX35P PU30/60	288	384	448	456	480	541
KVG400 with BX35P PU30/60	384	512	597	608	640	722
KVG500 with BX35P PU30/60	480	640	747	760	800	902
KVG600 with BX35P PU30/60	576	768	896	912	960	1083
KVG700 with BX35P PU30/60	672	896	1046	1064	1120	1263
KVG800 with BX35P PU30/60	768	1024	1195	1216	1280	1444
KVG900 with BX35P PU30/60	864	1152	1344	1368	1440	1624
KVG1000 with BX35P PU30/60	960	1280	1494	1520	1600	1805
KVG1100 with BX35P PU30/60	1056	1408	1643	1672	1760	1985
KVG1200 with BX35P PU30/60	1152	1536	1792	1824	1920	2166
KVG1300 with BX35P PU30/60	1248	1664	1942	1976	2080	2346

Specifications subject to change without notice.

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG1400 with BX35P PU30/60	1344	1792	2091	2128	2240	2527
KVG1600 with BX35P PU30/60	1536	2048	2390	2432	2560	2888
KVG1800 with BX35P PU30/60	1728	2304	2688	2736	2880	3249
KVG2000 with BX35P PU30/60	1920	2560	2987	3040	3200	3610
KVG200 with B52XP PU60	340	492	631	758	872	975
KVG300 with B52XP PU60	510	737	946	1136	1308	1463
KVG400 with B52XP PU60	680	983	1261	1515	1744	1951
KVG500 with B52XP PU60	850	1229	1577	1894	2180	2438
KVG600 with B52XP PU60	1020	1475	1892	2273	2616	2926
KVG700 with B52XP PU60	1190	1720	2208	2651	3052	3414
KVG800 with B52XP PU60	1360	1966	2523	3030	3488	3901
KVG900 with B52XP PU60	1530	2212	2838	3409	3924	4389
KVG1000 with B52XP PU60	1700	2458	3154	3788	4360	4877
KVG1100 with B52XP PU60	1870	2703	3469	4166	4796	5364
KVG1200 with B52XP PU60	2040	2949	3784	4545	5232	5852
KVG1300 with B52XP PU60	2210	3195	4100	4924	5668	6340
KVG1400 with B52XP PU60	2380	3441	4415	5303	6104	6828
KVG1600 with B52XP PU60	2720	3932	5046	6060	6976	7803
KVG1800 with B52XP PU60	3060	4424	5676	6818	7848	8778
KVG2000 with B52XP PU60	3400	4915	6307	7575	8720	9754
KVG200 with B52XP PU30/60	288	408	512	600	672	709
KVG300 with B52XP PU30/60	432	612	768	900	1008	1064
KVG400 with B52XP PU30/60	576	816	1024	1200	1344	1419
KVG500 with B52XP PU30/60	720	1020	1280	1500	1680	1773
KVG600 with B52XP PU30/60	864	1224	1536	1800	2016	2128
KVG700 with B52XP PU30/60	1008	1428	1792	2100	2352	2483
KVG800 with B52XP PU30/60	1152	1632	2048	2400	2688	2837
KVG900 with B52XP PU30/60	1296	1836	2304	2700	3024	3192

Specifications subject to change without notice.

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG1000 with B52XP PU30/60	1440	2040	2560	3000	3360	3547
KVG1100 with B52XP PU30/60	1584	2244	2816	3300	3696	3901
KVG1200 with B52XP PU30/60	1728	2448	3072	3600	4032	4256
KVG1300 with B52XP PU30/60	1872	2652	3328	3900	4368	4611
KVG1400 with B52XP PU30/60	2016	2856	3584	4200	4704	4966
KVG1600 with B52XP PU30/60	2304	3264	4096	4800	5376	5675
KVG1800 with B52XP PU30/60	2592	3672	4608	5400	6048	6384
KVG2000 with B52XP PU30/60	2880	4080	5120	6000	6720	7094
KVG200 with BX52P PU60	280	374	437	456	472	524
KVG300 with BX52P PU60	420	561	656	684	708	786
KVG400 with BX52P PU60	560	748	875	912	944	1048
KVG500 with BX52P PU60	700	935	1093	1140	1180	1311
KVG600 with BX52P PU60	840	1122	1312	1368	1416	1573
KVG700 with BX52P PU60	980	1309	1531	1596	1652	1835
KVG800 with BX52P PU60	1120	1496	1749	1824	1888	2097
KVG900 with BX52P PU60	1260	1683	1968	2052	2124	2359
KVG1000 with BX52P PU60	1400	1870	2187	2280	2360	2621
KVG1100 with BX52P PU60	1540	2057	2405	2508	2596	2883
KVG1200 with BX52P PU60	1680	2244	2624	2736	2832	3145
KVG1300 with BX52P PU60	1820	2431	2843	2964	3068	3408
KVG1400 with BX52P PU60	1960	2618	3062	3192	3304	3670
KVG1600 with BX52P PU60	2240	2992	3499	3648	3776	4194
KVG1800 with BX52P PU60	2520	3366	3936	4104	4248	4718
KVG2000 with BX52P PU60	2800	3740	4374	4560	4720	5242
KVG200 with BX52P PU30/60	256	344	405	427	448	495
KVG300 with BX52P PU30/60	384	516	608	640	672	742
KVG400 with BX52P PU30/60	512	688	811	853	896	989
KVG500 with BX52P PU30/60	640	860	1013	1067	1120	1237

Specifications subject to change without notice.

Type	Force, N, at a vacuum of					
	20%	30%	40%	50%	60%	70%
KVG600 with BX52P PU30/60	768	1032	1216	1280	1344	1484
KVG700 with BX52P PU30/60	896	1204	1419	1494	1568	1731
KVG800 with BX52P PU30/60	1024	1376	1621	1707	1792	1979
KVG900 with BX52P PU30/60	1152	1548	1824	1920	2016	2226
KVG1000 with BX52P PU30/60	1280	1720	2027	2134	2240	2473
KVG1100 with BX52P PU30/60	1408	1892	2229	2347	2464	2721
KVG1200 with BX52P PU30/60	1536	2064	2432	2560	2688	2968
KVG1300 with BX52P PU30/60	1664	2236	2635	2774	2912	3215
KVG1400 with BX52P PU30/60	1792	2408	2838	2987	3136	3462
KVG1600 with BX52P PU30/60	2048	2752	3243	3414	3584	3957
KVG1800 with BX52P PU30/60	2304	3096	3648	3840	4032	4452
KVG2000 with BX52P PU30/60	2560	3440	4054	4267	4480	4946
KVG200 with VL60BX	–	–	–	240	–	–
KVG300 with VL60BX	–	–	–	360	–	–
KVG400 with VL60BX	–	–	–	480	–	–
KVG500 with VL60BX	–	–	–	600	–	–
KVG600 with VL60BX	–	–	–	720	–	–
KVG700 with VL60BX	–	–	–	840	–	–
KVG800 with VL60BX	–	–	–	960	–	–
KVG900 with VL60BX	–	–	–	1080	–	–
KVG1000 with VL60BX	–	–	–	1200	–	–
KVG1100 with VL60BX	–	–	–	1320	–	–
KVG1200 with VL60BX	–	–	–	1440	–	–
KVG1300 with VL60BX	–	–	–	1560	–	–
KVG1400 with VL60BX	–	–	–	1680	–	–
KVG1600 with VL60BX	–	–	–	1920	–	–
KVG1800 with VL60BX	–	–	–	2160	–	–
KVG2000 with VL60BX	–	–	–	2400	–	–

Specifications subject to change without notice.

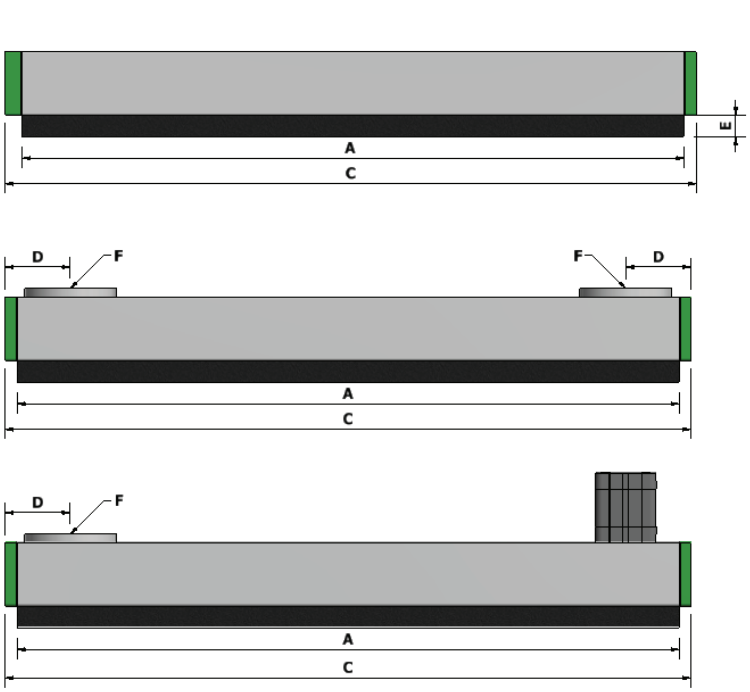
VACUUM FLOW

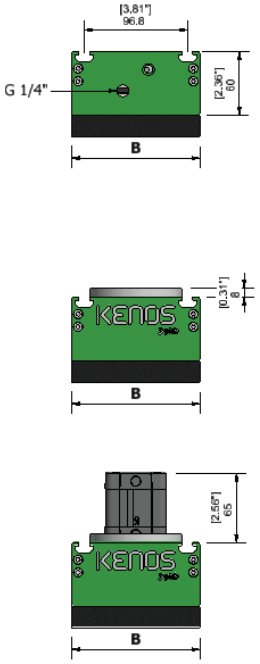
Air consumption/vacuum flow data related to number of COAX® ejectors.

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 ×1	0.6	1.75	6	3.5	2.6	1.7	0.9	0.6	0.5	0.35	—	—	75
MIDI Si32-3 ×2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75
MIDI Si32-3 ×3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.1	—	—	75
MIDI Si32-3 ×4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75
MIDI Si32-3 ×6	0.6	10.5	36	21	15.6	10.2	5.4	3.6	3	2.1	—	—	75/52*
MIDI Si32-3 ×8	0.6	14	48	28	20.8	13.6	7.2	4.8	4	2.8	—	—	75/52*

*Without/with 1×flap valve

DIMENSIONS FOR KVG120 WITH FOAM





With internal COAX® ejector

For blower

For pump

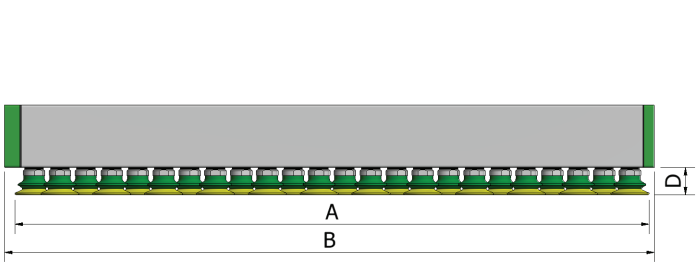
Length (mm)	A (mm)	C* ejector (mm)	C blower (mm)	D (mm)	E (mm)	F	Weight (kg)					
							COAX® ejector CV	COAX® ejector FR	Blower CV	Blower FR	Pump CV	Pump FR
KVG200	220	247	242	61	10/20/30/40	G 1-1/4"	2.6	2.4	2.4	2.1	2.5	2.2
KVG300	320	347	342	61	10/20/30/40	G 1-1/4"	3.6	2.8	3.3	2.5	3.4	2.6
KVG400	420	447	442	61	10/20/30/40	G 1-1/4"	4.5	3.4	4.2	3.1	4.3	3.2
KVG500	520	547	542	61	10/20/30/40	G 1-1/4"	5.3	4.1	5.0	3.8	5.1	3.9
KVG600	620	647	642	61	10/20/30/40	G 1-1/4"	6.2	4.8	5.9	4.5	6.0	4.6
KVG700	720	747	742	91	10/20/30/40	G 2"	7.2	5.5	6.9	5.2	7.0	5.3
KVG800	820	847	842	91	10/20/30/40	G 2"	8.0	6.2	7.7	5.9	7.8	6.0
KVG900	920	947	942	91	10/20/30/40	G 2"	8.9	6.8	8.6	6.5	8.7	6.6
KVG1000	1020	1047	1042	91	10/20/30/40	G 2"	9.8	7.4	9.5	7.1	9.6	7.2
KVG1100	1120	1147	1142	91	10/20/30/40	G 2"	10.7	8.0	10.4	7.7	10.5	7.8
KVG1200	1220	1247	1242	91	10/20/30/40	G 2"	11.6	8.5	11.3	8.2	11.4	8.3
KVG1300	1320	1347	1342	91	10/20/30/40	G 2"	12.4	9.0	12.1	8.6	12.2	8.7
KVG1400	1420	1447	1442	91	10/20/30/40	G 2"	13.2	9.6	12.6	9.0	12.9	9.1
KVG1600	1620	1647	1642	91	10/20/30/40	G 2"	15.0	10.7	14.4	10.1	14.6	10.2
KVG1800	1820	1847	1842	91	10/20/30/40	G 2"	16.8	11.8	16.2	11.2	16.2	11.3
KVG2000	2020	2047	2042	91	10/20/30/40	G 2"	18.6	13.0	18.0	12.4	17.9	12.6

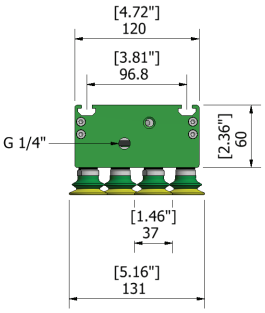
*with double ejector, "C" dimension is 5 mm longer.

ATTENTION: for type N206, dimensions A and C are 10 mm shorter.

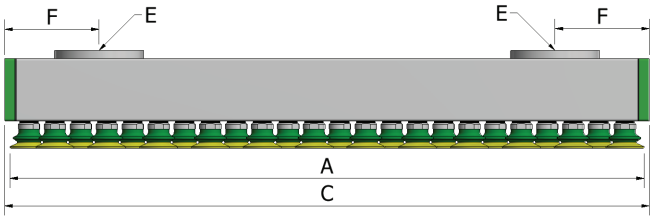
Specifications subject to change without notice.

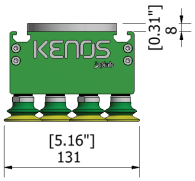
DIMENSIONS FOR KVG120 WITH BX35P & B35XP SUCTION CUPS



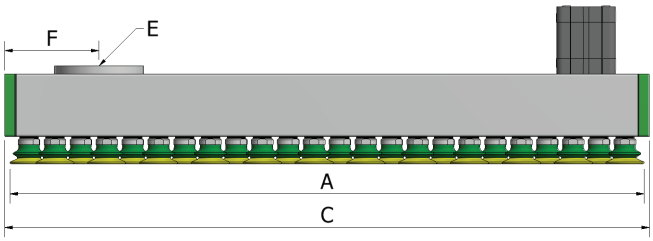


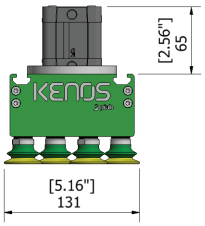
With internal COAX® ejector





For blower





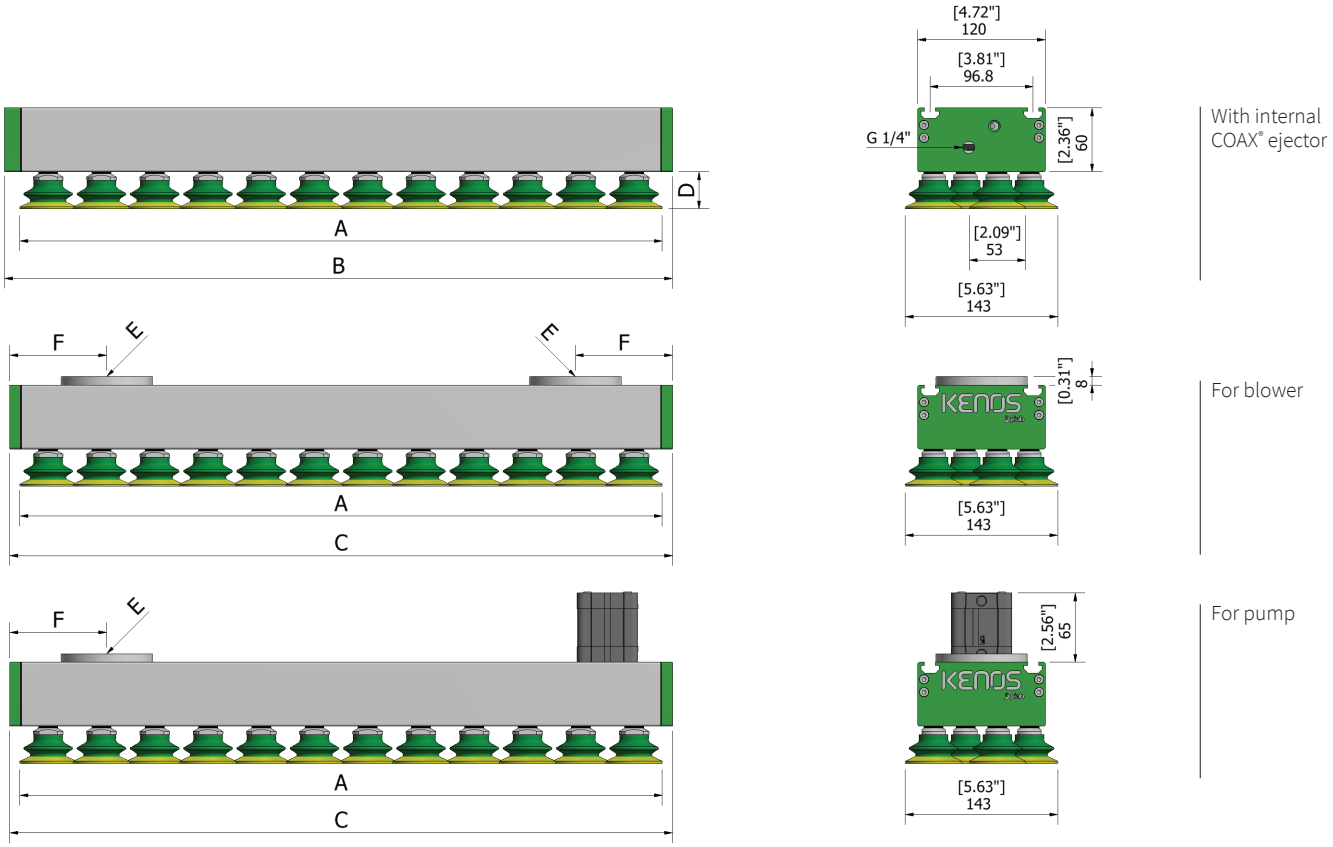
For pump

Length (mm)	A (mm)	B* (mm)	C (mm)	D** (mm)	E (inch)	F	Number of Pads	Weight (kg)		
								COAX® ejector	Blower	Pump
KVG200	212	227	222	26.4	1-1/4"	61	16	2.67	2.46	2.57
KVG300	312	327	322	26.4	1-1/4"	61	24	3.6	3.38	3.5
KVG400	412	427	422	26.4	1-1/4"	61	32	4.56	4.3	4.42
KVG500	512	527	522	26.4	1-1/4"	61	40	5.5	5.23	5.35
KVG600	612	627	622	26.4	1-1/4"	61	48	6.4	6.13	6.29
KVG700	712	727	722	26.4	2"	91	56	7.35	7.08	7.19
KVG800	812	827	822	26.4	2"	91	64	8.81	8.01	8.11
KVG900	912	927	922	26.4	2"	91	72	9.74	8.94	9.03
KVG1000	1012	1027	1022	26.4	2"	91	80	10.67	9.87	9.96
KVG1100	1112	1127	1122	26.4	2"	91	88	11.62	10.81	10.88
KVG1200	1212	1227	1222	26.4	2"	91	96	12.55	11.73	11.81
KVG1300	1312	1327	1322	26.4	2"	91	104	13.48	12.65	12.73
KVG1400	1412	1427	1422	26.4	2"	91	112	14.41	13.58	13.65
KVG1600	1612	1627	1622	26.4	2"	91	128	16.26	15.43	15.51
KVG1800	1812	1827	1822	26.4	2"	91	144	18.11	17.28	17.35
KVG2000	2012	2027	2022	26.4	2"	91	160	19.96	19.13	19.21

*with double ejector, “B” dimension is 5 mm longer. **with BX35P PU30/60 and BX35P PU60 cups, “D” is 34.6 mm.

Specifications subject to change without notice.

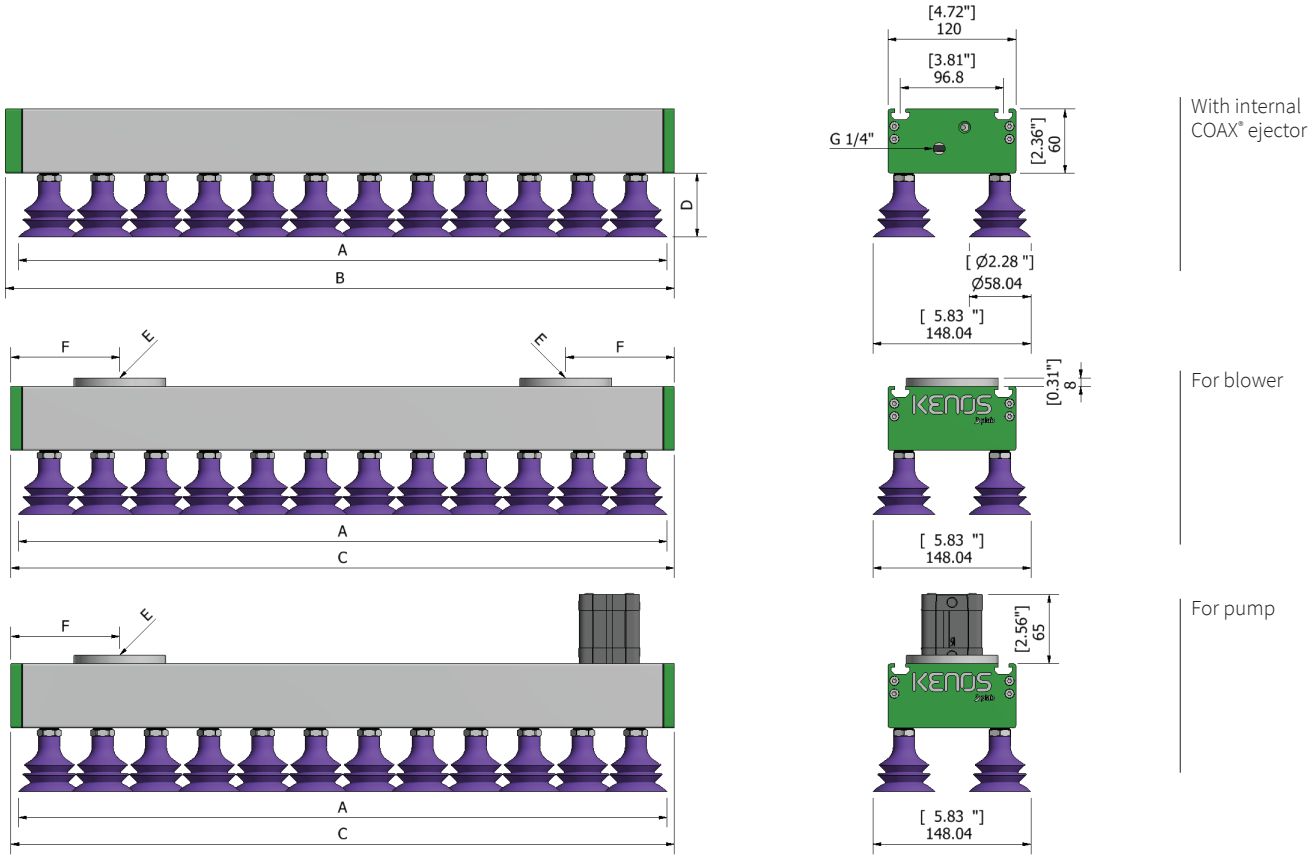
DIMENSIONS FOR KVG120 WITH BX52P & B52XP SUCTION CUPS



Length (mm)	A (mm)	B* (mm)	C (mm)	D** (mm)	E (mm)	F	Number of Pads	Weight (kg)		
								COAX® ejector	Blower	Pump
KVG200	203	227	222	34.8	1-1/4"	61	8	2.71	2.47	2.58
KVG300	303	327	322	34.8	1-1/4"	61	12	3.67	3.41	3.52
KVG400	403	427	422	34.8	1-1/4"	61	16	4.61	4.32	4.45
KVG500	503	527	522	34.8	1-1/4"	61	20	5.57	5.25	5.39
KVG600	603	627	622	34.8	1-1/4"	61	24	6.51	6.18	6.32
KVG700	703	727	722	34.8	2"	91	28	7.45	7.13	7.25
KVG800	803	827	822	34.8	2"	91	32	8.41	8.08	8.19
KVG900	903	927	922	34.8	2"	91	36	9.37	9.04	9.12
KVG1000	1003	1027	1022	34.8	2"	91	40	10.31	9.99	10.06
KVG1100	1103	1127	1122	34.8	2"	91	44	11.25	10.94	10.99
KVG1200	1203	1227	1222	34.8	2"	91	48	12.67	11.91	11.92
KVG1300	1303	1327	1322	34.8	2"	91	52	13.61	12.85	12.86
KVG1400	1403	1427	1422	34.8	2"	91	56	14.55	13.81	13.78
KVG1600	1603	1627	1622	34.8	2"	91	64	16.39	15.66	15.65
KVG1800	1803	1827	1822	34.8	2"	91	72	18.34	17.29	17.52
KVG2000	2003	2027	2022	34.8	2"	91	80	20.22	19.13	19.38

*with double ejector, “B” dimension is 5 mm longer. **with BX35P PU30/60 and BX35P PU60 cups, “D” is 34.6 mm.

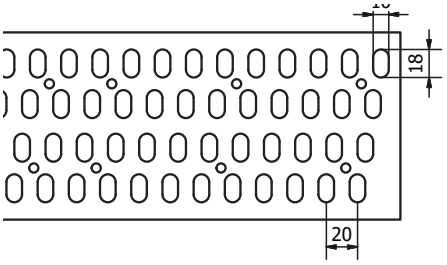
DIMENSIONS FOR KVG120 WITH VL60BX SUCTION CUPS



Length (mm)	A (mm)	B* (mm)	C (mm)	D** (mm)	E (nch)	F	Number of Pads	Weight (kg)		
								COAX® ejector	Blower	Pump
KVG 200	208	227	222	60	1-1/4"	61	4	2,61	2,38	2,48
KVG 300	308	327	322	60	1-1/4"	61	6	3,52	3,26	3,37
KVG 400	408	427	422	60	1-1/4"	61	8	4,41	4,14	4,26
KVG 500	508	527	522	60	1-1/4"	61	10	5,32	5,03	5,14
KVG 600	608	627	622	60	1-1/4"	61	12	6,21	5,92	6,03
KVG 700	708	727	722	60	2"	91	14	7,11	6,81	6,91
KVG 800	808	827	822	60	2"	91	16	8,01	7,67	7,79
KVG 900	908	927	922	60	2"	91	18	8,91	8,55	8,67
KVG 1000	1008	1027	1022	60	2"	91	20	9,81	9,42	9,56
KVG 1100	1108	1127	1122	60	2"	91	22	10,69	10,31	10,44
KVG 1200	1208	1227	1222	60	2"	91	24	11,58	11,17	11,32
KVG 1300	1308	1327	1322	60	2"	91	26	12,47	12,05	12,21
KVG 1400	1408	1427	1422	60	2"	91	28	13,36	12,92	13,09
KVG 1600	1608	1627	1622	60	2"	91	32	15,64	14,67	14,85
KVG 1800	1808	1827	1822	60	2"	91	36	17,42	16,42	16,62
KVG 2000	2008	2027	2022	60	2"	91	40	19,24	18,17	18,38

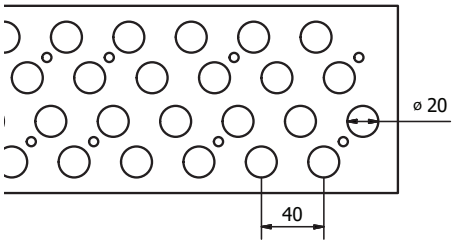
*with double ejector, “B” dimension is 5 mm longer.

KVG 120 FOAM DESCRIPTIONS



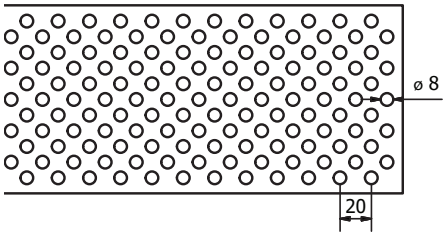
FINE (STEP 1)

Suitable for narrow parts bigger than 35 mm wide like strips of wood, metal, plastic, round shape like tubes especially with a thicker foam.



MEDIUM (STEP 2)

Suitable for general purpose with wide bigger than 60 mm, typical application for panels.



EXTRA FINE (STEP 6)

Suitable for small pieces larger than 25 mm like very narrow strips of wood.

KVG – CUSTOMER CODE

KVG . 600 . 120 . N201 . CVL . S1 . X . X

Code	Model
KVG	KVG

Code	Length
200	200 mm
300	300 mm
400	400 mm
500	500 mm
600	600 mm
700	700 mm
800	800 mm
900	900 mm
1000	1000 mm
1100	1100 mm
1200	1200 mm
1300	1300 mm
1400	1400 mm
1600	1600 mm
1800	1800 mm
2000	2000 mm

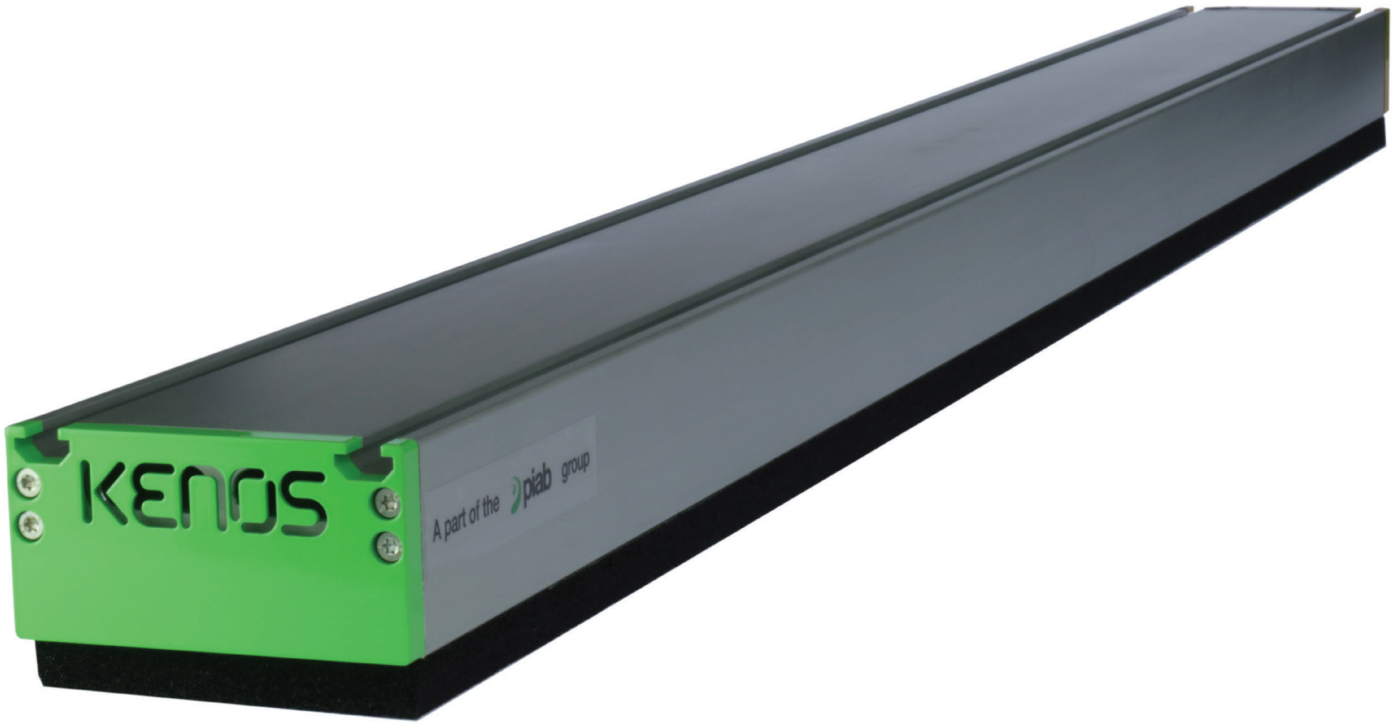
Code	Width
120	120 mm

Code	Type
N	Foam
Code	**Thickness**
4	Foam 40 mm
3	Foam 30 mm
2	Foam 20 mm
1	Foam 10 mm
Code	**Filter**
0	Without filter
1	With filter
Code	**Step**
1	Fine step
2	Medium step
6	Extra fine step

Code	Thickness
B35XP	Cups 1,5 bellows BX35P PU30/60
B35XP60	Cups 1,5 bellows BX35P PU60
B52XP	Cups 1,5 bellows BX52P PU 30/60
B52XP60	Cups 1,5 bellows BX52P PU 60
BX35P	Cups 2,5 bellows BX35P PU 30/60
BX35P60	Cups 2,5 bellows BX35P PU 60
BX52P	Cups 2,5 bellows BX52P PU 30/60
BX52P60	Cups 2,5 bellows BX52P PU 60
VL60BX	Cups 2,5 bellows VL60BX

Code	Technology
CVL	Check Valves Low flow
CVM	Check Valves Medium flow
CVH	Check Valves High flow
FR5	Flow Reduction 0,5 mm
FR6	Flow Reduction 0,6 mm
FR8	Flow Reduction 0,8 mm

Specifications subject to change without notice.



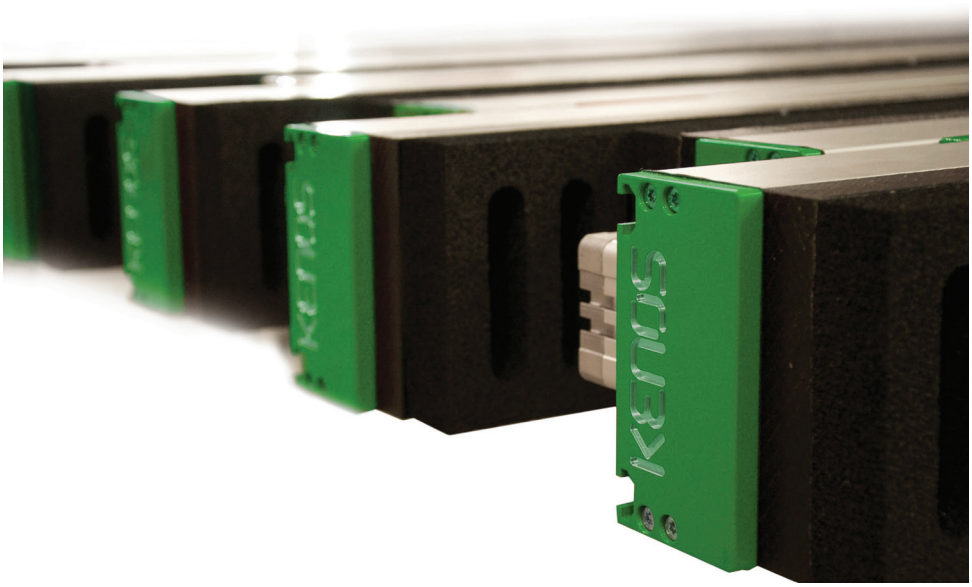
Code	Vacuum generator
S1	1 cartridge Si32-3
S2	2 cartridge Si32-3
S3	3 cartridge Si32-3
S4	4 cartridge Si32-3
S6	6 cartridge Si32-3
S8	8 cartridge Si32-3
PU	Pump connection (with cylinder)
BL1	Blower connection G1-1/4"
BL2	Blower connection G2"

Code	Control valves
V1	EV vacuum N.C.
V2	EV vacuum N.C. / EV blow-off N.C.
V3	EV vacuum N.O.
V4	EV vacuum N.O. / EV blow-off N.C.
A1	PV vacuum N.C.
A2	PV vacuum N.C. / PV blow-off N.C.
A3	PV vacuum N.O.
A4	PV vacuum N.O. / PV blow-off N.C.
TV	Vertical supply cover
X	Without control

Code	Monitoring
M1	Vacuum and pressure gauge
M2	Digital vacuum switch
M3	Vacuum Gauge
X	Without monitoring

Specifications subject to change without notice.

KHVG series



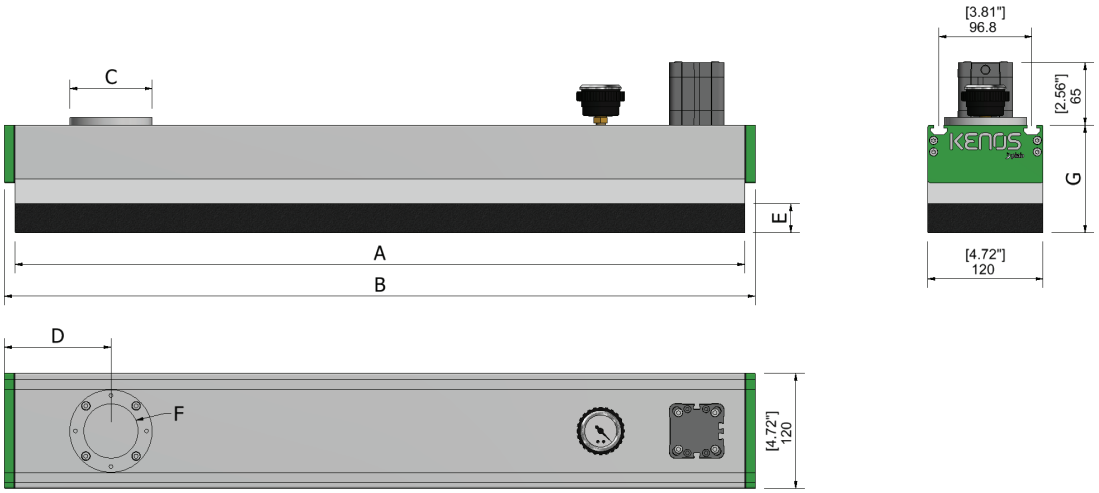
KHVG series products, Kenos® Heavy Vacuum Gripper, are designed for heavy duty applications in the wood and stone industry. KHVG gripping systems are suitable for handling, normally complete layer, of sawn timber, heavy planking, raw wood and materials for building, such as bricks. They are also useful to handle very long and arcuate workpieces.
KHVG systems are prepared for external vacuum generation with side channel blower. Provided with shutter check valve technology with low sensibility to the dust.

LIFTING FORCES

Theoretic gripping force on rigid and stable surface with completely covered module, without safety factor (N).

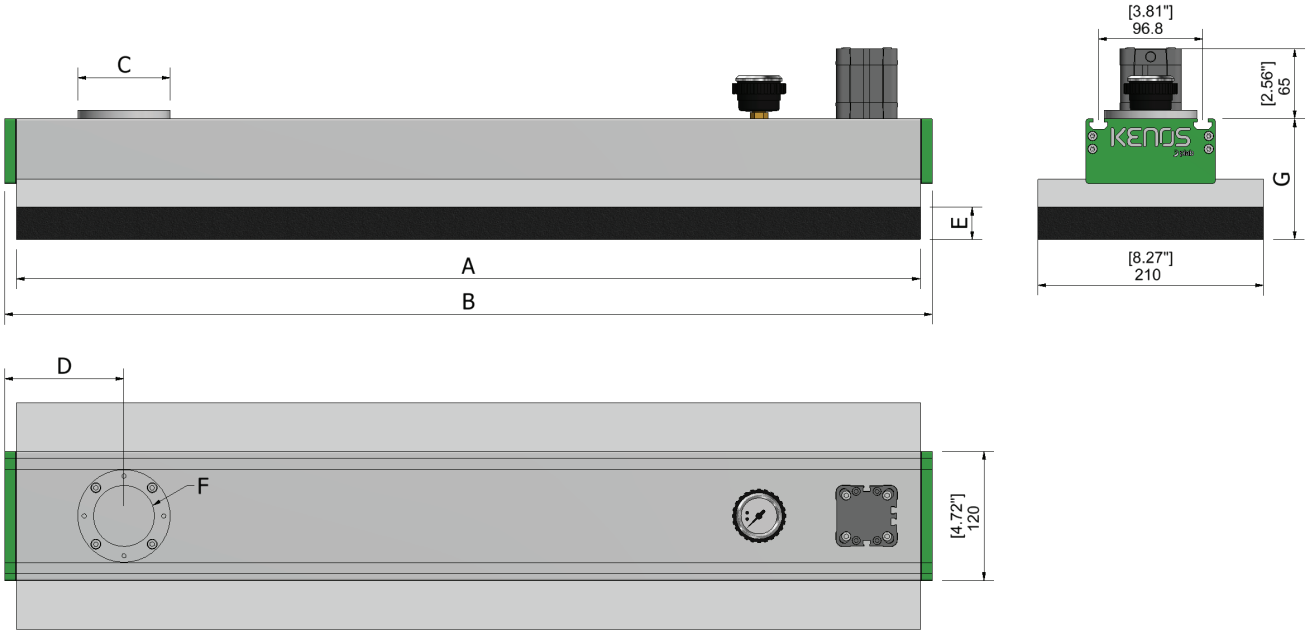
	Force, N, at a vacuum of				
Type	30%	40%	50%	60%	70%
KHVG.600.120 with step 35	726	969	1211	1453	1695
KHVG.800.120 with step 35	983	1310	1638	1966	2293
KHVG.1000.120 with step 35	1239	1652	2065	2478	2891
KHVG.1200.120 with step 35	1496	1994	2493	2991	3490
KHVG.1400.120 with step 35	1709	2279	2849	3418	3988
KHVG.600.120 with step 40	641	855	1068	1282	1496
KHVG.800.120 with step 40	855	1139	1424	1709	1994
KHVG.1000.120 with step 40	1068	1424	1780	2137	2493
KHVG.1200.120 with step 40	1282	1709	2137	2564	2991
KHVG.1400.120 with step 40	1496	1994	2493	2991	3490
KHVG.600.210 with step 35	1453	1937	2421	2906	3390
KHVG.800.210 with step 35	1880	2507	3134	3760	4387
KHVG.1000.210 with step 35	2393	3191	3988	4786	5583

Type	Force, N, at a vacuum of				
	30%	40%	50%	60%	70%
KHVG.1200.210 with step 35	2906	3874	4843	5811	6780
KHVG.1400.210 with step 35	3333	4444	5555	6666	7777
KHVG.600.210 with step 40	1282	1709	2137	2564	2991
KHVG.800.210 with step 40	1709	2279	2849	3418	3988
KHVG.1000.210 with step 40	2137	2849	3561	4273	4985
KHVG.1200.210 with step 40	2564	3418	4273	5128	5982
KHVG.1400.210 with step 40	2991	3988	4985	5982	6979



	Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (kg)
TYPE 120	KHVG600-120	640	662	70/86	111	20/30/40	G1-1/4''/2"	112	6.7
	KHVG800-120	840	862	70/86	111	20/30/40	G1-1/4''/2"	112	8.6
	KHVG1000-120	1040	1062	86	111	20/30/40	G2"	112	11.0
	KHVG1200-120	1240	1262	86	111	20/30/40	G2"	112	13.4
	KHVG1400-120	1440	1462	86	111	20/30/40	G2"	112	16.4

*The total dimension (G) is related with 30 mm foam.



	Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (kg)
TYPE 210	KHVG600-210	640	662	70/86	111	20/30/40	G1-1/4''/2"	112	8.7
	KHVG800-210	840	862	70/86	111	20/30/40	G1-1/4''/2"	112	11.2
	KHVG1000-210	1040	1062	86	111	20/30/40	G2"	112	13.7
	KHVG1200-210	1240	1262	86	111	20/30/40	G2"	112	16.2
	KHVG1400-210	1440	1462	86	111	20/30/40	G2"	112	17.4

*The total dimension (G) is related with 30 mm foam.

KHVG – CUSTOMER CODE



Code	Model
KHVG	KHVG

Code	Length
600	600 mm
800	800 mm
1000	1000 mm
1200	1200 mm
1400	1400 mm

Code	Width
120	120 mm
210	210 mm

Code	type
N	Foam
Code	**Thickness**
4	Foam 40 mm
3	Foam 30 mm
2	Foam 20 mm
Code	**Step**
35	Step 35 mm
40	Step 40 mm

Code	Vacuum generator
BL1	Blower connection G1-1/4"
BL2	Blower connection G2"

KSG series



KSG series products, Kenos® Sack Gripper, are suitable to handle sacks with different shapes, weights and materials. The specific knowhow in this segment, has driven us to develop systems dedicated to all the different applications of this industry. The integrated and modular vacuum generation makes the KSG flexible and reliable. The version for external vacuum generator is available. We have version for palletisation or de-palletization.

LIFTING FORCES

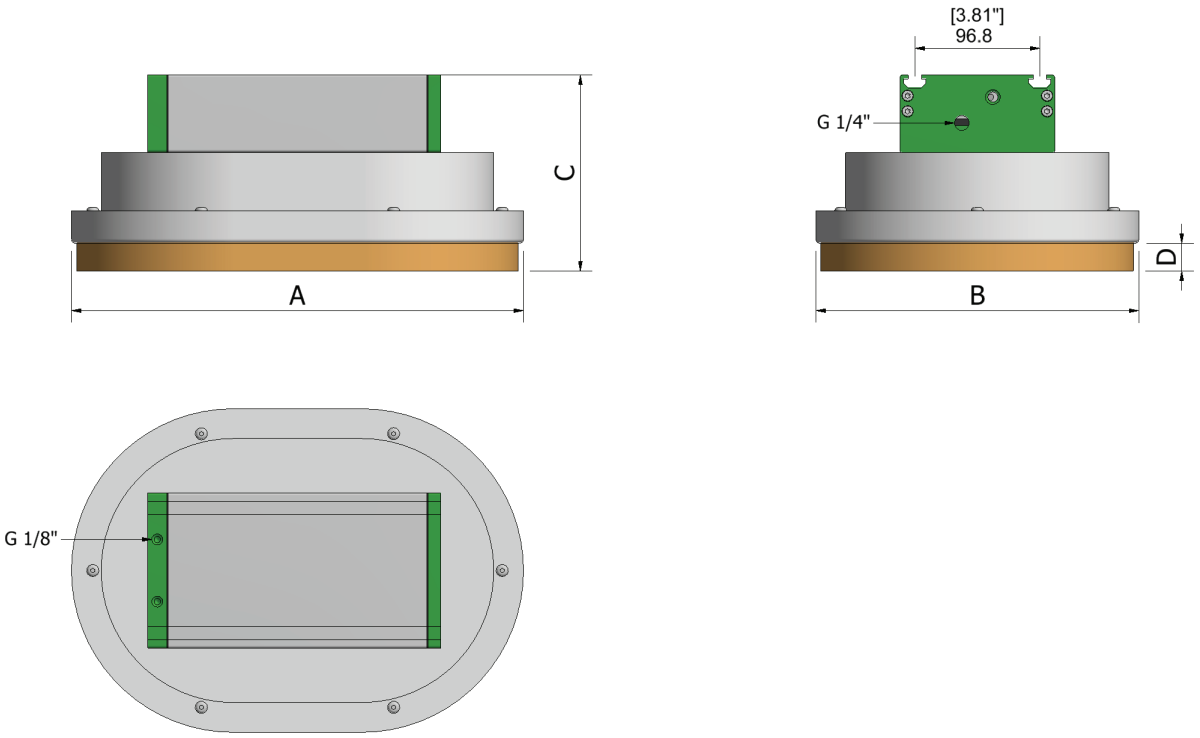
We can calculate the force generated by the gripping area for the vacuum value, but considering that the gripper handles bags and not rigid surfaces or pieces, these values could lead to a wrong selection of the product.
These types of grippers are designed to handle from 25 to 50 kg bags and the selection is made through the size of the bag and not on the basis of the gripping force.

VACUUM FLOW

Air consumption/vacuum flow data related to number of COAX® ejectors.

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 x2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75
MIDI Si32-3 x3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.1	—	—	75
MIDI Si32-3 x4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75

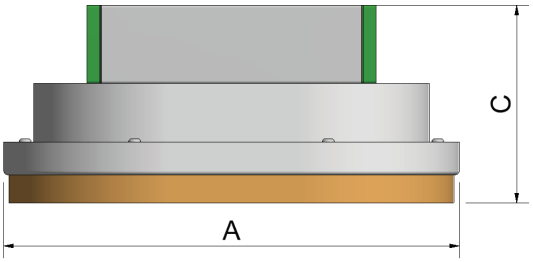
DIMENSIONS FOR KSG WITH EJECTOR

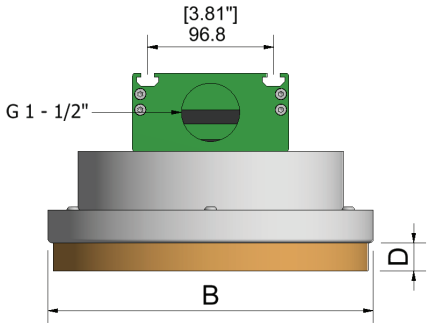


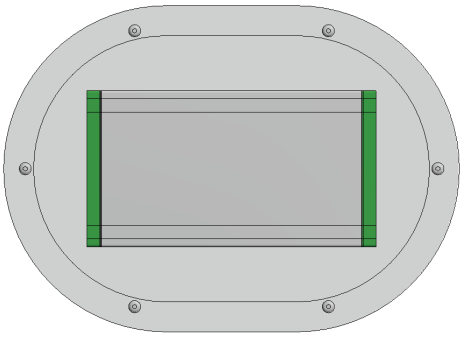
Type	A (mm)	B (mm)	C (mm)	D* (mm)	Weight (kg)
KSG-E-260-180	260	180	151.5	21.5	3.6
KSG-E-310-210	310	210	151.5	21.5	4.1
KSG-E-350-250	350	250	151.5	21.5	4.7
KSG-E-400-250	400	250	151.5	21.5	5.1

*the value ”D” is based on sealing ring G1. For metallic ring (G3) the value ”D” is 5 mm.

DIMENSIONS FOR KSG WITH BLOWER







Type	A (mm)	B (mm)	C (mm)	D* (mm)	Weight (kg)
KSG-E-260-180	260	180	151.5	21.5	3.1
KSG-E-310-210	310	210	151.5	21.5	3.6
KSG-E-350-250	350	250	151.5	21.5	4.2
KSG-E-400-250	400	250	151.5	21.5	4.6

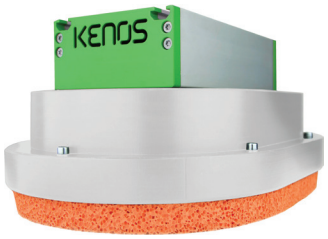
*the value ”D” is based on sealing ring G1. For metallic ring (G3) the value ”D” is 5 mm.

SEALING RINGS



Metal ring (G3)

A big advantage of the metal sealing ring is wear resistance. The sealing capacity is less compared with G1 type. For this reason, we recommend to combine with a blower.



NR Sealing ring (G1)

The NR sealing ring is suitable for all kinds of sacks thanks to its sealing capacity. This type of ring is subject to wear which may be very short in the presence of abrasive bags or intensive cycling.

KSG – CUSTOMER CODE

Code	Model
KSG	KSG

Code	Length
E	With sealing ring

Code	Dimensions
450-250	450-250
350-250	350-250
310-210	310-210
260-180	260-180

Code	Sealing ring
G1	NR sealing ring
G3	Metal ring

Code	Vacuum generator
S2	×2 cartridge Si32-3
S3	×3 cartridge Si32-3
S4	×4 cartridge Si32-3
BL	Blower connection

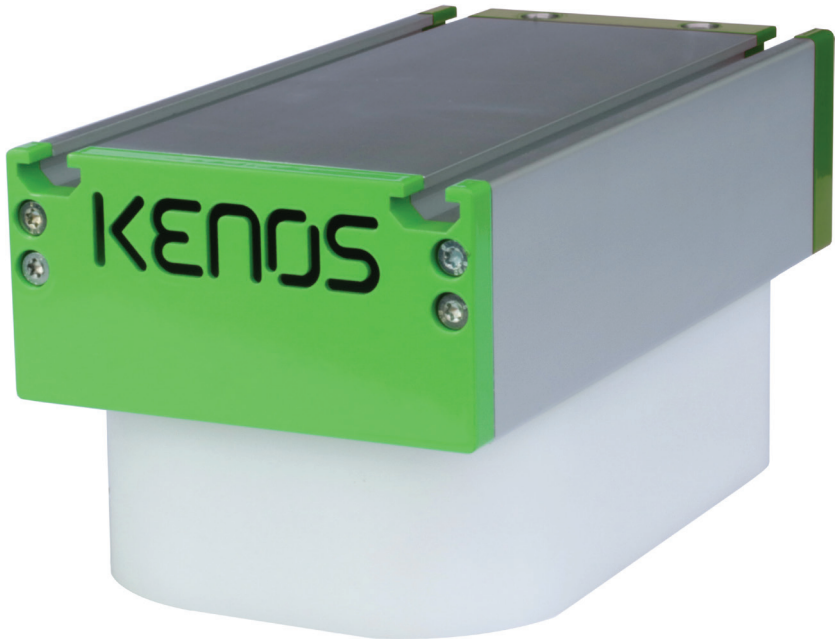
KSG . E . 450-250 . G1 . S3 . V1 . M1

Code	Control valves
V1	EV vacuum N.C.
V2	EV vacuum N.C. / EV blow-off N.C.
V3	EV vacuum N.O.
V4	EV vacuum N.O. / EV blow-off N.C.
A1	PV vacuum N.C.
A2	PV vacuum N.C. / PV blow-off N.C.
A3	PV vacuum N.O.
A4	PV vacuum N.O. / PV blow-off N.C.
TV	Vertical supply cover
X	Without control

Code	Monitoring
M1	Vacuum and pressure gauge
M2	Digital vacuum switch
M3	Vacuum Gauge
X	Without monitoring

Specifications subject to change without notice.

KBC series



KBC series products, Kenos® Bag Cup, born from the need of handling alimentary and not liquid bags, but are suitable also in the flowpack application. In KBC vacuum gripping systems, the integrated and modular COAX® vacuum cartridge gives the module flexibility. A version for external vacuum generation is available. A side channel blower is used when the application condition suggest it.

LIFTING FORCES

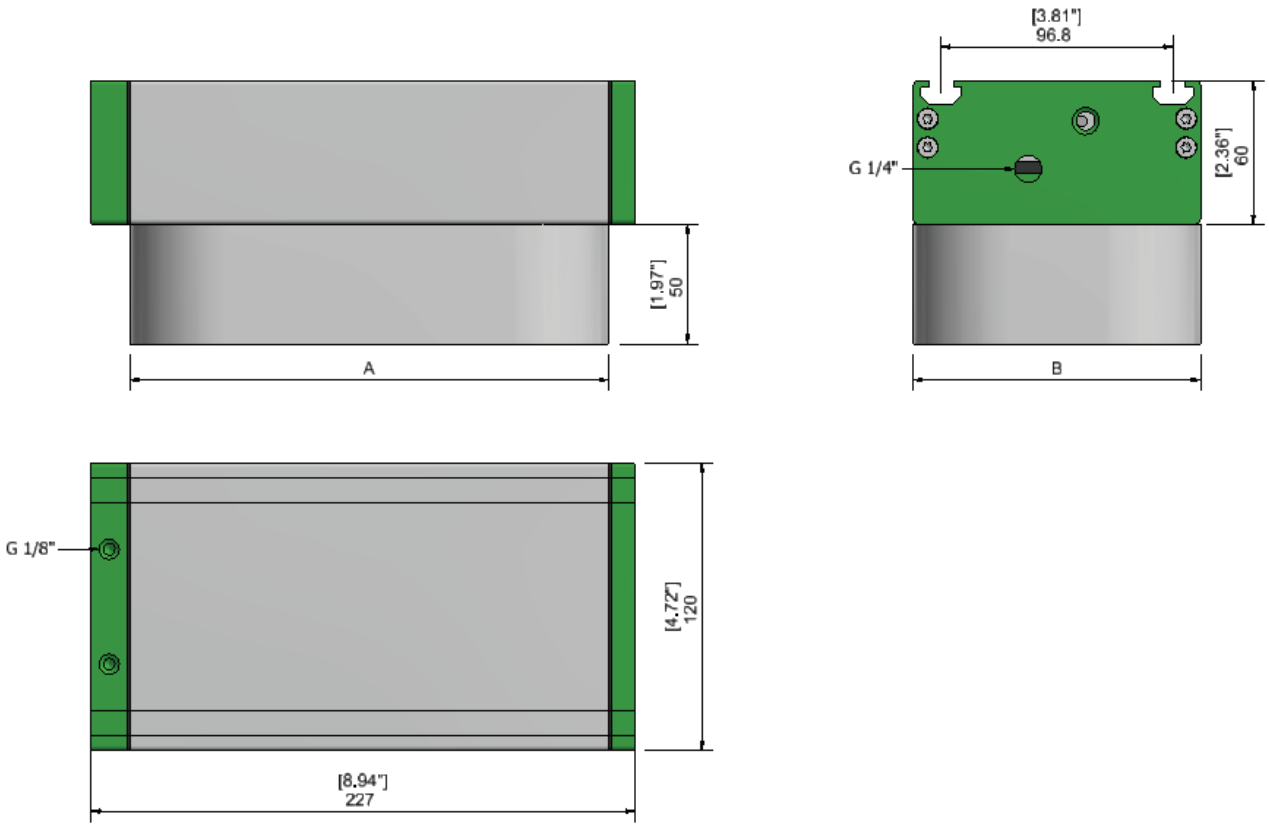
We can calculate the force generated by the gripping area for the vacuum value, but considering that the gripper handles bags and not rigid surfaces or pieces, these values could lead to a wrong selection of the product.
These types of grippers are designed to handle from 25 to 50 kg bags and the selection is made through the size of the bag and not on the basis of the gripping force – test on the product is mandatory to get the correct configuration.

VACUUM FLOW

Air consumption/vacuum flow data related to number of COAX® ejectors.

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 x2	0.6	3.5	12	7	5.2	3.4	1.8	1.2	1	0.7	—	—	75
MIDI Si32-3 x3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.1	—	—	75
MIDI Si32-3 x4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75

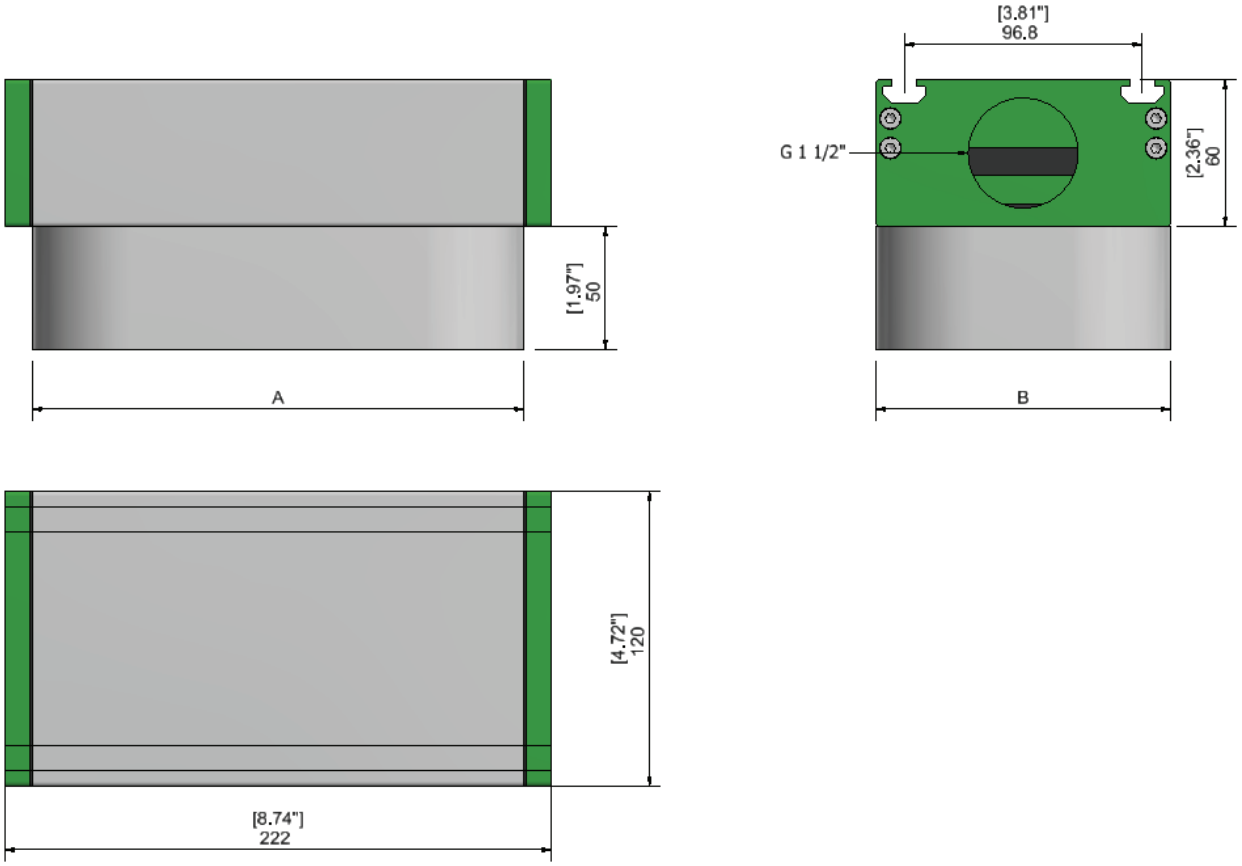
DIMENSIONS FOR KBC WITH EJECTOR



Type	A (mm)	B (mm)	Weight (kg)
KBC200-BC150-80	150	80	2.3
KBC200-BC200-100	200	100	2.5
KBC200-BC200-120	200	120	2.6
KBC200-BC200-180	200	180	2.9
KBC200-BC250-120	250	120	2.7
KBC200-BC300-120	300	120	2.9
KBC200-BC300-180	300	180	3.4
KBC200-BC350-150	350	150	3.4
KBC200-BC350-180	350	180	3.8
KBC200-BC350-250	350	250	4.1

Specifications subject to change without notice.

DIMENSIONS FOR KBC WITH BLOWER



Type	A (mm)	B (mm)	Weight (kg)
KBC200-BC150-80	150	80	1.8
KBC200-BC200-100	200	100	2.0
KBC200-BC200-120	200	120	2.1
KBC200-BC200-180	200	180	2.4
KBC200-BC250-120	250	120	2.2
KBC200-BC300-120	300	120	2.4
KBC200-BC300-180	300	180	2.9
KBC200-BC350-150	350	150	2.9
KBC200-BC350-180	350	180	3.3
KBC200-BC350-250	350	250	3.6

KBC – CUSTOMER CODE

Code	Model
KBC	KBC

Code	Profile length
200	200 mm

Code	Cup length
150	150 mm
200	200 mm
250	250 mm
300	300 mm
350	350 mm

Code	Cup width
80	80 mm
100	100 mm
120	120 mm
150	180 mm
180	150 mm
250	250 mm

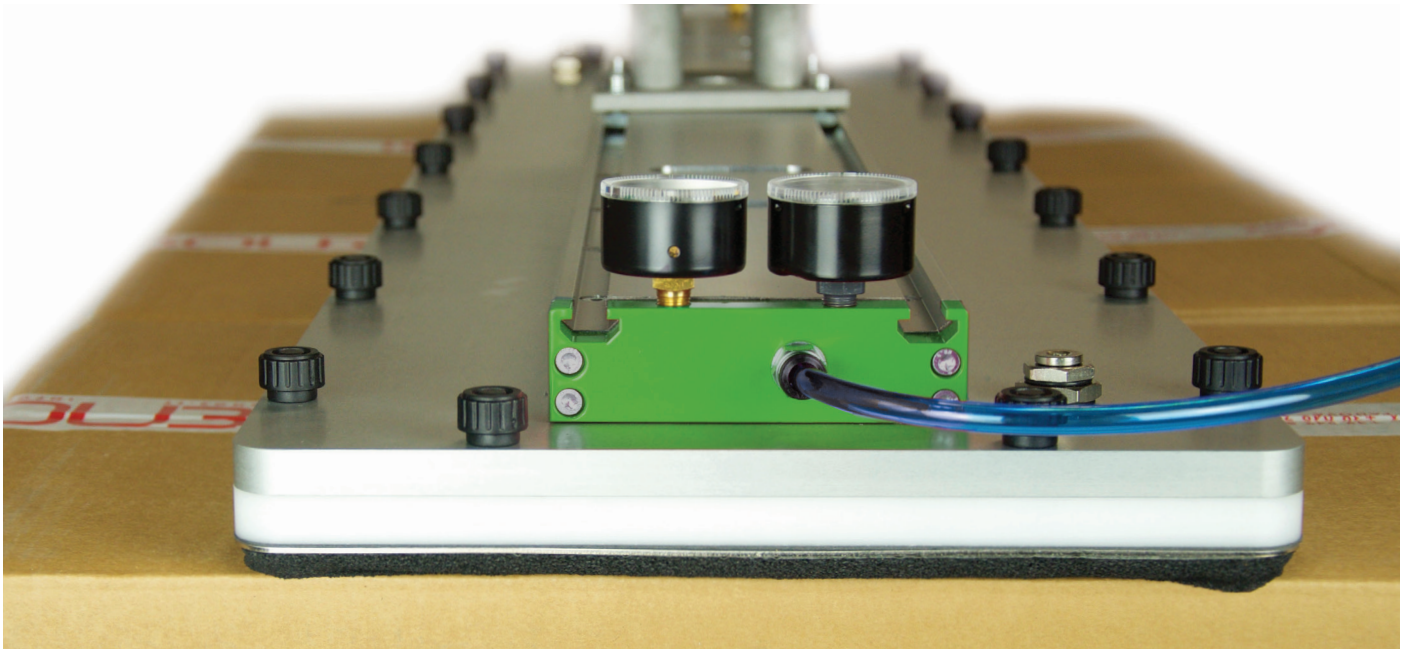
Code	Vacuum generator
S2	2 cartridge Si32-3
S3	3 cartridge Si32-3
S4	4 cartridge Si32-3
BL	Blower connection

KBC . 200 . 150 . 80 . S2 . V1 . M1

Code	Control valves
V1	EV vacuum N.C.
V2	EV vacuum N.C. / EV blow-off N.C.
V3	EV vacuum N.O.
V4	EV vacuum N.O. / EV blow-off N.C.
A1	PV vacuum N.C.
A2	PV vacuum N.C. / PV blow-off N.C.
A3	PV vacuum N.O.
A4	PV vacuum N.O. / PV blow-off N.C.
TV	Vertical supply cover
X	Without control

Code	Monitoring
M1	Vacuum and pressure gauge
M2	Digital vacuum switch
M3	Vacuum gauge
X	Without monitoring

KVGL-S series



KVGL-S product series, Kenos® Vacuum Gripper Layer - Standard, looks at the wide world of packaging, end line automation and other applications. Our adjustable check valve technology and the H40mm technical foam allows for superior gripping on different kind of boxes, wrap around packaging and primary ones. The large availability of standard dimensioning and the modularity, make this series highly effective.

LIFTING FORCES

Theoretic gripping force on rigid and stable surface with completely covered module, without safety factor (N).

Type		Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
WIDTH 240	KVGL400-240	791	1055	1319	1583	1846
	KVGL600-240	1253	1670	2088	2506	2923
	KVGL800-240	1714	2286	2857	3429	4000
	KVGL1000-240	2110	2813	3517	4020	4924
	KVGL1200-240	2638	3517	4396	5275	6154
WIDTH 300	KVGL400-300	1017	1356	1696	2035	2374
	KVGL600-300	1611	2148	2685	3222	3759
	KVGL800-300	2204	2939	3674	4409	5143
	KVGL1000-300	2713	3617	4522	5426	6330
	KVGL1200-300	3391	4522	5652	6782	7913

Type		Force, N, at a vacuum of				
		30%	40%	50%	60%	70%
WIDTH 400	KVGL400-400	1356	1809	2261	2713	3165
	KVGL600 -400	2148	2864	3580	4296	5011
	KVGL800-400	2939	3919	4898	5878	6858
	KVGL1000-400	3617	4823	6029	7235	8440
	KVGL1200-400	4522	6029	7536	9043	10550

VACUUM FLOW

Air consumption/vacuum flow data related to number of COAX® ejectors.

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)										Max vacuum
	MPa	Nl/s	0	10	20	30	40	50	60	70	80	90	-kPa
MIDI Si32-3 ×3	0.6	5.25	18	10.5	7.8	5.1	2.7	1.8	1.5	1.1	—	—	75
MIDI Si32-3 ×4	0.6	7	24	14	10.4	6.8	3.6	2.4	2	1.4	—	—	75
MIDI Si32-3 ×6	0.6	10.5	36	21	15.6	10.2	5.4	3.6	3	2.1	—	—	75
MIDI Si32-3 ×8	0.6	28	96	56	41.6	27.2	14.4	9.6	8	5.6	—	—	75

Specifications subject to change without notice.

KVGL-S – CUSTOMER CODE

Code	Model
KVGL	KVGL-S

Code	Length
400	400 mm
600	600 mm
800	800 mm
1000	1000 mm
1200	1200 mm

Code	Width
240	240 mm
300	300 mm
400	400 mm

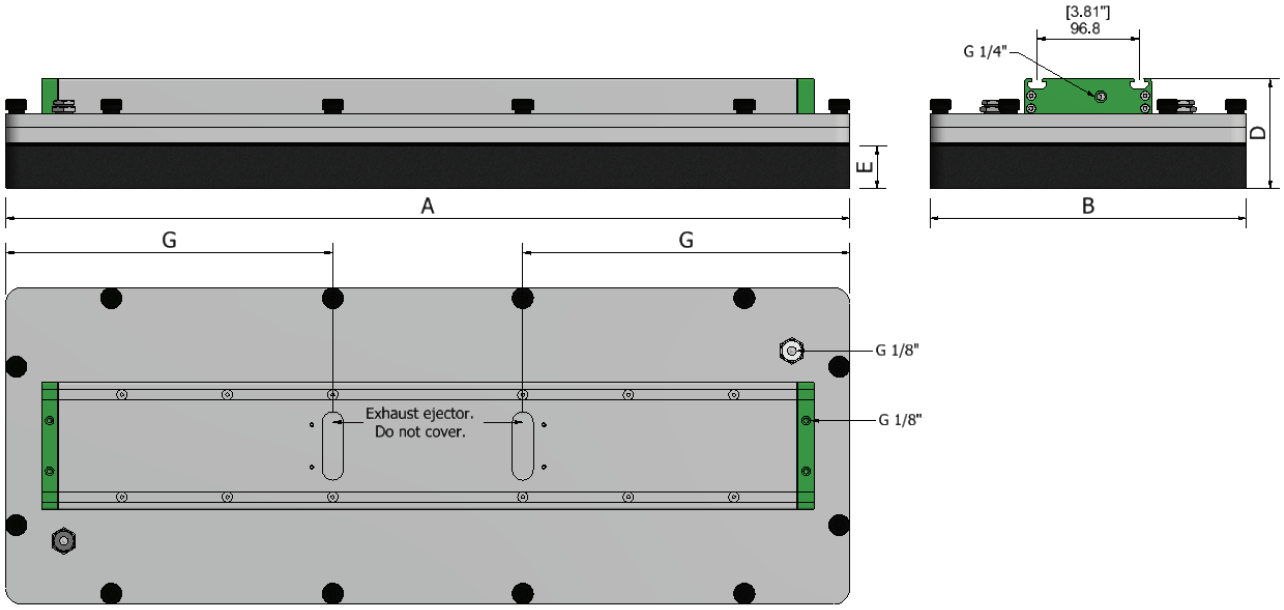
Code	Type
N	Foam
Code	**Thickness**
4	Foam 40 mm
3	Foam 30 mm
2	Foam 20 mm
1	Foam 10 mm
Code	**Filter**
0	Without filter
Code	**Step**
5	Step 30 mm

KVGL . 400 . 240 . N405 . CVL . S3

Code	Technology
CVL	Check Valves Low flow
CVM	Check Valves Medium flow
CVH	Check Valves High flow

Code	Vacuum generator
S3	3 cartridge Si32-3
S4	4 cartridge Si32-3
S6	6 cartridge Si32-3
S8	8 cartridge Si32-3
PU	Pump connection (with cylinder)
BL1	Blower connection G1-1/4"
BL2	Blower connection G2"

DIMENSIONS FOR KVGL-S WITH EJECTOR



	Type	A (mm)	B (mm)	D* (mm)	E (mm)	G** (mm)	Weight (kg)
TYPE 240	KVGL400-240	400	240	104	10/20/30/40	–	7.4
	KVGL600-240	600	240	104	10/20/30/40	–	10.9
	KVGL800-240	800	240	104	10/20/30/40	310	14.7
	KVGL1000-240	1000	240	104	10/20/30/40	310	18.2
	KVGL1200-240	1220	240	104	10/20/30/40	310	22.0
TYPE 300	KVGL400-300	400	300	104	10/20/30/40	–	8.7
	KVGL600-300	600	300	104	10/20/30/40	–	13.1
	KVGL800-300	800	300	104	10/20/30/40	310	16.7
	KVGL1000-300	1000	300	104	10/20/30/40	310	20.7
	KVGL1200-300	1220	300	104	10/20/30/40	310	25.0

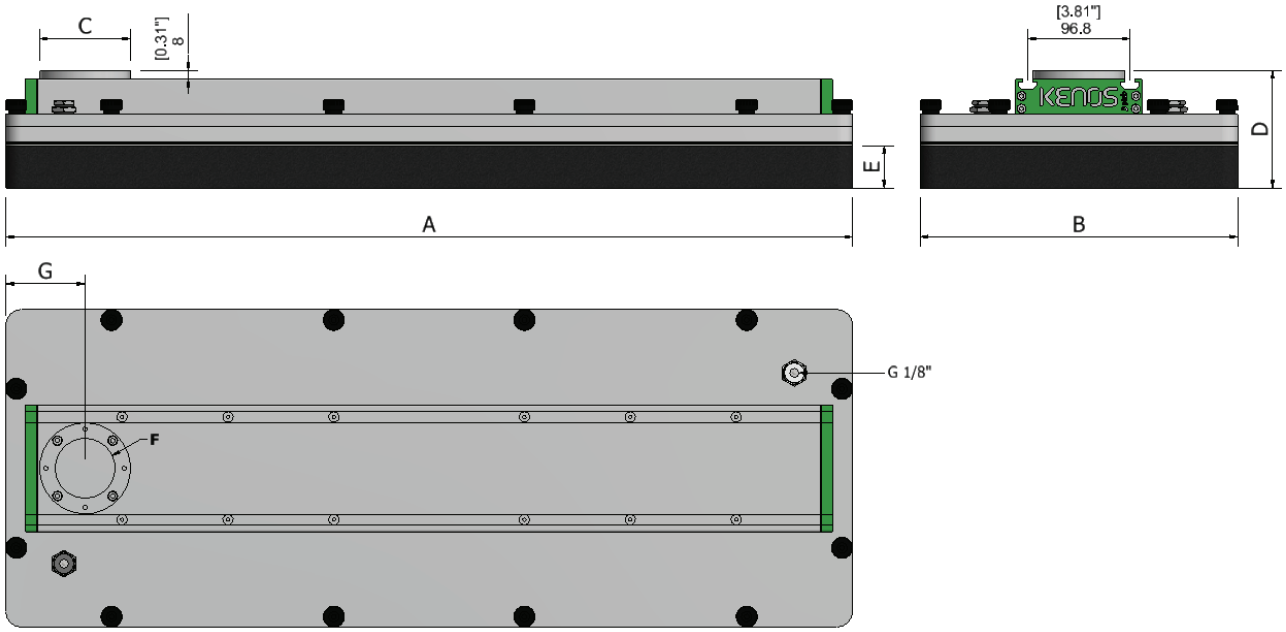
Specifications subject to change without notice.

	Type	A (mm)	B (mm)	D* (mm)	E (mm)	G** (mm)	Weight (kg)
TYPE 400	KVGL400-400	400	400	104	10/20/30/40	–	10.7
	KVGL600-400	600	400	104	10/20/30/40	–	16.2
	KVGL800-400	800	400	104	10/20/30/40	310	21.4
	KVGL1000-400	1000	400	104	10/20/30/40	310	26.6
	KVGL1200-400	1220	400	104	10/20/30/40	310	32.4

*The total dimension (D) is calculated with 40 mm foam.

**On KVGL400 and KVGL600 grippers there are no exhaust holes because the exhaust takes place axially.

DIMENSIONS FOR KVGL-S WITH BLOWER



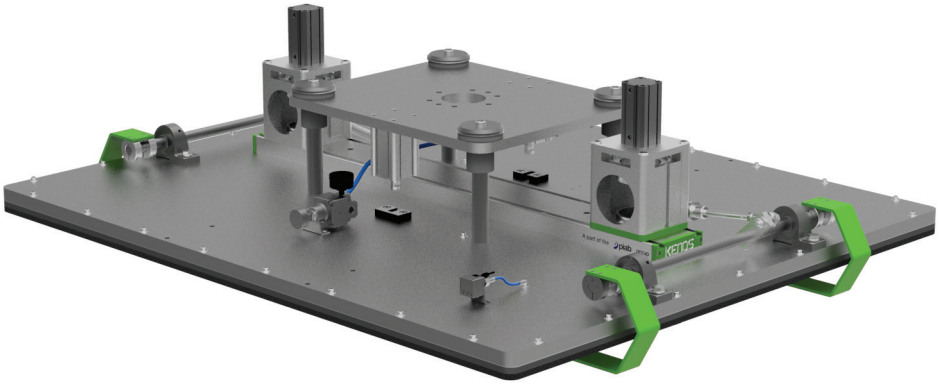
Type		A (mm)	B (mm)	C (mm)	D* (mm)	E (mm)	F (inch)	G (mm)	Weight (kg)
TYPE 240	KVGL400-240	400	240	70/86	112	10/20/30/40	G1-1/4" /2"	65/75	7.2
	KVGL600-240	600	240	70/86	112	10/20/30/40	G1-1/4" /2"	65/75	10.2
	KVGL800-240	800	240	70/86	112	10/20/30/40	G1-1/4" /2"	65/75	14.1
	KVGL1000-240	1000	240	86	112	10/20/30/40	G2"	75	17.7
	KVGL1200-240	1220	240	86	112	10/20/30/40	G2"	75	21.5

Type		A (mm)	B (mm)	C (mm)	D* (mm)	E (mm)	F (inch)	G (mm)	Weight (kg)
TYPE 300	KVGL400-300	400	300	70/86	112	10/20/30/40	G1-1/4" /2"	65/75	8.4
	KVGL600-300	600	300	70/86	112	10/20/30/40	G1-1/4" /2"	65/75	12.5
	KVGL800-300	800	300	70/86	112	10/20/30/40	G2"	65/75	16.2
	KVGL1000-300	1000	300	86	112	10/20/30/40	G2"	75	20.2
	KVGL1200-300	1220	300	86	112	10/20/30/40	G2"	75	24.6
TYPE 400	KVGL400-400	400	400	86	112	10/20/30/40	G2"	75	10.5
	KVGL600-400	600	400	86	112	10/20/30/40	G2"	75	15.6
	KVGL800-400	800	400	86	112	10/20/30/40	G2"	75	20.9
	KVGL1000-400	1000	400	86	112	10/20/30/40	G2"	75	26.1
	KVGL1200-400	1220	400	86	112	10/20/30/40	G2"	75	31.8

*The total dimension (D) is calculated with 40 mm foam.

Specifications subject to change without notice.

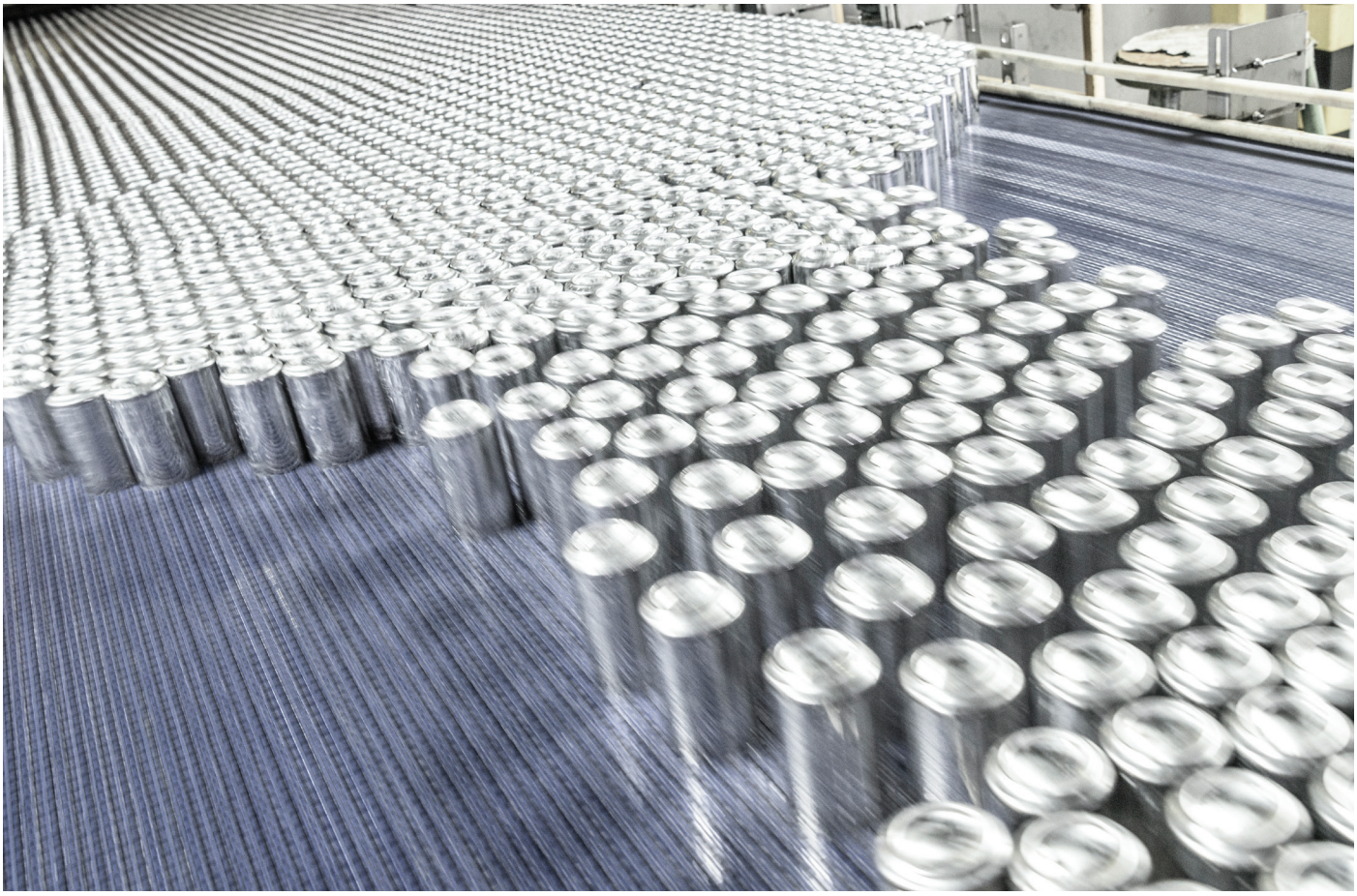
KVGL-CJ series



KVGL-CJ series, Kenos® Vacuum Layer - Cans Jars, born for the need to handle the complete layer of cans, jars that can be open or closed on the gripping area. Typical industrial segments involved are palletizing or de-palletising in packaging, beverage, food.

ADVANTAGES

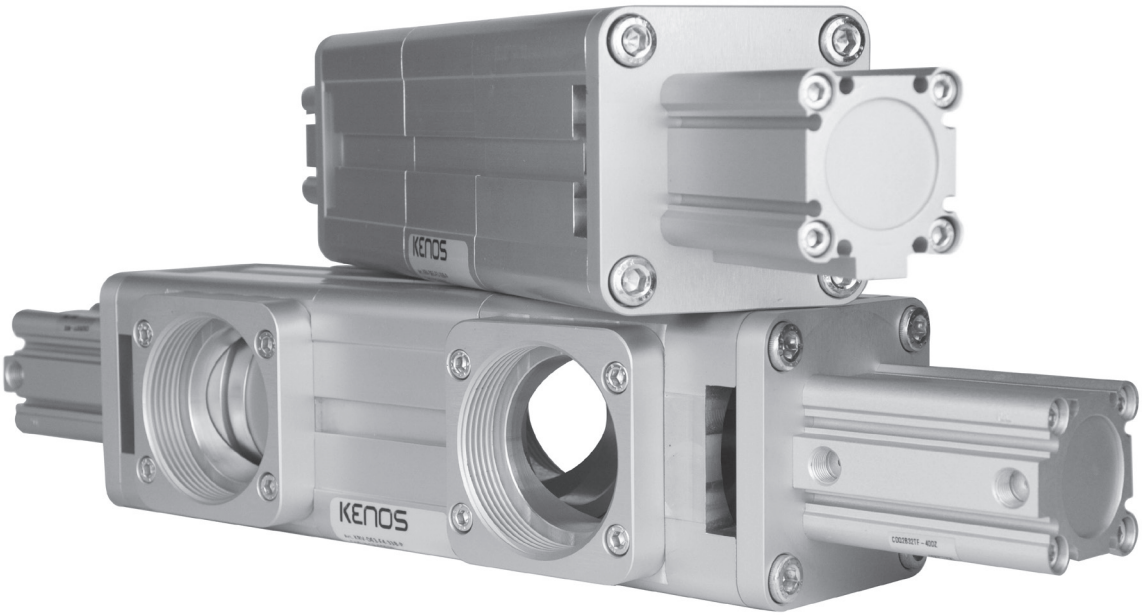
- Handling of the complete or partial layer
- Handling of pallet
- Handling of cardboard interlayer
- Flow reduction technologies
- External vacuum generation with side channel blower
- Connection flange integrated







KRV series



KRV series, Kenos® Reverse Valve, are valves for vacuum with pneumatic control 2x3/2 that are used in vacuum generation machines using side channel blower. They have the function of suction or blow flow depending on the operation. They are made of anodized aluminium with POM C seals.

KRV – CUSTOMER CODE

KRV . D63 . F4 . 33B . P

Code	Model
KRV	KRV

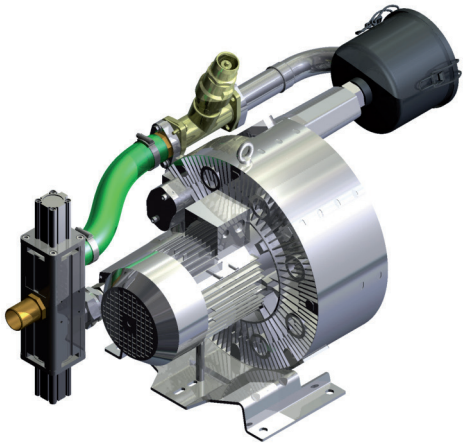
Code	Shape
D63	63 mm
D100	100 mm

Code	Size
F2	1-1/4”
F4	2”
F5	2-1/2”
F6	3”

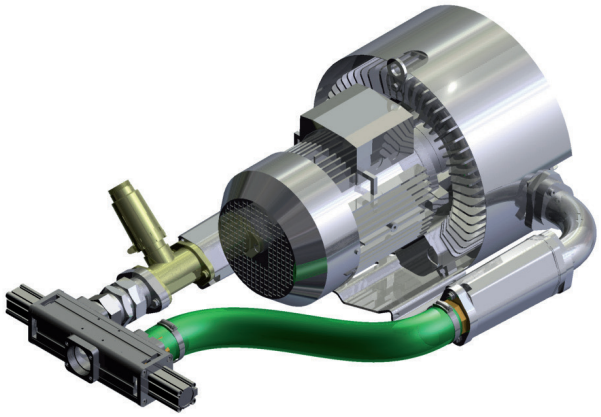
Code	Function
33	2×3/2
Code	**Condition**
B	Bistable

Code	Control
P	Pneumatic

Connection example.

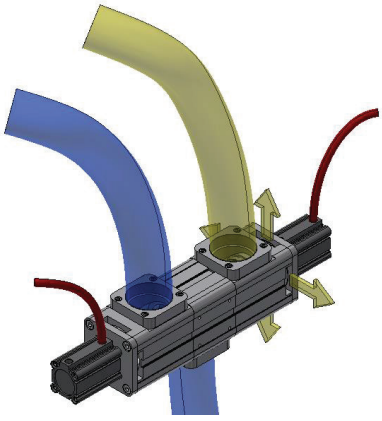


KRV-F2 with blower

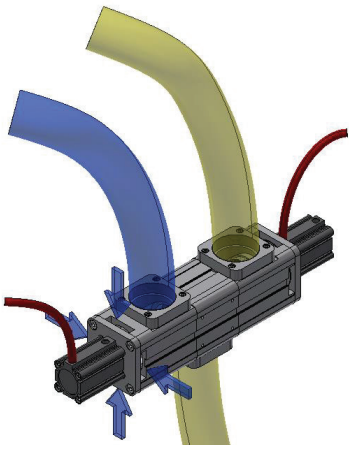


KRV-F4 with blower

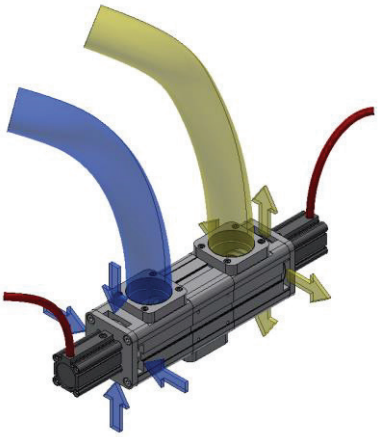
Functional diagram.



Suction position



Blowing position



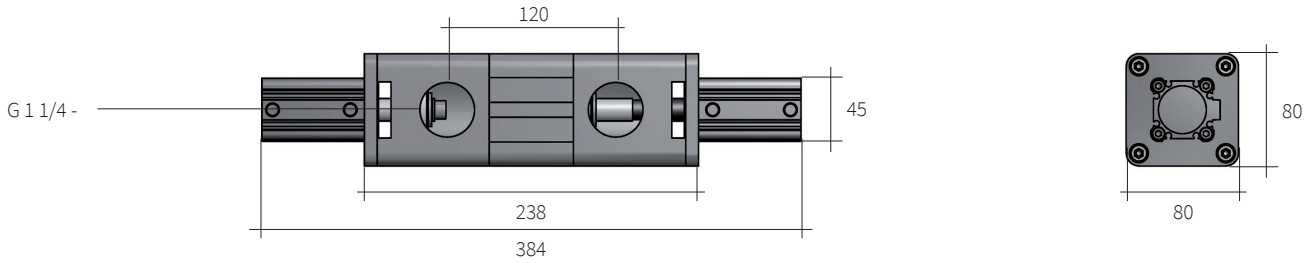
Neutral position

Suction hose

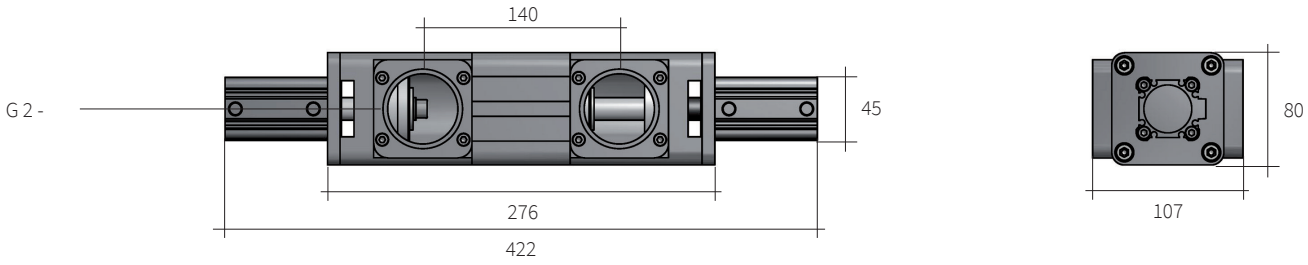
Blowing hose

Pressurization cylinder

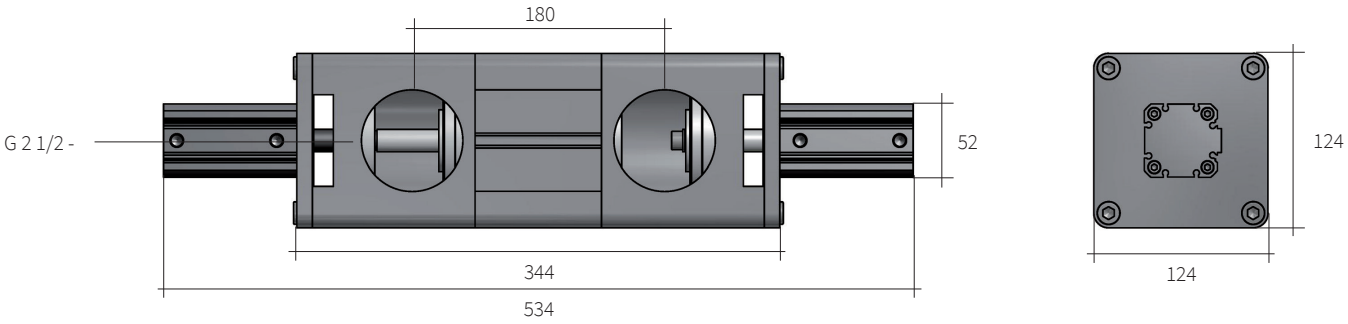
KRV-D63-F2-33B-P



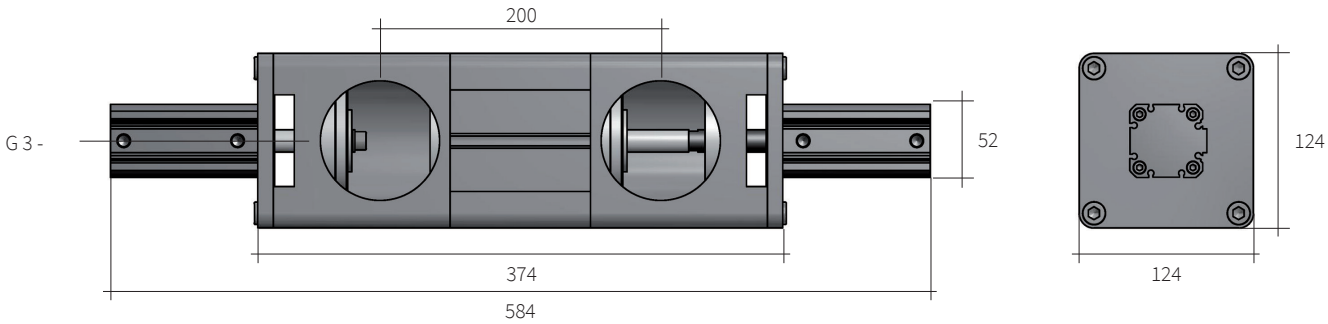
KRV-D63-F4-33B-P



KRV-D100-F5-33B-P



KRV-D100-F6-33B-P



unit of measure: mm

Specifications subject to change without notice.

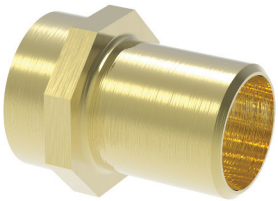
Kenos® accessories



KENOS® ACCESSORIES	**399**
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Hose connector	400
Hose clamps	402
Mounting kit	402
Sealing flange	403
T-slot nut kit	403
EV connection cable	403

Kenos® accessories





Hoses

- The hose range is made by PUR and specific for robot applications.
- Hoses are available in different sizes.

Hose connector

- Hose connectors are made by brass and available in different sizes.
- Together with the PUR hoses can connect pump and blowers to grippers.

TECHNICAL DATA

Description	Inner diameter (mm)	Outer diameter (mm)	Weight (kg)	Vacuum max. (mbar)	Radius curvature min. (mm)	Temperature (°C)
Hose PUR 25 – 10m	25	33	0.29	-940	47	-40/+90
Hose PUR 32 – 10m	32	41	0.39	-940	60	-40/+90
Hose PUR 40 – 10m	40	49	0.49	-830	72	-40/+90
Hose PUR 50 – 10m	50	61	0.71	-800	87	-40/+90
Hose PUR 60 – 10m	60	70	0.84	-750	102	-40/+90
Hose PUR 75 – 10m	75	87	1.06	-600	126	-40/+90
Hose PUR 90 – 10m	90	101	1.25	-520	149	-40/+90
Hose connector KP-1-25	–	–	0.03	–	–	–
Hose connector KP-1-32	–	–	0.19	–	–	–
Hose connector KP-1-1/4-32	–	–	0.19	–	–	–
Hose connector KP-1-1/2-40	–	–	0.29	–	–	–
Hose connector KP-1-1/4-40	–	–	0.24	–	–	–
Hose connector KP-2-50	–	–	0.37	–	–	–
Hose connector KP-2-60	–	–	0.59	–	–	–
Hose connector KP-2-1/2-75	–	–	0.69	–	–	–
Hose connector KP-3-75	–	–	1.22	–	–	–

Specifications subject to change without notice.

ORDERING INFORMATION

Description	Item no.
Hose PUR 25 – 10m	0210866
Hose PUR 32 – 10m	0210867
Hose PUR 40 – 10m	0210660
Hose PUR 50 – 10m	0210661
Hose PUR 60 – 10m	0210868
Hose PUR 75 – 10m	0210869
Hose PUR 90 – 10m	0210870
Hose connector KP-1-25	0210356
Hose connector KP-1-32	0208951
Hose connector KP-1-1/4-32	0208949
Hose connector KP-1-1/2-40	0208948
Hose connector KP-1-1/4-40	0208950
Hose connector KP-2-50	0208953
Hose connector KP-2-60	0208954
Hose connector KP-2-1/2-75	0208952
Hose connector KP-3-75	0208955

Specifications subject to change without notice.



Hose clamps

- Used to fixate hose to hose connector.



Mounting kit

- Allows grippers fix to the machine using the slots present on the body of the gripper.
- Level compensators can be connected trought the three threaded holes in the flange.
- Flange made by AL.

TECHNICAL DATA

Description	Clamp range (mm)	Width (mm)
Hose clamp D= 27–40	27–40	13
Hose clamp D= 45–60	45–60	13
Hose clamp D= 55–70	55–70	13
Hose clamp D= 70–90	70–90	13
Mounting kit KIT-FL-FX-KVG120-60	–	–

ORDERING INFORMATION

Description	Item no.
Hose clamp D= 27–40	0208956
Hose clamp D= 45–60	0208957
Hose clamp D= 55–70	0208958
Hose clamp D= 70–90	0208959
Mounting kit KIT-FL-FX-KVG120-60	0209503

Specifications subject to change without notice.



Sealing flange

- Integrated seal to close BL vacuum connection in case not in use.
- Flange made by AL.



T-slot nut kit

- The T-slots are used to fix grippers to the machine. You can insert the T-slot in the slots present on the body of the gripper.
- Available with different threaded holes.



EV connection cable

- Cable with standard M8 3 poles connector for solenoid valves supply.
- Cable lenght 2 meters.

TECHNICAL DATA

Description	Weight (kg)	Thread
Sealing flange CH-FL-CON-2-KVG120-60	0.1	–
T-slot nut kit M4 – 10mm – 4pcs	–	M4
T-slot nut kit M5 – 10mm – 4pcs	–	M5
T-slot nut kit M6 – 10mm – 4pcs	–	M6
T-slot nut kit M8 – 10mm – 4pcs	–	M8
Cable M8 3-pin fem. - L=2m	–	–

ORDERING INFORMATION

Description	Item no.
Sealing flange CH-FL-CON-2-KVG120-60	0208348
T-slot nut kit M4 – 10mm – 4pcs	0209862
T-slot nut kit M5 – 10mm – 4pcs	0209585
T-slot nut kit M6 – 10mm – 4pcs	0209586
T-slot nut kit M8 – 10mm – 4pcs	0209588
Cable M8 3-pin fem. - L=2m	0108141

Specifications subject to change without notice.

Warranties

- 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 vacuum pumps excluding accessories and controls.
- A one-year warranty is valid for other products if the failure has occurred within specified lifetime in terms of duty cycles.

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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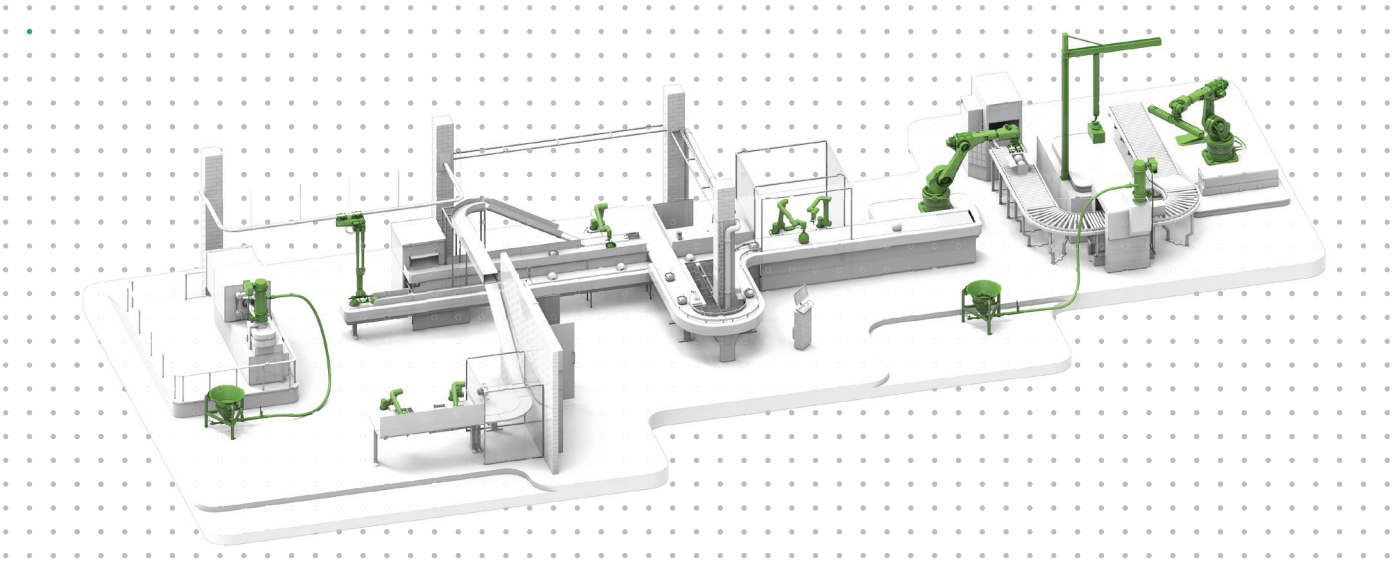
Flexibility – Fully configurable to specific needs in any application.

Productivity – Easy to clean and assemble.

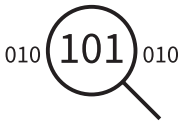
Space saving – Compact with minimum requirement on floor space.

Specifications subject to change without notice.

piSMART®



piSMART® – more intelligent and cloud-connected versions of the company's most advanced vacuum technology products, kitted out for the smart factories of the future. Visit **piab.com** to read more.



IO-Link provides a platform for integrated communication and sensors, enabling successful **information transparency**.



Estimates suggest that **condition monitoring** can achieve a drop of between 1–20% in unplanned and/or planned stops.



In large systems **energy saving** can help reduce the air consumption by up to 90% in every cycle.



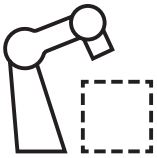
IO-Link guarantees **interoperability** between different devices, regardless of the technology standard used in the overall system.



The ability to use accurate **preset settings** provides opportunity for real-time adjustments of single or multiple settings without a major reset of the entire system.



Auto tuning is an example of **decentralised decisions** that form the basis for Industry 4.0.



With piSMART® it is **easy to simulate** the increase of efficiency of, for instance, vacuum pumps. Estimates show that a pump that is 5–20% percent more efficient would result in a productivity gain of up to 10%.

Specifications subject to change without notice.

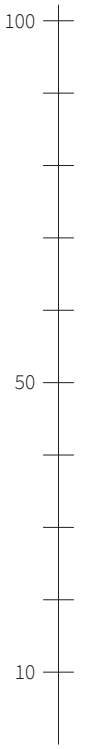
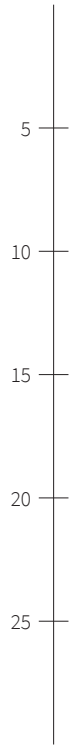
Tables

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PRESSURE UNIT CONVERSIONS

	Pa (N/m^2)	kPa	bar	at (kp/cm^2)	Torr	psi (lbf/in^2)	inHg
1 Pa	1	0.001	0.00001	10.1972×10^{-6}	7.50062×10^{-3}	0.145038×10^{-3}	0.3×10^{-3}
1 kPa	1000	1	0.01	10.1972×10^{-3}	7.50062	0.145038	0.3
1 bar	100000	100	1	1.01972	750.062	14.5038	30
1 at	98066.5	98.0665	0.980665	1	735.559	14.2233	29.42
1 torr	133.322	0.133322	1.33322×10^{-3}	1.35951×10^{-3}	1	19.3368×10^{-3}	0.04
1 psi	6894.76	6.89476	68.9476×10^{-3}	70.3069×10^{-3}	51.7149	1	2.07

NEGATIVE PRESSURE – IMPORTANT VALUES

Sea level	kpa 101.3	mbar 1013	Torr 760	-kPa* 0	-mmHg 0	-inHg 0	% vacuum 0
							
Absolute vacuum	0	0	0	101.3	760	30	100

FLOW CONVERSIONS

	m^3/s	m^3/h	l/min	l/s	ft^3/min (scfm)
m^3/s	1	3600	60000	1000	2118.9
m^3/h	0.28×10^{-3}	1	16.6667	0.2778	0.5885
l/min	16.67×10^{-6}	0.06	1	0.0167	0.035
l/s	1×10^{-3}	3.6	60	1	2.1189
ft^3/min	0.472×10^{-3}	1.6992	28.32	0.4720	1

VARIATION OF PRESSURE ACCORDING TO ALTITUDE (ABOVE SEA LEVEL)

Atmospheric pressure is the reference point for most vacuum meters. Air pressure decreases as the altitude rises. The table below shows vacuum grades at different heights. Piab pumps always reach the same absolute vacuum level, regardless of altitude.

Altitude	Air pressure*			Vacuum level depending on altitude				
m	kPa	mbar	mm Hg					
Sea level, 0	101.3	1013.25	760	60.0	75.0	85.0	90.0	99.0
111	99.99	999.9	750	59.9	74.9	84.9	89.9	98.9
200	98.66	986.6	740	58.6	73.7	83.6	88.7	97.7
275	97.33	973.3	730	57.3	72.3	82.3	87.3	96.3
467	95.99	959.9	720	55.9	71.0	81.0	86.0	94.9
545	94.66	946.6	710	54.6	69.7	79.7	84.7	93.7
655	93.33	933.3	700	53.3	68.3	78.3	83.3	92.3
778	91.99	919.9	690	52.0	67.0	77.0	82.0	91.0
1000	89.46	894.6	671	49.4	64.5	74.5	79.5	88.5
2000	79.06	790.6	593	39.0	54.1	64.1	69.1	78.1

*Air pressure depends on weather conditions. In order to calculate the values according to the different heights, we have taken as the reference point the normal air pressure at the sea level: 101.3 kPa.

CARTRIDGES AND PUMPS

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
STX0670	0,50	0,32	0,33	0,28	0,24	0,19
STX0670 ×2	0,50	0,64	0,65	0,56	0,47	0,38
Ti05-2	0,60	0,37	0,31	0,27	0,24	0,20
Ti05-2 ×2	0,60	0,74	0,62	0,54	0,48	0,40
Pi12-2	0,60	0,75	0,66	0,60	0,50	0,41
Pi12-2 ×2	0,60	1,50	1,32	1,20	1,00	0,82
Di16-2	0,60	0,75	0,64	0,57	0,49	0,41
SX12	0,50	0,72	1,22	1,03	0,78	0,52
SX12 ×2	0,50	1,44	2,44	2,06	1,56	1,04
Si32-2	0,60	1,75	3,30	3,00	2,60	1,70
Xi40-2	0,45	1,83	2,80	2,30	1,60	1,00
SX42	0,47	2,21	3,46	3,02	2,41	1,70
H120	0,6	7,6	8,4	6,6	4,7	2,7
H40	0,6	2,6	2,8	2,1	1,5	0,9
L14	0,6	0,98	–	1,5	1	0,57
L28	0,6	2	2,6	1,7	1,1	0,89
L56	0,6	4	5,1	3,5	2	1,7
L7	0,6	0,49	0,72	0,49	0,29	0,25
M10L	0,6	1,1	1,3	0,91	0,48	0,29
M20L	0,6	2,2	2,4	1,7	0,95	0,57

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
0,17	0,11	0,06	0,03	–	–	70	≥ 2,5 mm	≥ 2,5 mm	≥ 8 mm
0,33	0,22	0,12	0,05	–	–	70	≥ 2,5 mm	≥ 2,5 mm	≥ 8 mm
0,15	0,09	0,04	0,01	–	–	75	≥ 2,5 mm	≥ 2,5 mm	≥ 8 mm
0,30	0,18	0,08	0,02	–	–	75	≥ 2,5 mm	≥ 2,5 mm	≥ 8 mm
0,36	0,28	0,17	0,05	0,01	–	83	≥ 4 mm	≥ 8 mm	≥ 10 mm
0,72	0,56	0,34	0,10	0,02	–	83	≥ 4 mm	≥ 8 mm	≥ 10 mm
0,35	0,29	0,18	0,04	–	–	73	≥ 4 mm	≥ 8 mm	≥ 10 mm
0,27	0,21	0,15	0,09	0,03	–	85	≥ 4 mm	≥ 8 mm	≥ 10 mm
0,54	0,42	0,30	0,18	0,06	–	85	≥ 4 mm	≥ 8 mm	≥ 10 mm
0,90	0,60	0,50	0,35	–	–	75	≥ 4 mm	≥ 12 mm	≥ 15 mm
0,73	0,58	0,43	0,32	0,18	0,03	95	≥ 4 mm	≥ 12 mm	≥ 15 mm
1,02	0,61	0,47	0,28	0,10	–	90	≥ 4 mm	≥ 12 mm	≥ 15 mm
1,5	1,2	0,86	0,62	0,43	0,1	0,05	9	15	19
0,4	0,3	0,2	0,14	0,1	0,095	0,019	6	8	10
0,45	0,39	0,32	0,24	–	–	75	4	10	12
0,74	0,55	0,36	0,17	–	–	75	4	12	12
1,4	1,1	0,81	0,43	–	–	75	6	15	15
0,2	0,16	0,1	0,067	–	–	75	2	8	10
0,26	0,21	0,13	0,09	0,03	–	84	2	8	10
0,48	0,38	0,29	0,19	0,06	–	84	4	10	12

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
M5L	0,6	0,55	0,73	0,5	0,26	0,14
MLL1200	0,6	84	255	143	97	51
MLL200	0,6	14	48	27	18,1	9,5
MLL400	0,6	28	92	52	35	18,4
MLL800	0,6	56	176	99	67	35
P3010 Pi12-3	0,32	0,44	1,4	0,6	0,44	0,27
P3010 Si08-3	0,6	0,44	1,34	0,73	0,55	0,35
P3010 Xi10-3	0,5	0,46	1,43	0,7	0,5	0,33
P5010 Pi48-2 ×1	0,31	2	2,8	2,5	1,8	1,1
P5010 Pi48-2 ×2	0,31	4	5,6	5	3,6	2,2
P5010 Pi48-3 ×1	0,31	2,05	5,6	2,5	1,8	1,1
P5010 Pi48-3 ×2	0,31	4,1	11,2	5	3,6	2,2
P5010 Si32-2 ×1	0,6	1,75	3,3	3	2,6	1,7
P5010 Si32-2 ×2	0,6	3,5	6,6	6	5,2	3,4
P5010 Si32-3 ×1	0,6	1,75	6	3,5	2,6	1,7
P5010 Si32-3 ×2	0,6	3,5	12	7	5,2	3,4
P5010 Xi40-2 ×1	0,45	1,83	2,8	2,3	1,6	1
P5010 Xi40-2 ×2	0,45	3,66	5,6	4,6	3,2	2
P5010 Xi40-3 ×1	0,45	1,83	5,9	3	2	1,3
P5010 Xi40-3 ×2	0,45	3,66	11,8	6	4	2,6

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
0,12	0,1	0,08	0,05	0,02	–	84	2	5	8
26	17,9	12,8	6,1	2,6	0,05	91	20	75	100
4,8	3,3	2,4	1,1	0,48	0,01	91	10	32	40
9,2	6,4	4,6	2,2	0,92	0,02	91	12	40	60
17,6	12,3	8,8	4,2	1,8	0,04	91	15	50	75
0,19	0,14	0,1	0,06	0,03	–	90	4	8	10
0,23	0,17	0,13	0,08	–	–	75	4	8	10
0,19	0,15	0,11	0,07	0,045	0,011	94	4	8	10
0,65	0,5	0,35	0,25	0,1	–	90	6	12	15
1,3	1	0,7	0,5	0,2	–	90	8	15	19
0,65	0,5	0,35	0,25	0,1	–	90	6	12	15
1,3	1	0,7	0,5	0,2	–	90	8	15	19
0,9	0,6	0,5	0,35	–	–	75	4	12	15
1,8	1,2	1	0,7	–	–	75	6	15	19
0,9	0,6	0,5	0,35	–	–	75	4	12	15
1,8	1,2	1	0,7	–	–	75	6	15	19
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
1,46	1,16	0,86	0,64	0,36	0,06	95	6	15	19
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
1,46	1,16	0,86	0,64	0,36	0,06	95	6	15	19

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
P6010 Pi48-3 ×1	0,31	2	5,6	2,5	1,8	1,1
P6010 Pi48-3 ×2	0,31	4	11,2	5	3,6	2,2
P6010 Pi48-3 ×3	0,31	6	16,8	7,5	5,4	3,3
P6010 Pi48-3 ×4	0,31	8	22,4	10	7,2	4,4
P6010 Si32-3 ×1	0,6	1,75	6	3,5	2,6	1,7
P6010 Si32-3 ×2	0,6	3,5	12	7	5,2	3,4
P6010 Si32-3 ×3	0,6	5,25	18	10,5	7,8	5,1
P6010 Si32-3 ×4	0,6	7	24	14	10,4	6,8
P6010 Xi40-3 ×1	0,45	1,83	5,9	3	2	1,3
P6010 Xi40-3 ×2	0,45	3,66	11,8	6	4	2,6
P6010 Xi40-3 ×3	0,45	5,49	17,7	9	6	3,9
P6010 Xi40-3 ×4	0,45	7,32	23,6	12	8	5,2
P6040 Pi48-3 ×10	0,31	20	56	25	18	11
P6040 Pi48-3 ×11	0,31	22	61,6	27,5	19,8	12,1
P6040 Pi48-3 ×12	0,31	24	67,2	30	21,6	13,2
P6040 Pi48-3 ×13	0,31	22	61,6	27,5	19,8	12,1
P6040 Pi48-3 ×14	0,31	28	78,4	35	25,2	15,4
P6040 Pi48-3 ×15	0,31	30	84	37,5	27	16,5
P6040 Pi48-3 ×16	0,31	32	89,6	40	28,8	17,6
P6040 Pi48-3 ×7	0,31	14	39,2	17,5	12,6	7,7

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
0,65	0,5	0,35	0,25	0,1	–	90	6	12	15
1,3	1	0,7	0,5	0,2	–	90	8	15	19
1,95	1,5	1,05	0,75	0,3	–	90	10	19	22
2,6	2	1,4	1	0,4	–	90	10	22	25
0,9	0,6	0,5	0,35	–	–	75	4	12	15
1,8	1,2	1	0,7	–	–	75	6	15	19
2,7	1,8	1,5	1,05	–	–	75	8	19	22
3,6	2,4	2	1,4	–	–	75	8	22	25
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
1,46	1,16	0,86	0,64	0,36	0,06	95	6	15	19
2,19	1,74	1,29	0,96	0,54	0,09	95	8	19	22
2,92	2,32	1,72	1,28	0,72	0,12	95	8	22	25
6,5	5	3,5	2,5	1	–	90	11	40	45
7,15	5,5	3,85	2,75	1,1	–	90	12	40	50
7,8	6	4,2	3	1,2	–	90	12	40	50
7,15	5,5	3,85	2,75	1,1	–	90	13	40	55
9,1	7	4,9	3,5	1,4	–	90	13	40	55
9,75	7,5	5,25	3,75	1,5	–	90	14	45	60
10,4	8	5,6	4	1,6	–	90	14	45	60
4,55	3,5	2,45	1,75	0,7	–	90	11	35	40

Specifications subject to change without notice.

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
P6040 Pi48-3 ×8	0,31	16	44,8	20	14,4	8,8
P6040 Pi48-3 ×9	0,31	18	50,4	22,5	16,2	9,9
P6040 Si32-3 ×10	0,6	17,5	60	35	26	17
P6040 Si32-3 ×11	0,6	19,25	66	38,5	28,6	18,7
P6040 Si32-3 ×12	0,6	21	72	42	31,2	20,4
P6040 Si32-3 ×13	0,6	22,75	78	45,5	33,8	22,1
P6040 Si32-3 ×14	0,6	24,5	84	49	36,4	23,8
P6040 Si32-3 ×15	0,6	26,25	90	52,5	39	25,5
P6040 Si32-3 ×16	0,6	28	96	56	41,6	27,2
P6040 Si32-3 ×7	0,6	12,25	42	24,5	18,2	11,9
P6040 Si32-3 ×8	0,6	14	48	28	20,8	13,6
P6040 Si32-3 ×9	0,6	15,75	54	31,5	23,4	15,3
piCLASSIC Pi48-3 ×1	0,31	2,05	5,6	2,5	1,8	1,1
piCLASSIC Pi48-3 ×2	0,31	4,1	11,2	5	3,6	2,2
piCLASSIC Pi48-3 ×3	0,31	4,1	11,2	5	3,6	2,2
piCLASSIC Pi48-3 ×4	0,31	6,15	16,8	7,5	5,4	3,3
piCLASSIC Pi48-3 ×5	0,31	10,25	28	12,5	9	5,5
piCLASSIC Pi48-3 ×6	0,31	12,3	33,6	15	10,8	6,6
piCLASSIC Si32-3 ×1	0,6	1,75	6	3,5	2,6	1,7
piCLASSIC Si32-3 ×2	0,6	3,5	12	7	5,2	3,4

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
5,2	4	2,8	2	0,8	–	90	11	35	40
5,85	4,5	3,15	2,25	0,9	–	90	11	40	45
9	6	5	3,5	–	–	75	9	40	40
9,9	6,6	5,5	3,85	–	–	75	10	40	50
10,8	7,2	6	4,2	–	–	75	10	40	50
11,7	7,8	6,5	4,55	–	–	75	10	45	50
12,6	8,4	7	4,9	–	–	75	10	45	50
13,5	9	7,5	5,25	–	–	75	11	45	50
14,4	9,6	8	5,6	–	–	75	11	45	50
6,3	4,2	3,5	2,45	–	–	75	8	35	40
7,2	4,8	4	2,8	–	–	75	8	35	40
8,1	5,4	4,5	3,15	–	–	75	9	40	40
0,65	0,5	0,35	0,25	0,1	–	90	6	12	15
1,3	1	0,7	0,5	0,2	–	90	8	15	19
1,3	1	0,7	0,5	0,2	–	90	10	19	22
1,95	1,5	1,05	0,75	0,3	–	90	10	22	25
3,25	2,5	1,75	1,25	0,5	–	90	10	25	32
3,9	3	2,1	1,5	0,6	–	90	12	32	40
0,9	0,6	0,5	0,35	–	–	75	4	12	15
1,8	1,2	1	0,7	–	–	75	6	15	19

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
piCLASSIC Si32-3 ×3	0,6	5,25	18	10,5	7,8	5,1
piCLASSIC Si32-3 ×4	0,6	7	24	14	10,4	6,8
piCLASSIC Si32-3 ×5	0,6	8,75	30	17,5	13	8,5
piCLASSIC Si32-3 ×6	0,6	10,5	36	21	15,6	10,2
piCLASSIC Xi40-3 ×1	0,45	1,83	5,9	3	2	1,3
piCLASSIC Xi40-3 ×2	0,45	3,66	11,8	6	4	2,6
piCLASSIC Xi40-3 ×3	0,45	5,49	17,7	9	6	3,9
piCLASSIC Xi40-3 ×4	0,45	7,32	23,6	12	8	5,2
piCLASSIC Xi40-3 ×5	0,45	9,15	29,5	15	10	6,5
piCLASSIC Xi40-3 ×6	0,45	10,98	35,4	18	12	7,8
piCOMPACT® 10X Bi03-2	0.22	0.14	0.21	0.14	0.063	0.021
piCOMPACT® 10X Si02-2	0.604	0.11	0.26	0.18	0.095	0.053
piCOMPACT® 10X Ti05-2	0.43	0.23	0.31	0.28	0.22	0.16
piCOMPACT® 10X Xi2,5-2	0.51	0.13	0.23	0.15	0.079	0.044
piINLINE® MIDI	0,6	1,75	3,1	2,5	1,9	1,2
piINLINE® MICRO	0,4	0,27	0,32	0,28	0,23	0,17
piINLINE® MINI	0,6	0,44	0,69	0,55	0,42	0,28
piPUMP10X Bi03-2	0.2	0.14	0.21	0.14	0.063	0.021
piPUMP10X Si02-2	0.6	0.11	0.26	0.18	0.095	0.053
piPUMP10X Ti05-2	0.4	0.23	0.31	0.28	0.22	0.16

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
2,7	1,8	1,5	1,05	–	–	75	8	19	22
3,6	2,4	2	1,4	–	–	75	8	22	25
4,5	3	2,5	1,75	–	–	75	10	25	32
5,4	3,6	3	2,1	–	–	75	10	32	40
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
1,46	1,16	0,86	0,64	0,36	0,06	95	6	15	19
2,19	1,74	1,29	0,96	0,54	0,09	95	8	19	22
2,92	2,32	1,72	1,28	0,72	0,12	95	8	22	25
3,65	2,9	2,15	1,6	0,9	0,15	95	10	25	32
4,38	3,48	2,58	1,92	1,08	0,18	95	10	32	40
0.016	0.014	0.007	0.004	–	–	82	2	2	–
0.045	0.038	0.027	0.019	–	–	75	2	2	–
0.088	0.063	0.045	0.023	–	–	84	2	4	–
0.036	0.03	0.023	0.013	–	–	91	2	2	–
0,7	0,6	0,5	0,35	–	–	75	8	12	–
0,1	0,07	0,04	0,02	0,004	–	84	4	4	–
0,23	0,16	0,12	0,08	–	–	75	6	6	–
0.016	0.014	0.007	0.004	–	–	82	–	–	–
0.045	0.038	0.027	0.019	–	–	75	–	–	–
0.088	0.063	0.045	0.023	–	–	84	–	–	–

Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
piPUMP10X Xi2,5-2	0.5	0.13	0.23	0.15	0.079	0.044
Round Si32-3 ×6	0.6	10.5	36	21	15.6	10.2
VGS™2010 Bi03-2	0,18	0,14	0,23	0,15	0,06	0,04
VGS™2010 Si02-2	0,6	0,12	0,28	0,21	0,12	0,08
VGS™2010 Ti05-2	0,4	0,27	0,32	0,28	0,23	0,17
VGS™2010 Xi2,5-2	0,5	0,13	0,24	0,17	0,1	0,06
VGS™3010 Di16-2	0.6	0.75	0.64	0.57	0.49	0.41
VGS™3010 Pi12-2	0.32	0.44	0.68	0.6	0.44	0.27
VGS™3010 Pi12-3	0.32	0.44	1.4	0.6	0.44	0.27
VGS™3010 Si08-2	0.6	0.44	0.77	0.67	0.51	0.33
VGS™3010 Si08-3	0.6	0.44	1.34	0.73	0.55	0.35
VGS™3010 Xi10-2	0.5	0.46	0.75	0.63	0.49	0.33
VGS™3010 Xi10-3	0.5	0.46	1.43	0.7	0.5	0.33
VGS™3040 Pi12-2	0,32	0,44	0,68	0,6	0,44	0,27
VGS™3040 Pi12-3	0,32	0,44	1,4	0,6	0,44	0,27
VGS™3040 Si08-2	0,6	0,44	0,77	0,67	0,51	0,33
VGS™3040 Si08-3	0,6	0,44	1,34	0,73	0,55	0,35
VGS™3040 Xi10-2	0,5	0,46	0,75	0,63	0,49	0,33
VGS™3040 Xi10-3	0,5	0,46	1,43	0,7	0,5	0,33
VGS™5010 Pi48-2	0,31	2	2,8	2,5	1,8	1,1

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
0.036	0.03	0.023	0.013	–	–	91	–	–	–
5.4	3.6	3	2.1	–	–	75	10	50	50
0,035	0,023	0,013	0,006	—	–	83	3	3	8
0,07	0,06	0,04	0,02	—	–	75	3	3	8
0,1	0,07	0,04	0,02	0,004	–	84	3	3	8
0,04	0,03	0,02	0,01	0,01	–	92	3	3	8
0.35	0.29	0.18	0.04	—	—	73	4	8	8
0.19	0.14	0.1	0.06	0.03	—	90	4	8	8
0.19	0.14	0.1	0.06	0.03	—	90	4	8	8
0.23	0.16	0.12	0.08	—	—	75	4	8	8
0.23	0.17	0.13	0.08	—	—	75	4	8	8
0.19	0.15	0.11	0.07	0.04	0.011	94	4	8	8
0.19	0.15	0.11	0.07	0.04	0.011	94	4	8	8
0,19	0,14	0,1	0,06	0,03	—	90	4	8	10
0,19	0,14	0,1	0,06	0,03	—	90	4	8	10
0,23	0,16	0,12	0,08	—	—	75	4	8	10
0,23	0,17	0,13	0,08	—	—	75	4	8	10
0,19	0,15	0,11	0,07	0,045	0,011	94	4	8	10
0,19	0,15	0,11	0,07	0,045	0,011	94	4	8	10
0,65	0,5	0,35	0,25	0,1	—	90	6	12	15

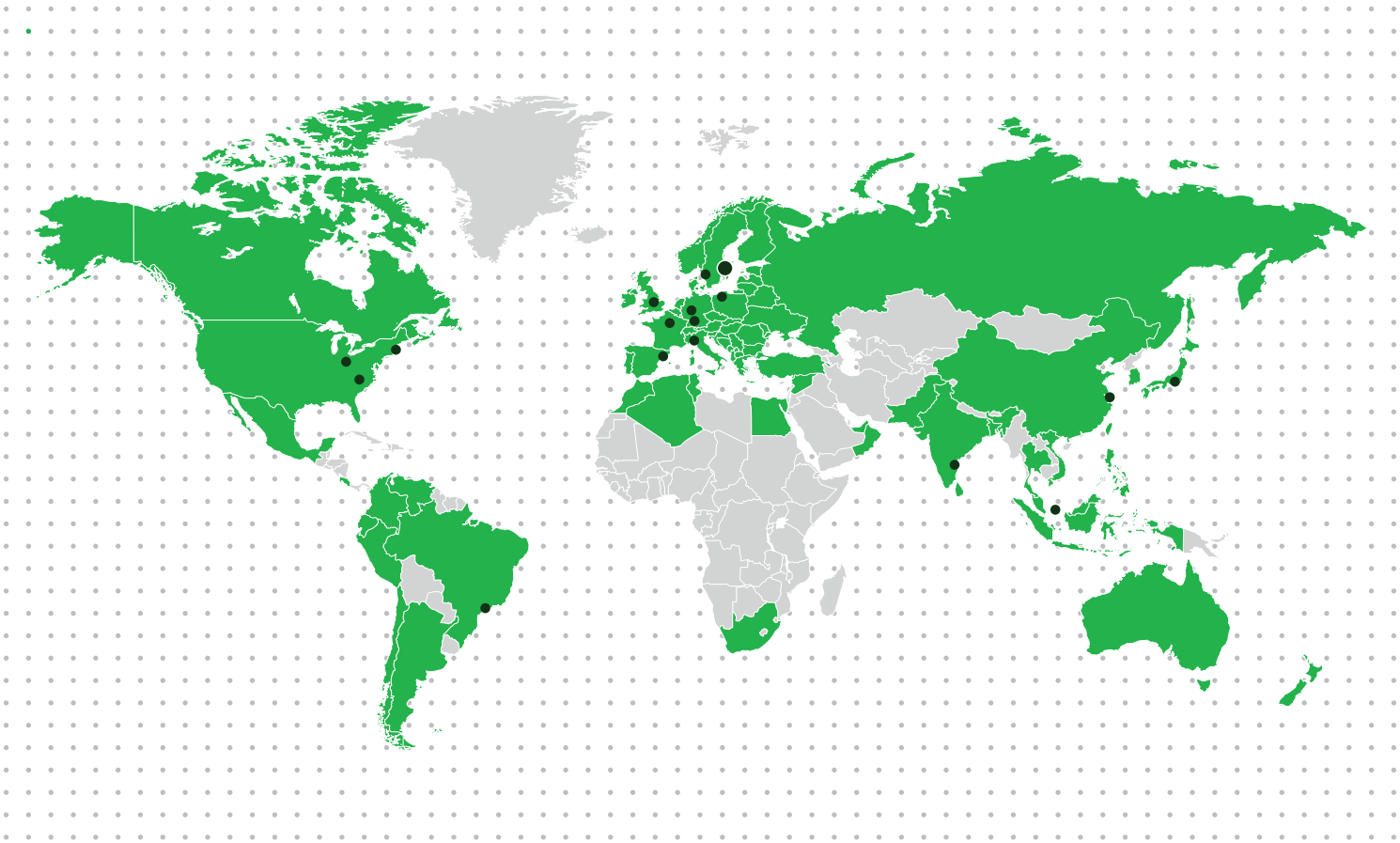
Description	Feed pressure	Air consumption	Vacuum flow (Nl/s) at different vacuum levels (-kPa)			
	MPa	Nl/s	0	10	20	30
VGS™5010 Pi48-3	0,31	2,05	5,6	2,5	1,8	1,1
VGS™5010 Si32-2	0,6	1,75	3,3	3	2,6	1,7
VGS™5010 Si32-3	0,6	1,75	6	3,5	2,6	1,7
VGS™5010 Xi40-2	0,45	1,83	2,8	2,3	1,6	1
VGS™5010 Xi40-3	0,45	1,83	5,9	3	2	1,3
X10L	0,4	0,79	0,76	0,35	0,24	0,21
X20L	0,4	1,6	1,9	1	0,5	0,44
X40L	0,4	3,1	3,2	1,5	1	0,9
X5L	0,4	0,39	0,48	0,24	0,12	0,11

*max. 2 m length

						Max. vacuum*	Ø inner tubes (recommended)*		
40	50	60	70	80	90	-kPa	feed	vacuum	exhaust
0,65	0,5	0,35	0,25	0,1	—	90	6	12	15
0,9	0,6	0,5	0,35	—	—	75	4	12	15
0,9	0,6	0,5	0,35	—	—	75	4	12	15
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
0,73	0,58	0,43	0,32	0,18	0,03	95	4	12	15
0,16	0,13	0,1	0,07	0,04	0,01	93	4	5	8
0,38	0,3	0,25	0,17	0,1	0,02	93	4	10	12
0,7	0,6	0,5	0,4	0,17	0,038	93	6	8	10
0,1	0,086	0,071	0,057	0,03	0,006	93	2	5	8

Notes

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