TECHNOLOGY FOR VACUUM APPLICATIONS

Components for pneumatic automation

PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

PNEUMAX®

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SUCTION CUPS

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LEVEL COMPENSATORS

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Introduction:

"*The vacuum is an experimentally attainable state", as it is defined in physics.*, By vacuum, we mean a space completely void of matter, "called absolute vacuum".In practice, this state is unattainable, so when we say vacuum, we mean that the air pressure inside an environment is lower than atmospheric pressure, or when the density of the particles in the air is lower. With the expressions "Vacuum", "suction", "negative pressure", etc., we are referring to a pressure below atmospheric pressure, due to the weight of the overlying air. At sea level, this pressure is equal to 1013 mBar.

Degree of Vacuum

Depending on whether the pressure is higher or lower than atmospheric pressure, the phenomena that occur can vary considerably, and thus the means of achieving and measuring such pressure also varies. Usually we distinguish between different degrees of vacuum that are referred to by specific names as a function of the various intervals of sub-atmospheric pressure, as indicated below:

1) Low vacuum
2) Medium vacuum
3) High vacuum
4) Ultra high vacuum
5) Extreme high vacuum

In the industrial field, the vacuum is subdivided into three areas of application, which depend on the degree of vacuum required:

- **Low vacuum:** This term means a degree of vacuum between 0 and -20 KPa inclusive, most often used in applications where high air flow suction is required. In this industrial segment, electromechanical impeller pumps, side channel blowers, vacuum generators etc.
- **Industrial Vacuum**: this term refers to a degree of vacuum between -20 and -99 KPa inclusive. This range includes many of the applications where the vacuum is produced mainly by vacuum generators based on the Venturi principle, powered by compressed air and by vacuum pumps of the rotary vane, liquid ring, piston and hook-and-claw types, all driven by electric motors.
- **Process Vacuum:** This is a degree of vacuum higher than -99 KPa, where the main generators of this degree of vacuum are the two-stage rotary vane pumps, turbo molecular pumps, diffusion pumps, cryogenic pumps, etc., all driven by electric motor.

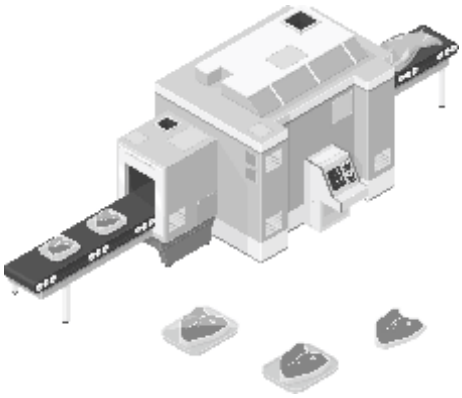
The highest value of vacuum reached on Earth is still far from the value of an absolute vacuum, which remains a purely theoretical matter. Even in space, so therefore in the absence of an atmosphere, there is a small presence of molecules per cubic metre. The impetus to improve vacuum technologies comes from industry and research. There is a great number of practical applications and highly disparate sectors: vacuum is used in the metallurgical, aerospace and food industries, in particle accelerators, in microelectronics, in the glass and ceramics industry, in industrial robotics, in moving and handling with suction cups, etc.

Some examples of application

Moving fragile products
- Handling eggs
- Handling glass
- Handling ceramic parts
- Handling electronic components

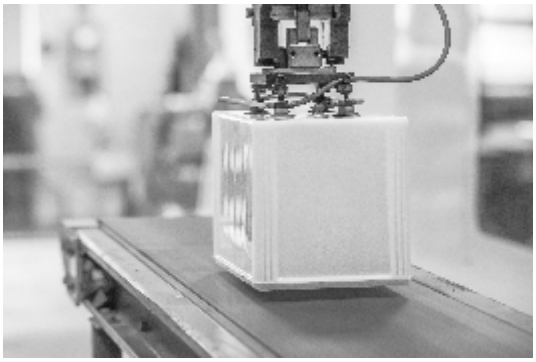
Robotics
- Handling auto parts for the automotive sector
- Palletisation in packaging sector
- Handling sheets of glass
- Handling slabs of marble
- Handling wood panels

Other examples of application



Vacuum packaging of food in modified atmosphere

Pick and Place
- Plastic sector
- Automotive sector
- Electronic sector
- Printing sector
- Packaging sector



Cardboard box forming
With the help of suction cups and vacuum generators, the cardboard boxes can be formed easily and quickly.

Transportation of powders and granules
With vacuum, it is possible to transport powders and granules while avoiding harm to the product and maintaining high standards of hygiene and safety.

Vacuum clamping
With the help of vacuum and proper suction cups, it is possible to clamp products such as wood, marble, glass, fibre composites, etc. onto workstations.

Evaporation and degassing
Vacuum can be used to lower the boiling point of any liquid, which considerably reduces the time needed to reach that point. In degassing applications, vacuum is used to reduce the gases present in a substance.
These gases may cause bubbles which have an adverse effection the product.

Vacuum infusion
Infusion of composite materials is a production process that is becoming increasingly more popular to improve the aesthetic quality of the end product and reduce total manpower costs. The general principle of infusion is to "absorb" the resin into there and in the fabrics to be reinforced by using vacuum technology. The vacuum reduces the pressure at one end of the layers of fabric, allowing the atmosphere to push the resin through all the layers of fabric. The speed and distance at which a stack of fabric can be filled depends on the viscosity of the resin system, permeability of the layers of fabric and pressure gradient that acts on the infused resin.

Thermoforming
Vacuum can be used in the process of thermoforming plastic materials.The preheated sheet of plastic material is placed on the die via suction (vacuum), so as to conform to the relief features of the die.

Medical
Vacuum is used in a number of procedures in the medical sector, such as: dentistry and oral prosthetics, compression therapy and other hospital procedures.

Conversion table for positive pressure

	Pa (N/m^2)	bar	Kg/cm^2	Torr	psi (ibf/in^2)	kPa	inHg
1 Pa	1	0,00001	$10.1792x10^{-6}$	$7.50062x10^{-3}$	$0.145038x10^{-3}$	0.001	$0.3x10^{-3}$
1 kPa	1000	0.01	$10.1792x10^{-3}$	7.50062	0.145038	1	0.3
1 bar	100000	1	1.01972	750.062	14.5038	100	30
1 kg/cm^2	98066.5	0.980665	1	735.559	14.2233	98.0665	29.42
1 torr	133.322	$1.33322x10^{-3}$	$1.35951x10^{-3}$	1	$19.3368x10^{-3}$	0.133322	0.04
1 Psi	6894.76	$68.9476x10^{-3}$	$70.3096x10^{-3}$	51.7149	1	6.89476	2.07

Conversion table for negative pressure

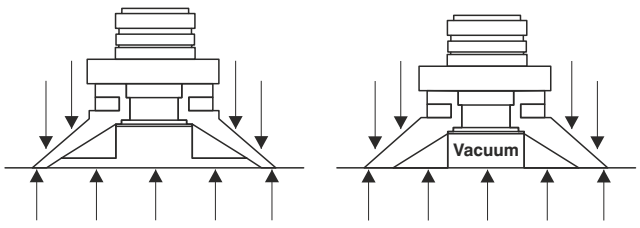
	mbar	kPa	-kPa	%Vacuum	Torr	-mmHg	-inHg
Atm	1013	101.3	0	0	760	0	0
	913	91.3	10	9.9	685	75	3
	813	81.3	20	19.7	610	150	6
	713	71.3	30	29.6	535	225	9
	613	61.3	40	39.5	460	300	12
	513	51.3	50	49.3	385	375	15
	413	41.3	60	59.2	310	450	18
	313	31.3	70	69.1	235	525	21
	213	21.3	80	79	160	600	24
	113	11.3	90	89	85	675	27
Absolute vacuum	0	0	101.3	100	0	760	30

Conversion table of Flow rate per unit of time

	m^3/s	m^3/h	l/min	l/s	ft^3/min (scfm)
1 m^3/s	1	3600	60000	1000	2118.9
1 m^3/h	$0.28x10^{-3}$	1	16.6667	0.2778	0.5885
1 l/min	$16.67x10^{-4}$	0.06	1	0.0167	0.035
1 l/s	$1x10^{-3}$	3.6	60	1	2.1189
1 ft^3/min (scfm)	$0.472x10^{-3}$	1.6992	28.32	0.4720	1

Suction cups

Suction cups are vacuum accessories that are indispensable whenever there is a problem with lifting, clamping or handling manufactured products, sheets or other objects that are "difficult to grip" with traditional gripping means, because they lack handholds, are fragile or are easily deformable.
Correct application of suction cups ensures simple, economical and safe gripping operations, which are critical requirements for the proper execution of any automatic action.
The suction cup adheres to the surface of an object whenever the pressure surrounding it outside (atmospheric pressure) is higher than the pressure existing between the suction cup and the surface of the object.
In order to generate low pressure inside the suction cup, the latter may be connected to a vacuum pump.
The lifting force of the suction cup will depend on the degree of vacuum attained by the pump and its capacity to compensate for losses.
The suction cup is an effective, simple and economical system for handling all kinds of shapes and surfaces.
The suction cup itself can have a number of different shapes: flat, oval, conical bellows with the possibility of adding various accessories, such as filters, shut-off valves, level compensators.
Any given suction cup is designed for a specific vacuum movement application.



Applications:
Gripping, handling, lifting, forming, palletising, pick & place, transferring, positioning. The materials that can be managed with suction cups are highly varied, but we can roughly categorise them as follows:
1) METALS: heavy loads, large sizes, middle frequencies, dirty surfaces.
2) PLASTIC: light loads, medium to small sizes with irregular shapes, no surface deposits.
3) WOOD: rough surface, slightly deformed, middle-weight loads, no surface deposits.

Criteria for selecting a suction cup:

Suction cups are gripping elements (or devices) that can handle many different kinds of objects; obviously their shape, weight, material, size and type of movement have a direct effect on the choice of suction cup, both in terms of shape and the material of which it is composed. Generally speaking, suction cups can have two or three types of shapes: flat, profiled and bellows (single or multiple).Flat and profiled suction cups are suitable for gripping and moving smooth, flat or slightly curved surfaces, especially in a direction perpendicular to the gripping surface, with good shear strength. For deformable, very heavy and/or superficially dirty surfaces, suction cups that have a high grip coefficient are available, obtained by using specially-shaped anchors in the gripping area. The bellows suction cups are suitable for gripping and moving irregular, cylindrical, curved surfaces. The suction cup's capacity to conform to the surface depends on the number of changes the bellows will have to make. Obviously the shear strength will be considerably less than for smooth suction cups, but the capacity for "articulated" action is highly flexible for angular grips.

The force of the suction cup is proportional to the degree of vacuum generated inside it and to the surface covered by this same suction cup.
The main reference data are:
Theoretical force (Ft): Ft = surface of the suction cup x percentage of vacuum
Effective force (Fe): Fe = Ft – 50%
K Factor (Safety coefficient): This factor is used to correctly and safely size the suction cup as a function of the various applications; the K factor will differ depending on the application.

K=2 : horizontal linear movement
K=4 : vertical linear movement and movement along more than one axis
axis K=6 : vertical movement along more than one axis (rotation)

Level of vacuum to be generated during gripping:

In practical applications no surface to be moved using vacuum is actually entirely impermeable.In cases of porous materials and surfaces that are non-regular (wood, cardboard, etc.) and smooth, some of the air will leak out in the direction of the vacuum; in this case, it is necessary to keep the vacuum flow rate high to compensate for the aforementioned leakage and maintain the grip; this is brought about with a low level of vacuum and broader diameters of the suction cups; on the other hand, if the materials are rigid and nonporous (metal, thick plastic, glass, etc.), the flow rate of the vacuum stays weak or non-existant, and so you need to raise the level of vacuum using more compact suction cups. In summary:

1) Porous materials: degree of vacuum between 35 – 60%
2) Nonporous materials: degree of vacuum between 55 – 80%

Determination of the suction cup diameter

After having chosen the type of suction cup and the material, you can go on to calculate the diameter of that suction cup; to do this, you need to use predefined formulas that take into account the following:

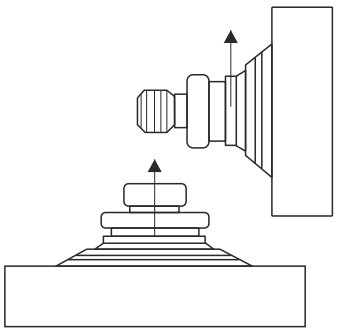
D *= diameter of the suction cup in mm* / ***K*** *= safety factor* / ***V*** *= degree of vacuum (- Kpa)*
n *= number of suction cups in the application* / ***m*** *= mass to be handled (in Kg)*

The formula will vary as a function of the type of suction cup (flat - profiled - bellows single or multiple).
The formulas are the following:

Flat suction cup $D = 140 * \sqrt{\frac{m*K}{V*n}}$

Profiled suction cup $D = 123 * \sqrt{\frac{m*K}{V*n}}$

Bellows suction cup $D = 152 * \sqrt{\frac{m*K}{V*n}}$ **(two bellows 223 / three bellows 558)**



We can subdivide the applications with suction cups into:
Horizontal, where the object is lifted and moved parallel to the plane
Vertical, where the object is lifted and moved perpendicular to the plane

Due to a number of factors intrinsic to the handling system, such as friction, gravity and acceleration, the safety factor has to be implemented to prevent the object from slipping and detaching while it is being moved.

Safety factor table

K (Safety factor)	Type of handling
2	Horizontal movement
4	Vertical movement
4	Horizontal movement with Robots
6	Vertical movement with Robots

Choice of suction cup:

Pneumax suction cups are available in different shapes, each one of which can meet a number of existing application requirements; the choice of cup must be made based on the characteristics listed below:

Suction cup Flat series TP:
Suction cup to be used for moving sheets and in those applications where the lifting force is parallel to the gripping plane. Internal reinforcements improve stability and make this cup suitable for handling heavy objects.

Suction cup Bellows series TS:
Suction cup best used in particular for moving light items in those applications where the lifting force is vertical to the gripping plane. The range of the bellows makes it possible to compensate for the irregularity of the surface and height of the object. The long bellows suction cup is best used in applications where it is necessary to pick off and move light products such as: leaves of paper or pieces of cardboard, thin sheets, wood panels, etc.
Due to their greater flexibility, these can be used to compensate for errors of flatness or to grip inclined surfaces, but are not suitable for applications with parallel loads or with a high degree of vacuum.

Suction cup (Plain) Cup series TN:
Among the most common types of suction cup, used in sectors of industry where special performance is not required: Handling of objects made of plastic, wood panels, thin sheets of glass and metal, etc.
Recommended for vertical movement of heavy objects.

High Grip suction cup:
Suction cup with high coefficient of friction, developed for the handling of oily surfaces, such as sheet metal in moulding processes, and also recommended for handling wet marbles and glasses, slabs and loads in general, subject to high accelerations and decelerations during movement.
Recommended for the "automotive" sector, available in various sizes and shapes: round and oval flat and round and oval bellows.
Suitable for horizontal and vertical movement.

Foam rubber suction cups:
This suction cup allows for the moving and gripping of loads with coarse, very rough or uneven surfaces, such as: textured, non-slip or ribbed/corrugated sheets, and sawn, bush-hammered or flamed marble. Items made of rough concrete, garden walkway tiles and brick in general. Recommended for use with oiled surfaces and to move vertical loads.

Choice of Mix. The choice of mix to be used is made by consulting the technical tables as a function of the individual application, and after having carefully evaluated the following factors :

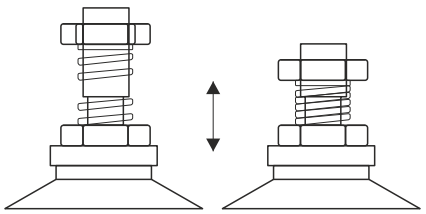
- Surface roughness of the load to be moved and its temperature
- Weight and dimensions of the load.
- The presence of chemical substances, oils, solvents etc. on the gripping surface.
- How labour-intensive and complex the work processes are.
- How important it is to ensure that no specks exist on the gripping surface.

Suction Cup Characteristics and Materials

Material	Temperature °C	Abrasion resistance	Oil resistance	Resistance to weather/atmospheric agents
N-NBR	-20 ÷ +110	Excellent	Excellent	Very good
S-Silicone	-40 ÷ +200	Good	Low	Excellent
PU-Polyurethane	10 ÷ 50	Excellent	Excellent	Excellent
F-Fluorinated rubber	-10 ÷ +230	Excellent	Very good	Very good

Level Compensator:
This accessory makes it possible to overcome differences in height that may be found in various applications, for example in lifting systems where the suction cups are fixed to a rigid structure or when a suction cup is used on the arm of an anthropomorphic robot or in a similar system where the items must be accurately positioned at the required height; in addition, the device makes it possible, within certain limits, to absorb pushback.

The Pneumax range is subdivided into three types:
- Compensator with external spring
- Compensator with internal spring
- Anti-rotation compensator with internal spring



Pneumatic pumps

Vacuum pumps of the pneumatic type or pneumatic vacuum generators, which operate on the Venturi principle: one or more nozzles are fed by compressed air, generating a jet of air that drags (in contact with the environment) the surrounding air and then evacuates. This "dragging" creates a depression which results in the generation of a vacuum. The big advantage of pneumatic pumps is that they can only operate when the suction cups or the application connected to them require vacuum.

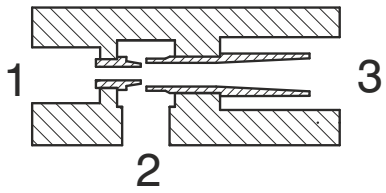
Advantages:

Consumption of air (and therefore power) limited to the moment of use.
Installation directly proximate to the suction cups (simplification of layout / savings).
Short response times and high capacity.
Flow rates for any requirement.
No limit to applications.
Compactness / lightness / reliability / little or no wear.

Types:

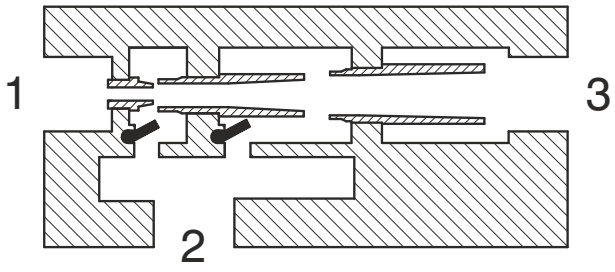
In terms of dimensions, functions and operation, we can categorise generators as one of two major types:

1) Single stage, compact and/or miniaturised, with pneumatic or electropneumatic control, for direct-contact installation with suction cup holders and suction cups.



Multistage generator

2) Multistage with or without integrated functions, pneumatic, electropneumatic operated for delocalized assembly and for operating groups of suction cups



Multistage generator

Range:

The **PNEUMAX** range consists of single-stage and multistage equipment of various sizes and types; the single-stage generators use the Venturi effect in a single medium/high throughput nozzle and promptly generate vacuum, flow rate and suction values that are suitable for medium/light applications.
Multistage generators having more than one nozzle (ejectors) in a line, using the kinetic energy that this layout generates to ensure, based on the flow rate, limited consumption of energy and attainment of a vacuum level equal to 90%, with various suction capabilities.
Single-stage generators, very fast in switching pressure/vacuum, can also be equipped with a quick-release system for highly cyclical applications.
On the other hand, **multistage generators** can often be accessorised with integrated management and control functions, such as for example electropneumatic control for power supply and power shut-off, quick-release blowing, a regulator to measure this release and a vacuum switch, to control the degree of vacuum generated.
These latter generators can be installed as modules as well, creating actual stand-alone generation modules and decentralised vacuum management for controlling more than one gripping element

Adjustable vacuum generators conveyor
Based on the Venturi principle, these differ from the ones described further above in that they have an ejector with a much larger diameter, and are adjustable.
This feature makes it possible to change the device's flow rate and degree of vacuum without affecting the supply pressure.
Their special shape and their operating principle make them suitable for suction and the transfer of powders, granules, sawdust, metal chips, liquid or dry food products, etc.;to control suction cups in the presence of large quantities of powders or liquids; these can also be used to suction smoke, coolant fog, water vapour, etc.

Suction filters
Preventing contaminants from reaching the pneumatic vacuum generator is very important for ensuring long-term and good operation.
This is why Pneumax vacuum filters are installed at the suction inlet of the pneumatic vacuum generators and/or on the pipework of the equipment.
The Pneumax product line includes vertical suction filters with flow rates ranging from 150 to 2520 l/m and threads running from G3/8" to G1".
In-line filters with flow rates ranging from 20 to 50 l/m and instant connectivity for pipes with diameters ø4, ø6 and ø8mm

SUCTION CUPS 1

PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

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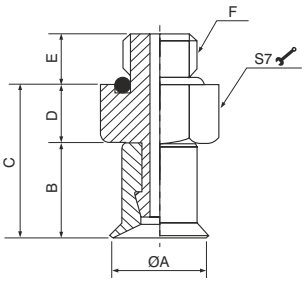
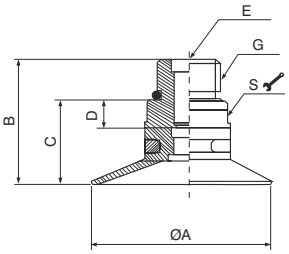
1

Standard round suction cup





Code V = Version N =NBR / S=Silicone	ØA	B	C	D	E	F
19VTN.V.05.004.00	5	6.1	10.1	4	3.5	M5
19VTN.V.05.008.00	9	7	11	4	3.5	M5
19VTN.V.05.010.00	11	10.5	15.5	5	3.5	M5

Code V = Version N =NBR / S=Silicone	ØA	B	C	D	E	G	S
19VTN.V.18.020.00	22	15.5	9.5	1.5	M5	G1/8"	S12
19VTN.V.18.030.00	32	17	11	1.5	M5	G1/8"	S12
19VTN.V.18.040.00	42	25	18	5	-	G1/8"	S17
19VTN.V.14.050.00	53	32.5	23.5	6	-	G1/8"	S24

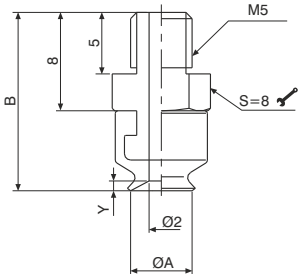
Standard round suction cup, suitable for gripping and moving with vacuum, objects with flat or slightly curved surfaces, allows gripping on concave surfaces.

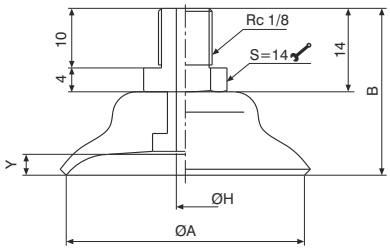
Table of lifting forces

Code V = Version N =NBR / S=Silicone	Volume cm³	Lifting force in vertical direction (N)			Lifting force in parallel direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	-20kPa	-60kPa	-90kPa	
19VTN.V.05.004.00	0.03	0.198	0.885	1.275	0.198	0.78	1	2.3
19VTN.V.05.008.00	0.1	1	2.55	3.8	1	2.85	3.35	2
19VTN.V.05.010.00	0.18	1.48	4.4	6.85	1.5	4.4	4.9	2.7
19VTN.V.18.020.00	1	5.9	12.2	16	5.9	8.8	9.8	3
19VTN.V.18.030.00	2	13	25	33	7.8	9.8	11	4.2
19VTN.V.18.040.00	5.5	20	37.5	60	13.8	22	27.5	11
19VTN.V.14.050.00	12	35.5	74	95	20	37	44	26.6

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	black	55	-20 ÷ 110
Silicone	red	50	-40 ÷ 200

Cup-style round suction cup





Code	ØA	B	Y
19VTC.N.05.006.00	6	14.5	0.8
19VTC.N.05.008.00	8	15	1.2
19VTC.N.05.010.00	10	15.5	1.5

Code	ØA	B	ØH	Y
19VTC.N.18.015.00	15	22	2	1.9
19VTC.N.18.020.00	20	24	3	2.3
19VTC.N.18.030.00	30	26	3	2
19VTC.N.18.040.00	40	28	3	3.5
19VTC.N.18.050.00	50	29	4	4

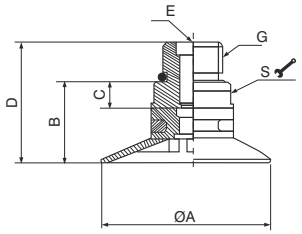
Typical cup-shaped suction cup, suitable for gripping and moving with vacuum, objects with flat or slightly curved surfaces, allows gripping on concave surfaces.

Table of lifting forces

Code	Volume cm³	Lifting force in vertical direction (N)		Weight (gr.)
		-60kPa	-90kPa	
19VTC.N.05.006.00	0.03	0.5	0.8	2.3
19VTC.N.05.008.00	0.1	1	1.5	2.4
19VTC.N.05.010.00	0.18	1.5	2	2.5
19VTC.N.18.015.00	0.9	5	7.5	11.5
19VTC.N.18.020.00	2.5	8.5	11	13.6
19VTC.N.18.030.00	5	18	23	14.9
19VTC.N.18.040.00	12	30	35	19.4
19VTC.N.18.050.00	15	45	60	29.4

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	black	55	-20 ÷ 110

Round flat suction cup



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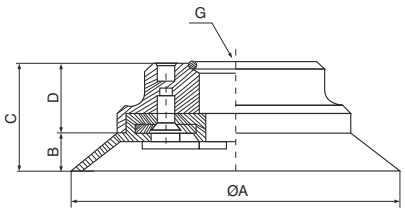
19VTP.Ⓥ.18.020.00	22	9.5	1.5	15.5	M5	G1/8"	S12
19VTP.Ⓥ.18.025.00	27	10.5	1.5	16.5	M5	G1/8"	S12
19VTP.Ⓥ.18.030.00	32	11.5	1.5	17.5	M5	G1/8"	S12
19VTP.Ⓥ.18.040.00	42	18	5	25	-	G1/8"	S17
19VTP.Ⓥ.14.050.00	53	22.5	6	32.5	-	G1/4"	S24



Code Ⓥ = Version N =NBR / S=Silicone	ØA	B	C	D	G
19VTP.Ⓥ.14.075.00	77	8	26	18	G1/4"
19VTP.Ⓥ.12.110.00	112	14	29	15	G1/2"
19VTP.Ⓥ.12.150.00	152	18	33	14	G1/2"

Flat round suction cup, suitable for gripping and moving with vacuum, objects with flat surfaces, offers good stability and minimal displacement. Recommended for applications with force parallel to grip plane, suitable for moving glass, wood, steel and plastic sheets. Internal reinforcements prevent thin objects from deforming and increase friction in applications with forces parallel to grip plane.

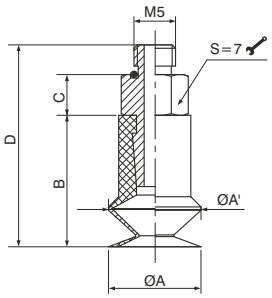
Table of lifting forces

Code Ⓥ = Version N =NBR / S=Silicone	Volume cm^3	Lifting force in vertical direction (N)			Lifting force in parallel direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	-20kPa	-60kPa	-90kPa	
19VTP.Ⓥ.18.020.00	1	6	15	18.7	5	7.95	8.45	3.1
19VTP.Ⓥ.18.025.00	1.1	9.2	19.3	24.9	7.95	8.95	10	3.6
19VTP.Ⓥ.18.030.00	2	13	24.8	30.8	11	15.98	20	4.5
19VTP.Ⓥ.18.040.00	4.8	20	40	50	15	25	29.5	11.5
19VTP.Ⓥ.14.050.00	10	37	74	96	24	40	50	27.9
19VTP.Ⓥ.14.075.00	20	80	201	272	60	110	140	121.3
19VTP.Ⓥ.12.110.00	70	141	418.5	562	140	248	299.7	245.3
19VTP.Ⓥ.12.150.00	160	300	845	1098	250	600	800	605

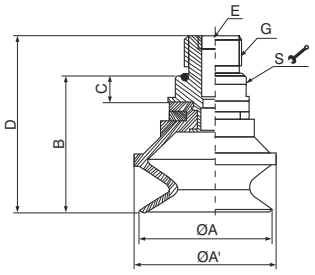
Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	black	55	-20 ÷ 110
Silicone	red	50	-40 ÷200

1

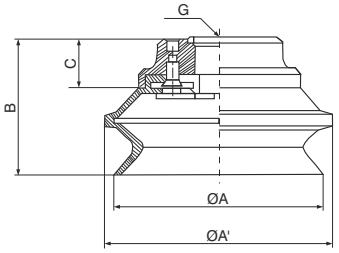
Round bellows suction cup



Code Ⓥ = Version N =NBR / S=Silicone	ØA	ØA'	B	C	D
19VTS.Ⓥ.05.005.15	5.6	6.2	9.2	4	16.7
19VTS.Ⓥ.05.010.15	11	12	16	5	25
19VTS.Ⓥ.05.015.15	15.5	17.5	19.5	5	28.5



Code Ⓥ = Version N =NBR / S=Silicone	ØA	ØA'	B	C	D	E	G	S
19VTS.Ⓥ.18.020.15	22	24	20.5	1.5	26.5	M5	G1/8"	S12
19VTS.Ⓥ.18.030.15	34	36	31	5	38	-	G1/8"	S17
19VTS.Ⓥ.18.040.15	43	46	33	5	40	-	G1/8"	S17
19VTS.Ⓥ.14.050.15	53	58	41	6	50	-	G1/4"	S24



Code Ⓥ = Version N =NBR / S=Silicone	ØA	ØA'	B	C	G
19VTS.Ⓥ.12.075.15	78	83	50	18	G1/2"
19VTS.Ⓥ.12.110.15	115	124	63	15	G1/2"
19VTS.Ⓥ.12.150.15	155	166	78	14	G1/2"

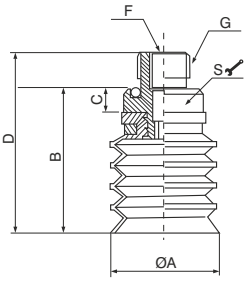
Round bellows suction cup, which, due to its shape, ensures that when in contact with the surface of the load to be lifted and in the presence of vacuum, it rapidly collapses, releasing the load of several millimetres, separately from the movements of the automation system; this rapid movement prevents the load underneath from remaining stuck to the one being lifted. For this reason, suction cups with this feature are recommended in cases where you need to pick off and move sheets of cardboard, fine sheets, wood panels, glass panes etc. and are also recommended for use on curved surfaces. This suction cup is not suitable for handling objects with lifting force parallel to the surface.

Table of lifting forces

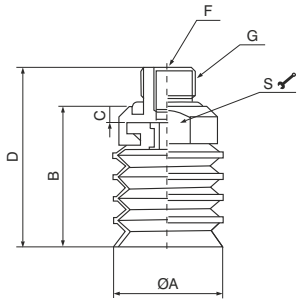
Code Ⓥ = Version N =NBR / S=Silicone	Volume cm^3	Lifting force in vertical direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	
19VTS.Ⓥ.05.005.15	0.05	0.295	0.786	0.99	2
19VTS.Ⓥ.05.010.15	0.48	1.7	3.5	5.1	2.9
19VTS.Ⓥ.05.015.15	1.1	3.3	6	8.9	3.5
19VTS.Ⓥ.18.020.15	2.7	5.8	10.6	15	5
19VTS.Ⓥ.18.030.15	10	13	25	28	13.6
19VTS.Ⓥ.18.040.15	15	22.5	42	50.2	20.2
19VTS.Ⓥ.14.050.15	32	34	65	83	39.5
19VTS.Ⓥ.12.075.15	110	74	166.4	226	131.3
19VTS.Ⓥ.12.110.15	310	136.5	343	460.5	316.6
19VTS.Ⓥ.12.150.15	650	295	686	883	733.3

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	black	55	-20 ÷ 110
Silicone	red	50	-40 ÷ 200

Long bellows suction cup



Code Ⓥ = Version N =NBR / S=Silicon	ØA	B	C	D	F	G	S
19VTS.Ⓥ.18.020.45	20	24.5	1.5	30.5	M5	G1/8"	S12
19VTS.Ⓥ.18.030.45	30	37	5	44	-	G1/8"	S17
19VTS.Ⓥ.18.040.45	40	17	5	24	-	G1/8"	S17
19VTS.Ⓥ.14.050.45	50	58	6	67	-	G1/4"	S24



Code	ØA	B	C	D	F	G	S	Weight (gr.)
19VTS.S.18.020.45	20	26	3	27	M5	G1/8"	S16	5.9

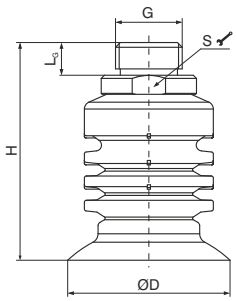
Long bellows suction cup which, due to its shape, makes it possible to compensate for differences in height. Its upward movements are particularly suitable for the separation of thin products, and suitable for handling food packed in plastic bags and for fragile objects. This suction cup is not suitable for handling objects with lifting force parallelto the surface.

Table of lifting forces

Code Ⓥ = Version N =NBR / S=Silicone	Volume cm^3	Lifting force in vertical direction (N)		Weight (gr.)
		-20kPa	-60kPa	
19VTS.Ⓥ.18.020.45	4	0.3	0.6	3.9
19VTS.Ⓥ.18.030.45	13	0.6	1.55	12.4
19VTS.Ⓥ.18.040.45	27	1.05	2.15	19.8
19VTS.Ⓥ.14.050.45	55	1.68	4.22	38.3

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	black	55	-20 ÷ 110
Silicone	red	50	-40 ÷ 200

Long bellows suction cup for bags



Code	D	H	G	L_G	S
19VTS.S.14.030.35	30.5	51.5	G1/4"	9	19
19VTS.S.38.040.35	40	56	G3/8"	10	22
19VTS.S.12.050.35	50	69	G1/2"	10	28

The long bellows suction cup is especially suited for the movement of bags, thanks to its very thin lip and internal notchings, which allow it to ensure secure gripping even with heavy bags that are difficult to lift.

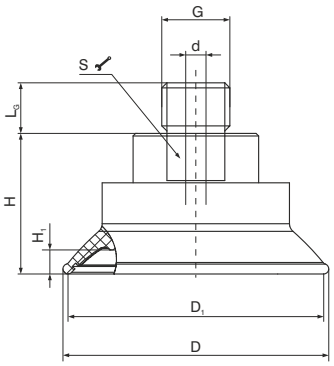
Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)	Weight (gr.)
		-60kPa	
19VTS.S.14.030.35	8.5	9	17.6
19VTS.S.38.040.35	14	15	23.6
19VTS.S.12.050.35	26	25	44.2

Material	Colour	Hardness °Shore A	Operating temperature °C
Silicone	red	40	-40 ÷ 200

1

High friction round suction cup



Code	D	D_1	d	G	H	L_G	S	H_1
19GTN.N.14.030.00	32	30	4	G1/4M	20	12	17	2.7
19GTN.N.14.040.00	42	40	4	G1/4M	22	12	17	3.7
19GTN.N.14.050.00	52	50	6	G1/4M	28	12	22	4.7
19GTN.N.14.060.00	62.5	60	6	G1/4M	31	12	22	6
19GTN.N.14.080.00	82	80	6	G1/4M	34	12	22	7.5
19GTN.N.14.100.00	103	100	6	G1/4M	36	12	22	9.2

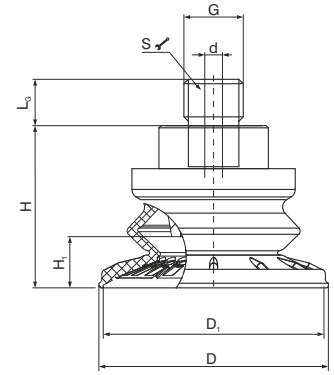
High friction round suction cup suitable for movement of pieces of various size and shape, reinforced internal structure ensures that lifted objects are not deformed and increases friction force in applications with force parallel to the grip plane. The innovative design of the support plane inside the suction cup ensures high coefficient of friction with the grip surface, in particular on very oily sheets or glass panes and very wet marble, thanks to this suction cup's drainage capability. This suction cup is most particularly recommended for applications of handing sheet metal parts in the "automotive" industry. This characteristic means that there is asecure and solid grip by the suction cup and consequently ensures accurate positioning of the load to be moved.

Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (gr.)
		-60kPa	-60kPa	-60kPa	
19GTN.N.14.030.00	1.6	45	35	33	28.3
19GTN.N.14.040.00	3.5	72	54	51	30.1
19GTN.N.14.050.00	7.5	112	90	86	55.4
19GTN.N.14.060.00	12.6	145	102	93	62.6
19GTN.N.14.080.00	35	288	212	190	81.4
19GTN.N.14.100.00	60	445	322	308	96.6

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	Orange	60	-20 ÷ 110

High friction round bellows suction cup



Code	D	D_1	d	G	H	L_G	S	H_1
19GTS.N.14.022.15	22	20	4	G1/4M	25	12	16	5.5
19GTS.N.14.030.15	32	30	4	G1/4M	28	12	17	9.5
19GTS.N.14.040.15	42	40	4	G1/4M	28.5	12	17	10
19GTS.N.14.050.15	52	50	6	G1/4M	37	12	22	11.5
19GTS.N.14.060.15	62.5	60	6	G1/4M	41	12	22	14.5
19GTS.N.14.080.15	82	80	6	G1/4M	50.5	12	22	22.5
19GTS.N.14.100.15	102.5	100	6	G1/4M	56	12	22	25

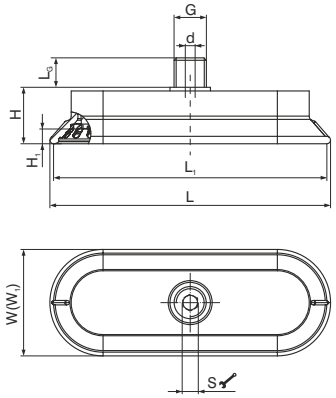
High friction round bellows suction cup suited for movement of pieces of various size and shape and where level compensation is necessary, such as when withdrawing from loaders. Especially recommended for applications with force parallel to the grip plane.The innovative design of the support plane inside the suction cup ensures high coefficient of friction with the grip surface, in particular on very oily sheets or glass panes and very wet marble, thanks to this suction cup's drainage capability.
This feature enables a secure and solid grip by the suction cup and consequently ensures accurate positioning of the load to be moved.

Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (gr.)
		-60kPa	-60kPa	-60kPa	
19GTS.N.14.022.15	1.5	23	20	6.5	25.2
19GTS.N.14.030.15	6.3	35	28	12	29.5
19GTS.N.14.040.15	7.2	62	37	34	30.9
19GTS.N.14.050.15	11.2	85	58	55	56.3
19GTS.N.14.060.15	22.5	141	88	83	64.4
19GTS.N.14.080.15	57	236	141	136	86.4
19GTS.N.14.100.15	92	371	228	221	116.6

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	Orange	60	-20 ÷ 110

High friction oval suction cup



Code	L	L_1	W	W_1	d	G	H	L_G	S	H_1
19GEN.N.14.AxH.00	84	82	24	22	6	G1/4M	17	12	6	5
19GEN.N.14.BxL.00	93	90	33	30	6	G1/4M	17.5	12	6	6
19GEN.N.14.CxN.00	113	110	43	40	6	G1/4M	23	12	6	6

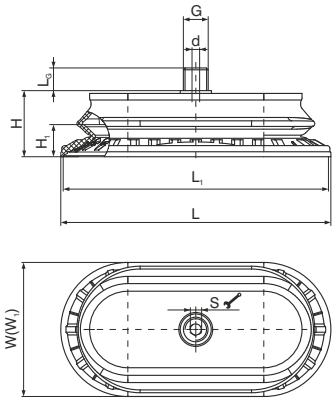
High friction oval suction cup suitable for movement of elongated thin pieces; the reinforced internal structure ensures that lifted objects are not deformed and increases friction force in applications with force parallel to the grip plane. The innovative design of the support plane inside the suction cup ensures high coefficient of friction with the grip surface, in particular on very oily sheets or glass panes and very wet marble, thanks to this suction cup's drainage capability. This suction cup is most particularly recommended for applications of handing sheet metal parts in the "automotive" industry. This feature enables a secure and solid grip by the suction cup and consequently ensures accurate positioning of the load to be moved.

Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (gr.)
		-60kPa	-60kPa	-60kPa	
19GEN.N.14.AxH.00	15	75	38	35	38.6
19GEN.N.14.BxL.00	18	120	77	60	41.5
19GEN.N.14.CxN.00	35	200	188	118	71.9

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	Orange	60	-20 ÷ 110

Oval high-friction bellows suction cup



Code	L	L_1	W	W_1	d	G	H	L_G	S	H_1
19GES.N.14.BxF.15	62	60	32	30	6	G1/4M	21.5	12	6	6
19GES.N.14.CxH.15	82	80	42	40	6	G1/4M	24.5	12	6	8.8
19GES.N.14.ExN.15	112	110	57	55	6	G1/4M	30.5	12	6	12.5
19GES.N.14.GxR.15	143	140	72	69	6	G1/4M	35	12	6	17

High friction oval bellows suction cup suited for movement of elongated and thin pieces and where level compensation is necessary, such as in the withdrawal of loaders.
Especially recommended for applications with force parallel to the grip plane. The innovative design of the support plane inside the suction cup ensures a high coefficient of friction with the grip surface, in particular on very oily sheets or glass panes and very wet marble, thanks to this suction cup's drainage capability.
This feature enables a secure and solid grip by the suction cup and consequently ensures accurate positioning of the load to be moved.

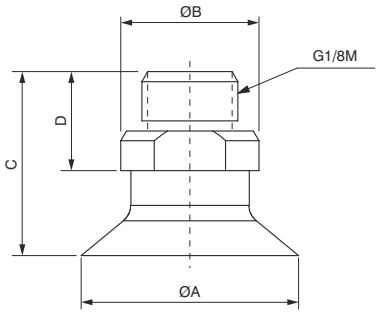
Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)	Lifting force in parallel drection (N)	Lateral force on oily surface (N)	Weight (gr.)
		-60kPa	-60kPa	-60kPa	
19GES.N.14.BxF.15	8.7	53	60	50	41.9
19GES.N.14.CxH.15	22	110	118	101	51.5
19GES.N.14.ExN.15	57	197	200	183	102.1
19GES.N.14.GxR.15	108	275	295	267	138.9

Material	Colour	Hardness °Shore A	Operating temperature °C
NBR	Orange	60	-20 ÷ 110

1

Standard round suction cup made of polyurethane



Code	ØA	ØB	C	D
19VTN.P.18.030.00	31	14	20.5	10
19VTN.P.18.040.00	41	14	24	10

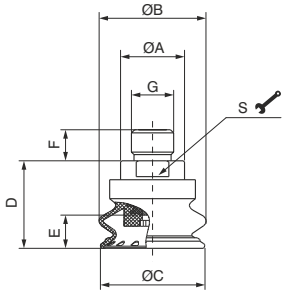
Standard round suction cup made of polyurethane, suitable for gripping and moving with vacuum, objects with flat or slightly curved surfaces, allows gripping on concave surfaces.
The main advantage of this suction cup is that the material it is made of--polyurethane--lasts longer than other materials, has optimum wear resistance, good flexibility and
Polyurethane suction cups are mark resistant.

Table of lifting forces

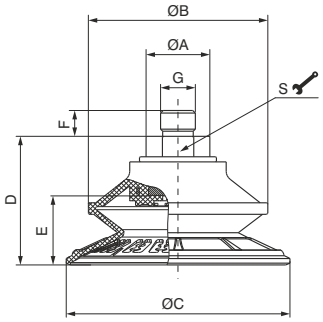
Code	Volume cm³	Lifting force in vertical direction (N)			Lifting force in parallel direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	-20kPa	-60kPa	-90kPa	
19VTN.P.18.030.00	2	13	23	33	7.8	9.8	11	5
19VTN.P.18.040.00	5.5	20	40	60	13.8	22	27.5	11.8

Material	Colour	Hardness °Shore A	Operating temperature °C
PU	yellow	40	10 ÷ 50

Round bellows suction cup made of polyurethane



Code	ØA	ØB	ØC	D	E	F	G	S
19VTS.P.14.030.15	19.8	32	32	28	7	13.5	G1/4" thread male	17
19VTS.P.14.040.15	19.8	32	42	29	9	13.5	G1/4" thread male	22
19VTS.P.14.050.15	25	40	51.5	37	11.5	13.5	G1/4" thread male	22



Code	ØA	ØB	ØC	D	E	F	G	S
19VTS.P.14.060.15	24	50	64	41.5	15	13.5	G1/4" thread male	21
19VTS.P.14.080.15	24	68	84	49.5	22.5	13.5	G1/4" thread male	21
19VTS.P.14.100.15	24	83	103	55	20.5	13.5	G1/4" thread male	22

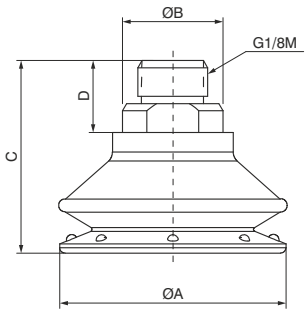
Round bellows suction cup made of polyurethane, suited for moving pieces of various sizes and shapes and where level compensation is necessary, such as when withdrawing from loaders.
The big advantage of this suction cup is that the material it is made of--polyurethane--lasts longer than other materials, has optimum wear resistance, good flexibility and optimum tensile strength.
Suitable for moving--with vacuum--steel sheets, glass sheets , cardboard boxes and wood panels.

Table of lifting forces

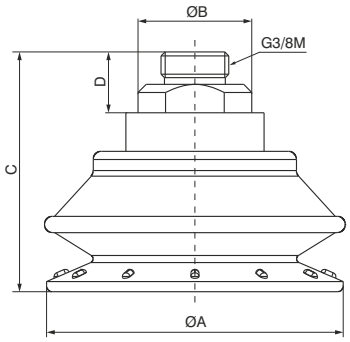
Code	Volume cm³	Lifting force in vertical direction (N)			Lifting force in parallel direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	-20kPa	-60kPa	-90kPa	
19VTS.P.14.030.15	6	11	60.2	91	8.4	30.5	76	30
19VTS.P.14.040.15	7.2	17.5	93	119.8	11.3	63.8	110.8	30.6
19VTS.P.14.050.15	11	25	128.5	157.8	20.5	94	144	58.5
19VTS.P.14.060.15	22	87.3	156.2	189.2	67	125.6	165.8	67.9
19VTS.P.14.080.15	59.5	118.6	210.5	252.6	89	167.8	221.2	89.9
19VTS.P.14.100.15	103.5	149	269.5	310.4	111.8	209.8	276.5	135.3

Material	Colour	Hardness °Shore A	Operating temperature °C
PU	Blue	60	10 ÷ 50

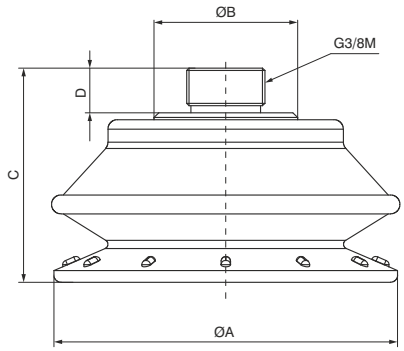
Round bellows suction cup made of polyurethane



Code	ØA	ØB	C	D
19VTS.P.18.030.15	31.5	14	26.8	10
19VTS.P.18.040.15	42	14	32.4	10



Code	ØA	ØB	C	D
19VTS.P.38.050.15	52.5	28	44.3	16



Code	ØA	ØB	C	D
19VTS.P.38.070.15	73	30.5	45.5	10

Round bellows suction cup made of polyurethane, suited for movement of pieces of various size and shape and where level compensation is necessary, such as when withdrawing from loaders. The big advantage of this suction cup is that the material it is made of--polyurethane--lasts longer than other materials, has optimum wear resistance, good flexibility and optimum tensile strength. Polyurethane suction cups are mark resistant.

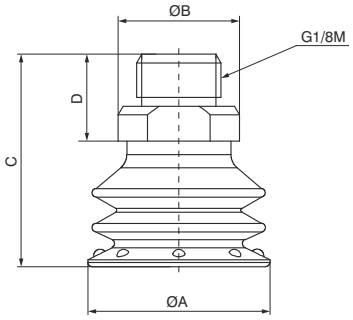
Table of lifting forces

Code	Volume cm^3	Lifting force in vertical direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	
19VTS.P.18.030.15	10	13	30	37	10.3
19VTS.P.18.040.15	15	22.5	60	75	17.3
19VTS.P.38.050.15	32	34	86	100	33.4
19VTS.P.38.070.15	108	74	165	225	60.6

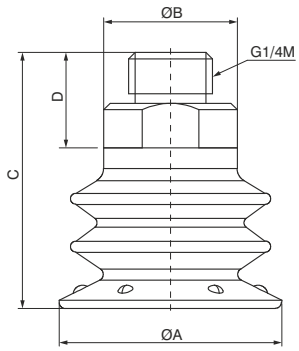
Material	Colour	Hardness °Shore A	Operating temperature °C
PU	yellow	40	10 ÷ 50

1

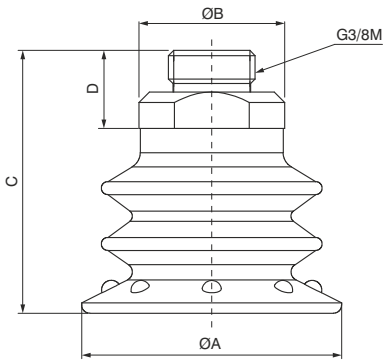
Round bellows suction cup made of polyurethane



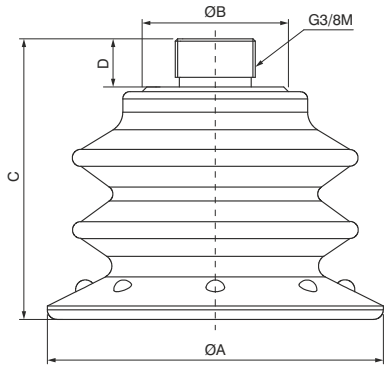
Code	ØA	ØB	C	D
19VTS.P.18.020.25	21	14	39	10
19VTS.P.18.030.25	30	14	31.3	10



Code	ØA	ØB	C	D
19VTS.P.14.040.25	40	21	43.5	15



Code	ØA	ØB	C	D
19VTS.P.38.050.25	50	18	51.5	16



Code	ØA	ØB	C	D
19VTS.P.38.070.25	70	30.5	58.5	10

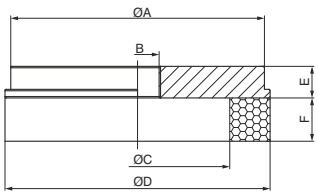
Round bellows suction cup made of polyurethane, suited for movement of pieces of various size and shape and where level compensation is necessary, such as when withdrawing from loaders. The big advantage of this suction cup is that the material it is made of--polyurethane--lasts longer than other materials, has optimum wear resistance, good flexibility and optimum tensile strength. Suitable for moving porous objects or ones with an irregular surface, such as cardboard. Polyurethane suction cups are mark resistant.

Table of lifting forces

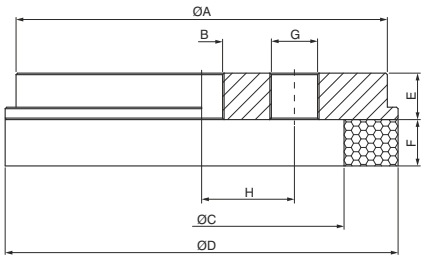
Code	Volume cm^3	Lifting force in vertical direction (N)			Weight (gr.)
		-20kPa	-60kPa	-90kPa	
19VTS.P.18.020.25	1.18	4.5	7	10	4.2
19VTS.P.18.030.25	9	10	19	25	6.9
19VTS.P.14.040.25	15	15	32	50	18.2
19VTS.P.38.050.25	30	35	58	79	32.6
19VTS.P.38.070.25	75	72	125	150	60.5

Material	Colour	Hardness °Shore A	Operating temperature °C
PU	Green	55	10 ÷ 50

Foam rubber round suction cup



Code	ØA	B	ØC	ØD	E	F
19VTN.G.14.040.00	40	G1/4"	20	40	10	15
19VTN.G.14.064.00	60	G1/4"	40	64	10	15
19VTN.G.14.092.00	88	G1/4"	64	92	11	15



Code	ØA	B	ØC	ØD	E	F	G	H
19VTN.G.14.127.00	120	G1/4"	92	127	15	15	G3/8"	30

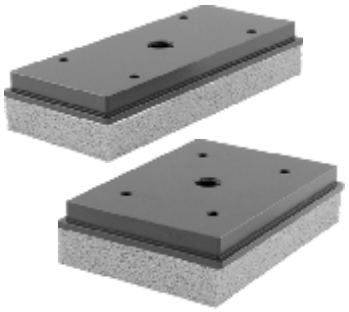
Foam rubber round suction cup is made from a special mixture called "NR", which has a density that allows for gripping even on very rough and irregular surfaces, and allows its elasticity to be maintained even after several working cycles. Especially suited for moving loads with coarse or very rough surfaces such as: sawn, bush-hammered or flamed marble, textured, non-slip or ribbed/corrugated sheets, brick, items made of rough concrete, garden walkway tiles, etc., and in general in all cases where traditional suction cups cannot be used.
Recommended for handling loads with lifting force parallel to the surface and for the movement of loads with oiled surfaces.

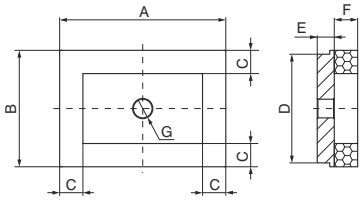
Table of lifting forces

Code	Lifting force in vertical direction (N) -60kPa	Weight (gr.)
19VTN.G.14.040.00	7.8	33.4
19VTN.G.14.064.00	35	82.4
19VTN.G.14.092.00	84	197.8
19VTN.G.14.127.00	172	489.3

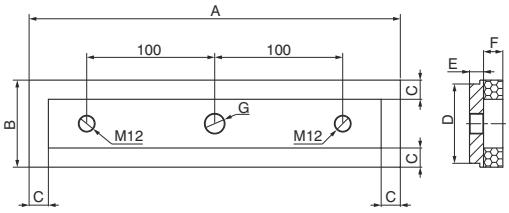
Material	Colour	Hardness °Shore A	Operating temperature °C
Foam rubber "NR"	Orange	30	-20 ÷ 80

Foam rubber rectangular suction cup





Code	A	B	C	D	E	F	G
19VRN.G.22.NxH.00	107	75	15	70	11	15	M12
19VRN.G.22.RxF.00	135	60	15	55	11	15	M12



Code	A	B	C	D	E	F	G
19VRN.G.12.SxR.00	290	140	15	134	11	15	G1/2"

Foam rubber rectangular suction cup is made from a special mixture called "NR", which has a density that allows for gripping even on very rough and irregular surfaces, and allows its elasticity to be maintained even after several working cycles.Especially suited for movement of loads with coarse or very rough surfaces such as: sawn, bush-hammered or flamed marble, textured, non-slip or ribbed/corrugated sheets, brick, items made of rough concrete, garden walkway tiles, etc. and in general in all cases where traditional suction cups cannot be used.
Not recommended for handling loads with lifting force parallel to the surface or for the movement of loads with oiled surfaces.

Table of lifting forces

Code	Lifting force in vertical direction (N) -60kPa	Weight (gr.)
19VRN.G.22.NxH.00	88	236.7
19VRN.G.22.RxF.00	79	231.7
19VRN.G.12.SxR.00	706	1175.1

Material	Colour	Hardness °Shore A	Operating temperature °C
Foam rubber "NR"	Orange	30	-20 ÷ 80

LEVEL COMPENSATORS 2

PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

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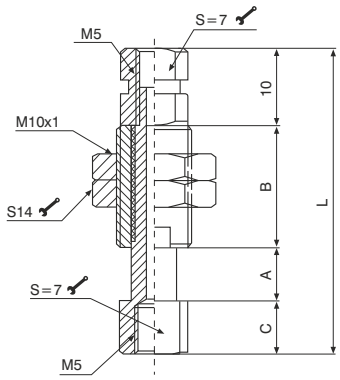
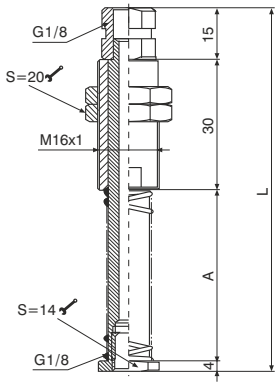
Standard level compensator M5 - internal spring



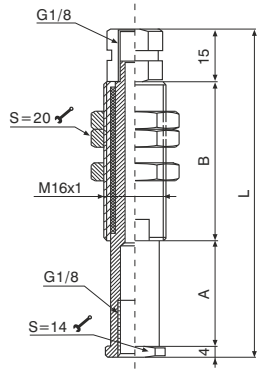
Code	A	B	C	L	Weight (gr.)
19P05.S.07.I	7	19	7	43	18.7
19P05.S.15.I	15	23	27	75	28.2
19P05.S.20.I	20	36	7	73	28.8

The standard level compensator M5 makes it possible to compensate for differences in height when the gripping system has to deal with objects of different heights, simplifies accurate positioning on vacuum systems, and makes it possible to position the suction cups on fragile items.

Standard level compensator G1/8” – internal and external spring



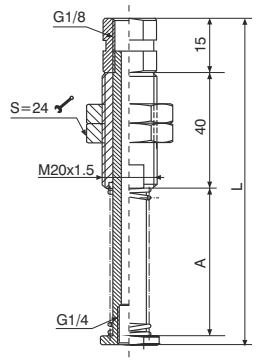
Code	A	L	Weight (gr.)
19P18.S.10.E	20	69	85
19P18.S.20.E	35	84	98
19P18.S.30.E	50	99	111.5
19P18.S.50.E	70	119	123.3



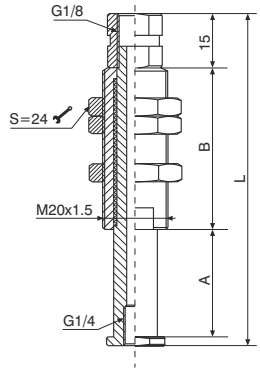
Code	A	B	L	Weight (gr.)
19P18.S.10.I	10	25	54	59.1
19P18.S.20.I	20	35	74	76.3
19P18.S.30.I	30	45	94	103.1
19P18.S.50.I	50	65	134	140.1

The standard level compensator G1/8” makes it possible to compensate for differences in height when the gripping system has to deal with objects of different heights, simplifies accurate positioning on vacuum systems, and makes it possible to position the suction cups on fragile items.

Standard level compensator G1/4” – internal and external spring



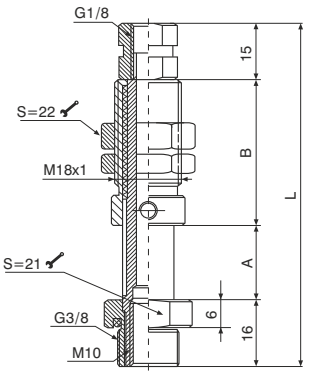
Code	A	L	Weight (gr.)
19P14.S.10.E	20	80	152.6
19P14.S.20.E	35	95	172.5
19P14.S.30.E	50	110	194
19P14.S.50.E	70	130	218.3



Code	A	B	L	Weight (gr.)
19P14.S.10.I	10	25	55	84.8
19P14.S.20.I	20	35	75	110.3
19P14.S.30.I	30	45	95	145.3
19P14.S.50.I	50	65	135	191.6

The standard level compensator G1/4” makes it possible to compensate for differences in height when the gripping system has to deal with objects of different heights, simplifies accurate positioning on vacuum systems, makes it possible to position the suction cups on fragile items.

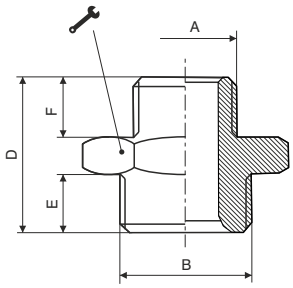
Anti-rotation level compensator G3/8" - internal spring



Code	A	B	L	Weight (gr.)
19P38.N.10.I	10	28	69	112.3
19P38.N.20.I	20	39	90	134.7
19P38.N.30.I	30	50	111	158.2
19P38.N.50.I	50	70	151	204.9

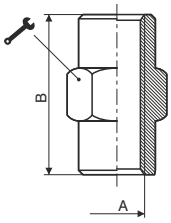
The anti-rotation level compensator G3/8" makes it possible to compensate for differences in height when the gripping system has to deal with objects of different heights, simplifies accurate positioning on vacuum systems, and makes it possible to position the suction cups on fragile items. The anti-rotation design makes it possible to use oval or rectangular suction cups.

Cylindrical nipples for compensators



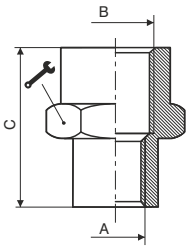
Code	A	B	D	E	F		Weight (gr.)
101M5M5	M5	M5	11.5	4	4	8	2.3
101M518	M5	G1/8"	14.5	6	4	14	8.4
1011818	G1/8"	G1/8"	16.5	6	6	14	9.2
1011814	G1/8"	G1/4"	19	8	6	17	14.6
1011838	G1/8"	G3/8"	20	9	6	19	19.7
1011414	G1/4"	G1/4"	21	8	8	17	15.7
1011438	G1/4"	G3/8"	22	9	8	19	22
1011412	G1/4"	G1/2"	23.5	10	8	24	36.5
1013838	G3/8"	G3/8"	23	9	9	19	24
1013812	G3/8"	G1/2"	24.5	10	9	24	38.1
1011212	G1/2"	G1/2"	25.5	10	10	24	40

Sleeves for antirotation level compensators



Code	A	B		Weight (gr.)
10338	G3/8"	23	22	34.9

Sleeves for antirotation level compensators



Code	A	B	C		Weight (gr.)
1061838	G1/8"	G3/8"	20	22	27.4
1061438	G1/4"	G3/8"	23	22	30.5
1063812	G3/8"	G1/2"	27.5	26	35.1

VACUUM GENERATORS 3

PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

PNEUMAX®

www.pneumaxspa.com

General details

Vacuum generators of the pneumatic type operate on the Venturi principle: one or more nozzles are fed by compressed air, generating a jet of air that drags (in contact with the environment) the surrounding air and then evacuates. This "dragging" creates a depression which results in generation of a vacuum. The big advantage of pneumatic pumps is that they can operate only when the suction cups connected to them require vacuum.

Advantages:

1) Consumption of air (and therefore power) limited to moments of use.
2) Installation directly proximate to the suction cups (simplification of layout / savings).
3) Short response times and high capacity.
4) Flow rates for any requirement.
5) No limit to applications.
6) Compactness / lightness / reliability / little or no wear.

Types:

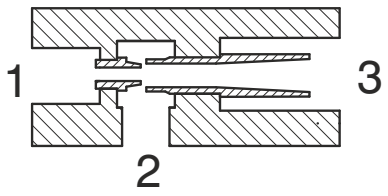
In terms of dimensions, functions and operation, we can categorise generators as one of two major types:

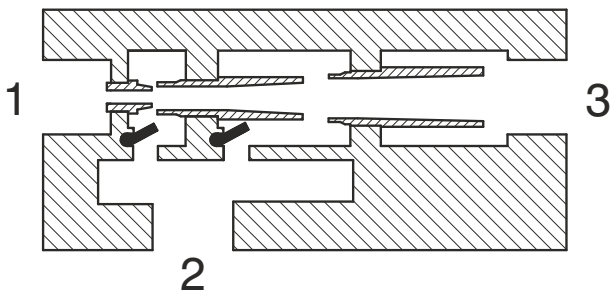
1) Single stage, compact and/or miniaturised, with pneumatic or electropneumatic control, for direct-contact installation with suction cup holders and suction cups.
2) Multistage with or without integrated functions, with pneumatic or electropneumatic control, for de-localised assembly and for controlling groups of suction cups.

Range:

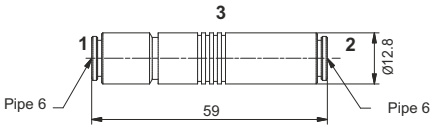
The **PNEUMAX** range consists of single-stage and multistage equipment of various sizes and types; the single-stage generators use the Venturi effect in a single medium/high throughput nozzle and promptly generate vacuum, flow rate and suction values that are suitable for medium/light applications. Multistage generators having more than one nozzle (ejectors) in a line, using the kinetic energy that this layout generates to ensure, based on the flow rate, limited consumption of energy and attainment of a vacuum level equal to 90%, with various suction capabilities.
Single-stage generators, very fast in switching pressure/vacuum, can also be equipped with a quick-release system for highly cyclical applications. Multistage generators can often be accessorised with integrated management and control functions, such as for example electropneumatic control for power supply and power shut-off, quick-release blowing, a regulator to measure this release, and a vacuum switch to control the degree of vacuum generated. These latter generators can be installed as modules as well, creating actual stand-alone modules for decentralised vacuum generation and management for controlling more than one gripping element.

Multistage section



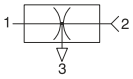


Single stage vacuum generator T06



Ordering code

19T06.S.05.HV.C0

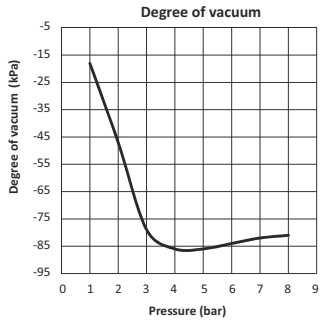


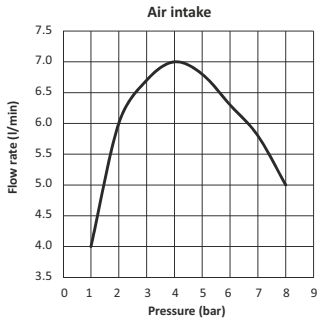
Single stage generators, with operation based on the Venturi principle; their main feature is the presence of feed pressure and connection for the vacuum, on the same axis. This makes it possible to connect the suction cups directly to the generator or through the suction cup holder, so therefore still on the same axis with obvious advantages in terms of system layout and simplicity. The outlet connection has a female thread G 1/8", or on circumference of the T06.

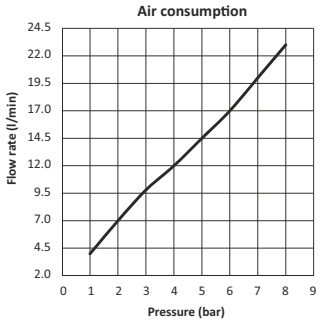
Performance characteristics

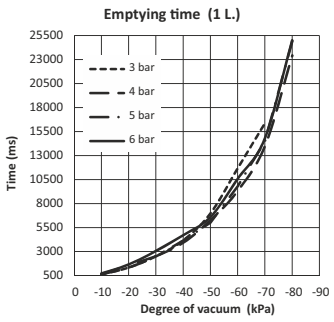
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	47	86	84
- Intake flow rate (l/min)	6	7	6
- Air consumption (l/min)	7	12	17

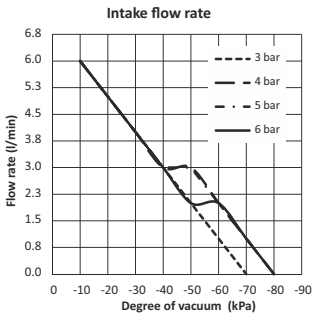
Performance Charts







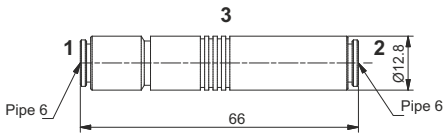




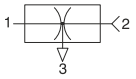
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	7

Single stage vacuum generator T06



Ordering code
19T06.S.07.HV.C0

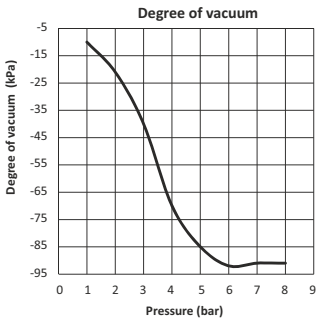


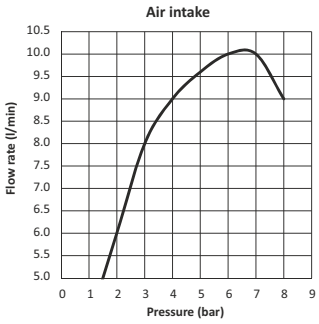
Single stage generators, with operation based on the Venturi principle; their main feature is the presence of feed pressure and connection for the vacuum, on the same axis. This makes it possible to connect the suction cups directly to the generator or through the suction cup holder, so therefore still on the same axis with obvious advantages in terms of system layout and simplicity. The outlet connection has a female thread G 1/8", or on circumference of the T06.

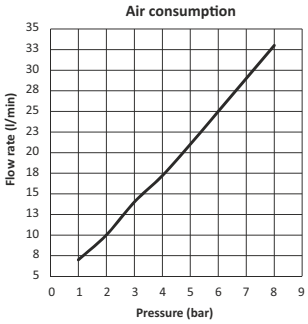
Performance characteristics

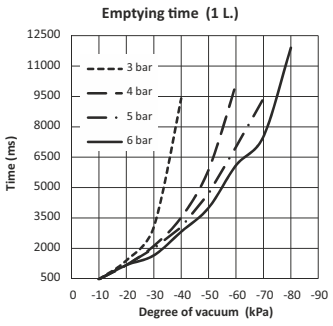
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	21	70	92
- Intake flow rate (l/min)	6	9	10
- Air consumption (l/min)	10	17	25

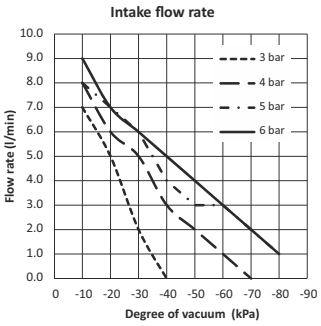
Performance Charts







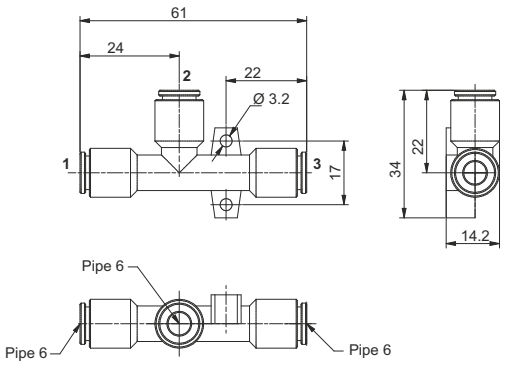




Technical features

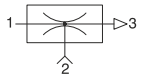
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	8

Single stage vacuum generator T06



Ordering code

19T06.S.07.HV.ZZ

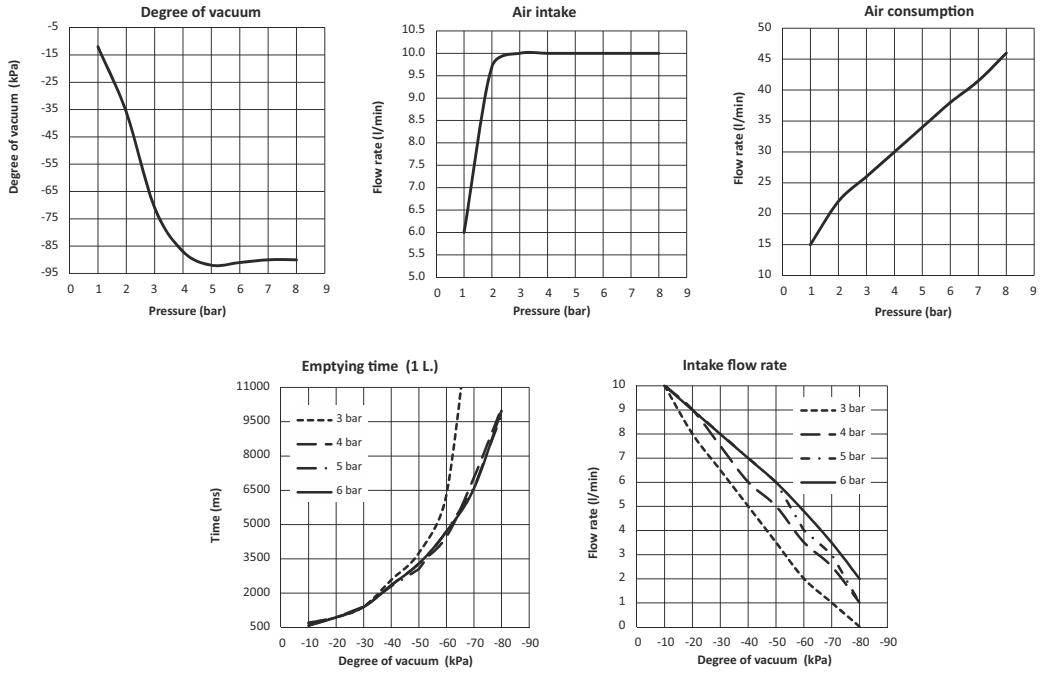


Single-stage generators, robust and reliable, with compact dimensions and suitable for applications that need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle, they have the vacuum connection orthogonal to the axis of supply and outlet. They can be connected directly to the suction cups and/or suction cup holder and can be applied in any position.

Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	36	87	91
- Intake flow rate (l/min)	10	10	10
- Air consumption (l/min)	22	30	38

Performance Charts



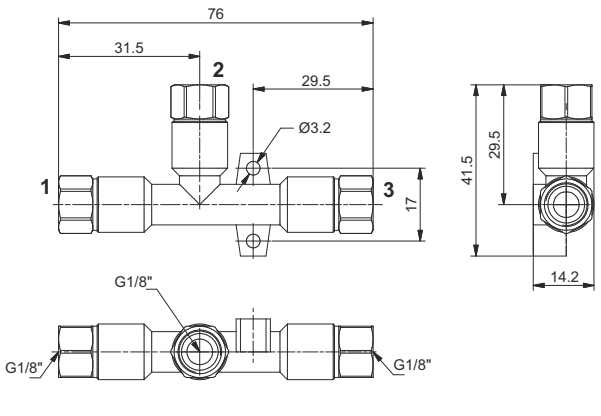
Technical features

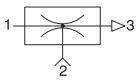
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	12

Single stage vacuum generator T18

Ordering code

19T18.S.07.HV.VV





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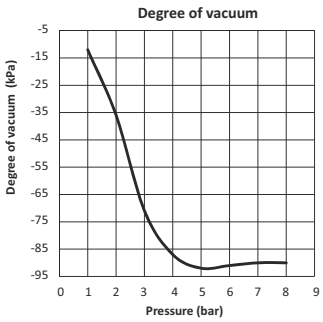
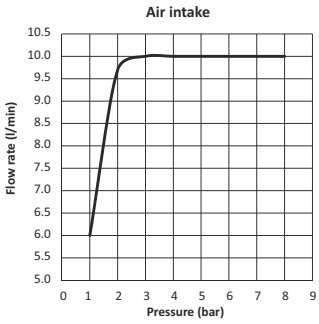
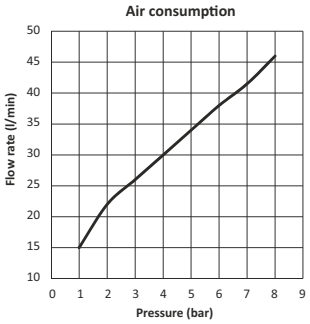
Performance characteristics

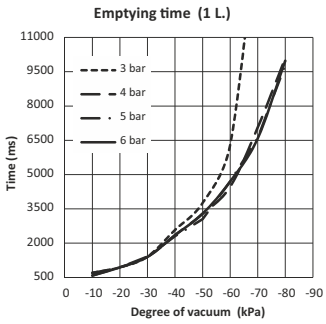
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	36	87	91
- Intake flow rate (l/min)	10	10	10
- Air consumption (l/min)	22	30	38

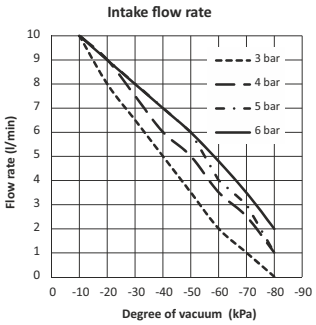
Performance Charts







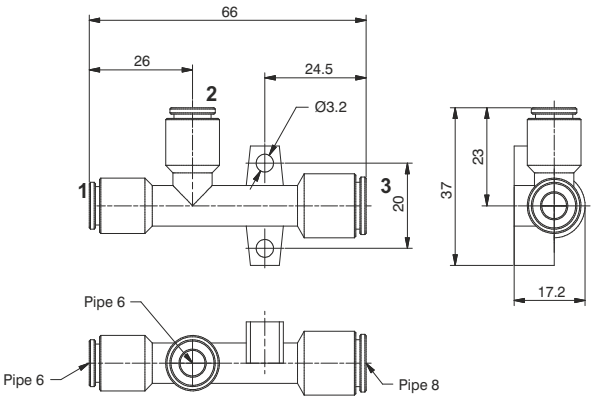




Technical features

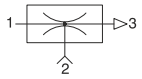
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	36

Single stage vacuum generator T06



Ordering code

19T06.S.10.HV.ZY



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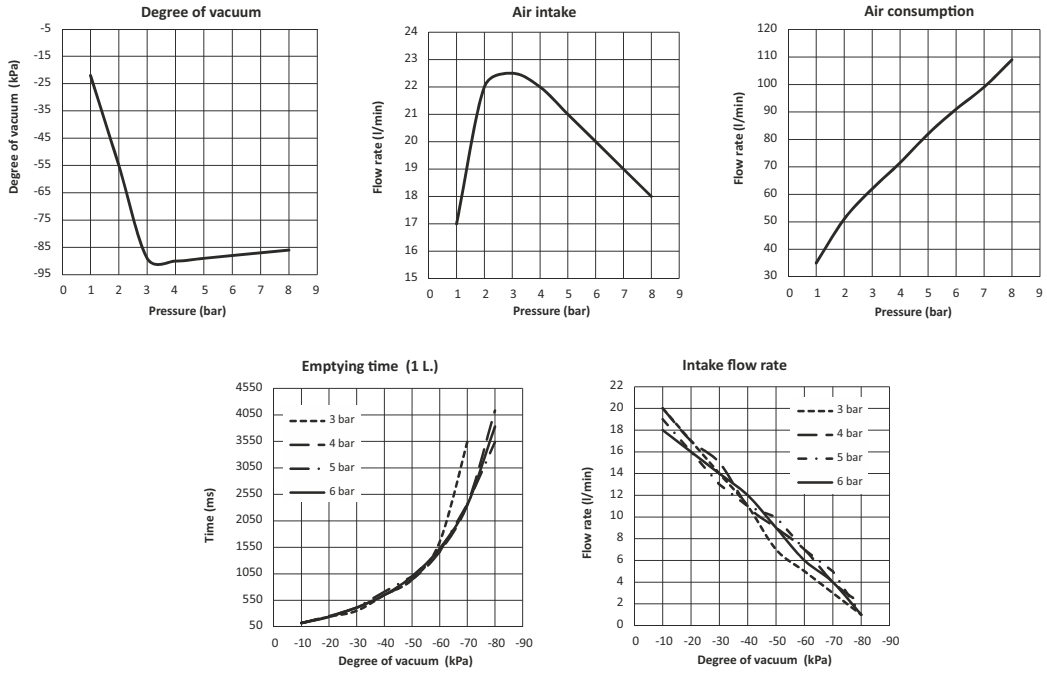
Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	55	90	88
- Intake flow rate (l/min)	22	22	20
- Air consumption (l/min)	51	72	91

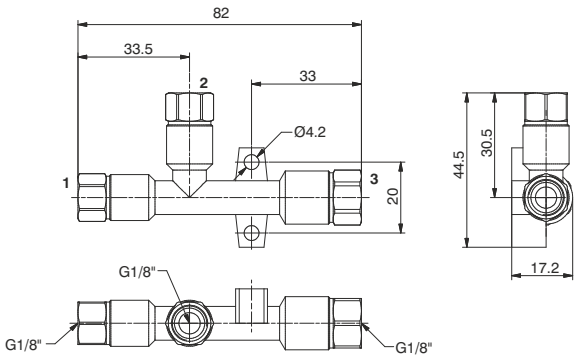
Performance Charts



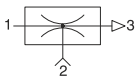
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	15

Single stage vacuum generator T18



Ordering code
19T18.S.10.HV.VV



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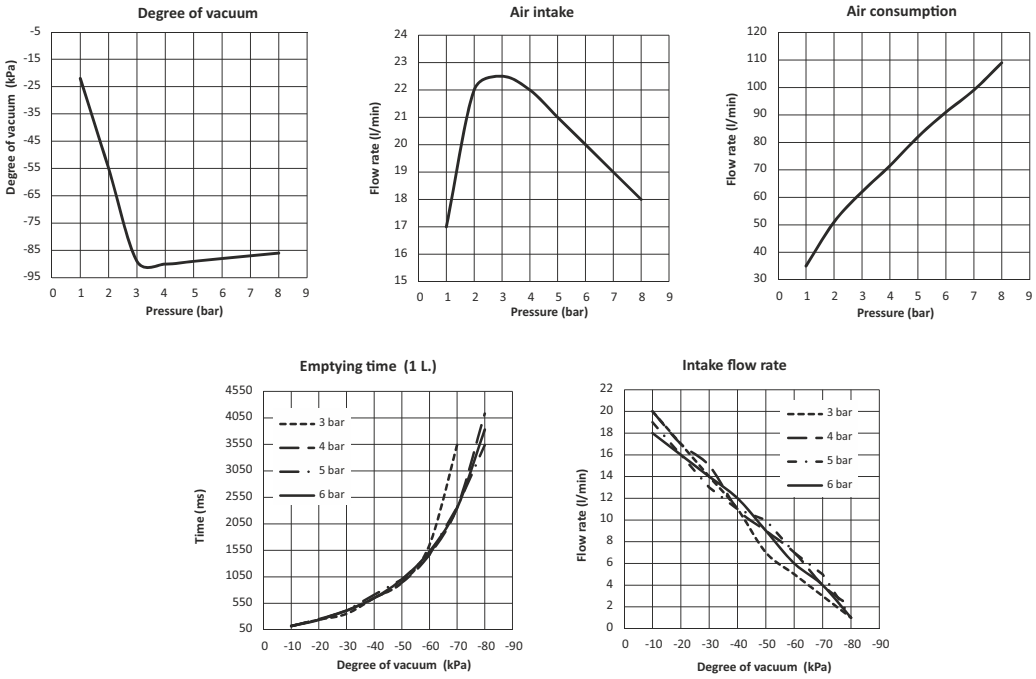
Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	55	90	88
- Intake flow rate (l/min)	22	22	20
- Air consumption (l/min)	51	72	91

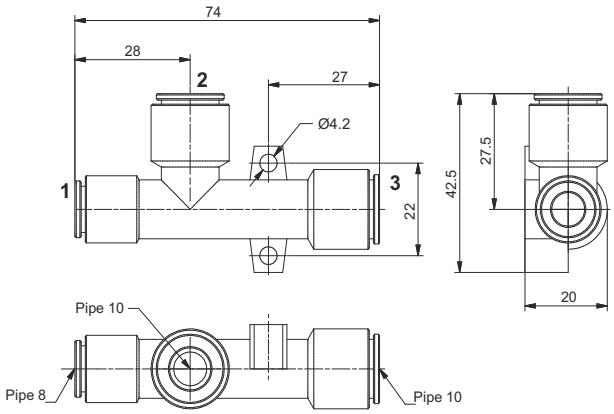
Performance Charts



Technical features

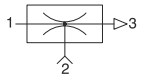
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	46

Single stage vacuum generator T10



Ordering code

19T10.S.13.HV.XX



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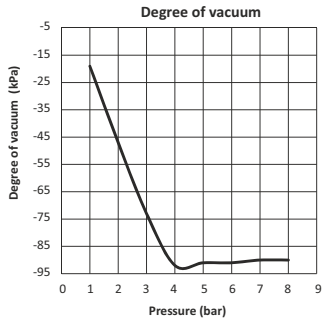
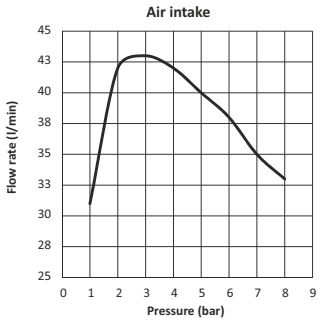
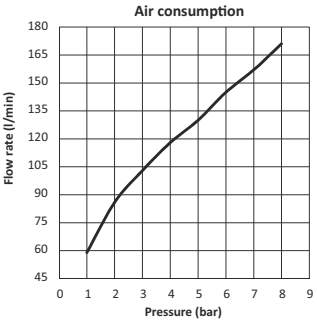
Performance characteristics

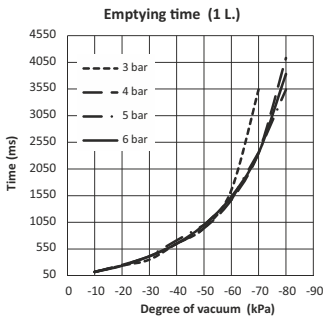
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	47	92	91
- Intake flow rate (l/min)	42	42	38
- Air consumption (l/min)	86	118	145

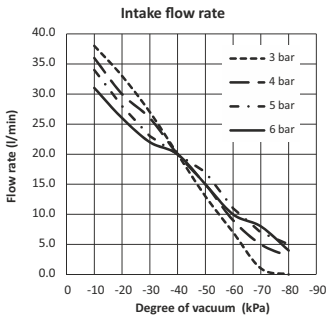
Performance Charts









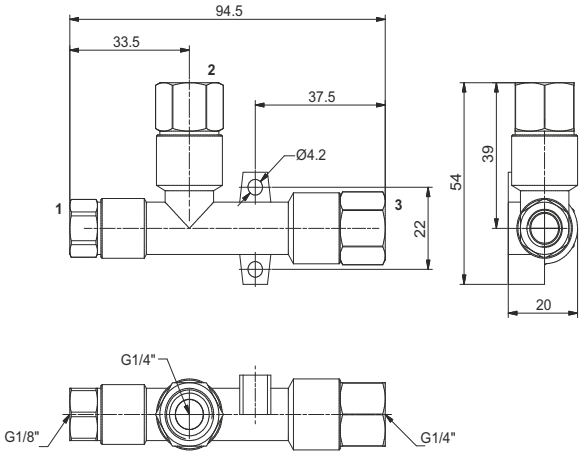


Technical features

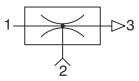
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	25

3

Single stage vacuum generator T14



Ordering code
19T14.S.15.HV.UU



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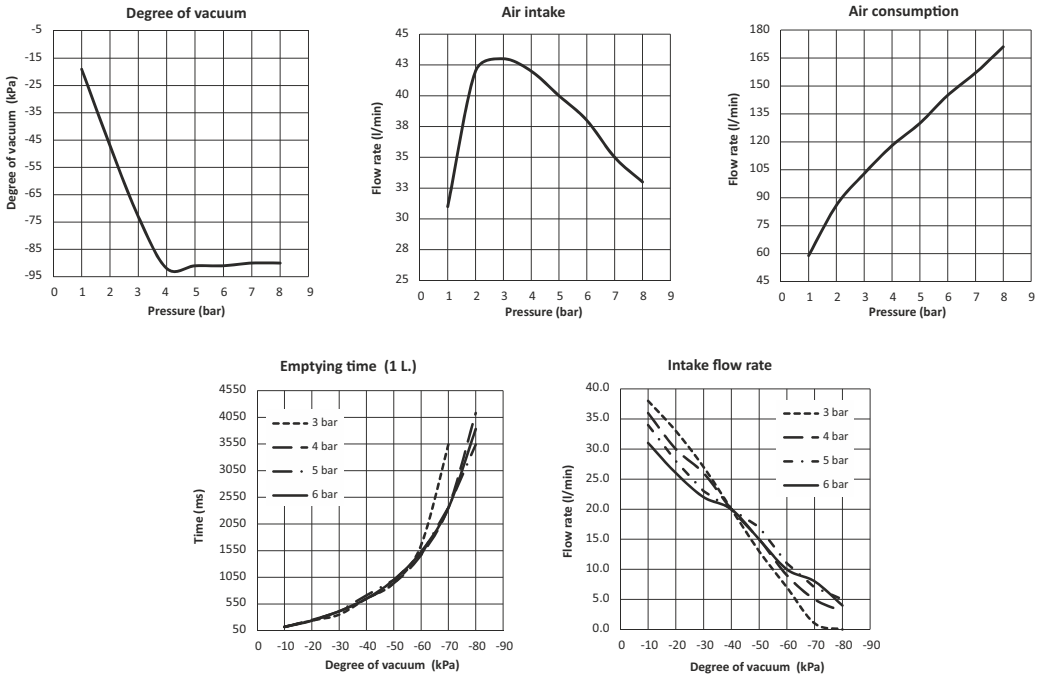
Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	47	92	91
- Intake flow rate (l/min)	42	42	38
- Air consumption (l/min)	86	118	145

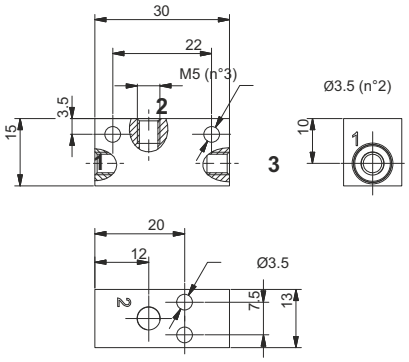
Performance Charts



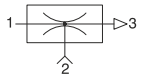
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	86

Single stage vacuum generator M5



Ordering code
19M05.S.05.SS.00



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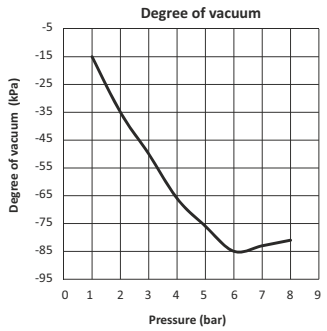
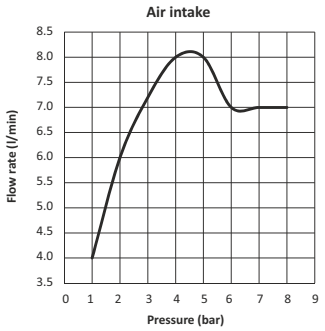
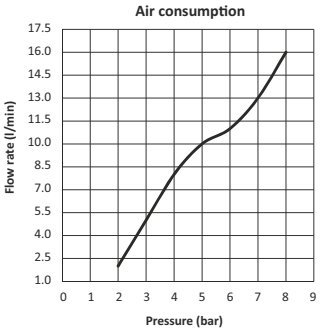
Performance characteristics

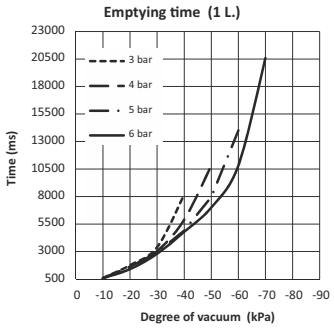
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	35	66	85
- Intake flow rate (l/min)	6	8	7
- Air consumption (l/min)	2	8	11

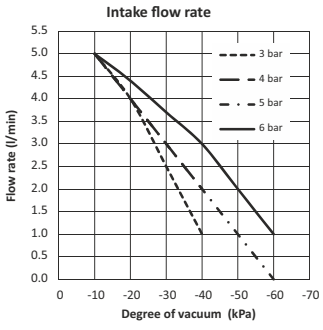
Performance Charts







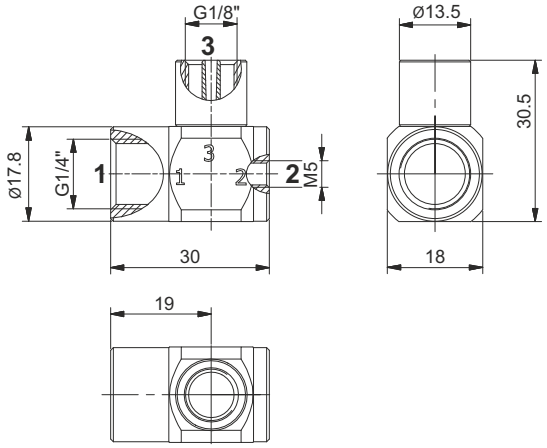




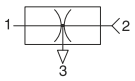
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	15

Single stage vacuum generator M5



Ordering code
19M05.S.08.SS.L0

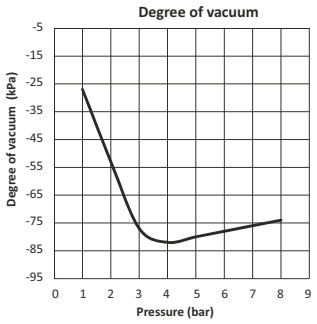


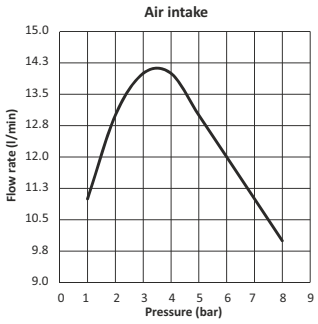
Single stage generators, with operation based on the Venturi principle; their main feature is the presence of feed pressure and connection for the vacuum, on the same axis. This makes it possible to connect the suction cups directly to the generator or through the suction cup holder, so therefore still on the same axis with obvious advantages in terms of system layout and simplicity. The outlet connection has a female thread G 1/8", or on circumference of the T06.

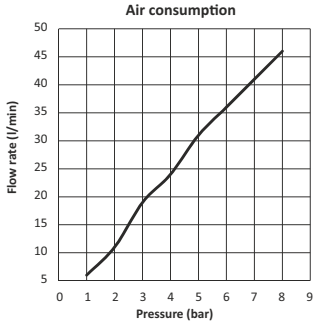
Performance characteristics

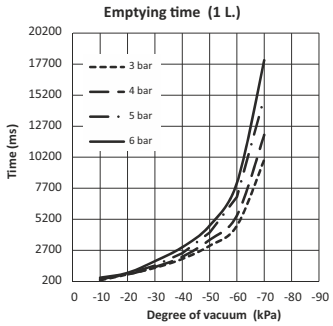
-	Supply pressure (bar)	2	4	6
-	Degree of Vacuum (-kPa)	53	82	78
-	Intake flow rate (l/min)	13	14	12
-	Air consumption (l/min)	11	24	36

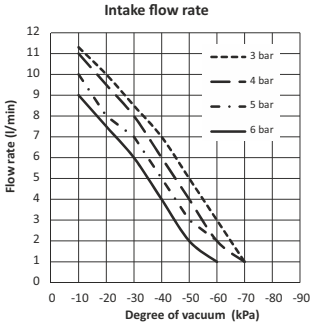
Performance Charts







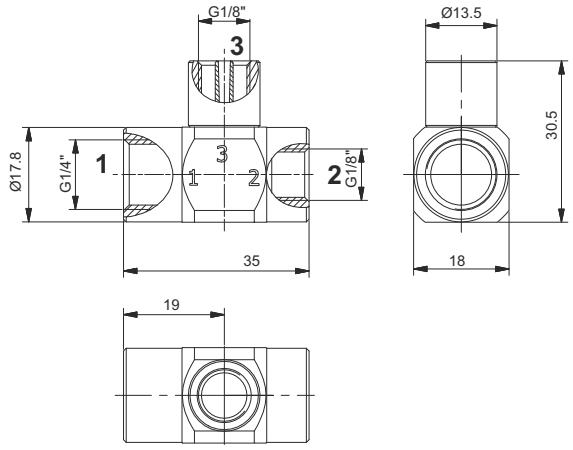




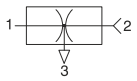
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	24

Single stage vacuum generator G1/8"



Ordering code
19M18.S.08.SS.L0



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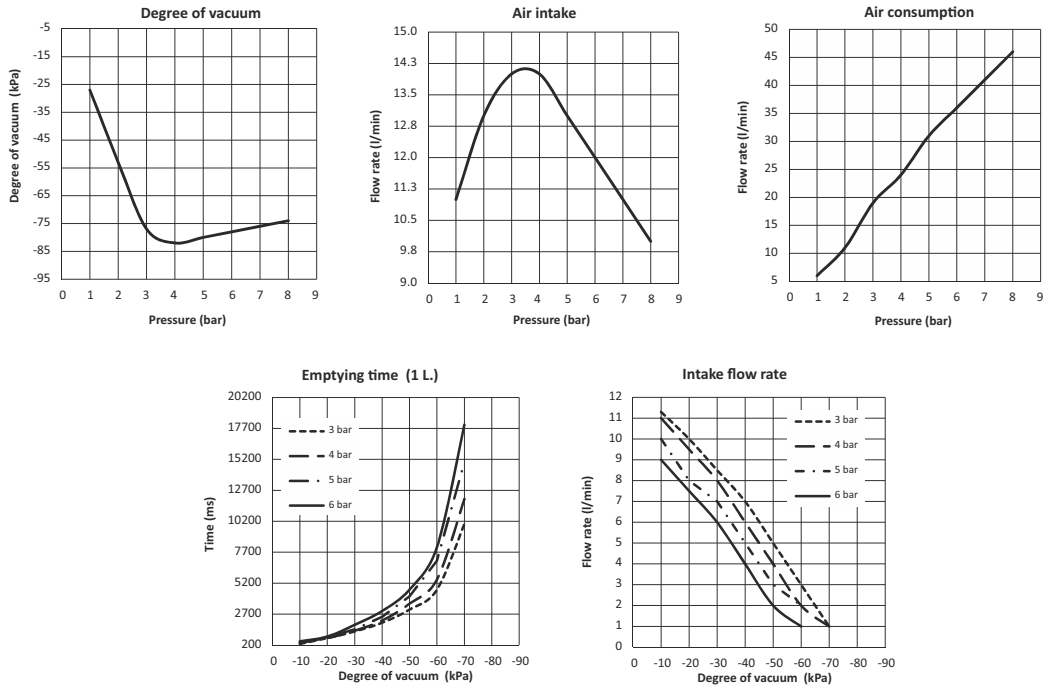
Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	53	82	78
- Intake flow rate (l/min)	13	14	12
- Air consumption (l/min)	11	24	36

Performance Charts

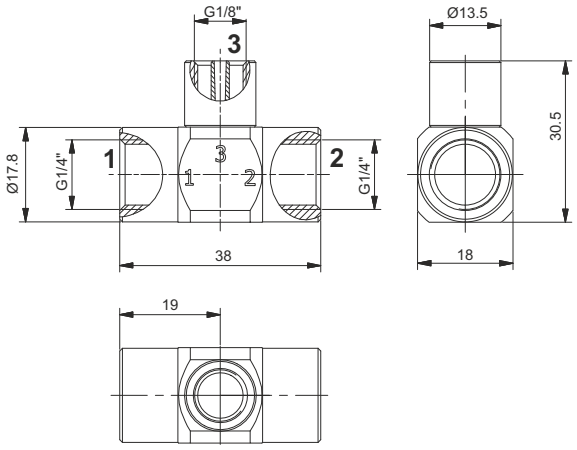


Technical features

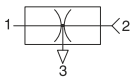
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	26

3

Single stage vacuum generator G1/4"



Ordering code
19M14.S.08.SS.L0

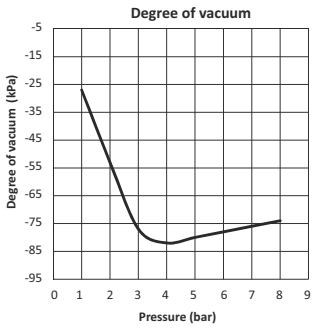


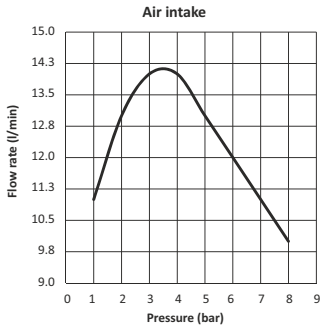
Single stage generators, with operation based on the Venturi principle; their main feature is the presence of feed pressure and connection for the vacuum, on the same axis. This makes it possible to connect the suction cups directly to the generator or through the suction cup holder, so therefore still on the same axis with obvious advantages in terms of system layout and simplicity. The outlet connection has a female thread G 1/8", or on circumference of the T06.

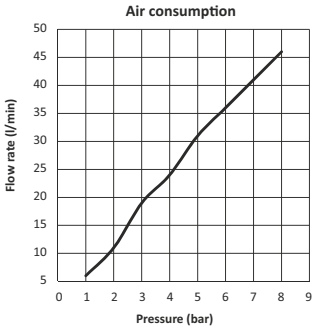
Performance characteristics

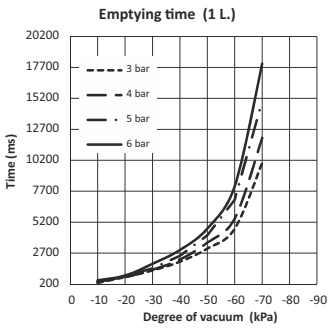
-	Supply pressure (bar)	2	4	6
-	Degree of Vacuum (-kPa)	53	82	78
-	Intake flow rate (l/min)	13	14	12
-	Air consumption (l/min)	11	24	36

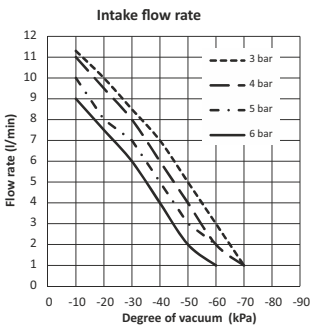
Performance Charts







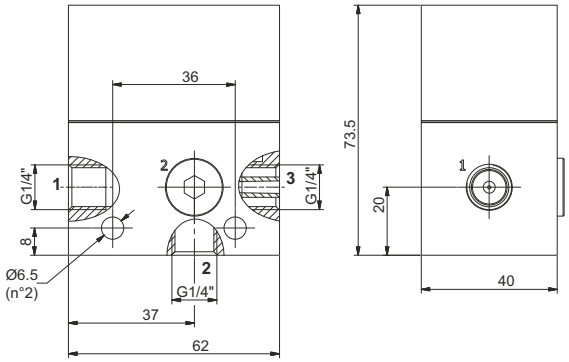




Technical features

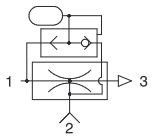
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	26

Single stage vacuum generator G1/4"



Ordering code

19M14.S.10.SS.E0

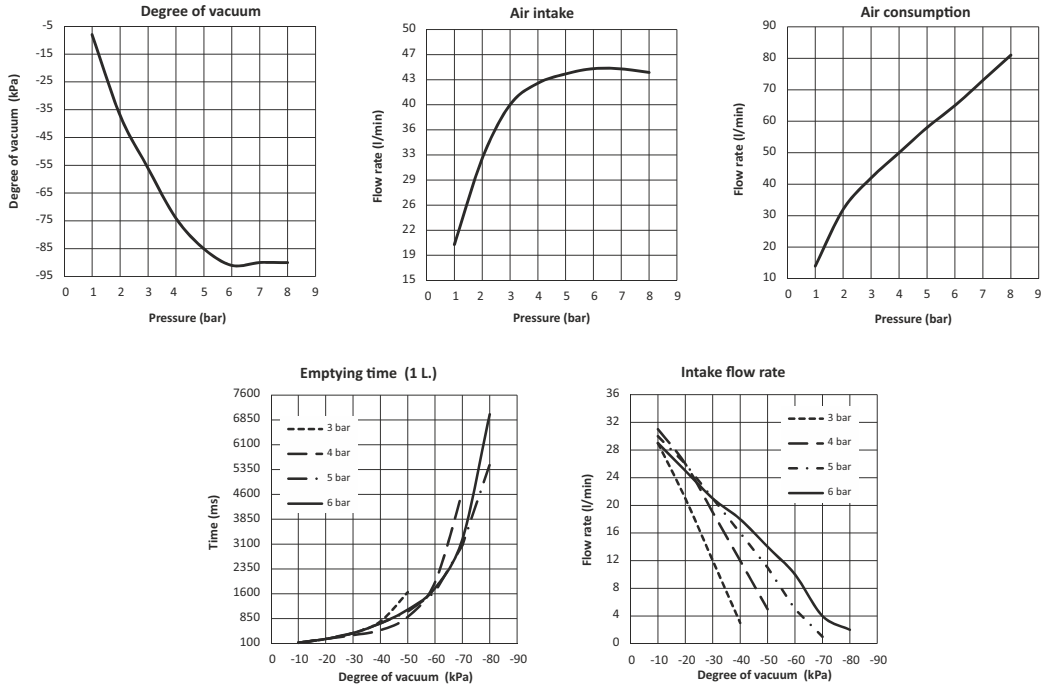


Single-stage generators derived from standard traditional single-stage generators, complete with automatic release system. The pressure supply, in addition to generating the defined vacuum through the Venturi principle, supplies a chamber which serves as a pressure accumulator. When the supply stops, through a non-return valve, the accumulated pressure will be discharged automatically through the vacuum connection, ensuring quick detachment of the gripped piece.

Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	37	74	91
- Intake flow rate (l/min)	32	43	45
- Air consumption (l/min)	32	50	75

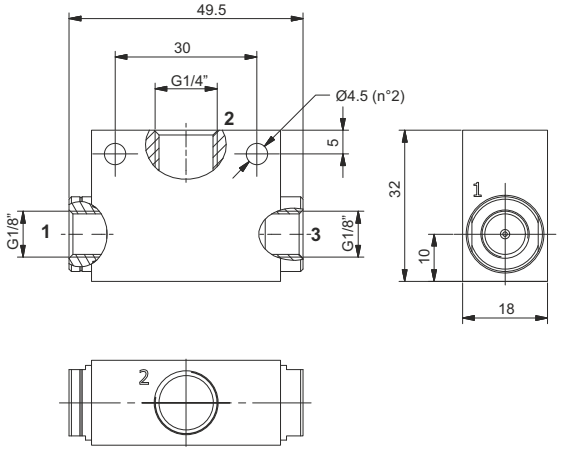
Performance Charts



Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	346

Single stage vacuum generator G1/4"



Ordering code
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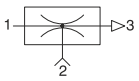
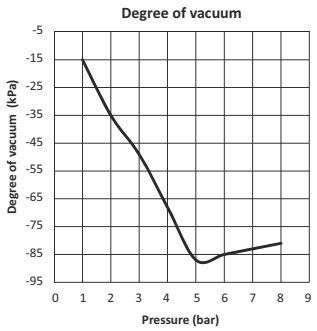


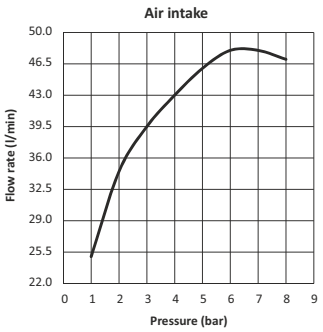
Single-stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle, they have the vacuum connection, orthogonal to the axis of supply and outlet. They can be connected directly to the suction cups and/or suction cup holder and applied in any position.

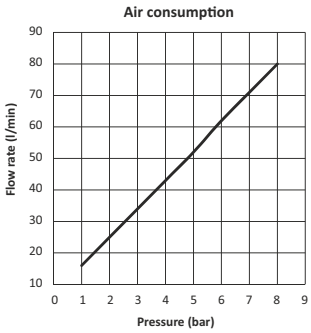
Performance characteristics

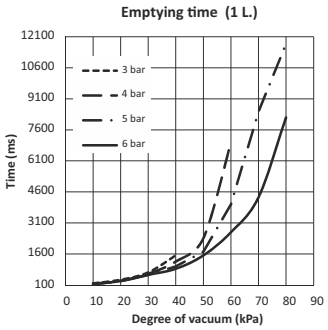
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	35	68	85
- Intake flow rate (l/min)	35	43	48
- Air consumption (l/min)	25	43	62

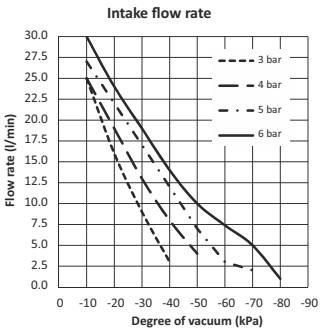
Performance Charts







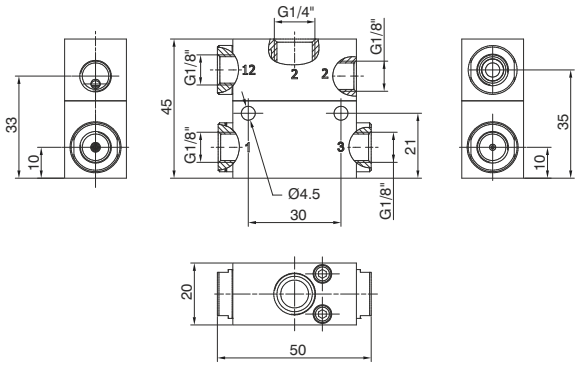




Technical features

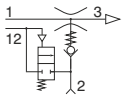
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	55

Single stage vacuum generator with built in vacuum retaining valve



Ordering code

19M14.S.10.SS.03

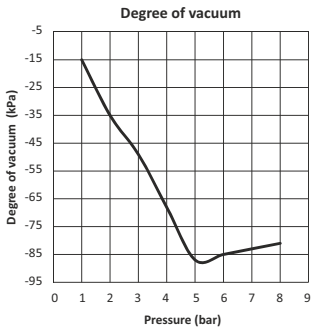


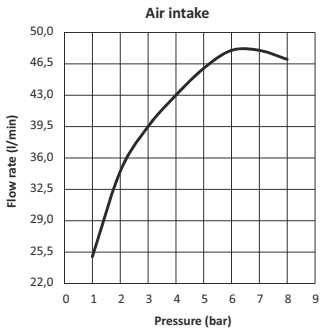
Single-stage generators, robust and reliable, with compact dimensions and suitable for applications which require the vacuum to be reached quickly with limited air flow. Operating using the Venturi principle, they have the vacuum connection at 90° to the axis of supply and exhaust. They can be connected directly to the suction cups or suction cup holder for the construction of a decentralized plant. Equipped with an integrated non-return valve, which holds the vacuum in sealed applications and breakdowns or lack of air supply and a flap valve for the quick release of the manipulated objects.

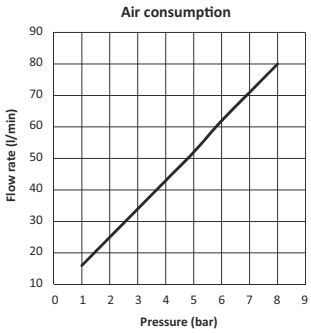
Performance characteristics

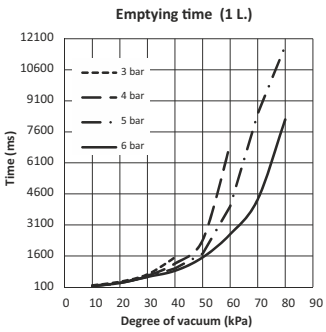
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	35	68	85
- Intake flow rate (l/min)	35	43	48
- Air consumption (l/min)	25	43	62

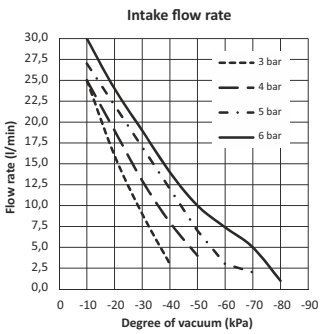
Performance Charts









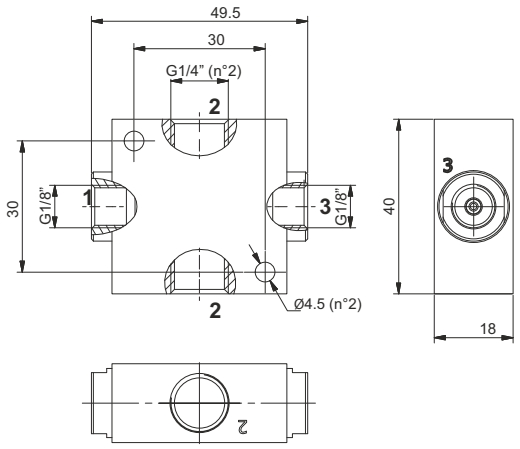


Technical features

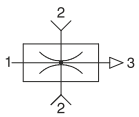
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	85

3

Single stage vacuum generator G1/4"



Ordering code
19M14.S.15.SS.RD

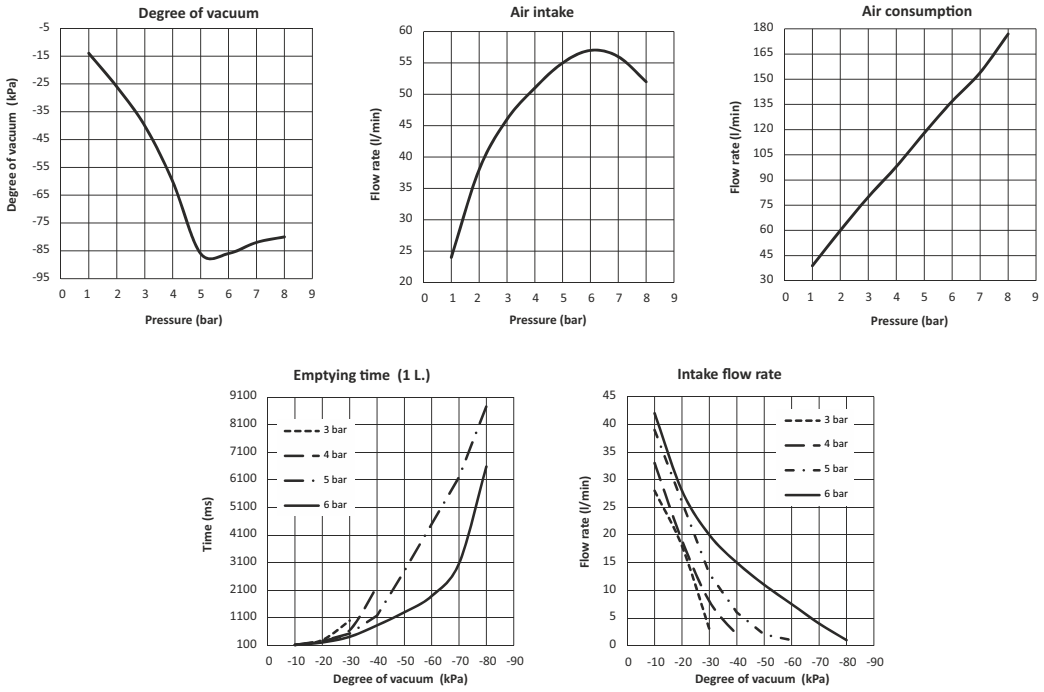


Single-stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle, they have the vacuum connection, orthogonal to the axis of supply and outlet. They can be connected directly to the suction cups and/or suction cup holder and applied in any position.

Performance characteristics

-	Supply pressure (bar)	2	4	6
-	Degree of Vacuum (-kPa)	26	60	86
-	Intake flow rate (l/min)	38	51	57
-	Air consumption (l/min)	60	98	137

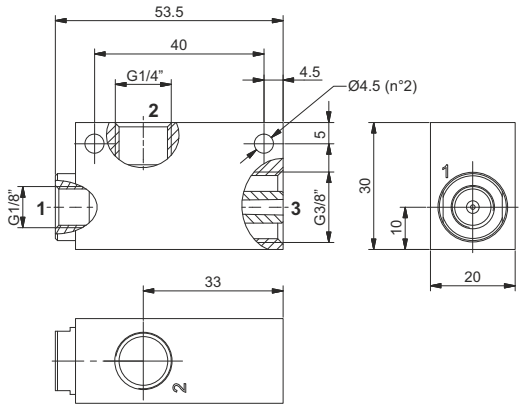
Performance Charts



Technical features

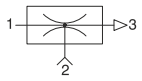
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	68

Single stage vacuum generator G1/4"



Ordering code

19M14.S.11.SS.00

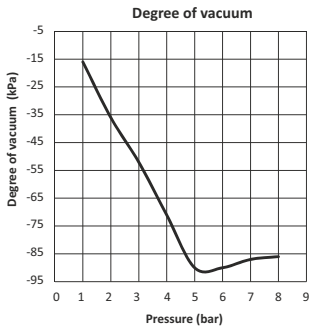


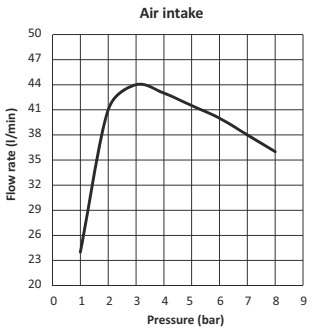
Single-stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle, they have the vacuum connection, orthogonal to the axis of supply and outlet. They can be connected directly to the suction cups and/or suction cup holder and applied in any position.

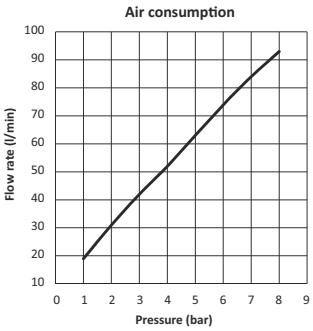
Performance characteristics

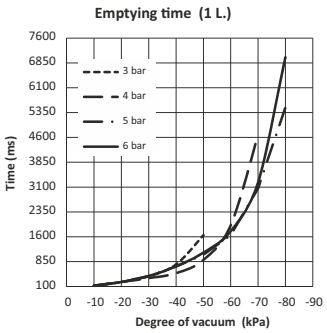
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	36	71	90
- Intake flow rate (l/min)	41	43	40
- Air consumption (l/min)	31	52	74

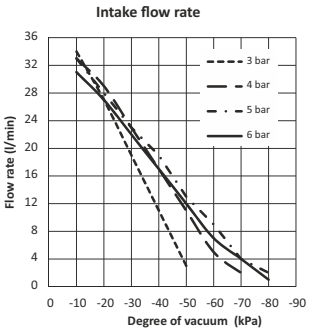
Performance Charts









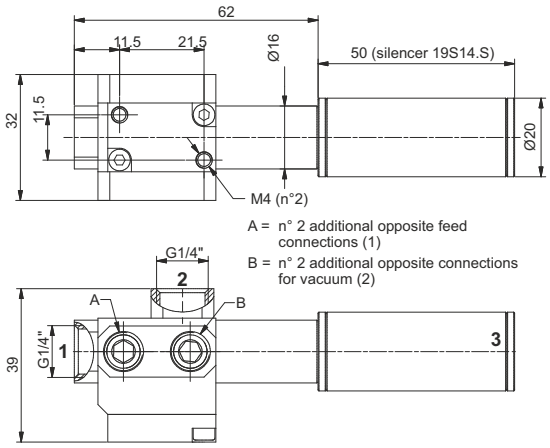


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	67

3

Single stage vacuum generator G1/4"



Ordering code
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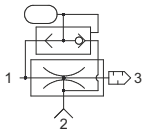
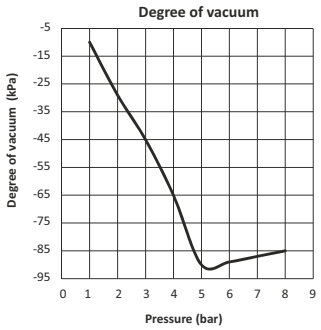


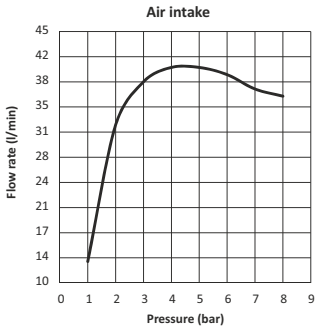
High-performance compact generator for high frequency applications; the presence of the integrated ejector ensures release capacity in the shortest possible time. The fact of it being extremely lightweight allows its application directly onto the robot gripping arms and/or mobile applications. Available with two flow rates in the same overall dimensions.

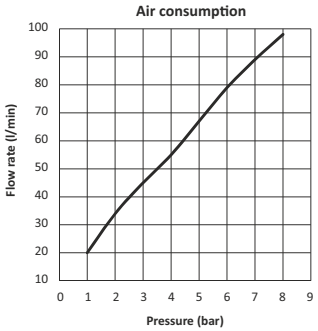
Performance characteristics

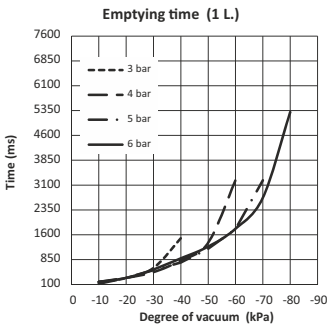
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	29	65	89
- Intake flow rate (l/min)	32	40	39
- Air consumption (l/min)	34	55	79

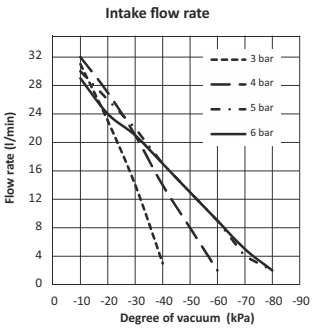
Performance Charts







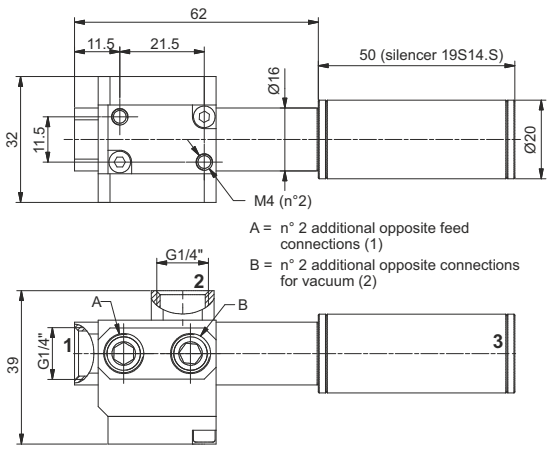




Technical features

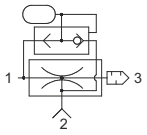
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	83

Single stage vacuum generator G1/4"



Ordering code

19M14.S.17.SL.ES

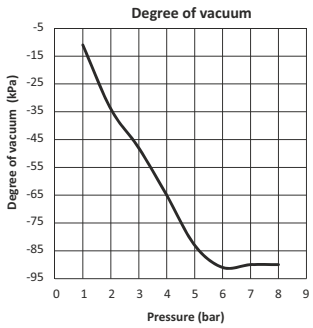


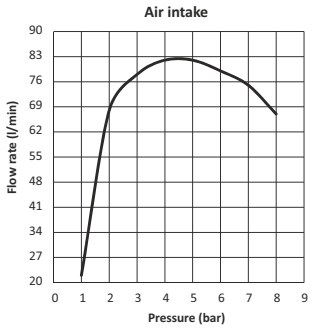
High-performance compact generator for high frequency applications; the presence of the integrated ejector ensures release capacity in the shortest possible time. The fact of it being extremely lightweight allows its application directly onto the robot gripping arms and/or mobile applications. Available with two flow rates in the same overall dimensions.

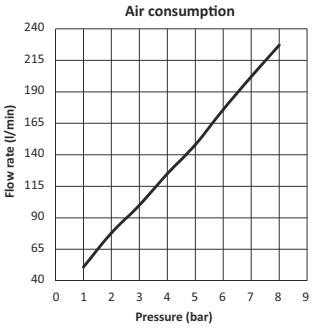
Performance characteristics

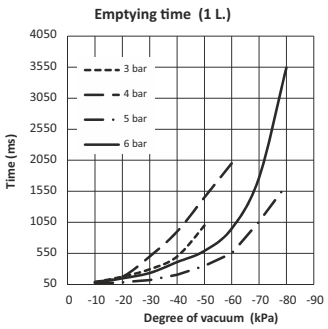
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	34	65	91
- Intake flow rate (l/min)	68	82	79
- Air consumption (l/min)	78	125	176

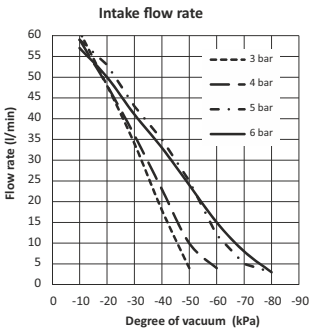
Performance Charts







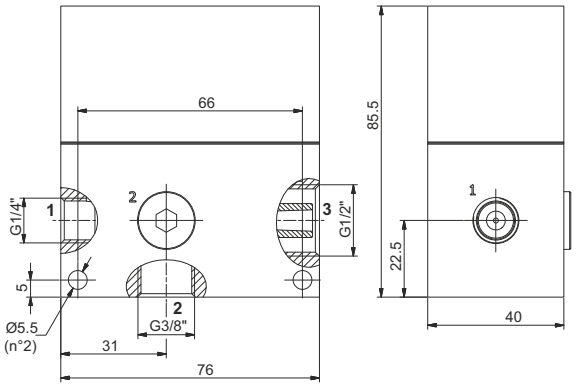




Technical features

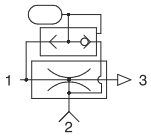
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	83

Single stage vacuum generator G3/8"



Ordering code

19M38.S.14.SS.E0

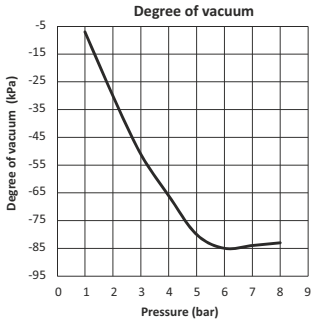


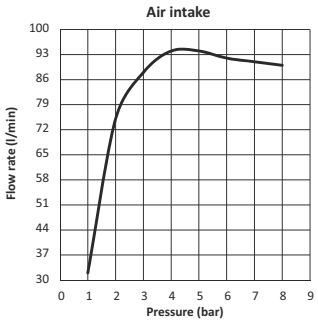
Single-stage generators derived from standard traditional single-stage generators, complete with automatic release system. The pressure supply, in addition to generating the defined vacuum through the Venturi principle, supplies a chamber which serves as a pressure accumulator. When the supply stops, through a non-return valve, the accumulated pressure will be discharged automatically through the vacuum connection, ensuring quick detachment of the gripped piece.

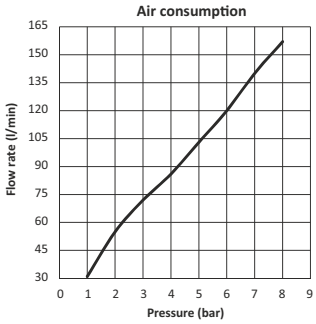
Performance characteristics

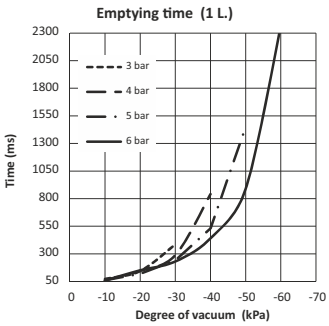
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	30	66	85
- Intake flow rate (l/min)	75	94	92
- Air consumption (l/min)	55	86	120

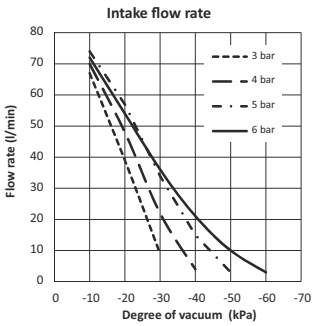
3 Performance Charts







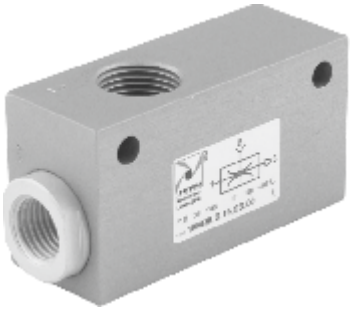


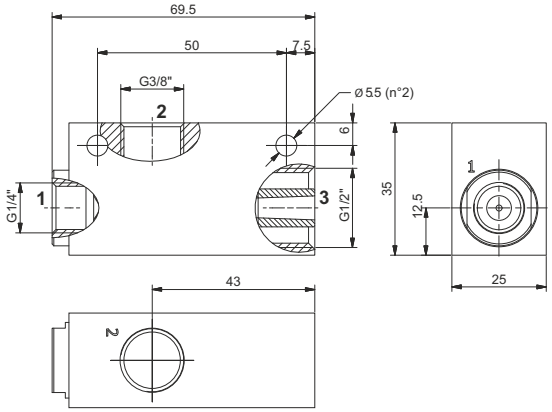


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	480

Single stage vacuum generator G3/8"





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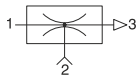
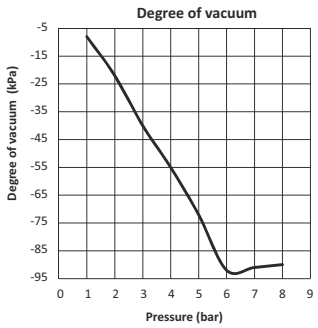


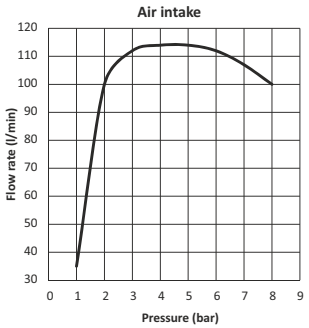
Single-stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle, they have the vacuum connection, orthogonal to the axis of supply and outlet. They can be connected directly to the suction cups and/or suction cup holder and applied in any position.

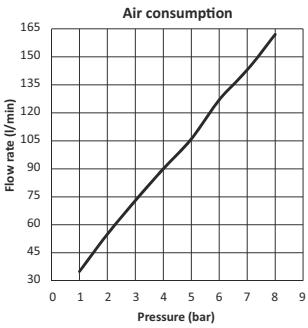
Performance characteristics

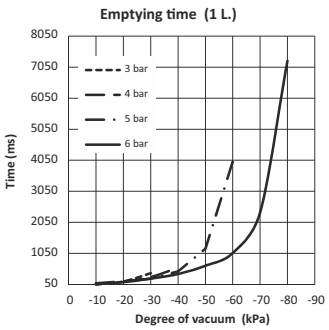
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	22	55	92
- Intake flow rate (l/min)	100	114	112
- Air consumption (l/min)	55	90	127

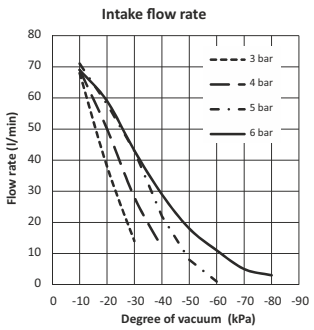
Performance Charts







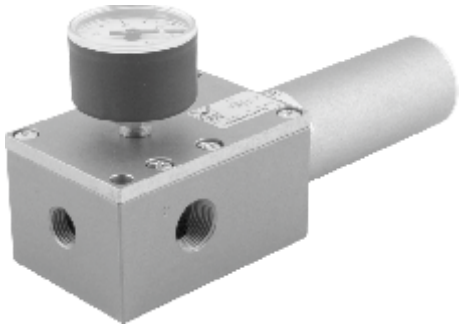


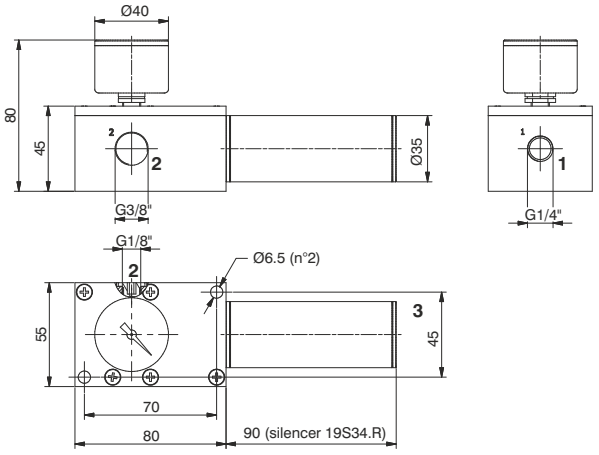


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	122

Single stage vacuum generator G3/8"





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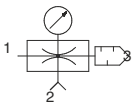
19M38.S.18.HV.◉

	OPTIONS
◉	VS = vacuum gauge + silencer
	0S = only silencer

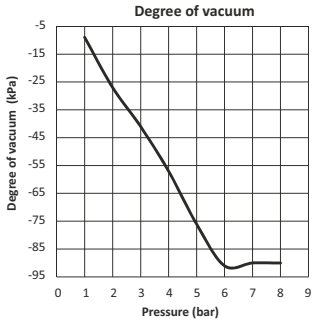


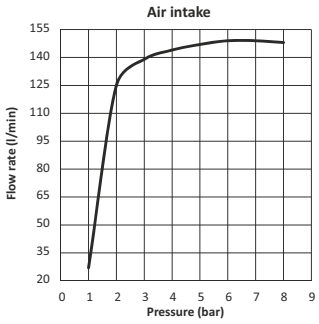
Single-stage generator with high suction capacity due to a pair of nozzles mounted in parallel; they are particularly quiet thanks to a free-flow type silencer, standard-fitted with a vacuum gauge, and allows direct connection with a vacuum switch or alternatively a solenoid valve for quick detachment via direct blowing into the vacuum connection. Suitable for decentralised connection of one or more suction cups.

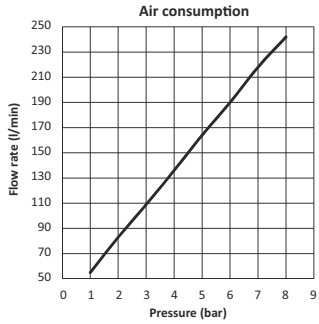
Performance characteristics

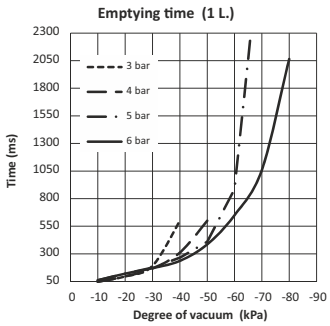
-	Supply pressure (bar)	2	4	6
-	Degree of Vacuum (-kPa)	27	57	91
-	Intake flow rate (l/min)	125	144	149
-	Air consumption (l/min)	83	136	190

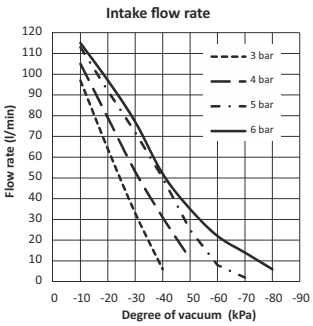
Performance Charts







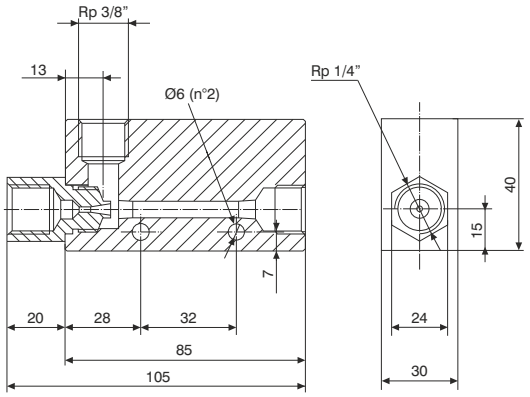




Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	450

High-flow single stage vacuum generator G3/8"



Ordering code

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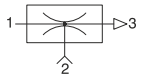
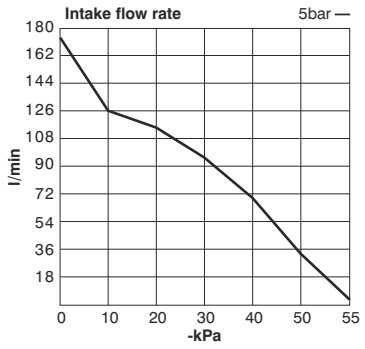


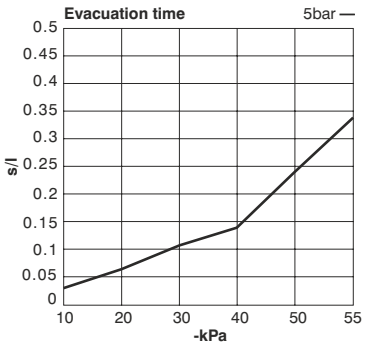
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and an average degree of vacuum are required (57 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	57
- Intake flow rate (l/min)	170
- Air consumption (l/min)	180

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)							Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	55	
5	180	170	125	115	95	70	35.5	7.5	57

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)						Degree of Vacuum max. (-kPa)
		10	20	30	40	50	55	
5	180	0.029	0.062	0.105	0.138	0.246	0.338	57

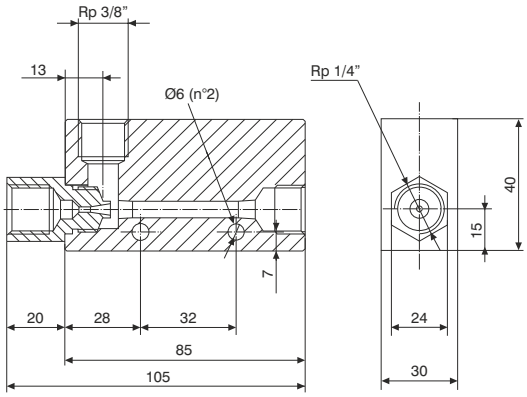
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	327

Accessories

19S12.S	Silencer G1/2"

High-flow single stage vacuum generator G3/8"



Ordering code

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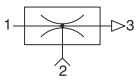
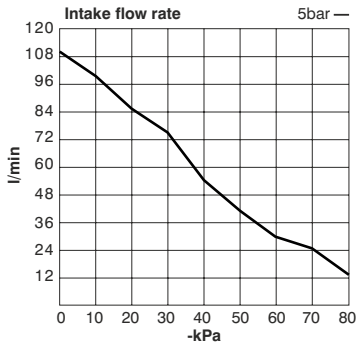


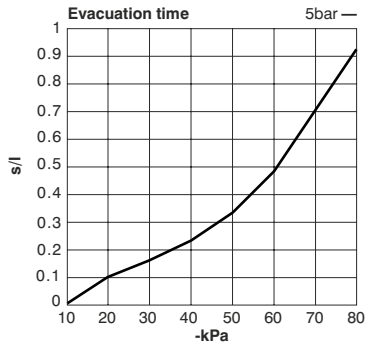
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and a high degree of vacuum are required (92 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	92
- Intake flow rate (l/min)	110
- Air consumption (l/min)	180

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	
5	180	110	100	85	75	55	40.5	30	20	12	92

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)								Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	
5	180	0.043	0.1	0.167	0.23	0.338	0.492	0.707	0.923	92

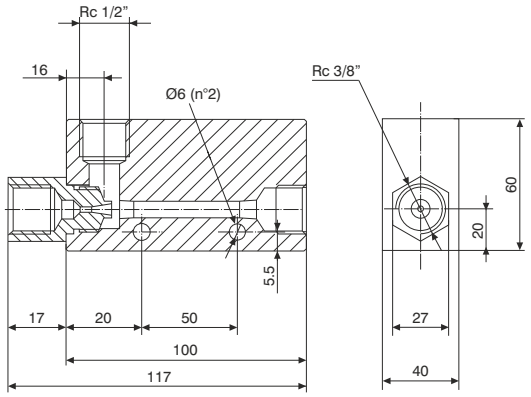
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	327

Accessories

19S12.S	Silencer G1/2"

High-flow single stage vacuum generator G1/2"



Ordering code

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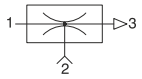
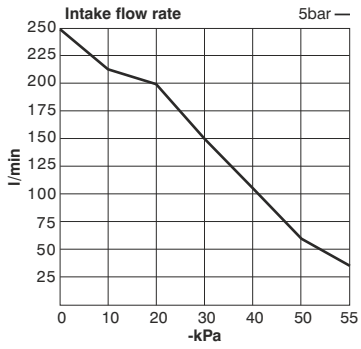


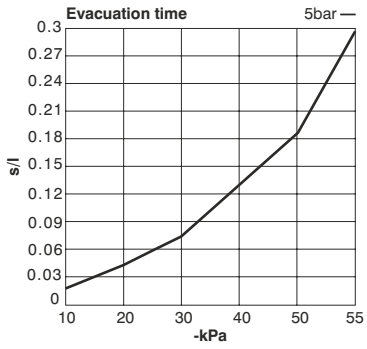
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and an average degree of vacuum are required (57 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	57
- Intake flow rate (l/min)	250
- Air consumption (l/min)	265

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)							Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	55	
5	265	250	215	200	150	105	60	36	57

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)						Degree of Vacuum max. (-kPa)
		10	20	30	40	50	55	
5	265	0.021	0.046	0.076	0.123	0.184	0.3	57

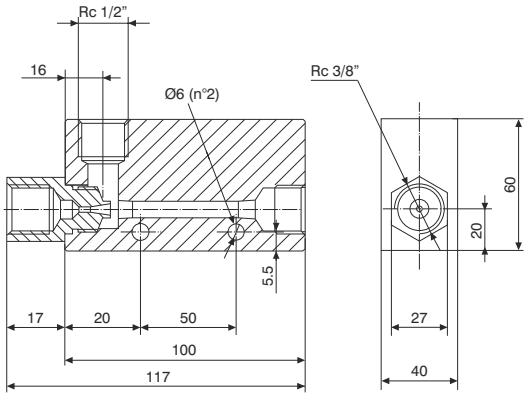
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	660

Accessories

19S34.R	Silencer G3/4"

High-flow single stage vacuum generator G1/2"



Ordering code

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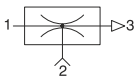
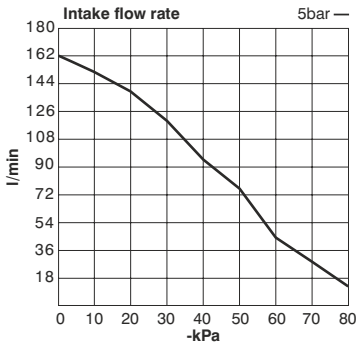


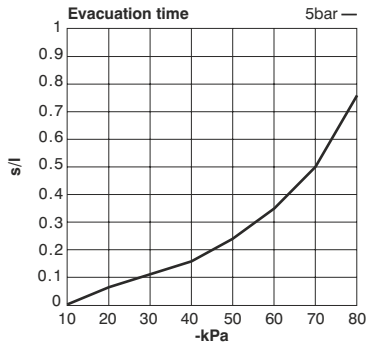
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and a high degree of vacuum are required (92 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	92
- Intake flow rate (l/min)	160
- Air consumption (l/min)	265

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	
5	265	160	155	140	120	95	72	47	28	15	92

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)								Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	
5	265	0.03	0.069	0.112	0.168	0.241	0.345	0.494	0.753	92

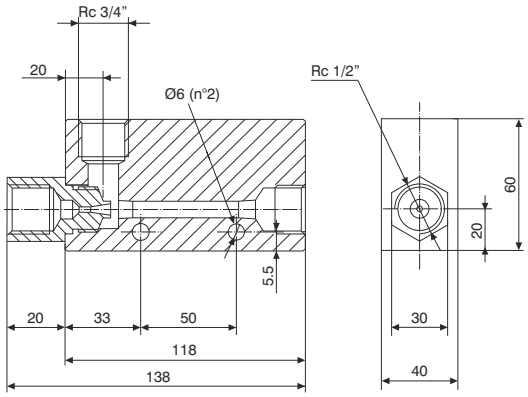
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	660

Accessories

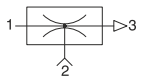
19S34.R	Silencer G3/4"

High-flow single stage vacuum generator G3/4"



Ordering code

19M34.S.30.HF.00

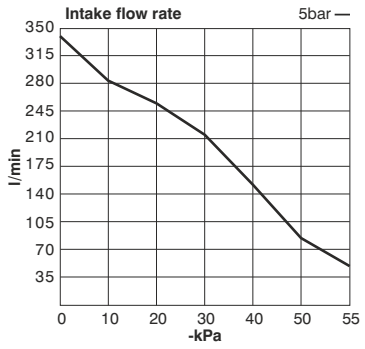


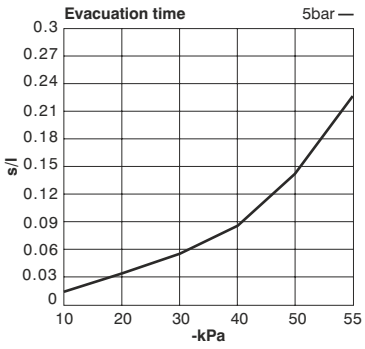
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and an average degree of vacuum are required (57 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	57
- Intake flow rate (l/min)	350
- Air consumption (l/min)	385

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)							Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	55	
5	385	350	295	267	215	150	85	41	57

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)						Degree of Vacuum max. (-kPa)
		10	20	30	40	50	55	
5	385	0.017	0.035	0.058	0.086	0.132	0.219	57

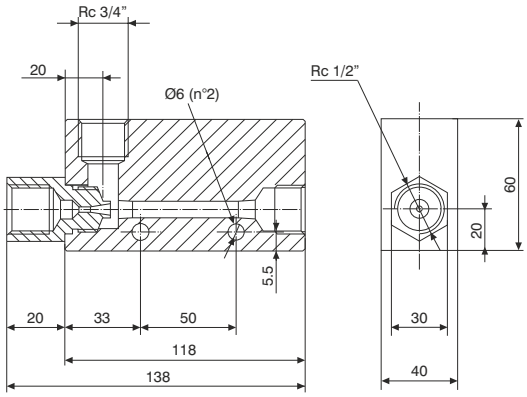
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	774

Accessories

19S34.R	Silencer G3/4"

High-flow single stage vacuum generator G3/4"



Ordering code

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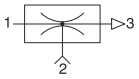
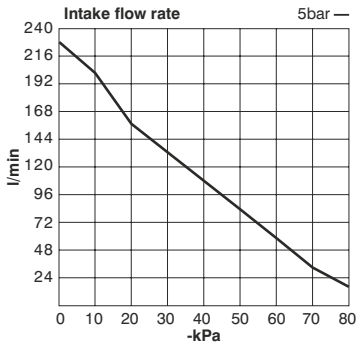


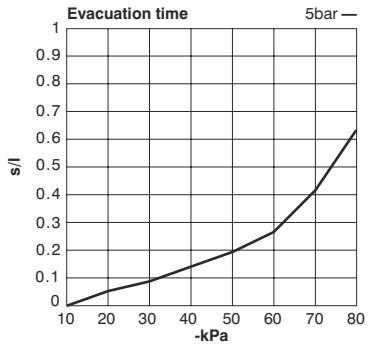
Single-stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Particularly suitable for use in dusty Environments and in applications where a large suction capacity and a high degree of vacuum are required (92 -kPa).

Performance characteristics

- Supply pressure (bar)	5
- Degree of Vacuum (-kPa)	92
- Intake flow rate (l/min)	225
- Air consumption (l/min)	385

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	
5	385	225	200	160	135	105	78	55	33	19	92

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)								Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	
5	385	0.029	0.058	0.092	0.136	0.196	0.265	0.406	0.625	92

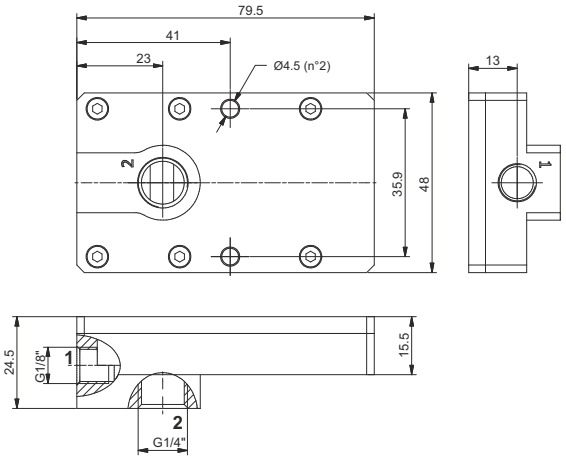
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 6
Temperature (°C)	0 ÷ +60
Weight (gr.)	774

Accessories

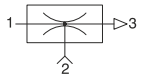
19S34.R	Silencer G3/4"

Multistage vacuum generator G1/4"



Ordering code

19M14.M.09.SS.00

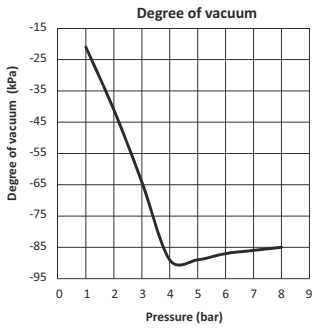


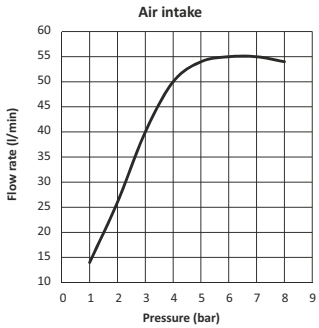
Compact generators comprising a number of modules as a function of the desired performance allow high-suction capacity with low consumption and other degrees of vacuum; as a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the sound-absorbent material inside of them.

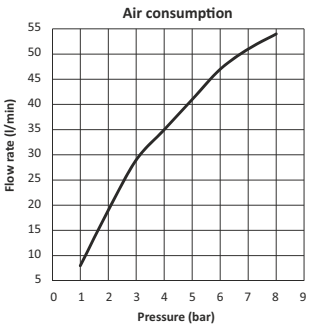
Performance characteristics

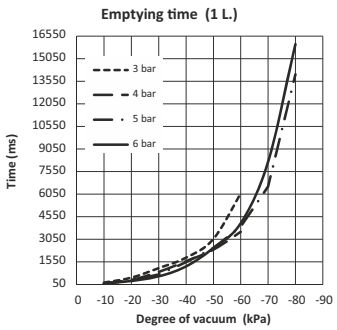
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	41	89	87
- Intake flow rate (l/min)	26	50	55
- Air consumption (l/min)	19	35	47

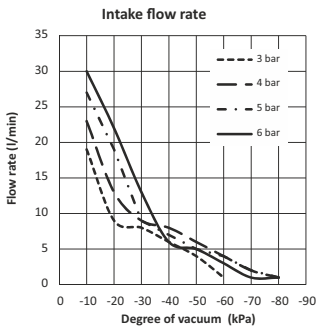
Performance Charts









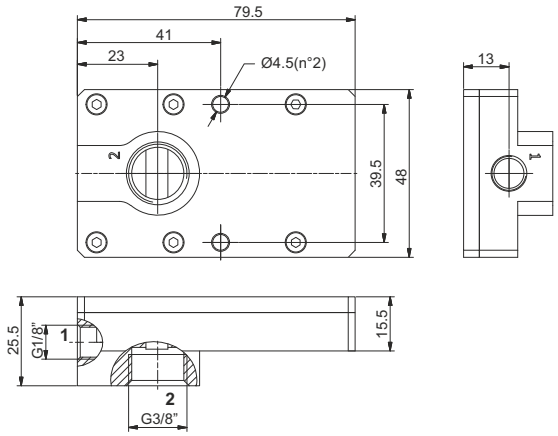


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	130

3

Multistage vacuum generator G3/8"



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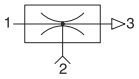
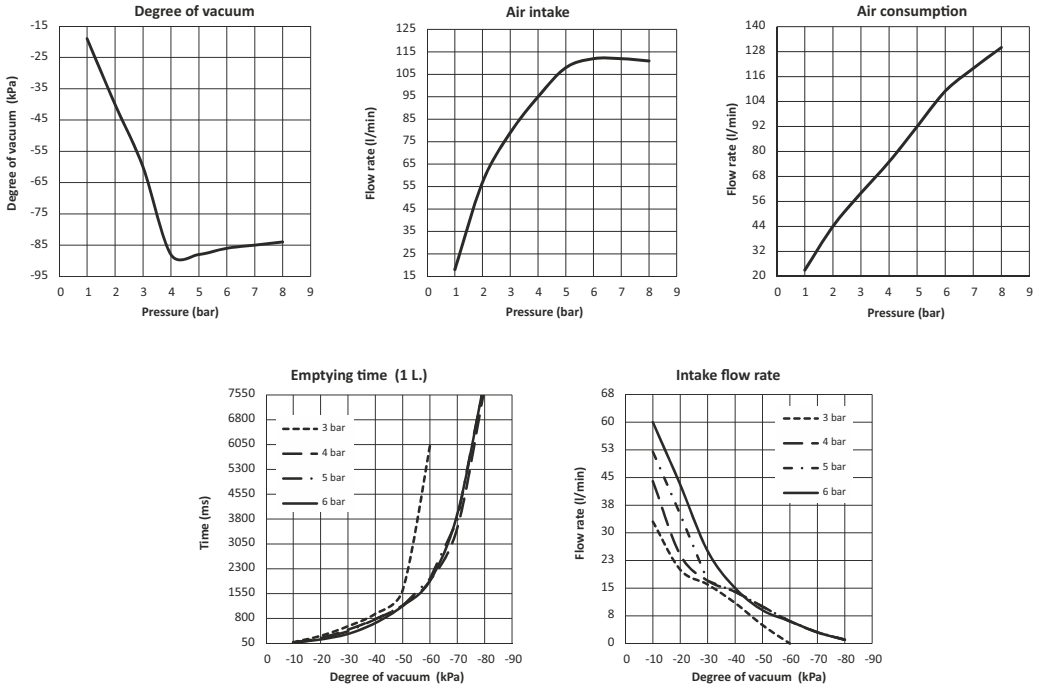


Compact generators comprising a number of modules as a function of the desired performance allow high-suction capacity with low consumption and other degrees of vacuum; as a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the sound-absorbent material inside of them.

Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	88	86
- Intake flow rate (l/min)	57	95	112
- Air consumption (l/min)	44	75	109

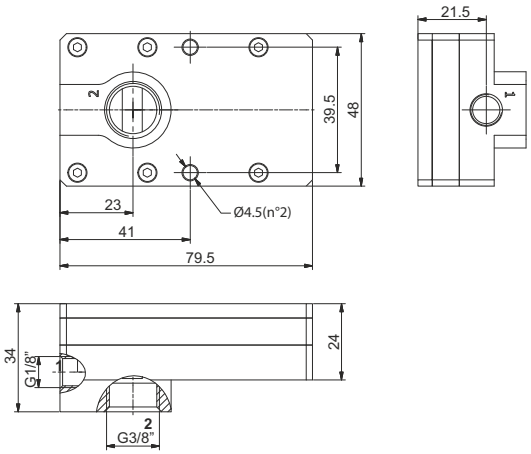
Performance Charts



Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	132

Multistage vacuum generator G3/8"



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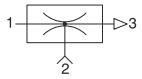

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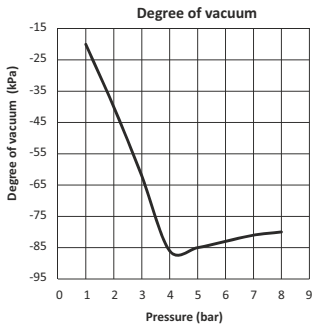
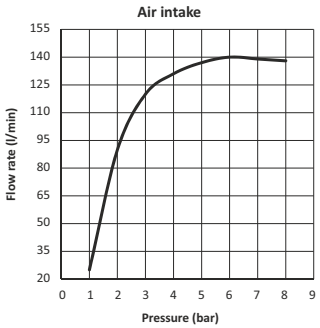
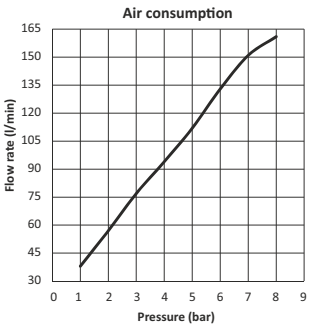
Performance characteristics

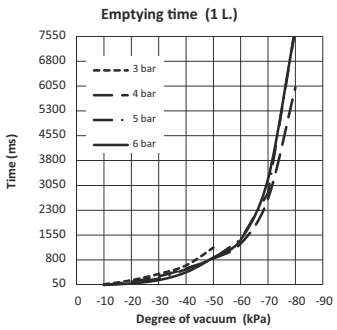
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	83
- Intake flow rate (l/min)	90	131	140
- Air consumption (l/min)	57	94	133

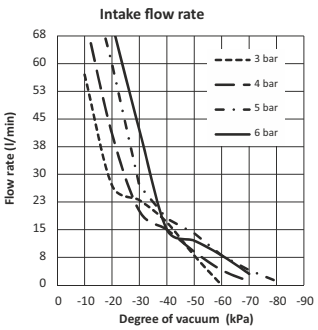
Performance Charts







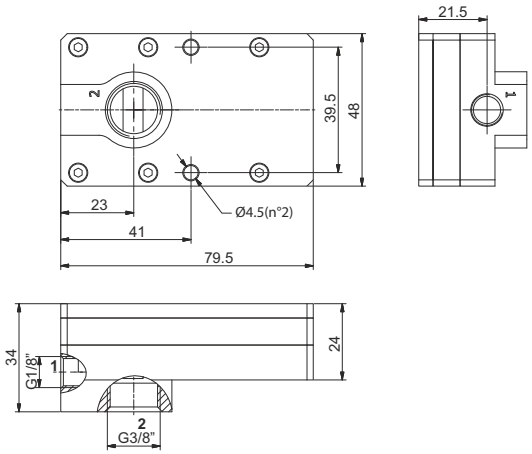




Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	178

Multistage vacuum generator G3/8"



Ordering code

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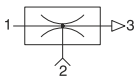
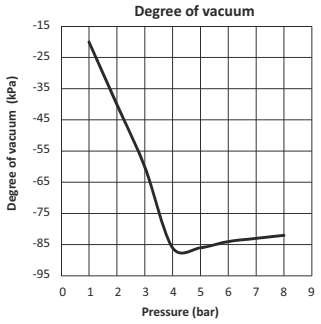


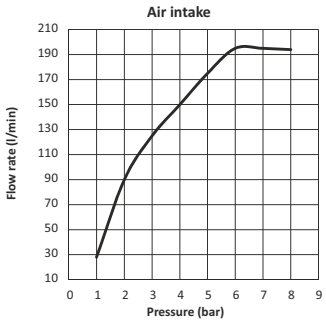
Compact generators comprising a number of modules as a function of the desired performance allow high-suction capacity with low consumption and other degrees of vacuum; as a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the sound-absorbent material inside of them.

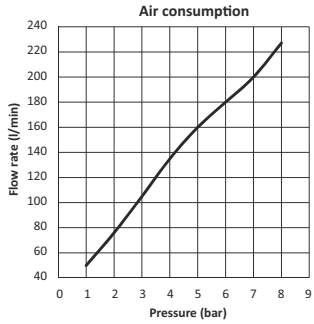
Performance characteristics

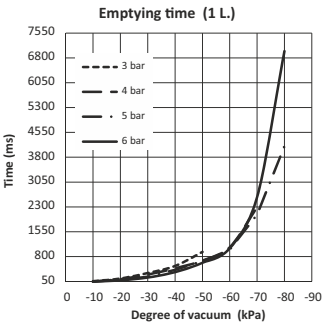
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	84
- Intake flow rate (l/min)	90	150	195
- Air consumption (l/min)	76	135	180

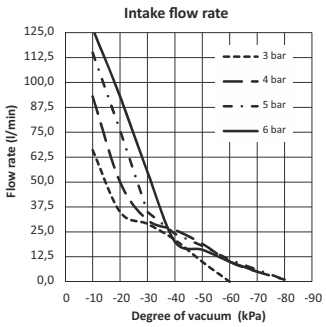
Performance Charts











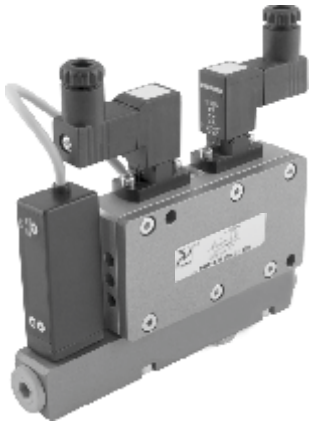
Technical features

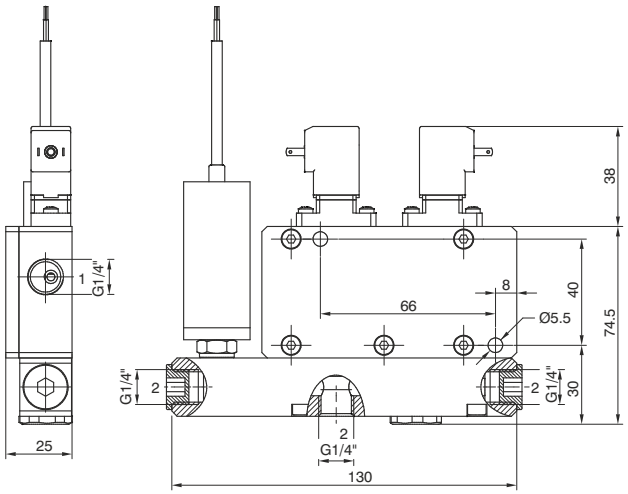
Fluid	Unlubricated filtered air
Pressure (bar)	1 ÷ 8
Temperature (°C)	-10 ÷ +80
Weight (gr.)	178

General details

These generators are separate vacuum units that can control a complete vacuum gripping system. They are designed and manufactured to be installed individually, model SE, or to be assembled with intermediate modules, model ME, the latter making it possible to create a multi-position manifold with a single compressed air supply. The modular design allows the number of autonomous vacuum units to be increased as a function of requirements. They are constructed from a piece of anodised aluminium, and inside of this, the multiple ejectors are mounted and the vacuum chambers are fashioned, as well as threaded connections for supply.
The outside components are:
A solenoid pilot valve for controlling the compressed air being supplied
A solenoid pilot valve for controlling the compressed air from the bellows
A vacuum switch with display for controlling and monitoring the system
A flow regulator with setting screw for regulating the air of the bellows
An intake manifold made of aluminium for the vacuum connections with the intake filter and check valve integrated inside it, serving to keep vacuum to be used should the electrical power or compressed air stop being supplied.
By activating the supply solenoid pilot valve, the generator creates vacuum that can be used, and when the maximum preset value is reached, the vacuum switch kicks in and, through the control solenoid pilot valve, cuts off the air supply and restores it when the vacuum value drops below the minimum set value.
This modulation allows considerable savings of compressed air in addition to keeping the degree of vacuum within safety range.
A second vacuum switch signal, which is separate from the first one and is adjustable, can be used to start up the cycle when the degree of vacuum reached is that needed for the application.
Once the cycle has completed, the supply solenoid pilot valve for air supply to the generator powers down and at the same time the release solenoid pilot valve powers up to quickly restore atmospheric pressure within the circuit.
This series of vacuum generators is suitable for controlling suction cup gripping systems for moving glass panes, marble slabs, ceramic slabs, plastic panels, cardboard boxes, wood panels, etc., and, given their particular shape, they lend themselves to applications in the industrial robotics sector where there is increasing demand for high-performance equipment and autonomous vacuum systems for controlling a greater number of gripping elements while keeping weight low and dimensions compact.

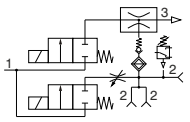
Multifunction vacuum generator





Ordering code
19M14.M.09.SE.◉

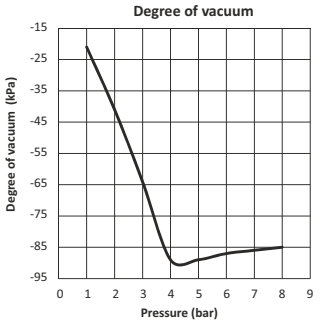
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve

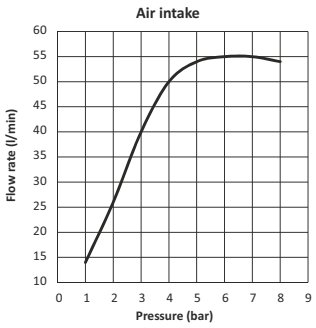


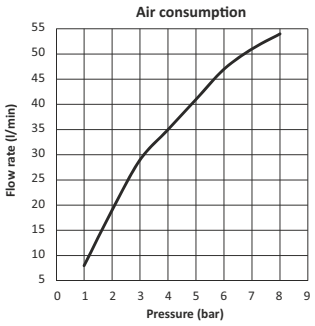
Performance characteristics

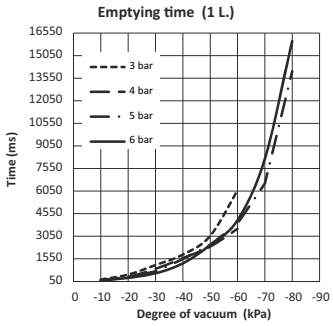
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	41	89	87
- Intake flow rate (l/min)	26	50	55
- Air consumption (l/min)	19	35	47

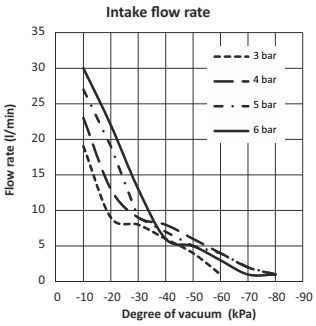
Performance Charts







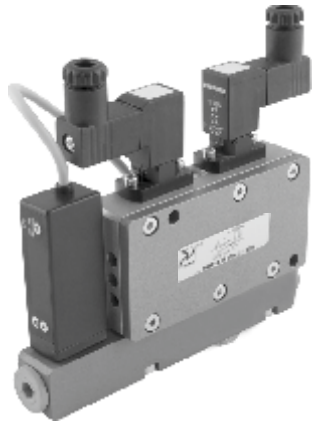


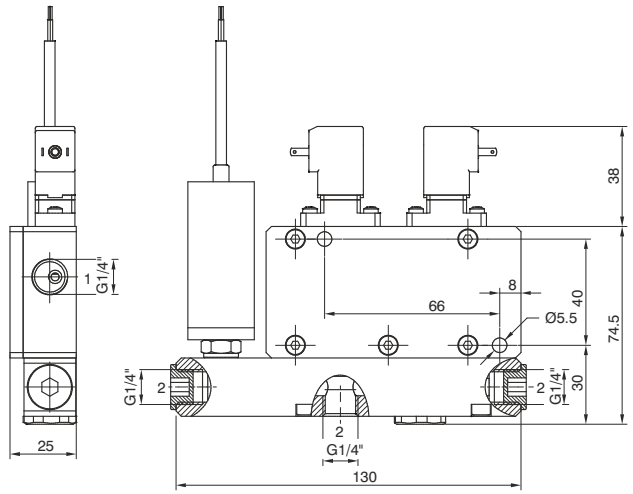


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	538

Multifunction vacuum generator





Ordering code

19M14.M.12.SE.◉

◉	OPTIONS
	ED = Solenoid valve with vacuum switch
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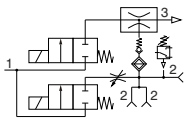
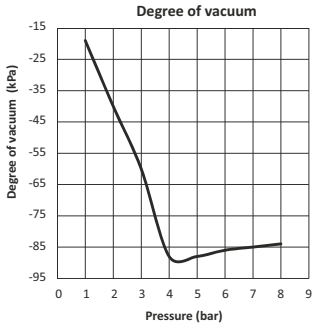
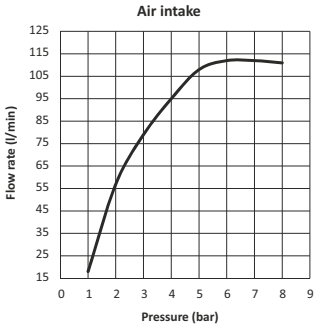


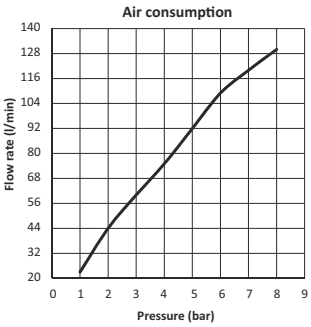
Performance characteristics

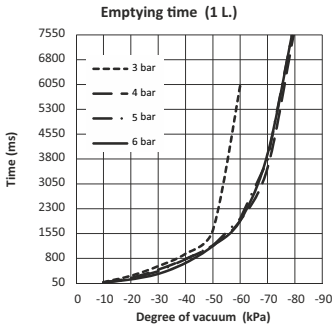
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	88	86
- Intake flow rate (l/min)	57	95	112
- Air consumption (l/min)	44	75	109

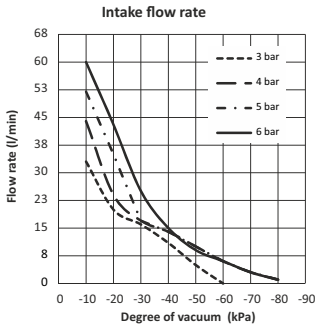
Performance Charts









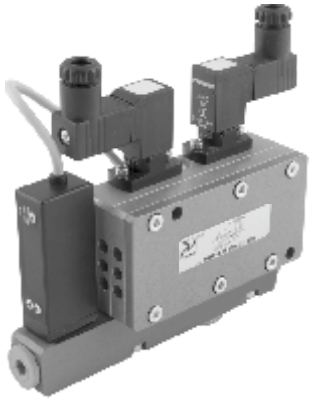


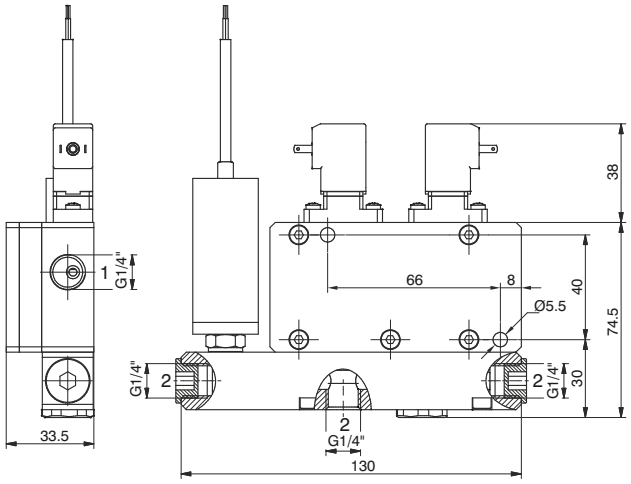
Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	538

3

Multifunction vacuum generator

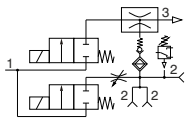




Ordering code

19M14.M.15.SE.◉

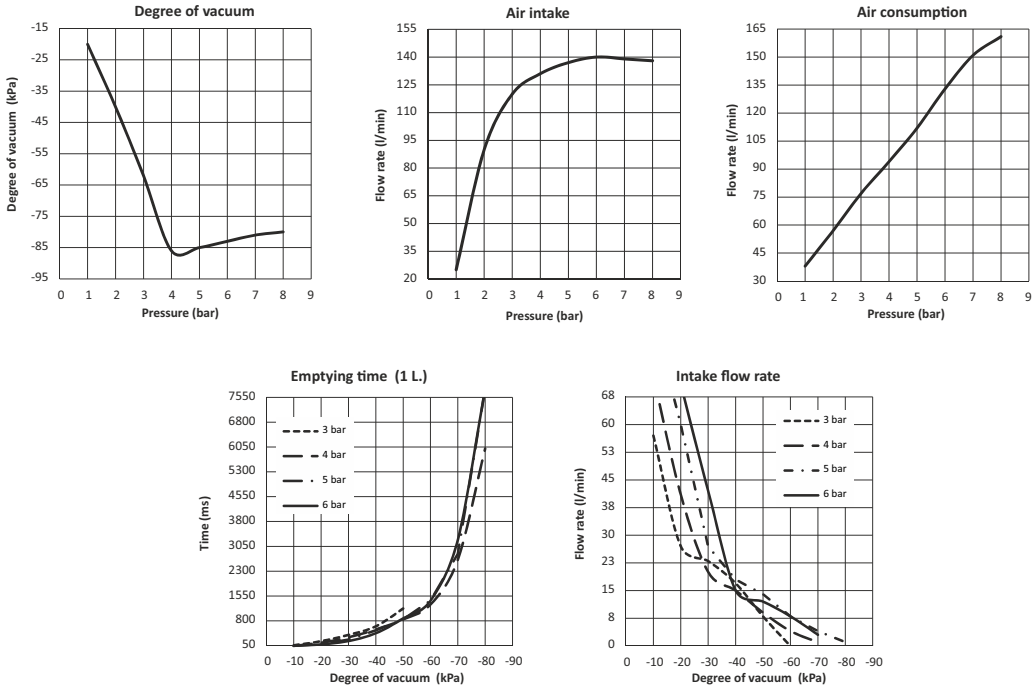
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve



Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	83
- Intake flow rate (l/min)	90	131	140
- Air consumption (l/min)	57	94	133

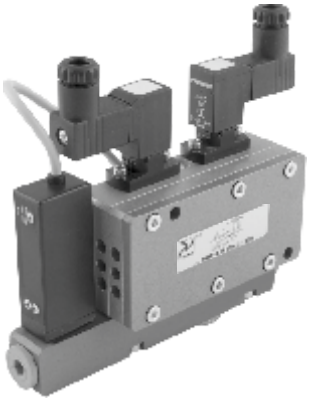
Performance Charts

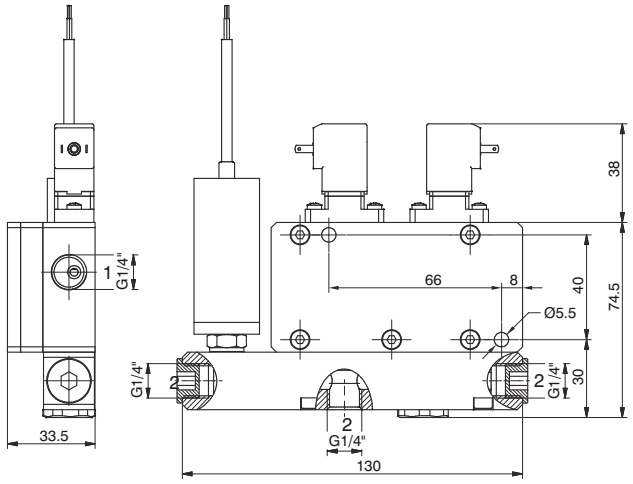


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	661

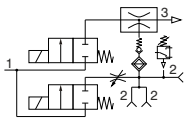
Multifunction vacuum generator





Ordering code
19M14.M.18.SE.◉

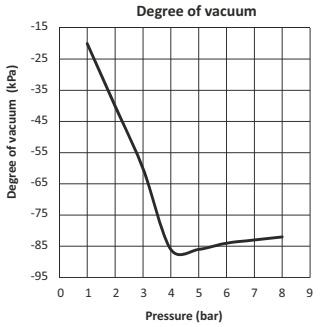
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve

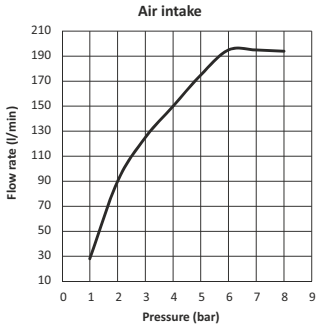


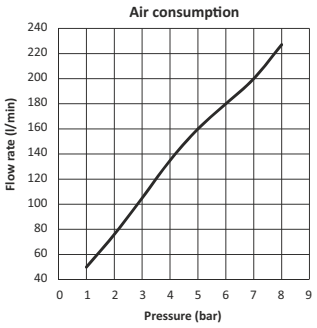
Performance characteristics

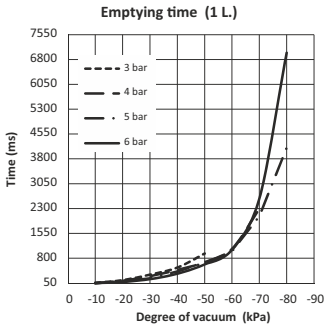
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	84
- Intake flow rate (l/min)	90	150	195
- Air consumption (l/min)	76	135	180

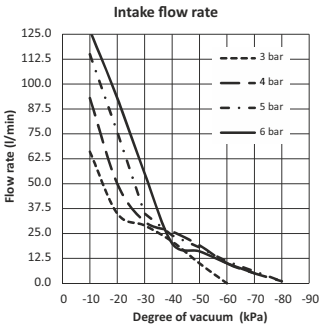
Performance Charts











Technical features

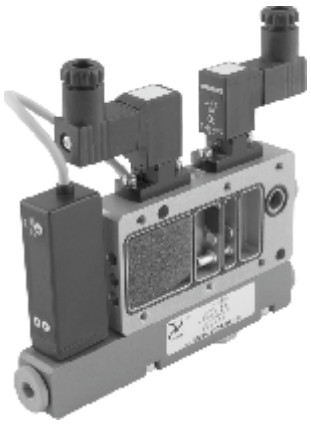
Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	661

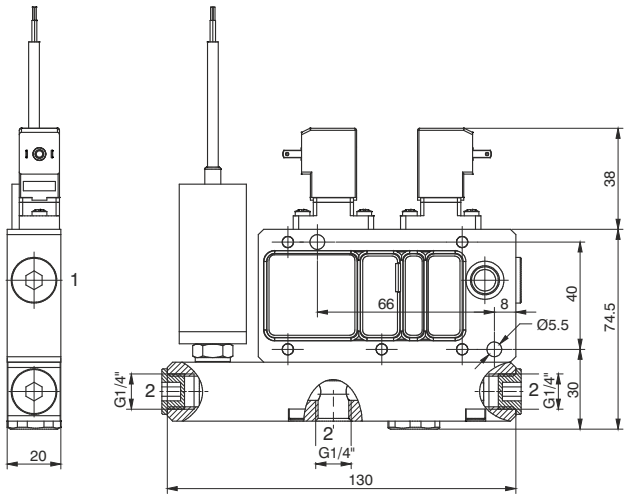
3

General details

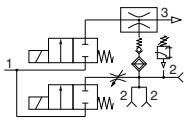
The intermediate "ME" models are multistage and multifunction vacuum generators that are not autonomous and must be hooked up to the "SE" units to operate. They were designed to be enclosed between the cap and the base of the "SE" vacuum generator and attached to the latter via M4 screws; with the distribution manifold inside the generator, the compressed air is distributed without having to use external manifolds.
These can be ordered as individual components in the desired number and capacity, although to mount them onto the "SE" generator, a kit with a number of screws corresponding to the number of modules to be attached is necessary.
The "ME" vacuum generators comprise the same components as the "SE" generators do, except for the sealing cap; their operation and use are the same as the "SE" vacuum generator on which they are mounted.

Modular multifunction vacuum generators





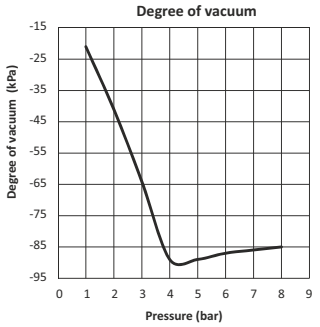
Ordering code	
19M14.M.09.ME.◉	
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve

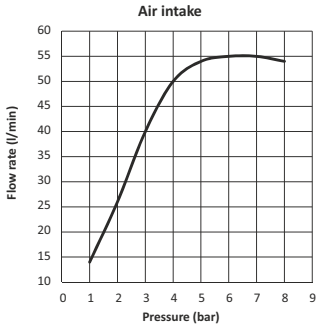


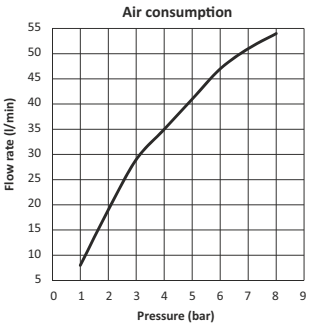
Performance characteristics

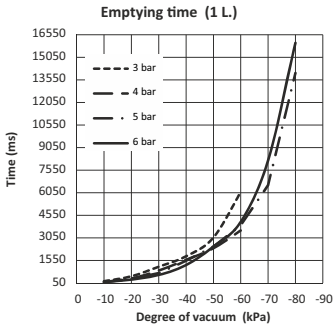
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	41	89	87
- Intake flow rate (l/min)	26	50	55
- Air consumption (l/min)	19	35	47

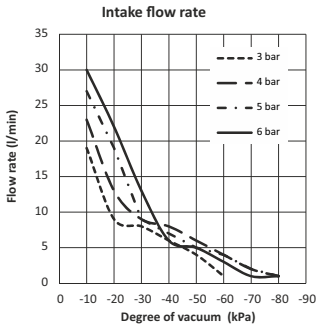
Performance Charts







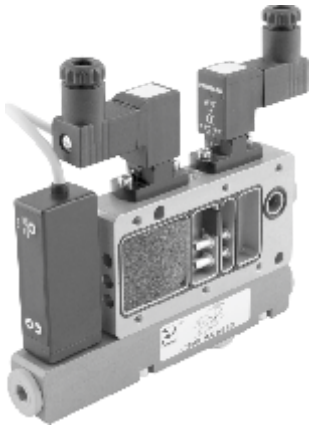


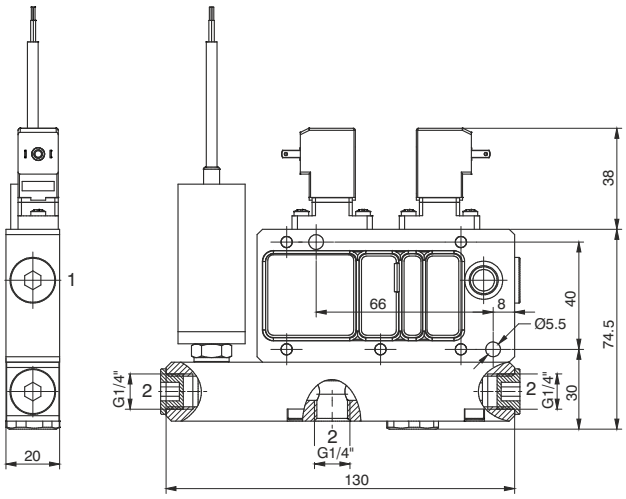


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	474

Modular multifunction vacuum generators

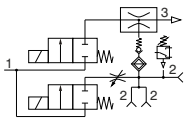




Ordering code

19M14.M.12.ME.◉

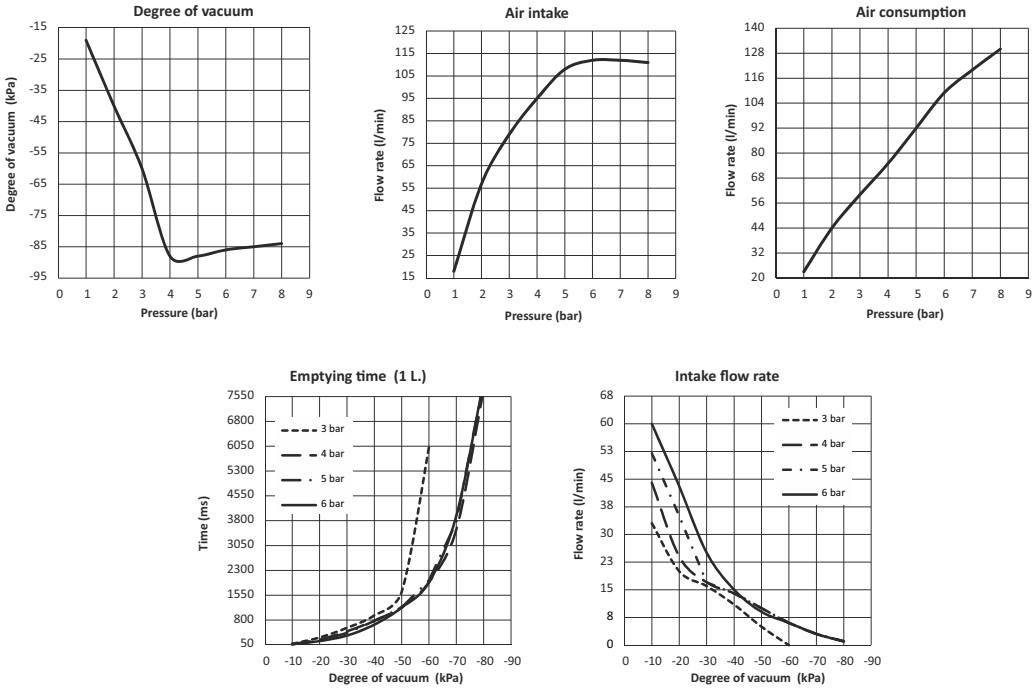
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve



Performance characteristics

- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	88	86
- Intake flow rate (l/min)	57	95	112
- Air consumption (l/min)	44	75	109

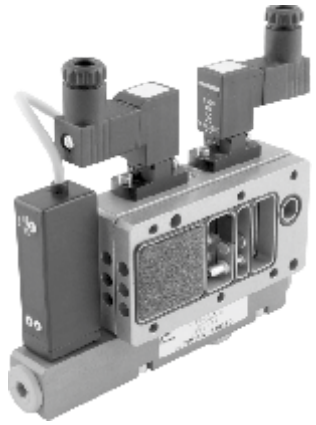
Performance Charts

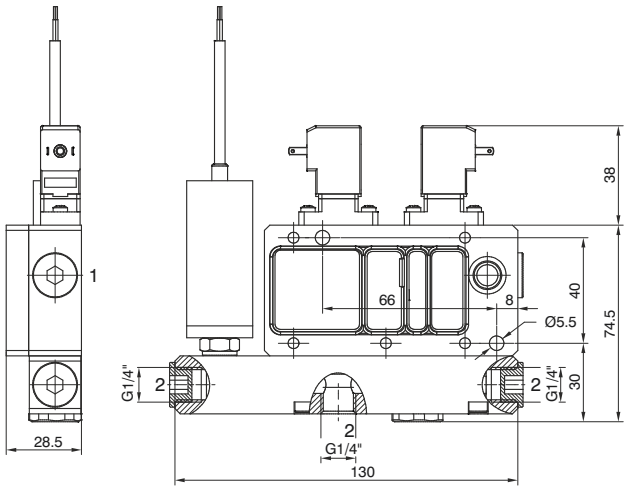


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	474

Modular multifunction vacuum generators

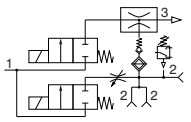




Ordering code

19M14.M.15.ME.◉

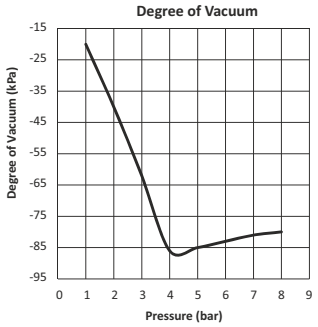
◉	OPTIONS
	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve

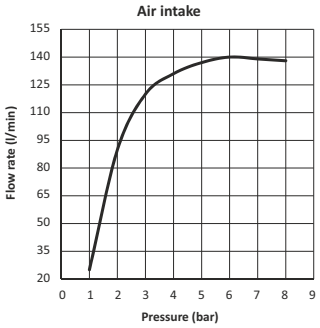


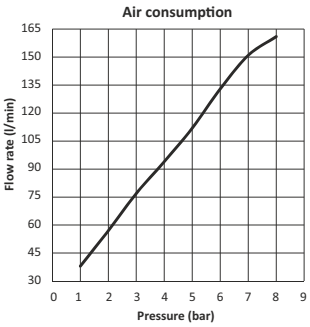
Performance characteristics

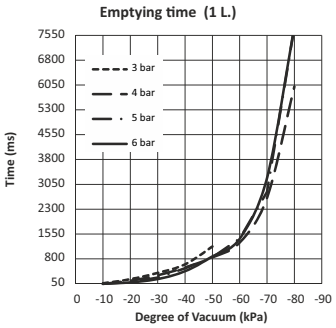
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	83
- Intake flow rate (l/min)	90	131	140
- Air consumption (l/min)	57	94	133

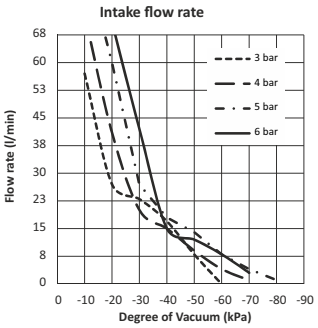
Performance Charts









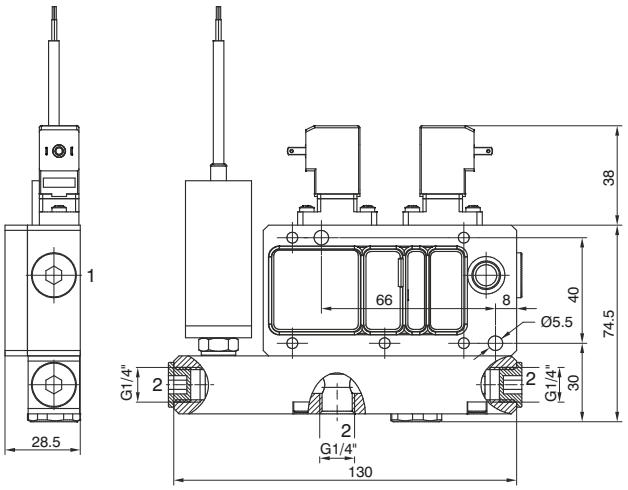


Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	537

3

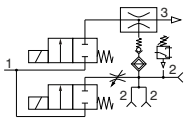
Modular multifunction vacuum generators



Ordering code

19M14.M.18.ME.◉

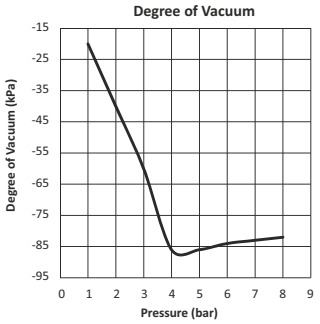
	OPTIONS
◉	ED = Solenoid valve with vacuum switch
	01 = Solenoid valve without vacuum switch
	02 = Vacuum switch without back pressure valve
	04 = Without vacuum switch and back pressure valve

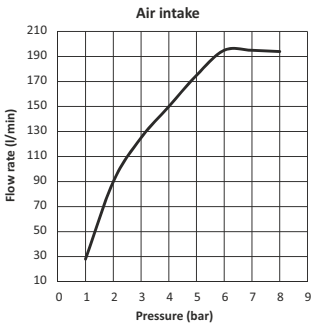


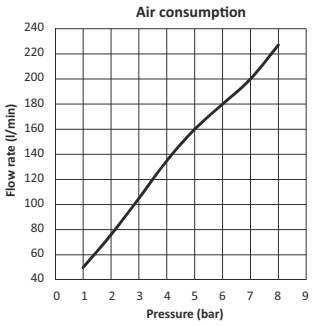
Performance characteristics

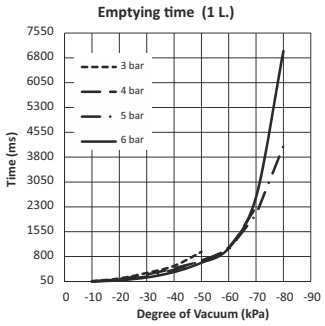
- Supply pressure (bar)	2	4	6
- Degree of Vacuum (-kPa)	40	86	84
- Intake flow rate (l/min)	90	150	195
- Air consumption (l/min)	76	135	180

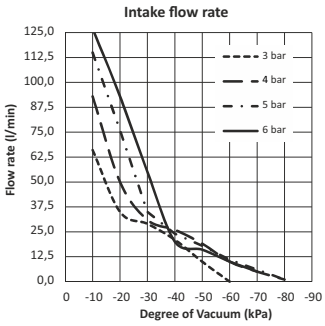
Performance Charts











Technical features

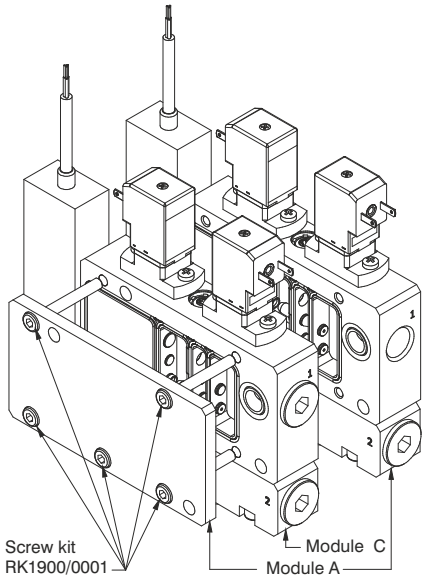
Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Supply and release solenoid valve function	N.C.
Power consumption	4 Watt
Supply voltage	24 VDC
Solenoid valve level of protection	IP65
Vacuum switch output	2 PNP
Vacuum switch level of protection	IP40
Temperature (°C)	-10 ÷ +60
Weight (gr.)	537

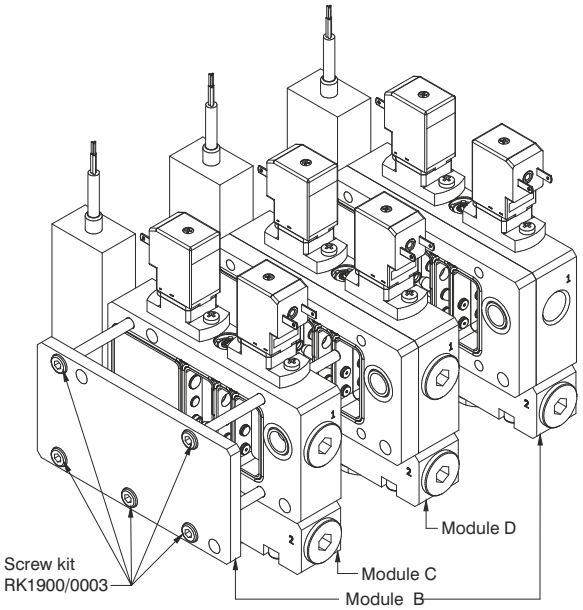
Composition of modular vacuum systems

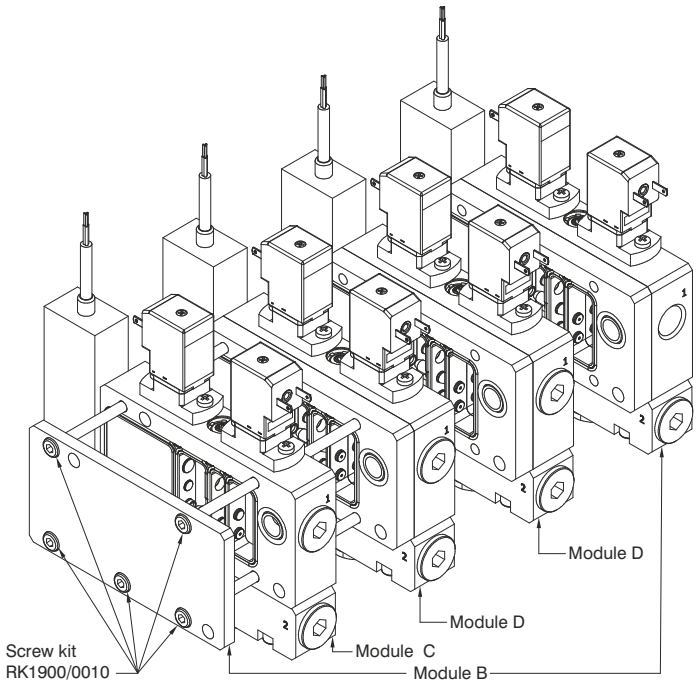
"SE" multifunction vacuum generators can be assembled with one or more "ME" intermediate modules, thus forming a modular vacuum system characterised by a compact shape and reduced size and weight.
With standard screw kits up to 4 vacuum units A+1C+1D can be assembled together independently but, with use of threaded bars, the manifold can be expanded to many more positions.
Below are a number of examples showing ways the manifold can be put together.

		Screws kit codes	Screw dimension
Combinations of standard modules	A+1C	RK1900/0001	M4X30
	A+2C	RK1900/0002	M4X50
	A+3C	RK1900/0003	M4X70
	A+1C+1D	RK1900/0004	M4X60
	A+1C+2D	RK1900/0005	M4X90
	A+2C+1D	RK1900/0006	M4X80
	A+3D	RK1900/0007	M4X100
	A+2D	RK1900/0003	M4X70
	A+1D	RK1900/0008	M4X40
	B+1C	RK1900/0008	M4X40
	B+2C	RK1900/0004	M4X60
	B+3C	RK1900/0006	M4X80
	B+1C+1D	RK1900/0003	M4X70
	B+1C+2D	RK1900/0007	M4X100
	B+2C+1D	RK1900/0005	M4X90
	B+2D	RK1900/0006	M4X80
	B+1D	RK1900/0002	M4X50

The letters of the modules correspond to purchase codes	
A	19M14.M.09.SE.ED
	19M14.M.12.SE.ED
B	19M14.M.15.SE.ED
	19M14.M.18.SE.ED
C	19M14.M.09.ME.ED
	19M14.M.12.ME.ED
D	19M14.M.15.SE.ED
	19M14.M.18.SE.ED

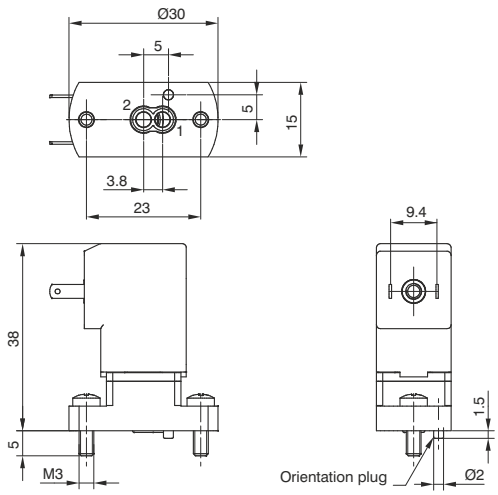






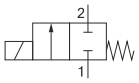
3

Mini solenoid valve 15 mm



Ordering code

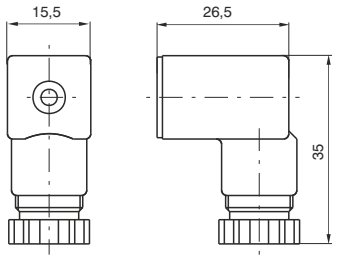
N221.0F



Technical features

Fluid	Unlubricated filtered air
Pressure (bar)	0 ÷ 6
Function	N.C.
Flow rate (Nl/m)	185
Operating voltage	24 VDC
Power	4 Watt
Class of insulation	F (155 °C)
Protection class	IP65 (with connector) - IP00 (with Faston)
Temperature (°C)	-5 ÷ +50
Weight (gr.)	35.5

Connector

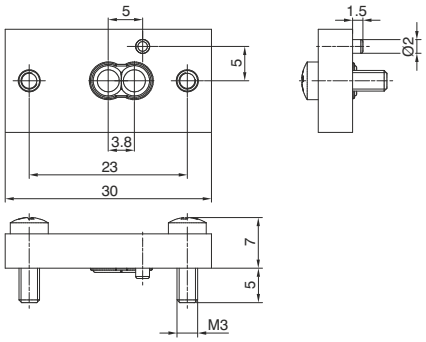


Weight 13 gr.

Ordering code

315.11.00

Closing plate

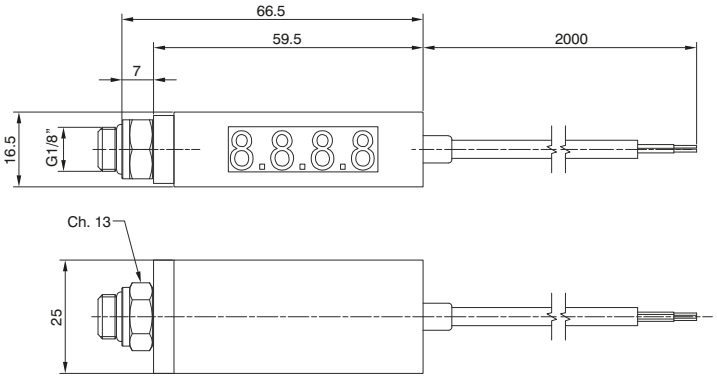


Weight 7.5 gr.

Ordering code

N221.00

Digital vacuum switch

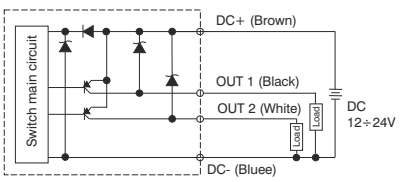


Ordering code
DS.30.C.C.F8.D.0

Technical features

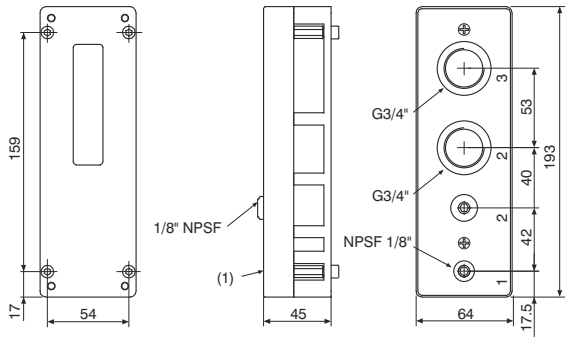
Working pressure range		-100.0÷100.0kPa
Regulation pressure range		-100.0÷100.0kPa
Maximum supported pressure		300 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
Pressure calibration sensitivity	kPa	0.1
	kgf/cm^2	0.001
	bar	0.001
	psi	0.01
	InHg	0.1
	mmHg	1
	mmH_2O	0.1
Supply voltage		From 12 to 24 VDC ± 10%
Current consumption		≤ 60mA
Digital output		PNP N.O. 2 outputs Maximum load current: 80mA Maximum supply voltage: 30VDC Voltage drop : ≤1V
Repeatability (Digital output)		± 0.2% Full scale ± 1 digit
Digital output	Type of hysteresis	fixed
	Hysteresis	0.003 bar
Response time		≤2,5 ms (anti-interference function: 24ms, 192ms and 768 ms selectable)
Protection from short circuit at output		Present
Display		Display with 3 1/2 digits (sampling 5 times per sec.)
Indicator precision		±2% F. S. ±1 digit (at ambient temperature of 25°C ±3°C)
Indicator		LED Green (output1) LED red (output2)
Ingress protection rating	Protection class	IP40
	Ambient temperature	Operational: 0÷50°C, Storage: -20÷60°C (without ice or condensation)
	Ambient humidity	Operational/Storage: 35÷85% (without condensation)
	Supported voltage	1000VAC in 1-min. (between body and cable)
	Insulation resistance	50MΩ min. (at 500VDC, between body and cable)
	Vibration	Total amplitude 1.5mm. or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z
	Impacts/shocks	980m/s² (100G), 3 times in each direction of X, Y and Z
Temperature characteristics		±2% Full Scale in a range between 0÷50°C
Type of connection		G1/8" (Swivel)
Electrical cable		Oil resistant cable
Weight		Approximately 67gr. (with 2 metres of cable)

Output circuit wiring scheme



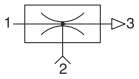
3

Multistage high flow vacuum generator G3/4"



Ordering code

19T34.M.32.HF.QQ

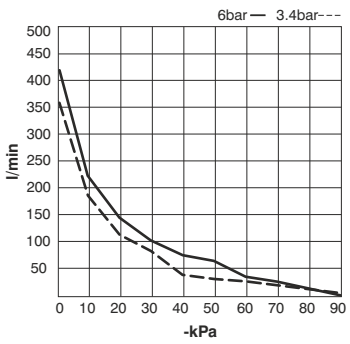


Performance characteristics

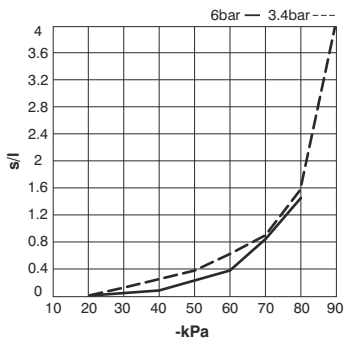
- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	360 / 420
- Air consumption (l/min)	116 / 185

Performance Charts

Intake flow rate



Evacuation time



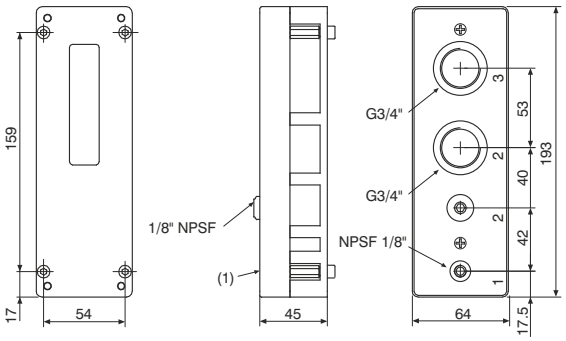
Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	116	360	180	115	80	43	30	22.5	15.5	7.5	1.2	92
6	185	420	240	125	100	82	65	38	12.5	3.5	/	89

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) a diversi gradi di Vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	116	0.022	0.06	0.11	0.21	0.4	0.65	0.95	1.60	4	92
6	185	0.018	0.05	0.08	0.18	0.25	0.40	0.62	1.55	/	89

Technical features

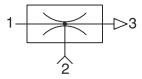
- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	675

Multistage high flow vacuum generator G3/4"



Ordering code

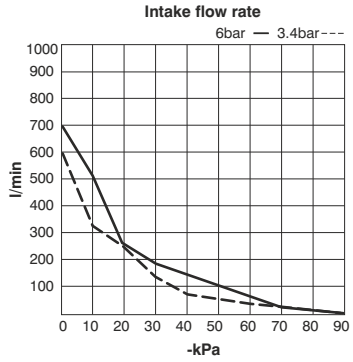
19T34.M.41.HF.QQ

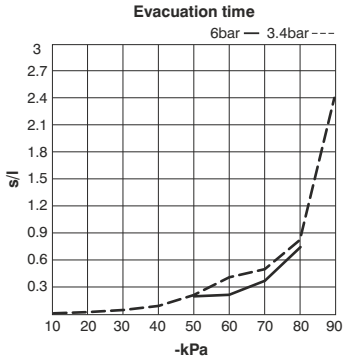


Performance characteristics

- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	600 / 700
- Air consumption (l/min)	230 / 370

Performance Charts





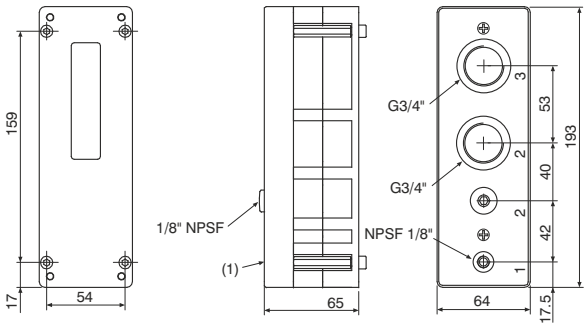
Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	230	600	320	250	135	75	60	46	30	13	1.5	92
6	370	700	510	290	195	160	115	70	22	8	/	89

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	230	0.014	0.031	0.06	0.10	0.20	0.34	0.50	0.80	2.5	92
6	370	0.01	0.022	0.048	0.08	0.11	0.20	0.35	0.78	/	89

Technical features

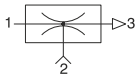
- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	675

Multistage high flow vacuum generator G3/4"



Ordering code

19T34.M.46.HF.QQ

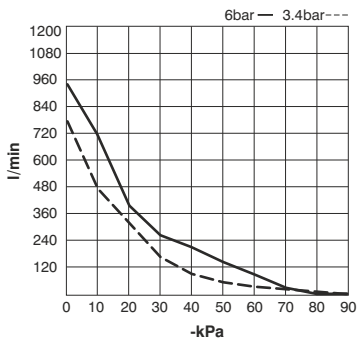


Performance characteristics

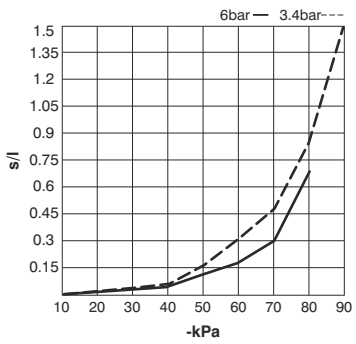
- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	760 / 950
- Air consumption (l/min)	365 / 610

Performance Charts

Intake flow rate



Evacuation time



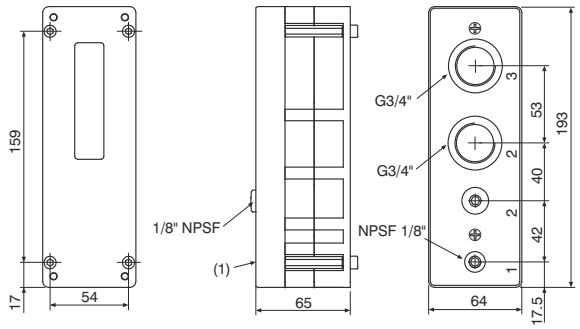
Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	365	760	445	340	175	110	85	70	43	20	1.8	92
6	610	950	710	380	285	230	170	100	32	11	/	89

Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	365	0.012	0.029	0.058	0.095	0.18	0.31	0.46	0.89	1.5	92
6	610	0.009	0.019	0.045	0.075	0.13	0.18	0.31	0.70	/	89

Technical features

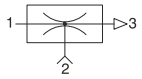
- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	837

Multistage high flow vacuum generator G3/4"



Ordering code

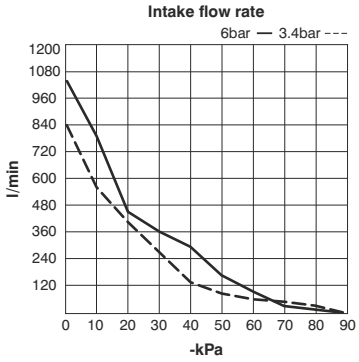
19T34.M.52.HF.QQ

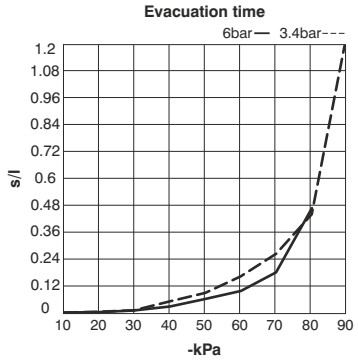


Performance characteristics

- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	850 / 1010
- Air consumption (l/min)	445 / 720

Performance Charts





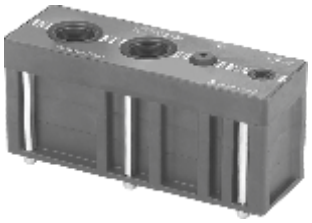
Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	445	850	550	430	280	145	115	85	60	28	2.2	92
6	720	1010	800	460	385	310	215	125	42	15.5	/	89

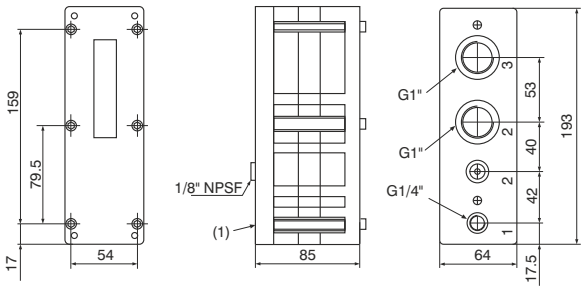
Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	445	0.010	0.025	0.043	0.075	0.11	0.19	0.27	0.45	1.2	92
6	720	0.007	0.018	0.038	0.055	0.08	0.12	0.19	0.47	/	89

Technical features

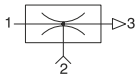
- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	837

Multistage high flow vacuum generator G1"





Ordering code
19TG1.M.58.HF.PP

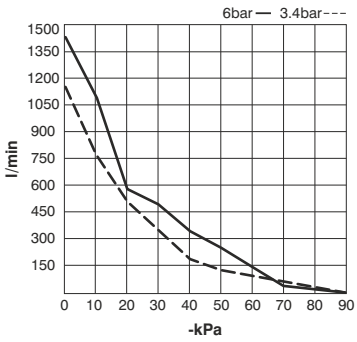


Performance characteristics

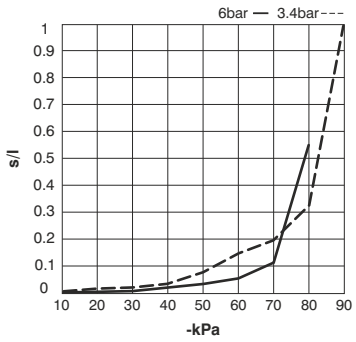
- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	1150 / 1400
- Air consumption (l/min)	545 / 780

Performance Charts

Intake flow rate



Evacuation time



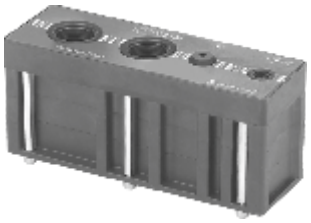
Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	545	1150	760	530	350	180	148	115	78	34.5	3.5	92
6	780	1400	1120	560	490	355	260	150	50	25	/	89

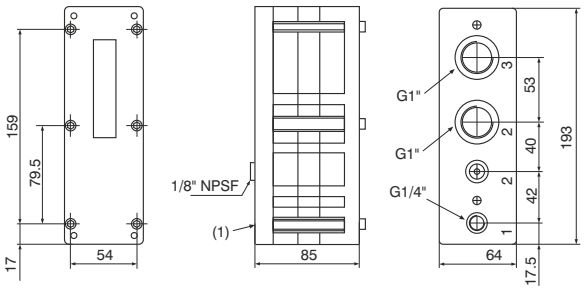
Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	545	0.006	0.015	0.029	0.052	0.085	0.145	0.202	0.330	1	92
6	780	0.005	0.013	0.026	0.045	0.062	0.115	0.194	0.56	/	89

Technical features

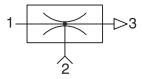
- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	1075

Multistage high flow vacuum generator G1"





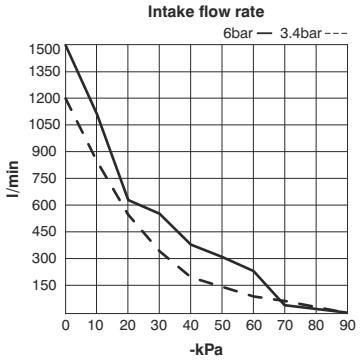
Ordering code
19TG1.M.61.HF.PP

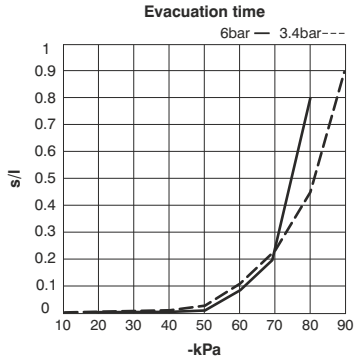


Performance characteristics

- Optimum supply pressure (bar)	3.4
- Supply pressure (bar)	3.4 / 6
- Degree of Vacuum (-kPa)	89 / 92
- Intake flow rate (l/min)	1200 / 1500
- Air consumption (l/min)	655 / 810

Performance Charts





Supply pressure (bar)	Air consumption (l/min)	Intake flow rate (l/min) at different levels of vacuum (-kPa)										Degree of Vacuum max. (-kPa)
		0	10	20	30	40	50	60	70	80	90	
3.4	655	1200	830	550	360	215	170	130	90	36	5	92
6	810	1500	1110	630	560	385	315	210	65	26	/	89

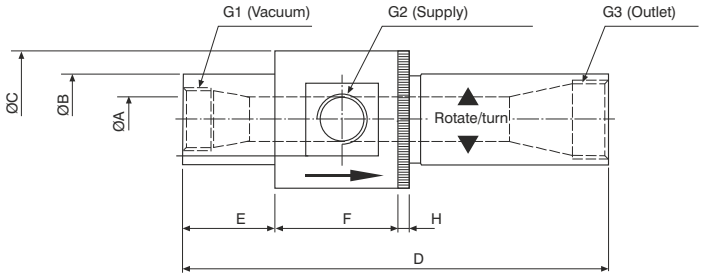
Supply pressure (bar)	Air consumption (l/min)	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum max. (-kPa)
		10	20	30	40	50	60	70	80	90	
3.4	655	0.005	0.013	0.027	0.045	0.070	0.105	0.23	0.46	0.9	92
6	810	0.003	0.009	0.014	0.030	0.060	0.095	0.20	0.8	/	89

Technical features

- Fluid	Unlubricated filtered air
- Max. supply pressure (bar)	7
- Noise (dBA)	60 ÷ 65
- Temperature (°C)	-20 ÷ 80
- Material	PPS, SS, PA, NBR
- Weight (gr.)	1075

3

Adjustable vacuum generator conveyor



Code	ØA	ØB	ØC	D	E	F	H	G1	G2	G3	Weight (gr.)
19M14.S.00.SS.RG	6.5	19	32	94-105	22	32	5	G1/4"	G1/8"	G1/4"	96
19M38.S.00.SS.RG	10	25	45	155-165	38	45	5	G3/8"	G3/8"	G1/2"	271.6
19M12.S.00.SS.RG	13	32	51	155-160	38	51	5	G1/2"	G3/8"	G3/4"	377.2
19M34.S.00.SS.RG	19	38	58	175-189	38	51	5	G3/4"	G1/2"	G1"	526.8

Based on the Ventury principle, these differ from traditional ones because they have a much better ejector and are adjustable, this characteristic makes it possible to change the device's low rate and degree of vacuum without affecting the supply pressure. Their special shape and their operating principle make them suitable for suction and the transfer of powders, granules, sawdust, metal chips, liquid or dry food products, etc., to control suction cups in the presence of large quantities of powders or liquids; these can also be used to suction smoke, coolant fog, water vapour, etc.

Performance characteristics

- Supply pressure (bar)	4÷6 (Max. 7)
- Max. Degree of Vacuum (-kPa)	84
- Max. Intake flow rate (l/min)	3390
- Max. Air consumption (l/min)	2550

		Supply pressure (bar)				
		5.5				
Code	Degree of Vacuum (-kPa)	17	34	50	68	84
19M14.S.00.SS.RG	Air consumption (l/min)	112	169	233	276	342
19M38.S.00.SS.RG		176	327	485	595	825
19M12.S.00.SS.RG		340	625	795	940	1280
19M34.S.00.SS.RG		650	875	1250	1790	2550

		Supply pressure (bar)				
		5.5				
Code	Degree of Vacuum (-kPa)	17	34	50	68	84
19M14.S.00.SS.RG	Intake flow rate (l/min)	280	240	200	162	125
19M38.S.00.SS.RG		846	735	620	520	395
19M12.S.00.SS.RG		1695	1325	1130	990	650
19M34.S.00.SS.RG		3390	2460	1970	1440	1130

VALVES AND SOLENOID VALVES 4

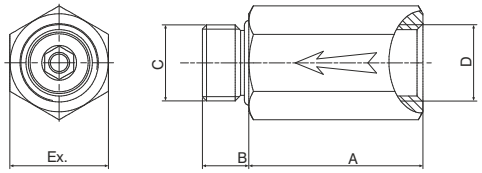
PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

www.pneumaxspa.com

General details

They are special non-return valves that can close the suction line in the event of air leakage from the suction cup that is not located on the workpiece or fully adherent thereto. Designed to be applied to the suction cups, the shut-off valves - if there is no object to be lifted, if the suction grip is defective or in the presence of leakage - automatically closes off the suction, preventing the degree of vacuum in the still-gripping suction cups from dropping. These can shut off completely with characteristics described above or control leakage, where the principle of operation is the same as the abovementioned, differing from the sealing shutter in that, even when shut off entirely, it still allows a small air flow to the vacuum source. This feature allows a suction cup that has not gripped the object to be lifted to recreate the vacuum inside of it, and therefore carry out its gripping action without having to repeat the work cycle; if, on the other hand, the suction cup does not grip due to the fact that there is no object to lift, the valve will not stop the degree of vacuum from dropping on the remaining gripping suction cups, but the small percentage of loss is easily controllable and therefore recoverable.

Shut-off valves

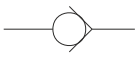


A	B	C	D	Ex.
27	7	G1/8"	G1/8"	13
30	8	G1/4"	G1/4"	17
33	9	G3/8"	G3/8"	20

Ordering code

19E(D).A.00.MF

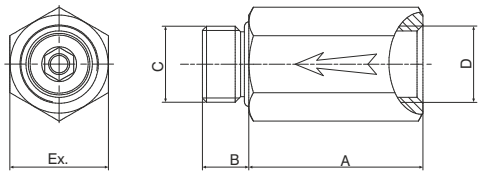
(D)	THREAD DIAMETER
	18 = G1/8"
	14 = G1/4"
	38 = G3/8"



Performance characteristics

- Minimum trigger flow rate (l/min)	25

Shut-off valves with controlled leakage loss

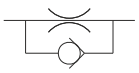


A	B	C	D	Ex.
27	7	G1/8"	G1/8"	13
30	8	G1/4"	G1/4"	17
33	9	G3/8"	G3/8"	20

Ordering code

19E(D).A.(F).MF

(D)	Ø THREAD
	18 = G1/8"
	14 = G1/4"
	38 = G3/8"
(F)	Ø NOZZLE ORIFICE
	03 = orifice Ø0.3
	05 = orifice Ø0.5
	07 = orifice Ø0.7
	10 = orifice Ø1



Performance characteristics

- Minimum trigger flow rate (l/min)	25

General details

Valves and solenoid valves with shutter for larger flow rates, for vacuum.
These are manufactured only in 3/2 and 2/2 versions, either normally closed or normally open.
Selection of the right type and connection to the pump requires some knowledge and skill.
For electrical actuation a normal M2 microsolenoid is used in the case of control via air and a special M2/V microsolenoid is used when control is via vacuum.
The ordering codes correspond to the solenoid valves with mechanisms that are "M2" or "M2/V" mounted.
The windings are not included and have to be ordered separately (see summary page for electric windings).

Certified windings are also available. c UL us

Construction features	G 3/8"	G 1/2" - G 3/4"	G 1"	G 1 1/2"
Body	Aluminium	Die-cast Zamak	Aluminium	Aluminium
End caps	Aluminium			
Shutters	NBR			
Control piston	Aluminium			
Shutter mount	Stainless steel INOX			
Springs	Stainless steel INOX			
Piston seals	NBR			

Wear and maintenance

These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation and consequently likely malfunctioning. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. For these products, due to the manner in which they are constructed and the particular use for which they are intended, maintenance by replacing valve parts does not have to be carried out. When necessary, basic internal cleaning can be performed, carefully removing any dirt accumulations .When the version of solenoid valves with self-supply is used, take care that it is never used to supply flow rate since in this case there would not be sufficient vacuum for actuation. This is normally found on shutter valves, since they do not have the closed centres position and insufficient actuation could cause the system to discharge from outlet 3. In this case, switch to the version with external actuation.

Connections of valves

NORMALLY CLOSED SELF-SUPPLIED

779/V.32.0.1AC P = 1 = DISCHARGE
773/V.32.0.1AC A = 2 = USE
771/V.32.0.1AC R = 3 = PUMP

NORMALLY OPEN SELF-SUPPLIED

779/V.32.0.1A P = 1 = PUMP
773/V.32.0.1A A = 2 = USE
771/V.32.0.1A R = 3 = DISCHARGE

NORMALLY CLOSED EXTERNALLY SUPPLIED

779/V.32.0.1C
773/V.32.0.1C
771/V.32.0.1C
779/V.32.11.1C
773/V.32.11.1C
771/V.32.11.1C

P = 1 = PUMP
A = 2 = USE
R = 3 = DISCHARGE

NORMALLY OPEN EXTERNALLY SUPPLIED

779/V.32.0.1A
773/V.32.0.1A
771/V.32.0.1A
779/V.32.11.1A
773/V.32.11.1A
771/V.32.11.1A

P = 1 = DISCHARGE
A = 2 = USE
R = 3 = PUMP

Response time (ms)

"The response time of the directional control valves or the moving parts of logic devices was measured in accordance with standard ISO 12238:2001"

Code	Type	Response time (ms)	
		energised	de-energised
779/V.32.11.1C	N.C.	12	46
779/V.32.11.1A	N.O.	13	48
779/V.32.0.1AC.M2/V	N.C.	26	9
779/V.32.0.1AA.M2/V	N.O.	16	11
779/V.32.0.1C.M2	N.C.	10	35
779/V.32.0.1A.M2	N.O.	11	36
772/V.32.11.1C	N.C.	30	105
772/V.32.11.1A	N.O.	17	150
772/V.32.0.1AC.M2/V	N.C.	80	20
772/V.32.0.1AA.M2/V	N.O.	25	20
772/V.32.0.1C.M2	N.C.	25	95
772/V.32.0.1A.M2	N.O.	15	140
773/V.32.11.1C	N.C.	30	105
773/V.32.11.1A	N.O.	17	145
773/V.32.0.1AC.M2/V	N.C.	75	13

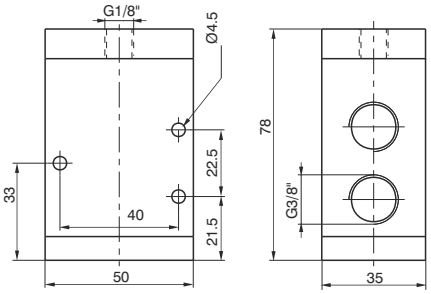
Code	Type	Response time (ms)	
		energised	de-energised
773/V.32.0.1AA.M2/V	N.O.	33	22
773/V.32.0.1C.M2	N.C.	25	95
773/V.32.0.1A.M2	N.O.	13	140
771/V.32.11.1C	N.C.	45	250
771/V.32.11.1A	N.O.	18	260
771/V.32.0.1AC.M2/V	N.C.	120	20
771/V.32.0.1AA.M2/V	N.O.	35	40
771/V.32.0.1C.M2	N.C.	45	250
771/V.32.0.1A.M2	N.O.	17	325

Pneumatic-Spring

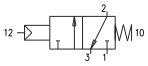
Ordering code

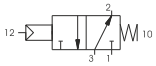
779/V.32.11.Ⓕ

Ⓕ	FUNCTION
	1C=Normally Closed
	1A=Normally Open



Weight 360 gr.
Minimum actuation pressure 2 bar





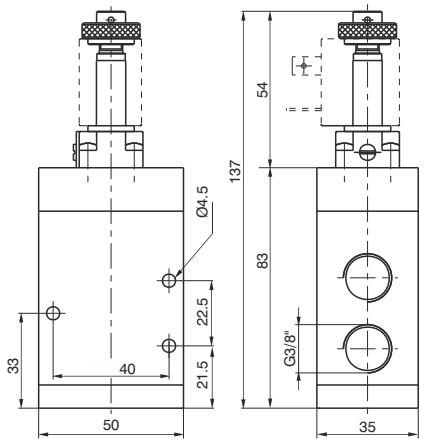
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	10	G3/8"	G1/8"	167	0 ÷ 101

Solenoid-Spring-Self-supplied

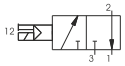
Ordering code

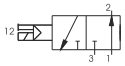
779/V.32.0.Ⓕ.M2/V

Ⓕ	FUNCTION
	1AA=Normally Open
	1AC=Normally Closed



Weight 420 gr.





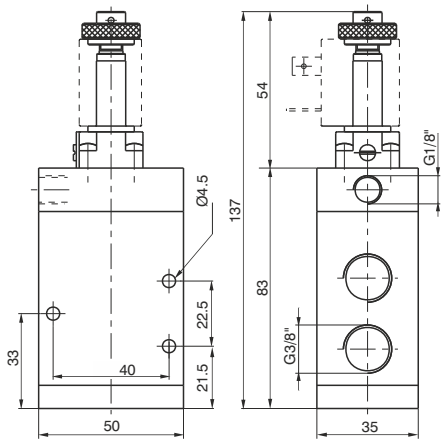
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	10	G3/8"	G1/8"	167	20 ÷ 101

Solenoid-Spring-External supply

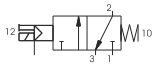
Ordering code

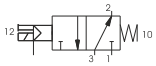
779/V.32.0.Ⓕ.M2

Ⓕ	FUNCTION
	1A=Normally Open
	1C=Normally Closed



Weight 420 gr.
Minimum actuation pressure 2 bar





Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	10	G3/8"	G1/8"	167	0 ÷ 101

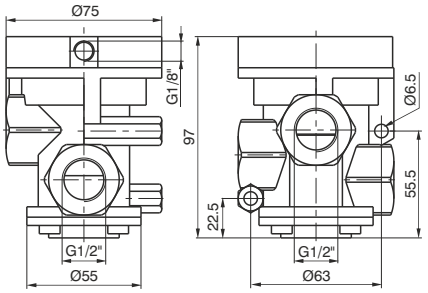
4

Pneumatic-Spring

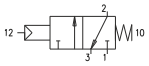
Ordering code

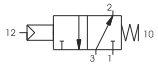
772/V.32.11.Ⓕ

Ⓕ	FUNCTION
	1C=Normally Closed
	1A=Normally Open



Weight 1100 gr.
Minimum actuation pressure 2 bar





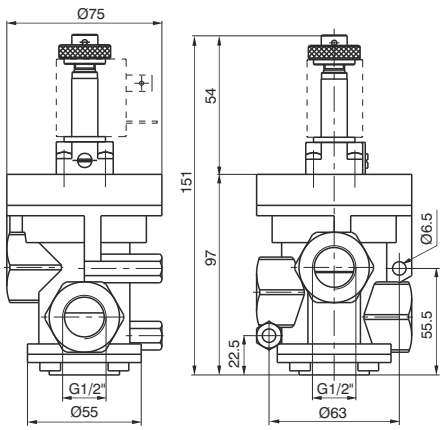
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	15	G1/2"	G1/8"	334	0 ÷ 101

Solenoid-Spring-Self-supplied

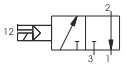
Ordering code

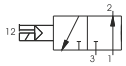
772/V.32.0.Ⓕ.M2/V

Ⓕ	FUNCTION
	1AA=Normally Open
	1AC=Normally Closed



Weight 1160 gr.





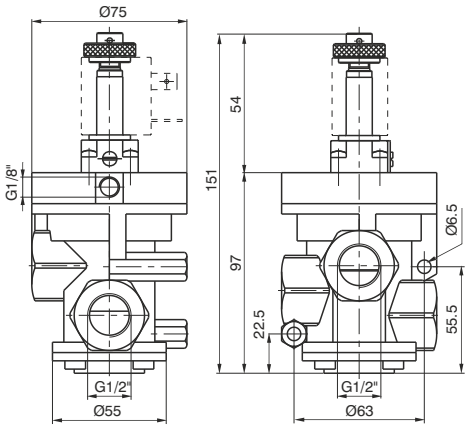
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	15	G1/2"	G1/8"	334	20 ÷ 101

Solenoid-Spring-External supply

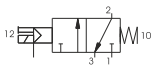
Ordering code

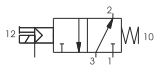
772/V.32.0.Ⓕ.M2

Ⓕ	FUNCTION
	1A=Normally Open
	1C=Normally Closed



Weight 1160 gr.
Minimum actuation pressure 2 bar





Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	15	G1/2"	G1/8"	334	0 ÷ 101

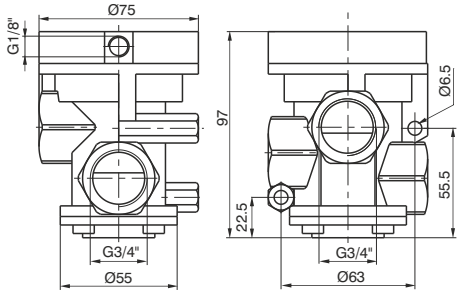
4

Pneumatic-Spring

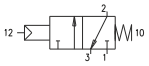
Ordering code

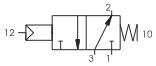
773/V.32.11.Ⓕ

	FUNCTION
Ⓕ	1C=Normally Closed
	1A=Normally Open



Weight 990 gr.
Minimum actuation pressure 2 bar





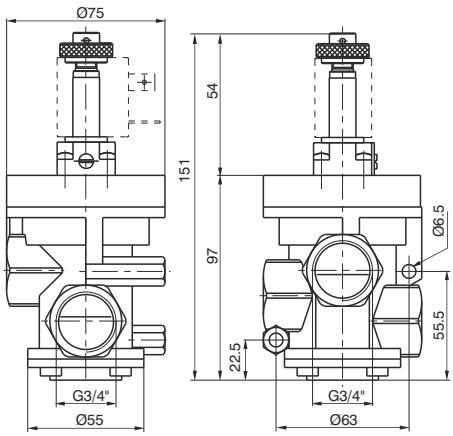
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	20	G3/4"	G1/8"	667	0 ÷ 101

Solenoid-Spring-Self-supplied

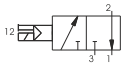
Ordering code

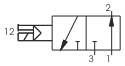
773/V.32.0.Ⓕ.M2/V

	FUNCTION
Ⓕ	1AA=Normally Open
	1AC=Normally Closed



Weight 1050 gr.





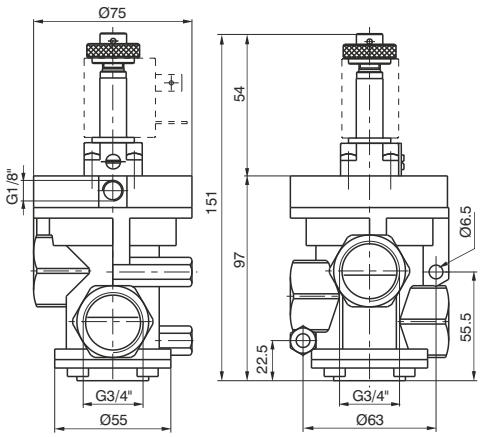
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	20	G3/4"	G1/8"	667	20 ÷ 101

Solenoid-Spring-External supply

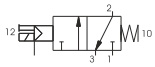
Ordering code

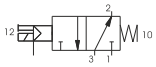
773/V.32.0.Ⓕ.M2

	FUNCTION
Ⓕ	1A=Normally Open
	1C=Normally Closed



Weight 1160 gr.
Minimum actuation pressure 2 bar





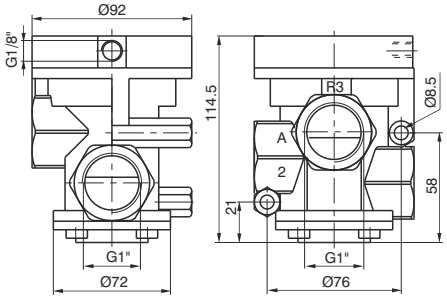
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	20	G3/4"	G1/8"	667	0 ÷ 101

Pneumatic-Spring

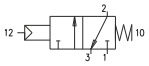
Ordering code

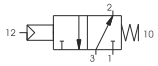
771/V.32.11.Ⓕ

Ⓕ	FUNCTION
	1C=Normally Closed
	1A=Normally Open



Weight 1060 gr.
Minimum actuation pressure 2 bar





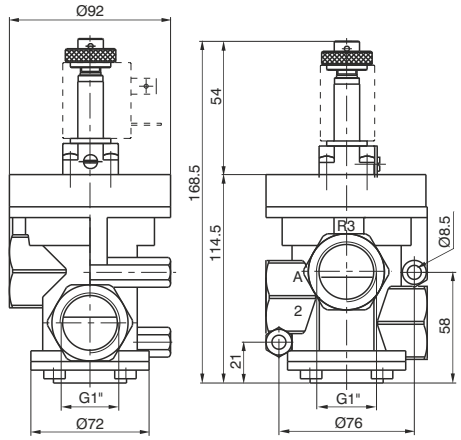
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	25	G1"	G1/8"	1500	0 ÷ 101

Solenoid-Spring-Self-supplied

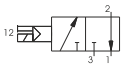
Ordering code

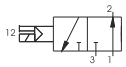
771/V.32.0.Ⓕ.M2/V

Ⓕ	FUNCTION
	1AA=Normally Open
	1AC=Normally Closed



Weight 1120 gr.





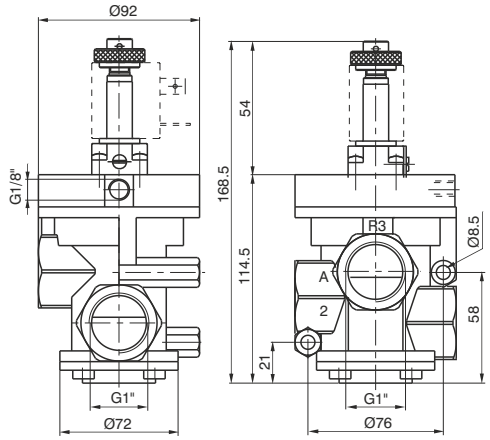
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	25	G1"	G1/8"	1500	20 ÷ 101

Solenoid-Spring-External supply

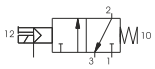
Ordering code

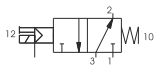
771/V.32.0.Ⓕ.M2

Ⓕ	FUNCTION
	1A=Normally Open
	1C=Normally Closed



Weight 1120 gr.
Minimum actuation pressure 2 bar





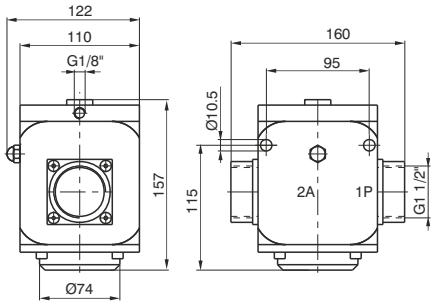
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	25	G1"	G1/8"	1500	0 ÷ 101

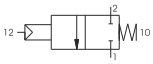
4

Pneumatic-Spring

Ordering code

776/V.22.11.1C





Weight 3950 gr.
Normally closed
Minimum actuation pressure 2 bar

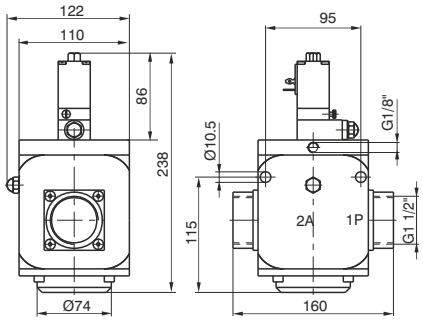
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	38	G1 1/2"	G1/8"	3000	0 ÷ 101

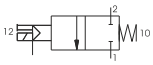
Solenoid-Spring

Ordering code

776/V.22.0.1C.Ⓢ

Ⓢ	Code SOLENOIDE See electric windings summary page





Weight 4450 gr.
External supply Normally closed
Minimum actuation pressure 2 bar

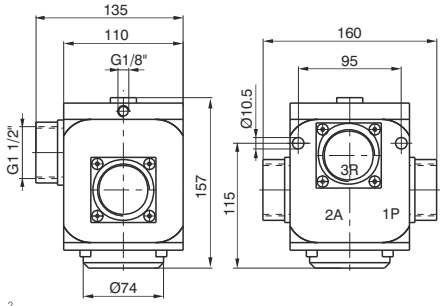
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	38	G1 1/2"	G1/8"	3000	0 ÷ 101

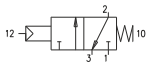
Pneumatic-Spring

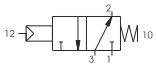
Ordering code

776/V.32.11.Ⓕ

Ⓕ	FUNCTION 1C=Normally Closed 1A=Normally Open







Weight 3900 gr.
Minimum actuation pressure 2 bar

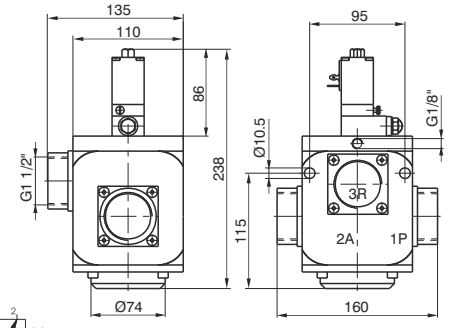
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	38	G1 1/2"	G1/8"	3000	0 ÷ 101

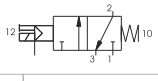
Solenoid-Spring

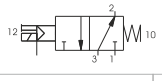
Ordering code

776/V.32.0.Ⓕ.Ⓢ

Ⓕ	FUNCTION 1C=External supply Normally closed 1A=External supply Normally open
Ⓢ	Code SOLENOIDE See electric windings summary page







Weight 4500 gr.
Minimum actuation pressure 2 bar

Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	38	G1 1/2"	G1/8"	3000	0 ÷ 101

General details

The new series of valves and solenoid valves with shutter G1/2" and G3/4" is a new version of the already-tested zamak version. The main feature of this version is the high-resistance thermoplastic material from which the components are moulded. This made it possible to obtain an aesthetically pleasing product with a considerably reduced weight compared to the standard version, and, most importantly, a reduction in price. There are also changes of a technical and functional nature, however, starting with the use of a rolling diaphragm in place of the traditional piston, thus eliminating friction and wear on the seal.
For versions with microsolenoid and internal or external supply, there is a fast discharge system incorporated in the operator, which reduces the response time for repositioning the valve by 60%.The mechanisms of the actuation solenoid valve are the MP with external supply and MV for self-supplied versions (they differ from the M2 and M2/V, used on zamak valves, for self-tapping fixation screws in plastic).
There are also double versions either for air or for vacuum on which, in place of the standard actuation mechanisms, there is a solenoid valve 3/2 Solenoid-Solenoid complete with 15mm 24V DC microactuators (code N331.0A).
The ordering codes correspond to the solenoid valves with mechanisms that are "MP" or "MV" mounted. The windings are not included and have to be ordered separately (see summary page for electric windings) with the exception of the dual versions which already have windings 24V DC (N331.0A).

Certified windings are also available c UL us

Construction features

Body, operator and bottom	High resistance thermoplastic material
Seals and shutters	Nitrile rubber (NBR), oilproof
Piston and guide pin	Acetal resin
Springs	Stainless steel AISI 302
Diaphragm	Rubberised fabric in nitrile (NBR) compound, oilproof

Wear and maintenance

These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation inside. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. For these products, due to the manner in which they are constructed and the particular use for which they are intended, maintenance by replacing valve parts does not have to be carried out. When necessary, basic internal cleaning can be performed, carefully removing any dirt accumulations. When the self-supply version is used in the solenoid valves, take care that the use is never, as air flow, the same as the supply, because in this case there would not be sufficient vacuum for actuation.
This is normally found on shutter valves since they do not have the closed centres position and insufficient actuation could cause the system to discharge from outlet 3.In this case switch to the version with external actuation.

Connections of valves

Normally closed Self-supplied
Normally open External supply

1 = DISCHARGE
2 = USE
3 = PUMP

Normally open Self-supplied
Normally closed External supply

1 = PUMP
2 = USE
3 = DISCHARGE

Response time (ms)

"***The response time of the directional control valves or the moving parts of logic devices was measured in accordance with the standard ISO 12238:2001***"

Code	Type	Response time (ms)	
		energised	de-energised
T772/V.32.11.1	N.C.	50	150
T772/V.32.11.1	N.O.	27	195
T772/V.32.0.1.MP	N.C.	42	135
T772/V.32.0.1.MP	N.O.	22	175
T772/VS.32.0.1.MP	N.C.	43	37
T772/VS.32.0.1.MP	N.O.	25	42
T772/V.32.0.1AA.MV	N.C.	55	30
T772/V.32.0.1AA.MV	N.O.	33	38

Code	Type	Response time (ms)	
		energised	de-energised
T773/V.32.11.1	N.C.	28	190
T773/V.32.11.1	N.O.	50	150
T773/V.32.0.1.MP	N.C.	25	175
T773/V.32.0.1.MP	N.O.	40	145
T773/VS.32.0.1.MP	N.C.	25	40
T773/VS.32.0.1.MP	N.O.	42	38
T773/V.32.0.1AA.MV	N.C.	35	30
T773/V.32.0.1AA.MV	N.O.	32	80

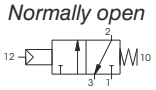
Pneumatic spring valve

3/2

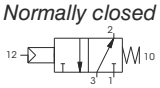
Ordering code

T772/V.32.11.1

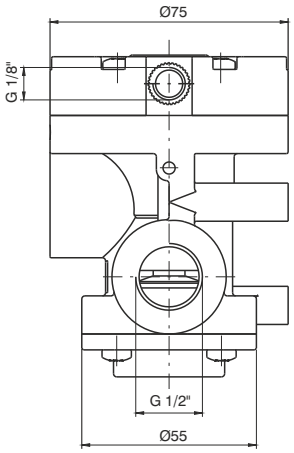
Normally open

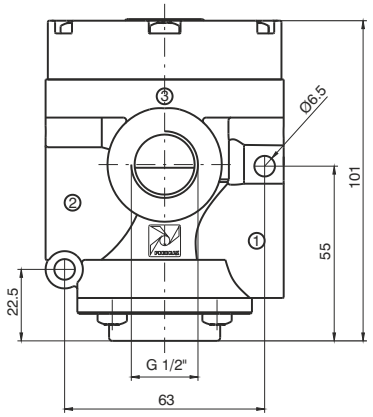


Normally closed



Weight 350 gr.



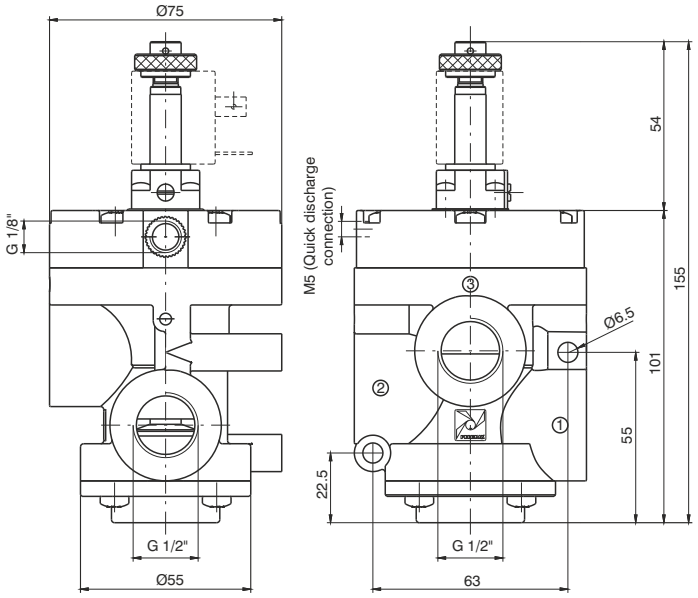


Minimum actuation pressure: 2,5 bar

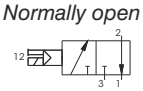
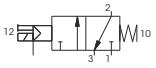
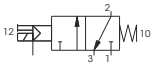
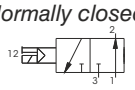
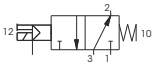
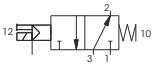
Spring Solenoid valve

3/2

Weight 390 gr.



Ordering code

Self-supplied	*External supply*	*External supply with quick discharge*
T772/V.32.0.1AA.MV *Normally open* 	**T772/V.32.0.1.MP** *Normally open* 	**T772/VS.32.0.1.MP** *Normally open* 
T772/V.32.0.1AC.MV *Normally closed* 	*Normally closed* 	*Normally closed* 

Minimum actuation pressure: 2,5 bar

Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	15	G1/2"	G1/8"	334	0 ÷ 101

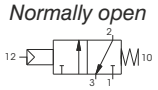
Pneumatic spring valve

3/2

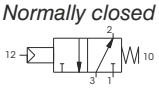
Ordering code

T773/V.32.11.1

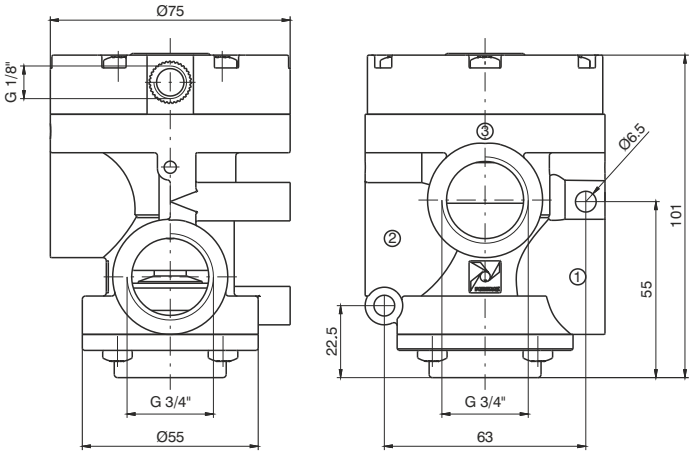
Normally open



Normally closed



Weight 330 gr.

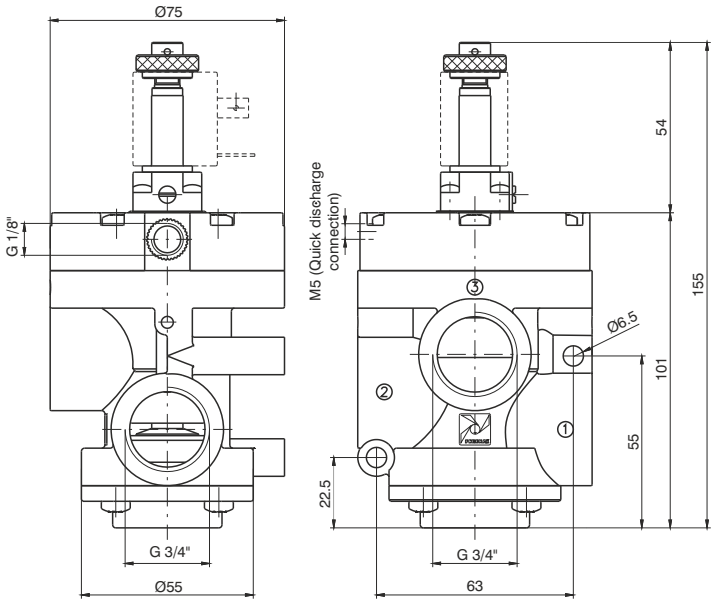


Minimum actuation pressure: 2,5 bar

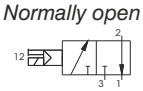
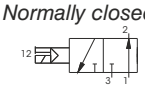
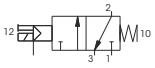
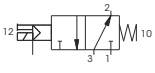
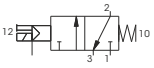
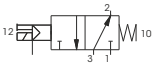
Spring Solenoid valve

3/2

Weight 370 gr.



Ordering code

Self-supplied	*External supply*	*External supply with quick discharge*
T773/V.32.0.1AA.MV *Normally open*  **T773/V.32.0.1AC.MV** *Normally closed* 	**T773/V.32.0.1.MP** *Normally open*  *Normally closed* 	**T773/VS.32.0.1.MP** *Normally open*  *Normally closed* 

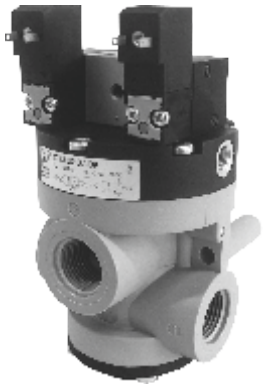
Minimum actuation pressure: 2,5 bar

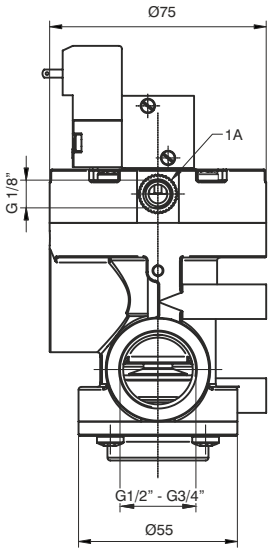
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	20	G3/4"	G1/8"	667	0 ÷ 101

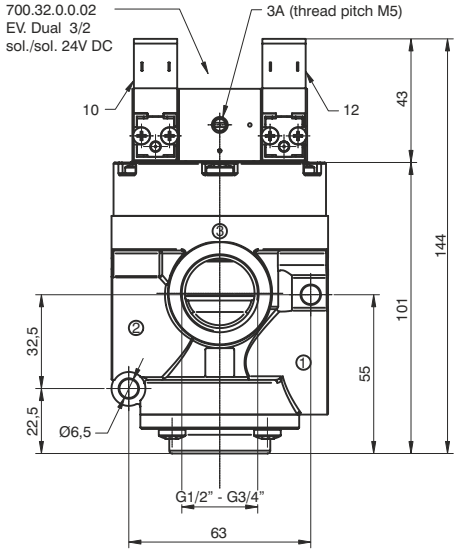
4

Bistable version

3/2

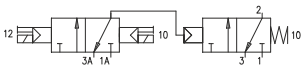


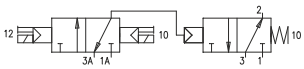




N.O.
Pump in 3
Use in 2
Discharge in 1

N.C.
Pump in 1
Use in 2
Discharge in 3





Weight 550 gr.

Ordering code

G 1/2”	*G 3/4”*	*G 1/2” (with quick discharge)*	*G 3/4” (with quick discharge)*
T772/V.32.0.1BP *Normally closed* *Normally open*	**T773/V.32.0.1.BP** *Normally closed* *Normally open*	**T772/VS.32.0.1.BP** *Normally closed* *Normally open*	**T773/VS.32.0.1.BP** *Normally closed* *Normally open*

Performance characteristics	Fluid	Min. actuation pressure (bar)	Temperature °C	Nominal flow passage diameter (mm) G1/2"	Nominal flow passage diameter (mm) G3/4"	Supply connection	Actuation connection	Flow rate (l/min) G1/2"	Flow rate (l/min) G3/4"	Degree of Vacuum(-kPa)
	Vacuum	2,5	-5 ÷ +50	15	20	G1/2" - G3/4"	G1/8"	167	334	0 ÷ 101

4

General details

The new series of valves and solenoid valves with shutter G1" is a new version of the already-proven zamak version and of the version G1/2" - 3/4" series T772 and T773 made of technopolymer. For this version too, the main feature is the high-resistance thermoplastic material from which the components are moulded.
This made it possible to obtain an aesthetically pleasing product with a considerably reduced weight compared to the standard version, and, most importantly, a reduction in price.
As for the versions of 1/2" and 3/4" there were also technical and functional changes made, starting with the use of a rolling diaphragm in place of the traditional piston, thus eliminating friction and wear on the seal.
For the versions with microsolenoids that are internally or externally supplied, a quick discharge system is available, incorporated in the operator, which reduces the valve's repositioning response times by a further 80% .The actuation solenoid valve mechanisms are the MP with external supply and MV for the self-supplied vacuum versions (they differ from the M2 and M2/V, used on zamak valves, in that there are self-tapping fixation screws in plastic).There are also double versions either for air or for vacuum on which, in place of the standard actuation mechanisms, there is mounted a solenoid valve 3/2 Solenoid-Solenoid complete with 15mm 24V DC microactuators (code N331.0A).
The ordering codes correspond to the solenoid valves with mechanisms "MP" or "MV" mounted. The windings are not included and have to be ordered separately (see summary page for electric windings) with the exception of the dual versions which already have windings 24V DC (N331.0A).
Certified windings are also available c UL us

Construction features

Body, operator and bottom	High resistance thermoplastic material
Seals and shutters	Nitrile rubber (NBR), oilproof
Piston and guide pin	Acetal resin
Springs	Stainless steel AISI 302
Diaphragm	Rubberised fabric in nitrile (NBR) compound, oilproof

Wear and maintenance

These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation inside. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. For these products, due to the manner in which they are constructed and the particular use for which they are intended, maintenance with replacement of valve parts does not have to be carried out. When necessary, basic internal cleaning can be performed, carefully removing any dirt accumulations. When the self-supply version is used in the solenoid valves, take care that the use is never, as air flow, the same as the supply, because in this case there would not be sufficient vacuum for actuation. This is normally found on shutter valves since they do not have the closed centres position and insufficient actuation could cause the system to discharge from outlet 3. In this case switch to the version with external actuation.

Connections of valves:

Normally closed self-supplied Normally open externally supplied	1 = DISCHARGE 2 = USE 3 = PUMP
Normally open self-supplied Normally closed externally supplied	1 = PUMP 2 = USE 3 = DISCHARGE

Response time (ms)

"***The response time of the directional control valves or the moving parts of logic devices was measured in accordance with the standard ISO 12238:2001***"

Code	Type	Response time (ms)	
		energised	de-energised
T771/V.32.11.1	N.C.	55	320
T771/V.32.11.1	N.O.	19	450
T771/V.32.0.1.MP	N.C.	50	315
T771/V.32.0.1.MP	N.O.	19	450
T771/VS.32.0.1.MP	N.C.	50	50
T771/VS.32.0.1.MP	N.O.	19	70
T771/V.32.0.1AA.MV	N.C.	100	60
T771/V.32.0.1AA.MV	N.O.	80	60

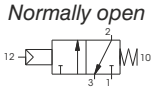
Pneumatic spring valve

3/2

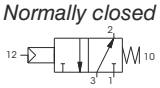
Ordering code

T771/V.32.11.1

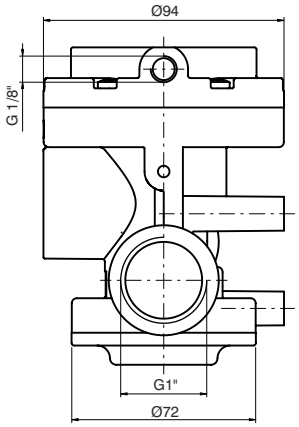
Normally open

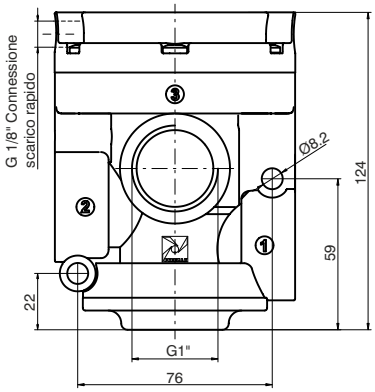


Normally closed



Weight 480 gr.



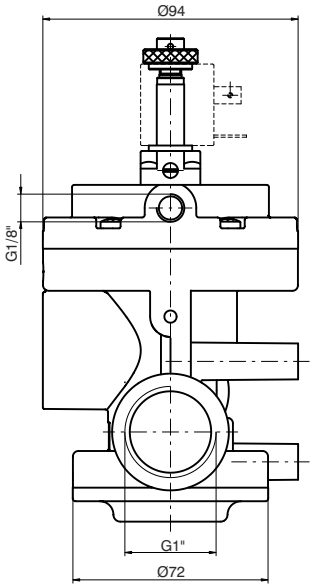


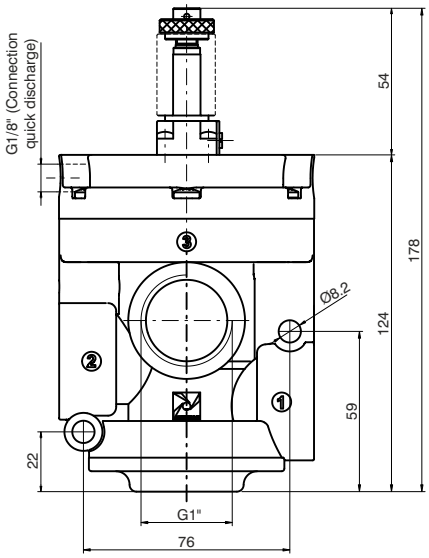
Minimum actuation pressure: 2 bar

Spring Solenoid valve

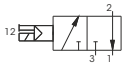
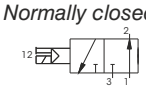
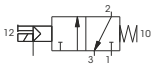
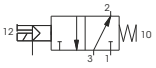
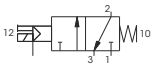
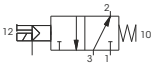
3/2

Weight 520 gr.





Ordering code

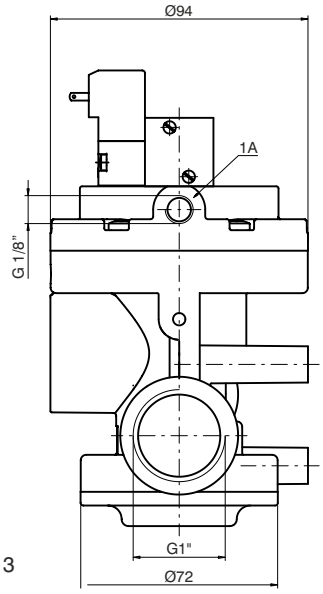
Self-supplied	*External supply*	*External supply with quick discharge*
T771/V.32.0.1AA.MV *Normally open*  **T771/V.32.0.1AC.MV** *Normally closed* 	**T771/V.32.0.1.MP** *Normally open*  *Normally closed* 	**T771/VS.32.0.1.MP** *Normally open*  *Normally closed* 

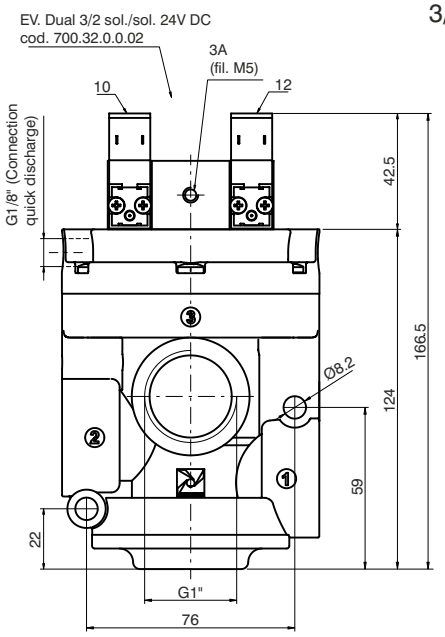
Minimum actuation pressure: 2 bar

Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	25	G1"	G1/8"	1500	0 ÷ 101

Bistable version

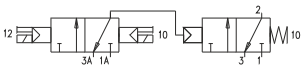
3/2

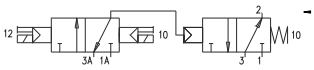




N.O.
Pump in 3
Use in 2
Discharge in 1

N.C.
Pump in 1
Use in 2
Discharge in 3





Weight 680 gr.

Ordering code

	(with quick discharge)
T771/V.32.0.1BP *Normally closed / Normally open*	**T771/VS.32.0.1.BP** *Normally closed / Normally open*

Performance characteristics	Fluid	Min. actuation pressure (bar)	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	2.5	-5 ÷ +50	25	G1"	G1/8"	1500	0 ÷ 101

4

General details

The series of valves and solenoid valves N776 of G1 1/2", developed technically and functionally out of series 776. A rolling diaphragm was introduced in place of the traditional piston, thus eliminating friction and wear on the gasket.
There is an additional gasket on the piston that insulates connection 3, making it possible to have normally open versions and self-supplied versions with vacuum (not available in the previous series 776). The actuation mechanisms are the M3R (Mechanism CNOMO) with two-position manual control.

The windings are not included and have to be ordered separately (see summary page for electric windings).

Certified windings are also available c UL us

Construction features

Body, operator and bottom:	Die-cast aluminium
Seals and shutters:	Nitrile rubber (NBR), oilproof,
Piston:	Acetal resin
Guide pin:	Nickel-plated steel
Springs:	Steel
Diaphragm:	Rubberised nitrile fabric (NBR), oilproof

Wear and maintenance

These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation and consequently likely malfunctioning.
Check to make sure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. For these products, due to the manner in which they are constructed, maintenance by replacing valve parts does not have to be carried out. When necessary, basic internal cleaning can be performed, carefully removing any dirt accumulations. When the self-supply version is used in the solenoid valves, take care that the use is never, as air flow, the same as the supply, because in this case there would not be sufficient vacuum for actuation.
This is normally found on shutter valves since they do not have the closed centres position and insufficient actuation could cause the system to discharge from outlet 3. In this case switch to the version with external actuation.

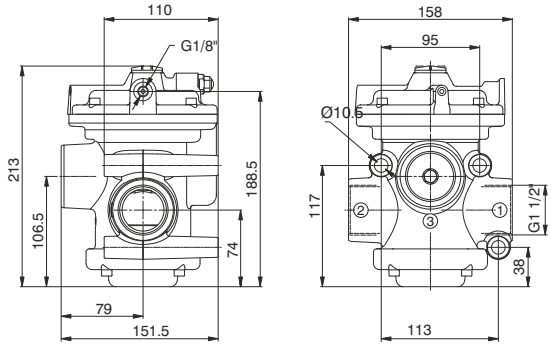
Connections of valves:

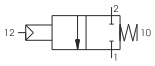
Normally closed Self-supplied Normally open External supply	1 = DISCHARGE 2 = USE 3 = PUMP
Normally open Self-supplied Normally closed External supply	1 = PUMP 2 = USE 3 = DISCHARGE

Pneumatic-Spring

Ordering code

N776/V.22.11.1C





Weight 3178 gr.
Normally closed
Minimum actuation pressure 2 bar

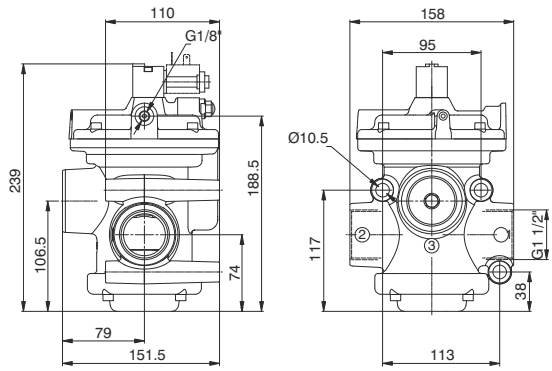
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	38	G1 1/2""	G1/8"	3000	0 ÷ 101

Solenoid-Spring

Ordering code

N776/V.22.0.Ⓕ.M3R

	FUNCTION
Ⓕ	1AC=Self-supplied Normally closed
	1C=External supply Normally closed



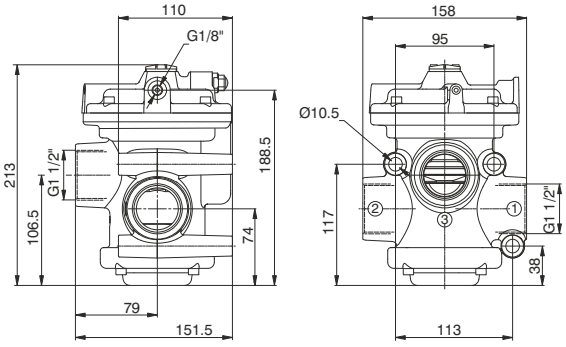
Weight 3238 gr.
Minimum actuation pressure 2 bar

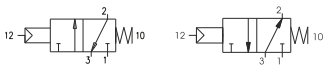
Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	38	G1 1/2""	G1/8"	3000	0 ÷ 101

Pneumatic-Spring

Ordering code

N776/V.32.11.1





Weight 3168 gr.
Normally closed / Normally open
Minimum actuation pressure 2 bar

Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +70	38	G1 1/2"	G1/8"	3000	0 ÷ 101

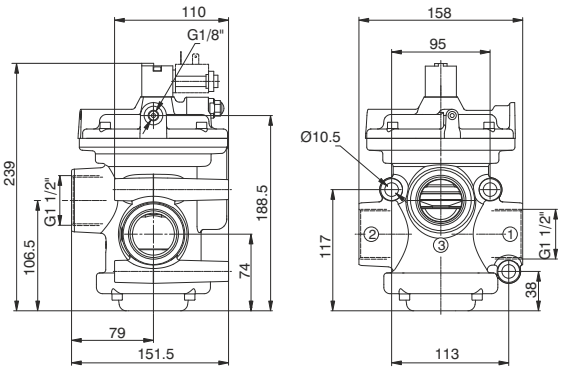
4

Solenoid-Spring

Ordering code

N776/V.32.0.Ⓕ.M3R

Ⓕ	FUNCTION
	1AC=Self-supplied Normally closed
	1AA=Self-supplied Normally open
	1=External supply Normally closed- Normally open



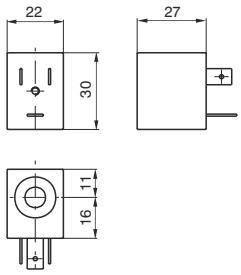
Weight 3228 gr.
Minimum actuation pressure 2 bar

Performance characteristics	Fluid	Temperature °C	Nominal flow passage diameter (mm)	Supply connection	Actuation connection	Flow rate (l/min)	Degree of Vacuum (-kPa)
	Vacuum	-5 ÷ +50	38	G1 1/2""	G1/8"	3000	0 ÷ 101

4

Winding (for Series 771, 772, 773, 779, T772, T773, T771 and N776)

Weight 52 gr.



Standard version

Ordering code	Available voltages
MB 4	12 D.C. Direct current
MB 5	24 D.C. Direct current
MB 6	48 D.C. Direct current
MB 9 *	24 D.C. (2 Watt) (Direct current, low consumption)
MB 17	24/50 alternating current 50 Hz
MB 21	48/50 alternating current 50 Hz
MB 22	110/50 alternating current 50 Hz
MB 24	230/50 alternating current 50 Hz
MB 37	24/60 alternating current 60 Hz
MB 39	110/60 alternating current 60 Hz
MB 41	230/60 alternating current 60 Hz
MB 56	24/50-60 alternating current 50/60 Hz
MB 57	110/50-60 alternating current 50/60 Hz
MB 58	230/50-60 alternating current 50/60 Hz
MB 66 **	24/50-60 alternating current 50/60 Hz
MB 67 **	110/50-60 alternating current 50/60 Hz
MB 68 **	230/50-60 alternating current 50/60 Hz

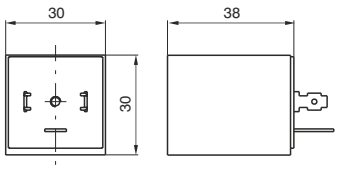
* Can be used only with mechanism M2/9
** low consumption

c UL us Version

Ordering code	Available voltages
UMB 4	12 D.C. Direct current
UMB 5	24 D.C. Direct current
UMB 56	24/50-60 alternating current 50/60 Hz
UMB 57	110÷120/50-60 alternating current 50/60 Hz
UMB 58	230/50-60 alternating current 50/60 Hz

Winding (for Series N776)

Weight 110 gr.



Standard Version

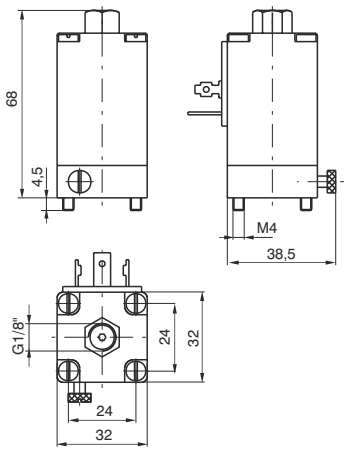
Ordering code	Available voltages
MC 5	24 D.C. Direct current
MC 9	24 D.C. (2 Watt) Direct current
MC 56	24/50-60 alternating current 50/60 Hz
MC 57	110/50-60 alternating current 50/60 Hz
MC 58	230/50-60 alternating current 50/60 Hz

c UL us Version

Ordering code	Available voltages
UMC 5	24 D.C. Direct current
UMC 56	24/50-60 alternating current 50/60 Hz
UMC 57	110÷120/50-60 alternating current 50/60 Hz
UMC 58	230/50-60 alternating current 50/60 Hz

Solenoid valve (for Series 776)

Weight 220 gr.



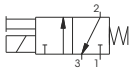
Standard Version

Ordering code	Available voltages
S 2	6 D.C. Direct current
S 4	12 D.C. Direct current
S 5	24 D.C. Direct current
S 6	48 D.C. Direct current
S 16	12/50 alternating current 50 Hz
S 17	24/50 alternating current 50 Hz
S 19	32/50 alternating current 50 Hz
S 20	42/50 alternating current 50 Hz
S 21	48/50 alternating current 50 Hz
S 22	110/50 alternating current 50 Hz
S 23	115/50 alternating current 50 Hz
S 24	230/50 alternating current 50 Hz
S 36	12/60 alternating current 60 Hz
S 37	24/60 alternating current 60 Hz
S 38	48/60 alternating current 60 Hz
S 39	110/60 alternating current 60 Hz
S 40	115/60 alternating current 60 Hz
S 41	230/60 alternating current 60 Hz
S 56	24/50-60 alternating current 50/60 Hz
S 57	110/50-60 alternating current 50/60 Hz
S 58	230/50-60 alternating current 50/60 Hz

c UL us Version

Ordering code	Available voltages
US 4	12 D.C. Direct current
US 5	24 D.C. Direct current
US 56	24/50-60 alternating current 50/60 Hz
US 57	110÷120/50-60 alternating current 50/60 Hz
US 58	230/50-60 alternating current 50/60 Hz

Normally closed (N.C.)



4

General details

Pad valves are one of the more functional and economic solutions, given the lower costs, for intercepting fluids. The valves are composed of a bronze body, 2-way, with pneumatic control, with a compact single or double acting cylinder with connections which can be turned 360°.

Versions are available that have the gaskets in contact with the fluid, and are made of NBR, FPM or PTFE.

The liner profile allows use of magnetic sensors with codes "1500._", "RS._", "HS._", for type "A" slot

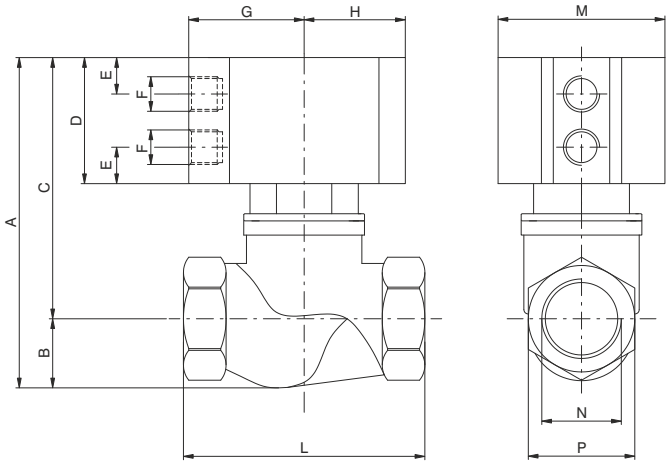
Construction features

Bottom, Piston and guide	Anodised aluminium
Head Cylinder	Anodised aluminium alloy
Spring	Galvanised harmonic steel
Pneumatic cylinder seals	NBR (FPM for the models that have seals in contact with fluid and made of FPM or PTFE)
Seals in contact with fluid	NBR, FPM, PTFE
Piston rod	Chrome-plated stainless steel
Bush, Plug sleeve, Buffer nut	Brass

Functional characteristics

Pneumatic cylinder fluid	Air filtered and lubricated or unlubricated
Valve fluid	Fluid compatible with the compounds from which the available gaskets are made
Max. cylinder operating pressure (bar)	10
Max. valve operating pressure (-kPa)	101.3
Temperature °C, Non magnetic piston, seals NBR	-5 / + 70
Non magnetic piston, seals FPM	-5 / + 150
Non magnetic piston, seals PTFE	-5 / + 150
Magnetic piston, seals NBR, FPM, PTFE	-5 / + 70

2/2 vacuum pad valve "T" body



Ordering code

PVA.B.Ⓐ.Ⓟ.T.Ⓒ.Ⓜ

	ACTUATION
Ⓐ	DE=Double acting
	SC=Normally closed
	SA=Normally Open
	PISTON
Ⓟ	N= Non magnetic
	M= Magnetic
	CONNECTIONS
	A=G1/4"
	B=G3/8"
	C=G1/2"
Ⓒ	D=G3/4"
	E=G1"
	F=G1 1/4"
	G=G1 1/2"
	H=G2"
	SHUTTER COMPOSITION
Ⓜ	N=NBR
	V=FPM
	F=PTFE

TABLE OF DIMENSIONS

	Non-magnetic piston			Magnetic piston											TECHNICAL DATA		
Attachments (N)	A	C	D	A	C	D	B	E	F	G	H	L	M	P	*Actuator Ø*	*Valve Ø*	*Weight (gr.)*
G1/4"	93.5	77.5	41	97.5	81.5	45	16	10.25	G1/8"	32.5	28.5	64	47	25	Ø40	Ø13.5	350
G3/8"	93.5	77.5	41	97.5	81.5	45	16	10.25	G1/8"	32.5	28.5	64	47	25	Ø40	Ø13.5	350
G1/2"	93.5	78	41	99.5	82	45	17.5	10.25	G1/8"	32.5	28.5	68	47	30	Ø40	Ø15	400
G 3/4"	105	83	41	113	90	48	22	11.25	G1/8"	44	40	79	70	36	Ø63	Ø20.5	850
G1"	117	89	41	125	101	53	28	11.25	G1/8"	44	40	94	70	44	Ø63	Ø25	1100
G1 1/4"	131	103	48	136	108	53	28	11.25	G1/8"	44	40	110	70	55	Ø63	Ø30	1400
G1 1/2"	154	118	57	166	130	69	36	13.75	G1/8"	56	49	120	90	60	Ø80	Ø38	2100
G2"	169	124	57	181	136	69	45	13.75	G1/8"	56	49	140	90	73	Ø80	Ø49.5	3000

2-way valves to intercept fluids, pneumatic control with a compact double or single acting cylinder with connections that can turn 360°, seals in contact with fluid are made of NBR,FPM or PTFE.
The liner profile allows use of PNEUMAX series 1500 magnetic sensors.

Construction features

- Bottom. Piston and guide Head = oxidised aluminium
- Cylinder = anodised aluminium alloy
- Spring = galvanised harmonic steel
- Gaskets = NBR, FPM, PTFE
- Valve stem = chrome-plated stainless steel
- Bush, plug sleeve, buffer nut = Brass

Fluid	Air filtered and lubricated or unlubricated
Max. operating pressure (-kPa)	101
Min. operating pressure single action (cylinder)	5 bar
Min. operating pressure double action (cylinder)	5 bar
Temperature °C (Non magnetic piston, NBR seals)	-5 / + 70
Temperature °C (Non magnetic piston, FPM seals)	-5 / + 150
Temperature °C (Non magnetic piston, PTFE seals)	-5 / + 150
Temperature °C (Magnetic piston, NBR, FPM or PTFE seals)	-5 / + 70

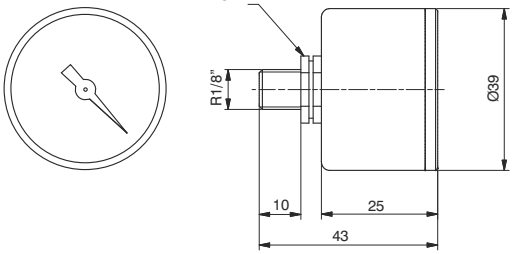
4

ACCESSORIES 5

PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

www.pneumaxspa.com

Vacuum Gauge



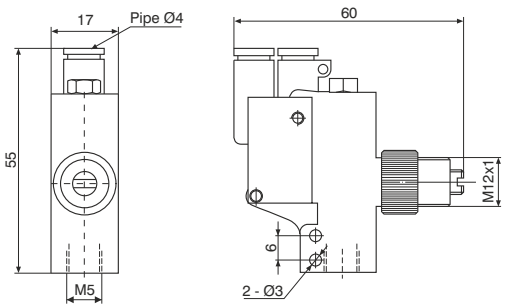
Ordering code

17070A.V

Technical features

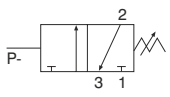
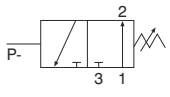
Fluid	Unlubricated filtered air
Scale (-kPa)	0 ÷ 100
Temperature (°C)	-10 ÷ 80
Weight (gr.)	56

Pneumatic vacuum switch

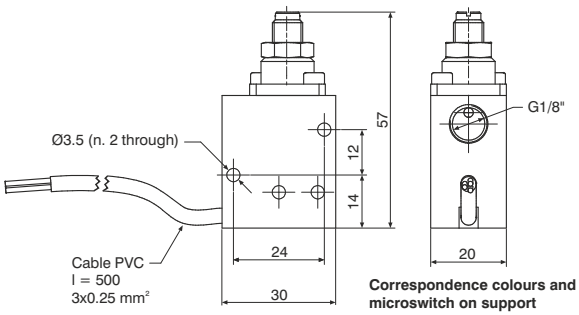


Vacuum switch whose function is, depending on the model, to turn a pneumatic signal on or off when a certain vacuum level is reached. The pressure differential that exists between the maximum value set and the restoration value cannot be adjusted. Especially recommended for the control of vacuum generators with a view to save energy.

Code	19TR4.C	19TR4.A
Type of contact	N.C. (Normally closed)	N.O. (Normally open)
Pressure (bar)	1.5 ~ 8	
Actuation threshold can be set (-kPa)	15 ~ 95	10 ~ 95
Hysteresis (kPa)	12	3
Temperature (°C)	-10 ~ +60°C	
Weight (gr.)	44	
Connections for vacuum	M5	

Function	Settable
N.C. (Normally closed)	
N.O. (Normally open)	

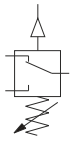
Electromechanical vacuum switch



Correspondence colours and mounted microswitch on support
Black = Common
Blue = N.C.
Grey = N.O.

Ordering code

19VCE.0.C1

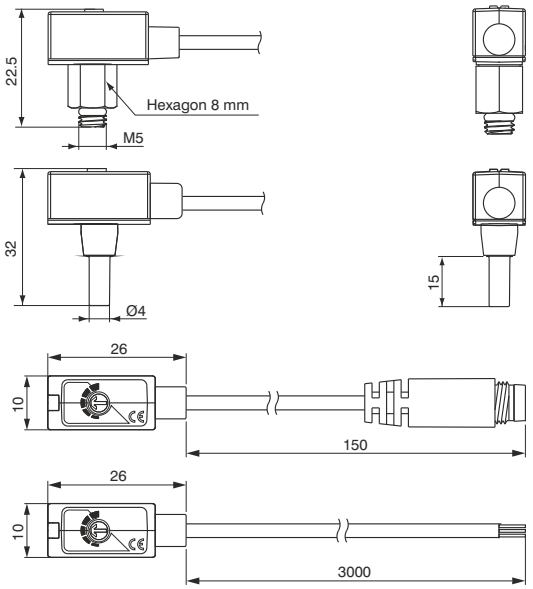


Vacuum switch whose function is to turn an electrical signal on or off when a certain vacuum level is reached. The pressure differential that exists between the maximum value set and the restoration value cannot be adjusted. Recommended for all cases where it is necessary to obtain an electrical signal once a certain level of vacuum is reached to start a work cycle, for control of the already attained grip by the suction cups or for reasons of safety, etc.

Technical features

Fluid	Vacuum
Flow rate	2A - 250 VAC
Regulation (-kPa)	20 ÷ 90
Temperature (°C)	-5 ÷ 70
Protection class	IP 67
Weight (gr.)	62,5

Mini digital vacuum switch



Ordering code

DS.10.V.B.Ⓒ.Ⓛ.Ⓞ

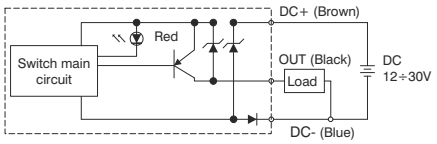
Ⓒ	CONNECTION
	F4=Male M5
	R4=Plug-in connection Ø4
Ⓛ	CABLE LENGTH
	A=150 mm *
	E=3000 mm **
Ⓞ	OPTIONS
	0=Without connector
	1=With connector M8 male 3 Pin

* only with M8 connector
** only without connector

Technical features

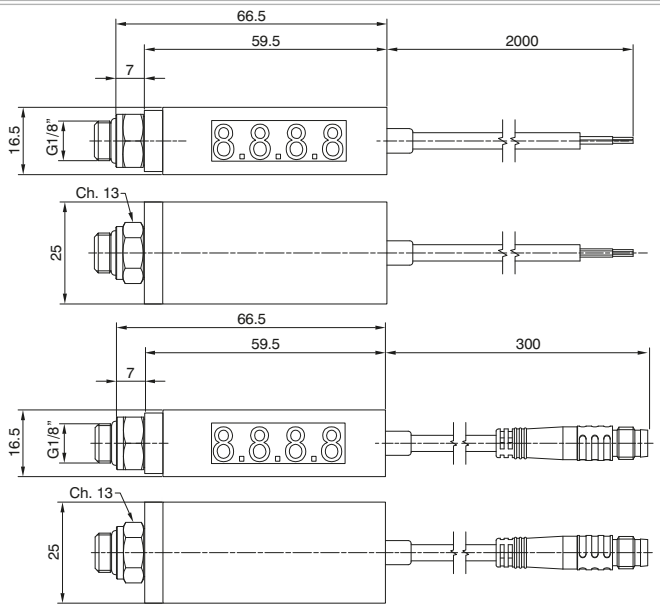
Working pressure range		0÷-100.0kPa
Regulation pressure range		0÷-100.0kPa
Maximum supported pressure		600 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
Supply voltage		From 12 to 30 VDC ±10%
Current consumption		≤ 10mA
Digital output		PNP N.O. 1 outputs Maximum load current: 80mA Maximum supply voltage: 30VDC Voltage drop: ≤0.8V
Repeatability (Digital output)		± 1% Full Scale
Digital output	Type of hysteresis	fixed
	Hysteresis	3% Full Scale max.
Response time		1ms
Protection from short circuit at output		Present
Method of setting threshold		Adjustable, trimmer
Indicator		LED red (output)
Ingress protection rating	Protection class	IP40
	Ambient temperature	Operational: 0÷60°C, Storage: -20÷70°C (without ice or condensation)
	Ambient humidity	Operational/Storage: 35÷85% (without condensation)
	Vibration	Total amplitude 1.5mm.,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z
	Impacts/shocks	980m/s² (100G), 3 times in each direction of X, Y and Z
Temperature characteristics		±2% Full Scale in a range between 0÷50°C
Type of connection		Male M5x0.8, Plug-in connection Ø4
Electrical cable		Oilproof cable, 3 wires (0.18mm²), Ø2.6mm
Weight		Approximately 50 gr. (with 3 metres of cable)

Output circuit wiring scheme



5

Digital vacuum switch



Ordering code

DS.30.C.C.F8.Ⓛ.⓪

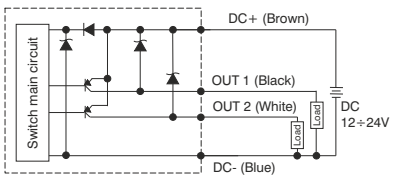
Ⓛ	CABLE LENGTH
	B=300 mm *
	D=2000 mm **
⓪	OPTIONS
	0=Without connector
	1=With connector M8 male 4 Pin

* only with M8 connector
** only without connector

Technical features

Working pressure range		-100.0÷100.0kPa
Regulation pressure range		-100.0÷100.0kPa
Maximum supported pressure		300 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
Pressure calibration sensitivity	kPa	0.1
	kgf/cm^2	0.001
	bar	0.001
	psi	0.01
	InHg	0.1
	mmHg	1
	mmH$_2$O	0.1
Supply voltage		From 12 to 24 VDC ± 10%
Current consumption		≤ 60mA
Digital output		PNP N.O. 2 outputs Maximum load current: 80mA Maximum supply voltage: 30VDC Voltage drop: ≤1V
Repeatability (Digital output)		± 0.2% Full Scale ± 1 digit
Digital output	Type of hysteresis	fixed
	Hysteresis	0.003 bar
Response time		≤2,5 ms (anti-interference function: 24ms, 192ms and 768 ms selectable)
Protection from short circuit at output		Present
Display		Display with 3 1/2 digits (sampling 5 times per sec.)
Indicator precision		±2% F. S. ±1 digit (at ambient temperature of 25°C ±3°C)
Indicator		LED Green (output1) LED red (output2)
Ingress protection rating	Protection class	IP40
	Ambient temperature	Operational: 0÷50°C, Storage: -20÷60°C (without ice or condensation)
	Ambient humidity	Operational/Storage: 35÷85% (without condensation)
	Supported voltage	1000VAC in 1-min. (between body and cable)
	Insulation resistance	50MΩ min. (at 500VDC, between body and cable)
	Vibration	Total amplitude 1.5mm. or 10G, 10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z
	Impacts/shocks	980m/s^2 (100G), 3 times in each direction of X, Y and Z
Temperature characteristics		±2% Full Scale in a range between 0÷50°C
Type of connection		G1/8" (Swivel)
Electrical cable		Oil resistant cable
Weight		Approximately 67 gr. (with 2 metres of cable)

Output circuit wiring scheme



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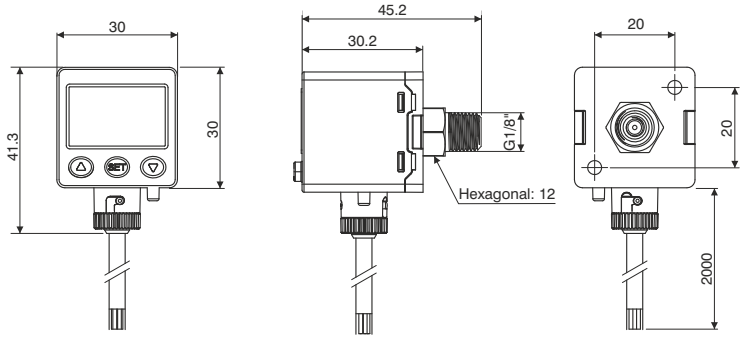
Panel-mounted digital vacuum switch



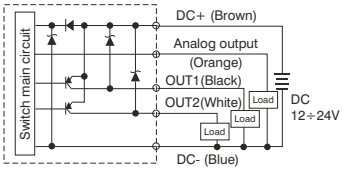
Ordering code

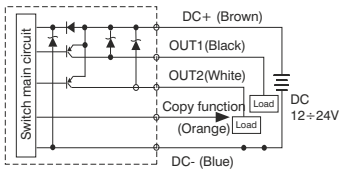
DS.45.Ⓥ.Ⓤ.F3.D.0

Ⓥ	VERSION
	C=Vacuum/Pressure (-100 / 100 kPa)
	V=Vacuum (0 / -101,3 kPa)
Ⓤ	OUTPUTS
	E=2 PNP outputs + Analog output (4 / 20 mA)
	L=2 PNP outputs + copy function

Technical features		DS.45.C.B.C.F3.D.0 (Composite)	DS.45.V.B.E.F3.D.0 (Vacuum)
Working pressure range		-100.0 ÷100.0kPa	0 ÷ -100.0kPa
Regulation pressure range		-100.0 ÷100.0kPa	0 ÷ -100.0kPa
Maximum supported pressure		300 kPa	
Allowed fluids		Air, non-corrosive gases, non-combustible gases	
Pressure calibration sensitivity	kPa	0.1	
	kgf/cm²	0.001	
	bar	0.001	
	psi	0.01	
	InHg	0.1	
Supply voltage		From 12 to 24 VDC	
Current consumption		≤40mA (without load)	
Digital output		PNP N.O. 2 outputs Maximum load current: 125mA Maximum supply voltage: 24VDC Voltage drop: ≤1.5V	
Repeatability (Digital output)		± 0.2% Full Scale ± 1 digit	
Digital output	Type of hysteresis	Settable	
	Hysteresis	from 0.001 to 0.008 bar	
Response time		≤2,5 ms (anti-interference function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selectable)	
Protection from short circuit at output		Present	
Display		Display with 3 1/2 digits (red/Green)	
Indicator precision		±2% F. S. ±1 digit	
Indicator		LED Orange (output1) LED Orange (output2)	
Analog output		Output current: 4÷20mA ±2.5% F. S. Linearity: ±1% F. S. Maximum load resistance: 250Ω supply at 12V and 600Ω supply at 24V Minimum load resistance: 50Ω	
Ingress protection rating	Protection class	IP65	
	Ambient temperature	Operational: 0÷50°C, Storage: -10÷60°C (without ice or condensation)	
	Ambient humidity	Operation/Storage: 35÷85% (without condensation)	
	Supported voltage	1000VAC in 1min. (between body and cable)	
	Insulation resistance	50MΩ (at 500VDC, between body and cable)	
	Vibration	Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z	
	Impacts/shocks	100m/s² (10G), 3 times in each direction of X, Y and Z	
Temperature characteristics		±2.5% Full Scale in a range between 0÷50°C	
Type of connection		G1/8" (BSPP), M5 female	
Electrical cable		Oil resistant cable (internal 0.15mm²)	
Weight		Approximately 86 gr. (with 2 metres of cable)	

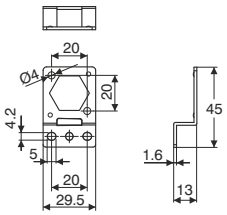
Output circuit wiring scheme





Fastening bracket

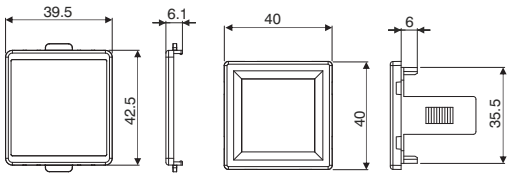
Ordering code
DS.BT10



Panel mount adapter

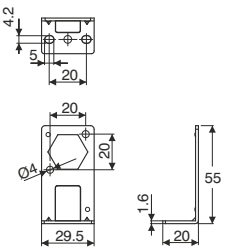
Ordering code
DS.PAE

Accessories



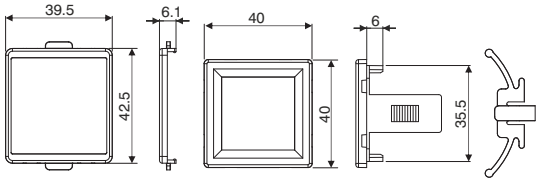
Fastening bracket

Ordering code
DS.BT11



Panel mount adapter with screen protection

Ordering code
DS.PAF



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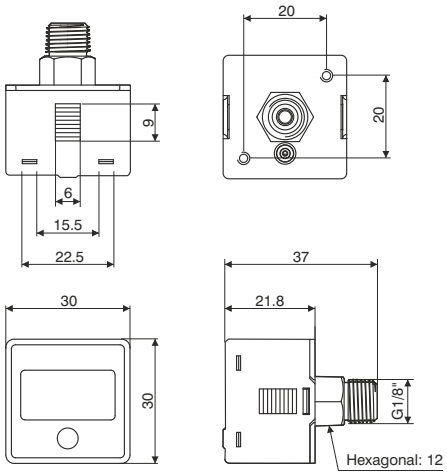
Digital battery vacuum gauge



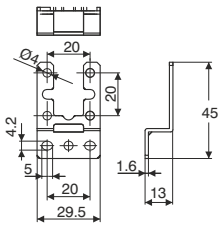
Ordering code
DS.60.V.I.F1.F.0

Technical features

Working pressure range		0 ÷ -100.0kPa
Regulation pressure range		0 ÷ -100.0kPa
Maximum supported pressure		300 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
Pressure calibration sensitivity	kPa	0.1
	bar	0.01
	psi	0.1
	mmHg	1
Battery		CR 2032 lithium
Backlight		Not present
Battery life		3 years (5 powerups a day)
Indication of battery level		Present
Battery replaceable		Yes
Display powerup time		Goes off after 60 seconds
Sampling frequency		2 Hz (2 times per second)
Repeatability		±1% F. S. ±1 digit
Display		Display with 3 1/2 digits
Indicator precision		±2% F.S. ±1 digit (at ambient temperature of 25°C ±3°C)
Ingress protection rating	Protection class	IP65 (only with connected air pipe)
	Ambient temperature	Operational: 0÷50°C, Storage: -10÷60°C (without ice or condensation)
	Ambient humidity	Operational/Storage 35÷85% (without condensation)
	Vibration	Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z
	Impacts/shocks	100m/s² (10G), 3 times in each direction of X, Y and Z
Temperature characteristics		±2% Full Scale in a range between 0÷50°C
Type of connection		R1/8", M5 female
Weight		Approximately 40 gr.

Fastening bracket

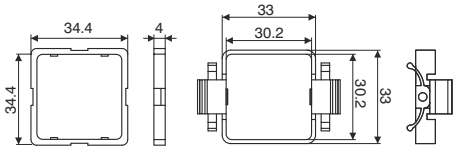
Ordering code
DS.BT5



Panel mount adapter

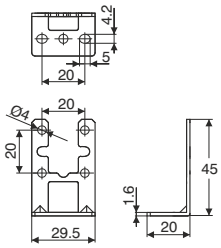
Ordering code
DS.PAC

Accessories



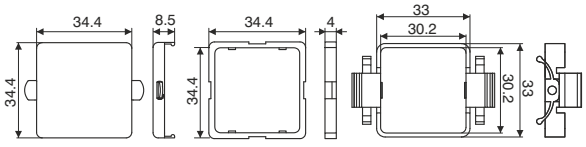
Fastening bracket

Ordering code
DS.BT6



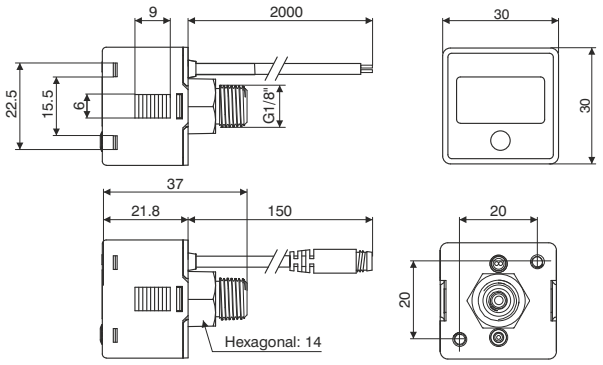
Panel mount adapter with screen protection

Ordering code
DS.PAD



5

Digital vacuum gauge



Ordering code

DS.61.V.I.F1.L.O

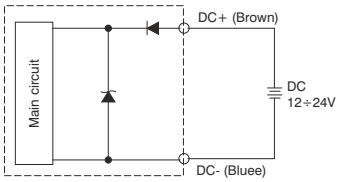
L	CABLE LENGTH
	A=150 mm *
	D=2000 mm **
O	OPTIONS
	0=Without connector
	2=With connector M8 male 4 Pin

* only with M8 connector
** only without connector

Technical features

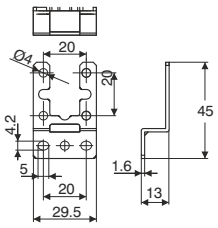
Working pressure range		0 ÷ -100.0kPa
Regulation pressure range		0 ÷ -100.0kPa
Maximum supported pressure		300 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
Pressure calibration sensitivity	kPa	1
	kgf/cm²	0.01
	bar	0.01
	psi	0.1
Supply voltage		From 12 to 24 VDC ± 10%
Current consumption		10mA
Repeatability		± 1% Full Scale ±1 digit
Display		Display with 3 1/2 digits (sampling 5 times per sec.)
Indicator precision		±2% F. S. ±1 digit (at ambient temperature of 25°C ±3°C)
Ingress protection rating	Protection class	IP65 (only with connected air pipe)
	Ambient temperature	Operational: 0÷50°C, Storage: -10÷60°C (without ice or condensation)
	Ambient humidity	Operation/Storage: 35÷85% (without condensation)
	Supported voltage	1000VAC in 1 min. (between body and cable)
	Insulation resistance	50MΩ (at 500VDC, between body and cable)
	Vibration	Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z
	Impacts/shocks	100m/s² (10G), 3 times in each direction of X, Y and Z
Temperature characteristics		±2% Full Scale in a range between 0÷50°C
Type of connection		R1/8", M5 female
Electrical cable		Oil resistant cable (internal 0.15mm²)
Weight		Approximately 60 gr. (with 2 metres of cable) and Approximately 40 gr. (with M8 4 pin male connector)

Output circuit wiring scheme



Fastening bracket

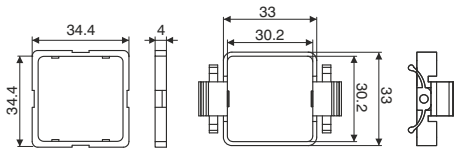
Ordering code
DS.BT5



Panel mount adapter

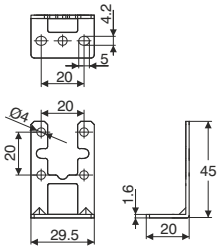
Ordering code
DS.PAC

Accessories



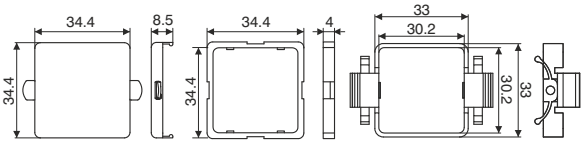
Fastening bracket

Ordering code
DS.BT6



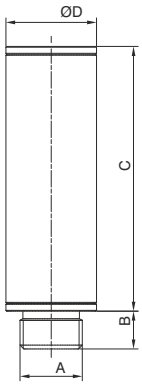
Panel mount adapter with screen protection

Ordering code
DS.PAD



5

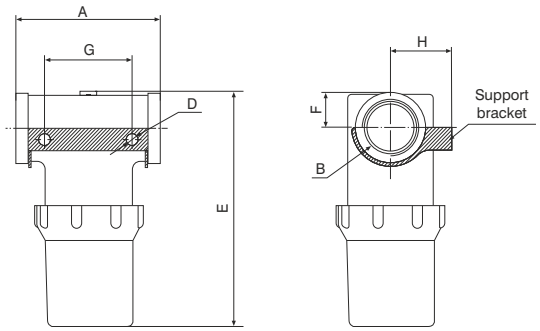
High efficiency silencers



Code	Description	A	B	C	ØD	Weight (gr.)
19S18.S	Silencer G1/8"	G1/8"	6	30	16	10
19S14.S	Silencer G1/4"	G1/4"	8	50	20	21
19S38.S	Silencer G3/8"	G3/8"	10	70	24	35
19S12.R	Silencer G1/2" Reduced	G1/2"	12	70	29	46
19S12.S	Silencer G1/2"	G1/2"	12	90	35	83
19S34.R	Silencer G3/4" Reduced	G3/4"	12	90	35	86
19S34.S	Silencer G3/4"	G3/4"	12	110	50	144
19S10.R	Silencer G1" Reduced	G1"	14	110	50	144

The use of sound-absorbing material enclosed in appropriate aluminium containers made it possible to create this range of silencers which significantly lower air noisein the vacuum generator discharge stage.
Noise reduction: between -13 and -20 dBA
Working temperature: from -20 to +100 °C

Vertical filters



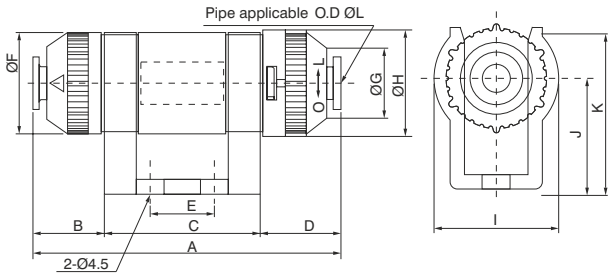
Code	Description	A	B	D	E	F	G	Weight (gr.)
19F38.V.00	Filter G3/8"	76	2-G3/8"	2-Ø6.5	71.3	14	45	70
19F12.V.00	Filter G1/2"	91	2-G1/2"	2-Ø8.5	131.5	16	50	168
19F34.V.00	Filter G3/4"	91	2-G3/4"	2-Ø8.5	138.5	18.5	50	170
19F10.V.00	Filter G1"	126	2-G1"	2-Ø10.5	167	23	80	424

Filter elements

Code	Description
RK1900/0022	Filter element for 19F38.V.00
RK1900/0023	Filter element for 19F12.V.00 AND 19F34.V.00
RK1900/0024	Filter element for 19F10.V.00

Preventing contaminants from reaching the vacuum generator is critical for maintaining its proper operation. Filters of this series have this function, manufactured in a simple way, have threaded connections for installation and a bowl that can be easily taken off to allow fast cleaning of the internal filter cartridge. The various models of filter cover a flow rate range running from 150 to 2520 l/m, Degree of filtration :10 micron, Working temperature:-20 / 80 °C, Working pressure:-100 / 0 kPa.

Line filters



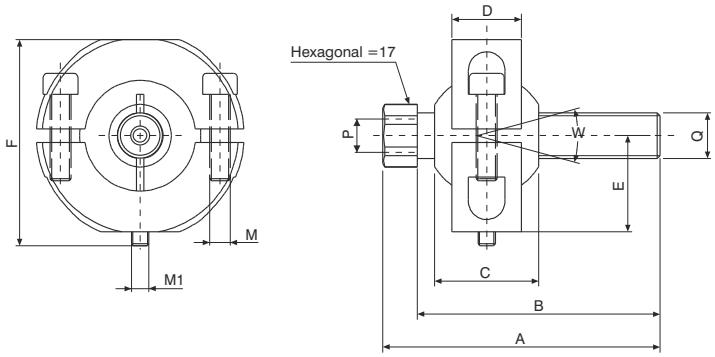
Code	Description	A	B	C	D	E	ØF	ØG	ØH	I	J	K	ØL	Weight (gr.)
19F04.L.01	Pipe Ø4 - 20 l/min	53.2	9.1	30	14.1	10	18	11.6	19.5	23	20	29	4	14
19F06.L.01	Pipe Ø6 - 20 l/min	53.2	9.1	30	14.1	10	18	11.6	19.5	23	20	29	6	13
19F06.L.02	Pipe Ø6 - 50 l/min	67	15.5	34	17.5	14	22	15.6	23.1	27	24	35	6	26
19F08.L.02	Pipe Ø8 - 50 l/min	67	15.5	34	17.5	14	22	15.6	23.1	27	24	35	8	24

Filter elements

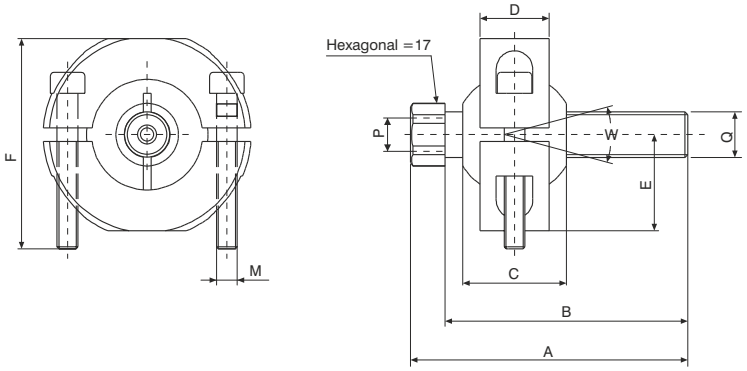
Code	Description
RK1900/0020	Filter element for 19F04.L.01 and 19F06.L.01
RK1900/0021	Filter element for 19F06.L.02 and 19F08.L.02

Line filters can handle very fine powders and contaminants without interfering with the intake flow rate. Thanks to the small dimensions they can be installed directly on the suction cups or on the vacuum pipework, and since they have automatic connections, wiring operations are facilitated.
Degree of filtration:10 micron, Working temperature:0-60 °C, Working pressure:-100 / 0 kPa.

Suction Cup Support



Code	A	B	C	D	E	F	P	Q	M	M1	W	Weight (gr.)
19SP1.T	80	70	55.6	20	27.5	59.5	G1/8"	G1/4"	M6	M5	30°	174



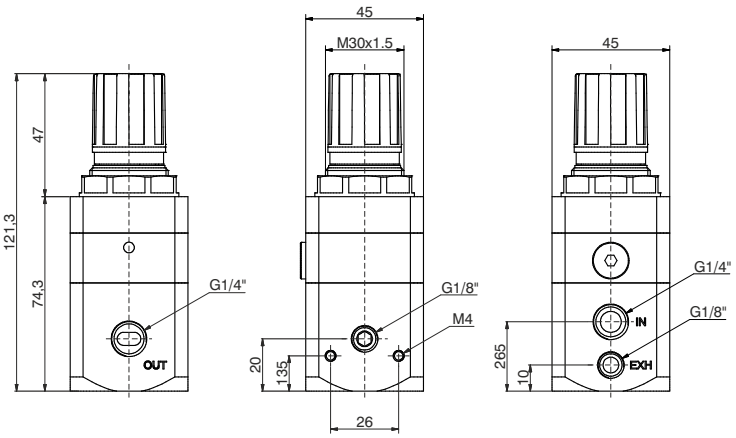
Code	A	B	C	D	E	F	P	Q	M	W	Weight (gr.)
19SP2.T	80	70	55.6	20	27.5	61	G1/8"	G1/4"	M6	30°	180

Support for suction cup with adjustability and fastening via a ball bearing that allows it to be kept in the desired position.

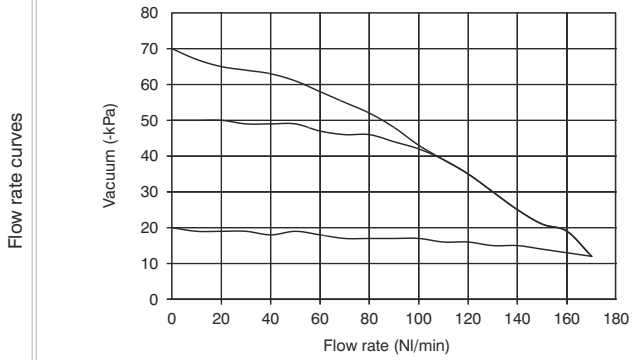
Regulator for vacuum

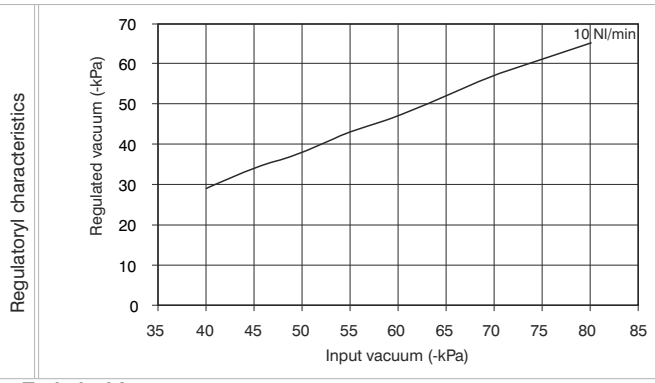
Ordering code

171S2B000V



Example: 171S2B000V
Regulator for vacuum G1/4"





Construction features

- Precision in keeping the set pressure value.
- Sensitivity combined with high flow rate of the downstream overpressure discharge valve.
- High flow rate with very low pressure drop.
- Setting knob can be locked using pressure into the desired position.
- Body made of light alloy.
- Two attachments for vacuum gauge with a cap equipped with a gasket.
- Ring nut for panel mounting.
- Once the reducer has been placed under vacuum, air intake through the appropriate orifice is an attribute and not a defect.

Technical features

Connections	G1/4"
Max. operating pressure (-kPa)	101
Operating temperature °C	-5 ÷ +50
Pressure gauge attachments	G1/8"
Weight (gr.)	400
Mounting position	any
Maximum tightening torque for connections (Nm)	25
Fluid	Filtered air 20μm
Diameter of panel mounting orifice (mm)	30

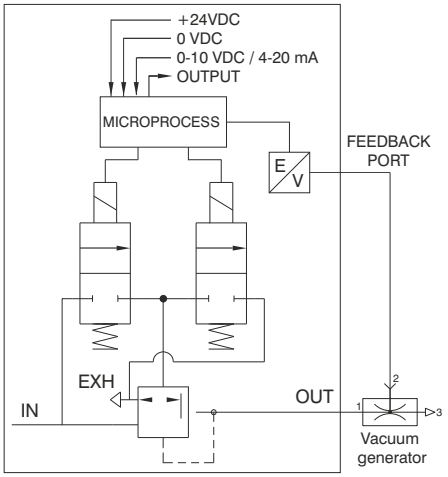
General details

Modern industrial applications demand increasingly higher performance out of pneumatic components. In the specific case of a pneumatic cylinder, it has to act on parameters that determine the force generated and the speed at which the valve stem moves. The same holds true for a rotary actuator where we do not speak of force but rather the application of torque.
These parameters often have to be modified dynamically during operation of the the machine on which they are installed. Traditional solutions that make use of the pneumatic logic associated with use of valves supplied at different pressures often need to be large in size. It was from this requirement that the alternative solution of using a regulator came about, since it can change the pressure value over time. This type of regulator is called an electronically controlled proportional regulator. There are 3 sizes with flow rates of 7; 1,100; and 4,000 Nl/min.The model that manages the positive pressure controling a vacuum generator was then added to this range.

Field of application

Fields of application for proportional regulators are any where it is necessary to dynamically control the force of an actuator, variation of pressure or degree of vacuum. Some examples: locking systems, painting systems, tensioning systems, packaging machinery, pneumatic control braking systems, force control for welding clamps, thickness compensating systems, balancing systems, laser cutting, pressure transducers to control modulating valves, test benches for testing systems, controlling the force of air gauges in sanding systems, management of force exerted by suction cups in handling applications.

Functional diagram

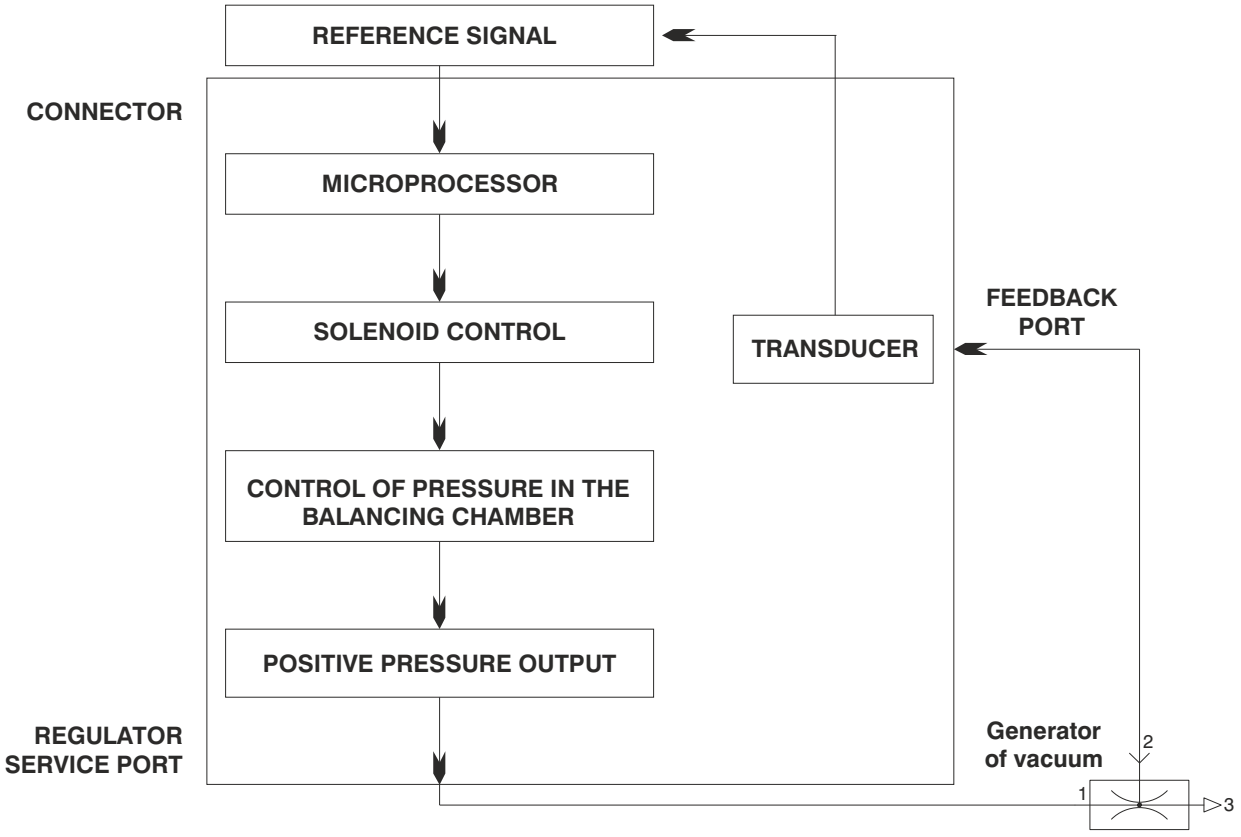


Product description

The pneumatic connections of the regulator require the aperture for supply and discharge to be on one side and the aperture for use on the opposite side. On the other two remaining sides there are apertures of G1/8" that are plugged up with removable plugs, however it is possible to connect a pressure gauge through them or use the connections as outputs. On the side where the service connection is, there is an M5 aperture where you can connect the return vacuum signal (to the pressure transducer).This option makes it possible to pick up the signal from a remote point rather than directly from the service connection. In the upper part of tregulators there are control solenoid valves, the pressure sensor and the electronics forcontrol. The part for electronically controlling the regulators is the same for all the 3 sizes. The new range of proportional regulators is supplied as standard with all the functionality initially considered only as optional; the only selections necessary in the ordering phase are thus related to the type of signal for control of voltage(T) or current (C) and the range of working pressures.

CLOSED LOOP scheme (internal control circuit)

The proportional regulator is defined as CLOSED LOOP because a pressure transducer in the circuit transmits a continuous analog signal to the microprocessor that compares the reference value with the one that is detected and behaves accordingly, supplying the control solenoid valves in the correct way.



Characteristics

Pneumatic

Fluid	5 micron filtered and dehumidified air		
Input minimum pressure	As a function of the type of vacuum generator		
Input max pressure	10 bar		
Output pressure	Ordering code	0009	
	Pressure value	0 ÷ 9 bar	
Nominal flow rate from 1 to 2 (6 bar Δp 1 bar)	**Size 0**	**Size 1**	**Size 3**
	7 Nl /min	1.100 Nl /min	4.000 Nl/min
Discharge flow rate (at 6 bar with overpressure of 1 bar)	7 Nl /min	1.300 Nl /min	4.500 Nl/min
Air consumption	< 1 Nl/min	< 1 Nl/min	< 1 Nl/min
Supply connection	M5	G 1/4"	G 1/2"
Service connection	M5	G 1/4"	G 1/2"
Discharge connection	Ø1.8	G 1/8"	G 3/8"
Maximum tightening torque for connections	3 Nm	15 Nm	15 Nm

Electric

Supply voltage	24VDC ± 10% (stabilised with ripple <1%)	
Current consumption in standby	55mA	
Current consumption with actuated EV	145mA	
Reference signal	Voltage	*0 ÷ 10 V *0 ÷ 5 V *1 ÷ 5 V
	Current	*4 ÷ 20 mA *0 ÷ 20 mA
Input impedance	Voltage	10KΩ
	Current	250Ω
Analog output Voltage	*0 ÷ 10V *0 ÷ 5V	
Analog output Current	*4 ÷ 20mA *0 ÷ 20mA	
Digital inputs	24VDC ±10%	
Digital outputs	24 VDC PNP (max current 50 mA)	
Connector	D-sub 15 poles	

Functional

Linearity	< ± 0.3 % F.S.
Hysteresis	<0.3 % F.S.
Repeatability	< ± 0.3 % F.S.
Sensitivity	< ± 0.3 % F.S.
Mounting position	Any
Protection class	IP65 (with proper nut mounted)
Ambient temperature (°C)	-5° ÷ 50°C / 23° ÷ 122°F

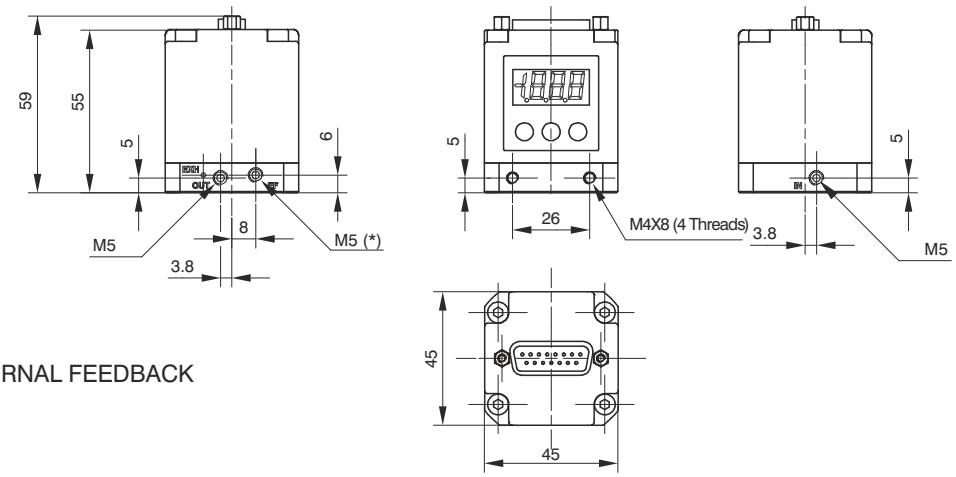
Constructional

Body	Anodised aluminium		
Shutters	Brass with vulcanised NBR		
Diaphragm	Rubberised fabric		
Sealing seals	NBR		
Cover electrical part	Technopolymer		
Springs	AISI 302		
Weight	**Size 0**	**Size 1**	**Size 3**
	168 gr.	360 gr.	850 gr.

*** Can be selected using keyboard or with RS-232**

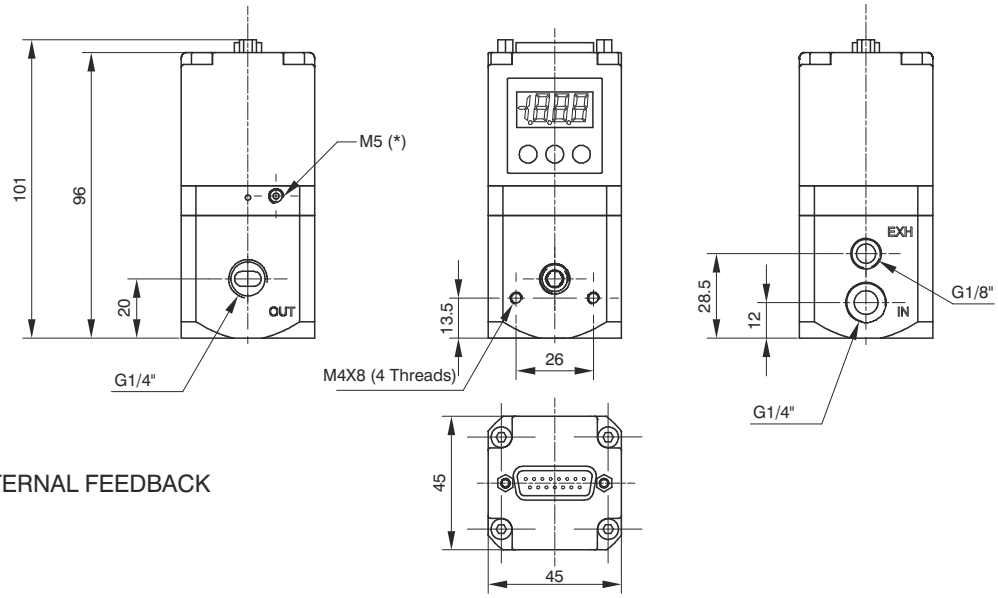
Overall dimensions

SIZE 0



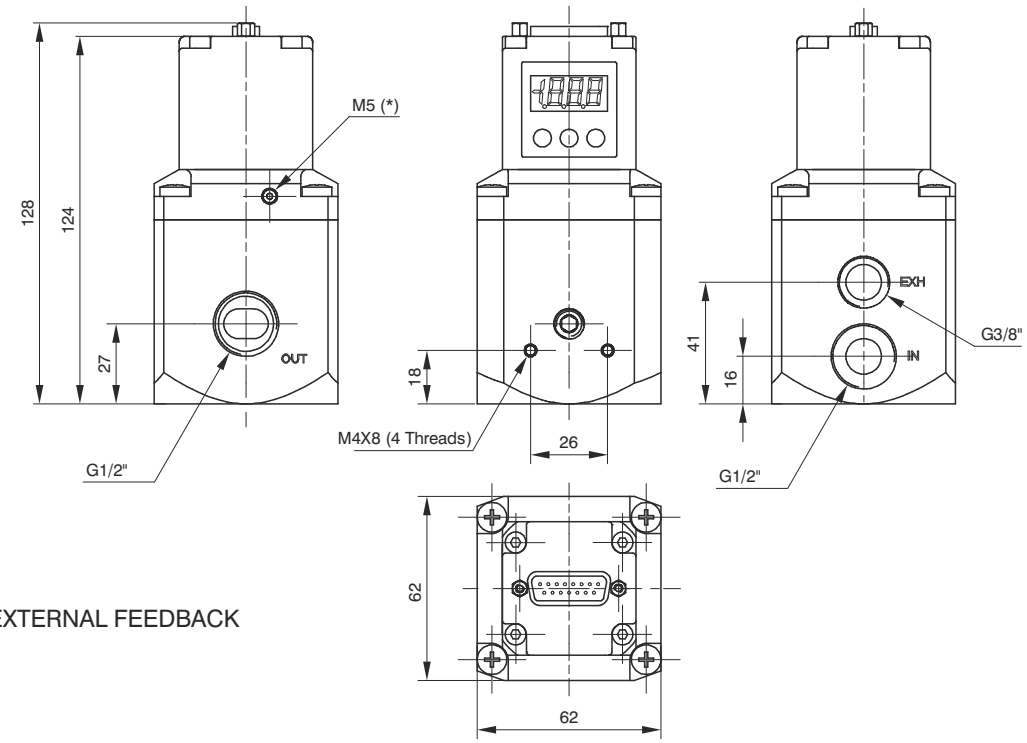
* = CONNECTION FOR EXTERNAL FEEDBACK

SIZE 1



* = CONNECTION FOR EXTERNAL FEEDBACK

SIZE 3

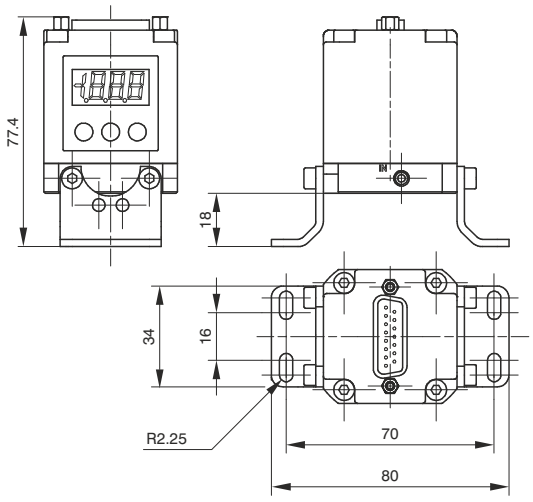


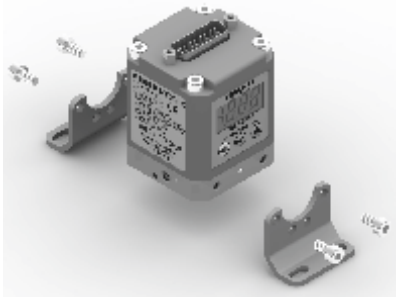
* = CONNECTION FOR EXTERNAL FEEDBACK

5

Mounting Option

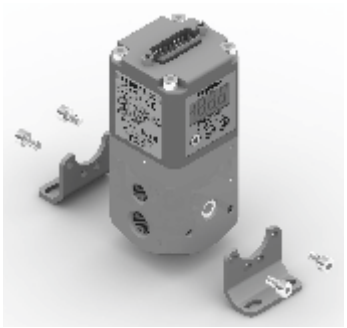
In addition to the possibility of fastening it directly to the wall using the M4 apertures present on the body, there is also the option of using the fastening bracket code 170M5 as can be seen in the figures shown below.

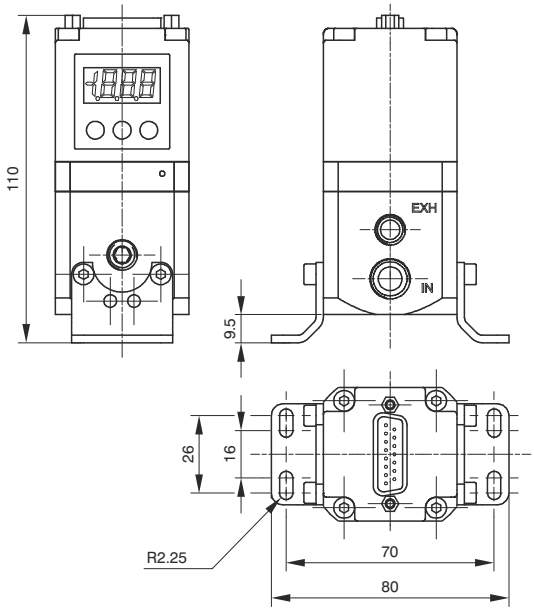


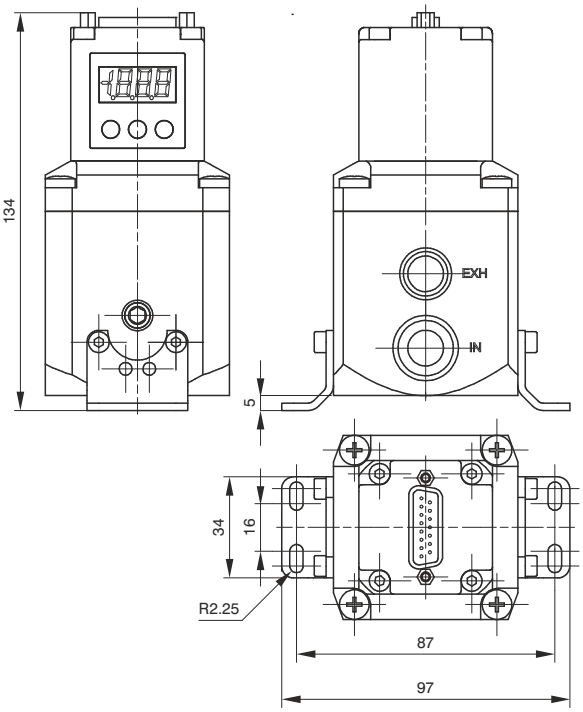


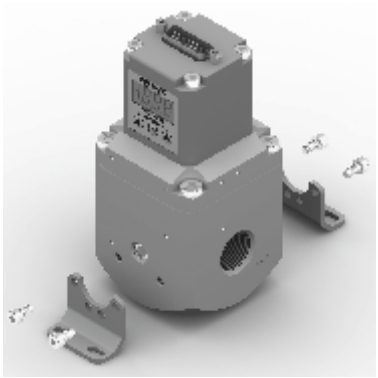
SIZE 0

SIZE 1









SIZE 3

5

Installation/ Operation

PNEUMATIC CONNECTION

Pneumatic connection can be made through the threaded apertures M5 (for Size 0 regulators), G 1/4" (for Size 1 regulators) and G 1/2" (for Size 3 regulators) present on the body.
Before making the connections, it is recommended that any contaminants present in the connection pipes be eliminated in order to prevent powders or chips from ending up inside the unit. It is also recommended that the circuit is supplied with a pressure no greater than 10 bar and that the compressed air is dry (too much condensation may cause malfunction of the equipment) and filtered at 5 microns. The minimum supply pressure required depends on the characteristics of the vacuum generator.
By putting a silencer in the discharge path it is possible to change the response time of the unit; periodically check to make sure that the silencer has not become dirty, and, if it is dirty, replace it.

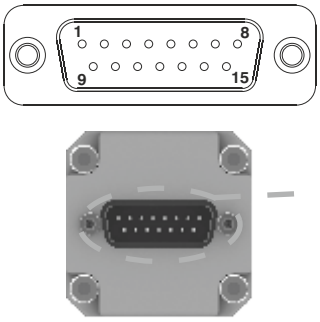
ELECTRICAL CONNECTION

The electrical connection can be created using a female SUB-D 15 poles
Put the electrical connections together in accordance with the diagram shown in the figure at bottom.
Attention: WRONG CONNECTIONS MAY DAMAGE THE DEVICE

NOTES ON OPERATION

If the electricity supply is cut off, the output pressure will be kept at the set value. However, maintenance of this exact value is not guaranteed given the fact that the solenoid valve cannot be actuated.
To discharge the circuit downstream, clear the reference, make sure the display shows a pressure value equal to zero, and then cut off the electrical power supply.
A version of the device is available as an option that discharges the circuit downstream right at the time the electricity is cut off (final letter A in the ordering code).If the air supply is stopped and the power supply is maintained, you may hear a humming noise being generated due to the solenoids; it is possible to activate an operating parameter (P18) that allows the regulator to be protected any time the pressure is not reached within 4 seconds after the moment the reference signal is sent. In this case, the system will intervene by interrupting control of the solenoid valves. Every 20 seconds the unit will start the restoration procedure until standard operating conditions are reintegrated.

REGULATOR CONNECTOR VIEWED FROM ABOVE



CONNECTOR PIN:
1 = DIGITAL INPUT 1
2 = DIGITAL INPUT 2
3 = DIGITAL INPUT 3
4 = DIGITAL INPUT 4
5 = DIGITAL INPUT 5
6 = DIGITAL INPUT 6
7 = DIGITAL INPUT 7
8 = ANALOG INPUT / DIGITAL INPUT 8
9 = SUPPLY (24 VDC)
10 = DIGITAL OUTPUT (24 VDC PNP)
11 = ANALOG OUTPUT (CURRENT)
12 = ANALOG OUTPUT (VOLTAGE)
13 = Rx RS-232
14 = Tx RS-232
15 = GND

Ordering codes

19_E2P._ . D . 0090 . __

SIZE :
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

CONTROL :
- **C** = Signal in current (4-20 mA / 0-20 mA)
- **T** = Signal in voltage (0-10 V / 0-5 V / 1-5 V)

RANGE OF PRESSURE:
- **0090** = from 0 to 90%

EXHAUST :
- **E** = External pressure feedback without exhaust downstream pressure when power supply is removed
- **AE** = External pressure feedback with exhaust downstream pressure when power supply is removed

Accessories

Model with connector SUB-D 15 poles	
	**5300.F15.00.00** : Direct connector + Nut IP65 *
	5300.F15.00.03 : Direct connector + Cable 3 meters
	5300.F15.00.05 : Direct connector + Cable 5 meters
	5300.F15.90.00 : Connector 90° + Nut IP65 *
	5300.F15.90.03 : Connector 90° + Cable 3 meters
	5300.F15.90.05 : Connector 90° + Cable 5 meters

*** No cable**

Fastening bracket
170M5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