





www.pneumaxspa.com



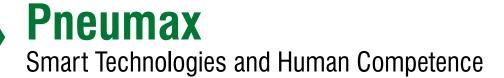
Vacuum Technology Catalogue Reliability, technology

and quality of materials

1

All Pneumax components for vacuum technology applications are made using carefully selected materials to ensure the best performance and the highest reliability.



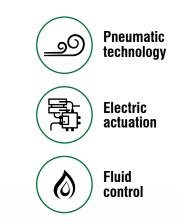


Founded in 1976, **Pneumax S.p.A.** is today one of the leading international manufacturers of components and systems for automation.

It is at the forefront of a Group comprised of 25 companies, with over 730 employees worldwide.

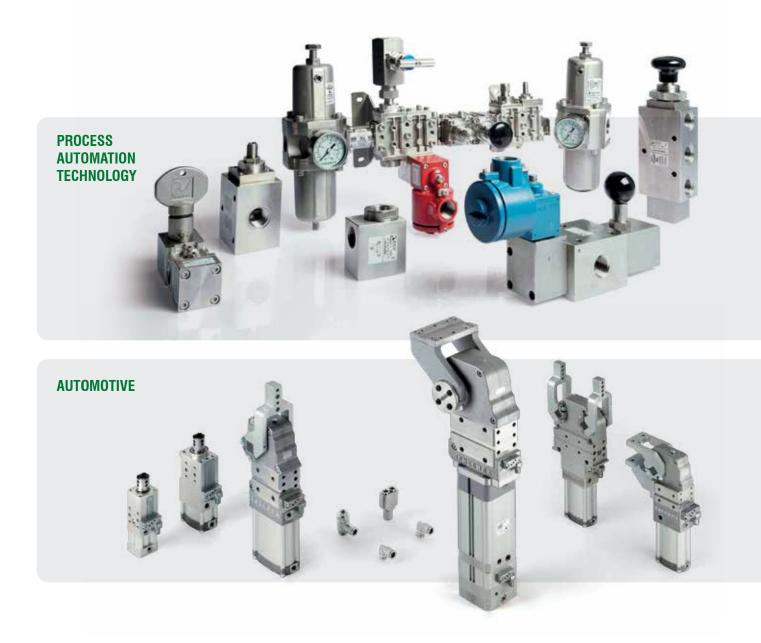
Ongoing investment in research and development has allowed **Pneumax** to continually expand its range of standard products and customized solutions including pneumatic components and systems, electric actuators and fluid control components.

The desire to provide the service and specific application skills has led to the creation of 3 business units, dedicated to Industrial Automation, Process Automation and Automotive sector.



INDUSTRIAL AUTOMATION





The ability to provide various technologies and solutions for each of our clients applications is the main objective of the Company, making Pneumax the ideal strategic partner.

What defines us is the "**Pneumax Business Attitude**", born out of the capacity to combine industry sectors, technology and our application skills via the clients collaboration with our business and product specialists. The most effective solutions are studied around the TCO (Total cost of ownership) related to the entire life cycle of the product.

This represents the main Pneumax distinguishing factor.







Introduction

Vacuum technique

Suction cups 10 Image: Substance of the second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most demanding industrial sectors. Image: Second state of the most demanding industrial sectors. Second state of the most deman



Single stage vacuum generators

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 high flow rates.

6

Series 1900



Multistage vacuum generators

Compact generators, composed of several modules according to the required performance to obtain high suction capacity with low consumption and high vacuum degrees.

Series 1900



Multifunction vacuum generators

Separate vacuum units that can control a complete vacuum gripping system.

28

58

69

Series 1900



Multifunction modular vacuum generators

The intermediate "ME" multistage and multifunction vacuum generators are not autonomous and must be hooked up to the "SE" units to operate.

Series 1900

74



82



Accessories and spare parts for multifunction vacuum generators "SE" - "ME"

Series 1900

Valves and solenoid valves



Shut-off valves

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 that is not completely adherent to it.





Valves and solenoid valves poppet system

Valves and solenoid valves poppet system for high flow rates, for vacuum.

80

Series 700	85	Series T771	100
Series T772-773	92	Series N776	105



Solenoid coils

For Series 771, 772, 773, 779, T772, T773, T771 and N776



Pad valves

Pad valves, are one of the more functional and cost effective solutions, for intercepting fluids. PVV series is specifically designed for large suction capacities.

Series PVA	110	Series PVV	112

Regulators



Manual regulator

Precision in keeping the vacuum regulated for applications that require stability and accuracy.

Series 1700 115



Proportional regulators

Electronic proportional pressure regulator with closed Loop. Air-vacuum and vacuum-vacuum versions.

116



Vacuum-vacuum Series 1900 122

Accessories and instruments

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Vacuum switch, vacuum gauge, silencers and filters.



126 Series 1900

131

108

126

114

VACUUM TECHNIQUE

"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.

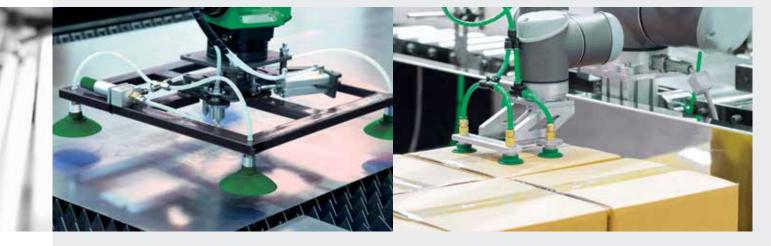
Industrial Vacuum: this term refers to a degree of vacuum between -20 and -99 KPa inclusive. This range

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.





Robotics

Handling auto parts for the automotive sector, Palletisation in packaging sector, handling sheets of glass, marble and wood panels.

Food packaging

Vacuum packaging of food in modified atmosphere

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, onto machining centers.

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.

• Pick and Place

Plastic sector, automotive, electronic, printing, packaging.

• Moving fragile products

High sensitivity vacuum components are suitable to handling eggs, glass, ceramic parts and electronic components.

• 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.

	Pa (N/m³)	bar	Kg/cm ²	Torr	psi (ibf/in²)	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	68,9476x1-3	70,3096x10 ⁻³	51,7149	1	6,89476	2,07

Conversion table for positive pressure

Conversion table for negative pressure

	mbar	kPa	-kPa	%Vuoto	Torr	-mmHg	inHg
	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
Atm	613	61,3	40	39,5	460	300	12
Aun	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

	m³/s	m³/h	l/min	l/s	ft ³ /min (scfm)
1 m³/s	1	3600	60000	1000	2118,9
1 m³/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 ft³/min (scfm)	0,472x10 ⁻³	1,6992	28,32	0,4720	1

Suction cups

Suction cups are vacuum accessories that are indispensable whenever it is needed to 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.

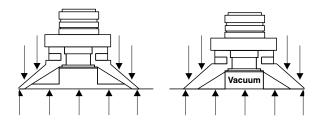
In order to generate low pressure inside the suction cup, the latter may be connected to a vacuum pump.

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:

METALS: heavy loads, large sizes, middle frequencies, dirty surfaces.

PLASTIC: light loads, medium to small sizes with irregular shapes, no surface deposits.

WOOD: rough surface, slightly deformed, middle-weight loads, no surface deposits.





Application symbols

	Applications	Description
	Universal	Multipurpose applications, flat or slightly curved surface.
	Packaging	Product packaging and handling of packaged products, mainly used for handling cardboard boxes and interlayers.
	Plastick bag	Gripping and handling of plastic and paper bags, high capacity suction cups are designed to deform and adapt to the characteristics of the bag being picked up or opened.
	Food packaging	Designed for the handling of product within the food industry such as bread, chocolate, brioches etc. High capacity cups are designed to deform and adapt to the characteristics of the product being handled.
	Metal sheet	Sheet metal industry, mainly used for handling, fixing and the processing of metal plate. Particularly suitable for oily surfaces and for handling pieces with lateral force, high slip resistance.
	Stone & Marble	Stone and marble processing industry, mainly for handling marble slabs and bricks. Particularly suitable for uneven surfaces, where a large deformation of the suction cup is required.
72	Slip resistance	Suitable for handling material with a smooth surface, prevent side sliding when gripped.
~~~~	Rough surface	Suitable for handling material with a rough surface such as sawn wood, marble slabs and bricks. Suction cups with sponge rubber are used in order to better compensate for the irregularity of the surface.
	Long life time	Made with a particular anti-abrasive compound that increases its resistance and longevity.
	Oily surfaces	Special suction cups suitable for oily surfaces



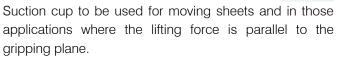
# **SUCTION CUPS**

Pneumax suction cups are available in different shapes and materials, to meet the application requirements of the most demanding industrial sectors.



#### Suction cup choice

#### Suction cup Flat series TP



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, nonslip 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.

Vacuum technology

Catalogue

#### Material choice

The material choice depend on the individual application, evaluating as follows:

- 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

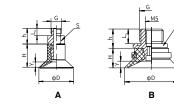
Material	Temperature °C	Abrasion resistance	Oil resistance	Resistance to weather/ atmospheric agents
N NBR	-20 +110	Excellent	Excellent	Good
S Silicone	-40 +200	Good	Low	Excellent
PU Polyurethane	10 50	Excellent	Good	Excellent
<b>F</b> Fluorinated rubber	-20 +80	Low	Low	Low
E-EPDM	-30 +150	Good	Low	Excellent

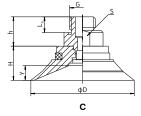


#### Series 1900

Standard round suction cup







Code V=Version N=NBR / S=Silicone	Drawing	D	н	G	L _G	h	S	Y
19VTN. <b>V</b> .05.008.00	A	9	7	M5	3.5	7.5	7	2
19VTN. <b>V</b> .05.010.00	A	11	10.5	M5	3.5	7.5	7	2
19VTN. <b>V</b> .18.020.00	В	22	8	G1/8"	6	7.8	13	2.2
19VTN. <b>V</b> .18.030.00	В	32	9.5	G1/8"	6	7.8	13	4.5
19VTN. <b>V</b> .18.040.00	С	42	13	G1/8"	6	12	17	5.2
19VTN. <b>V</b> .14.050.00	С	53	17.5	G1/4"	9	17	24	7

UNVERSAL

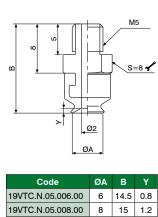
Standard round suction cup, suitable for gripping and moving with vacuum objects with flat or slightly curved surfaces, allows gripping on concave surfaces.

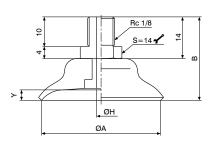
Code V=Version	Volume cm ³	Lifting fo	orce in vertical dire	ection (N) 📩	Lifting for	orce in parallel di	rection (N)	Maight (g)
N=NBR / S=Silicone		-20 kPa	-60 kPa	-90 kPa	-20 kPa	-60kPa	-90 kPa	Weight (g)
19VTN. <b>V</b> .05.004.00	0.03	0.198	0.885	1.275	0.198	0.78	1	2.3
19VTN. <b>V</b> .05.008.00	0.1	1	2.55	3.8	1	2.85	3.35	2
19VTN. <b>V</b> .05.010.00	0.18	1.48	4.4	6.85	1.5	4.4	4.9	2.7
19VTN. <b>V</b> .18.020.00	1	5.9	12.2	16	5.9	8.8	9.8	3
19VTN. <b>V</b> .18.030.00	2	13	25	33	7.8	9.8	11	4.2
19VTN. <b>V</b> .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	Working temperature °C		
NBR	Black	55	-20 110		
Silicone	Red	50	-40 200		

#### Cup-style round suction cup







Code	ØA	В	ØН	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.

10 15.5 1.5

19VTC.N.05.010.00

	Ocde	Volume cm ³	Lifting force in ve	ertical direction (N) 💻	
	Code	volume cm ³	-60 kPa	-90 kPa	Weight (g)
1	9VTC.N.05.006.00	0.03	0.885	1.275	2.3
1	9VTC.N.05.008.00	0.1	2.55	3.8	2
1	9VTC.N.05.010.00	0.18	4.4	6.85	2.7
1	9VTC.N.18.015.00	0.9	12.2	16	3
1	9VTC.N.18.030.00	5	37.5	60	11
1	9VTC.N.18.040.00	12	74	95	26.6
1	9VTC.N.18.050.00	15	74	95	26.6
М	aterial C	olor	Hardness °Shore A	Working ter	mperature °C
NBR	В	lack	55	-20	110

Suction cups Series 1900

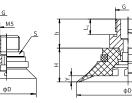
## Vacuum technology

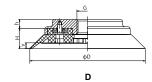
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#### **Round flat suction cup**



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Catalogue

Code V =Version N=NBR / S=Silicone	Drawing	D	н	G	L _G	h	s	Y
19VTP. 05.015.00	A	16,5	11	M5	3,5	7,5	7	0,8
19VTP. 0.18.020.00	В	22	8	G1/8"	6	7,8	13	1
19VTP. 0.18.025.00	В	27	9	G1/8"	6	7,8	13	1
19VTP. <b>V</b> .18.030.00	В	32	10	G1/8"	6	7,8	13	1,2
19VTP. <b>V</b> .18.040.00	С	42	13	G1/8"	6	12	17	1,2
19VTP. <b>V</b> .14.050.00	С	53	17,5	G1/4"	9	17	24	3,2
19VTP. <b>V</b> .14.075.00	D	77	13	G1/4"	*	13	*	4
19VTP. 0.12.110.00	D	112	20	G1/2"	*	9	*	6
19VTP. 0.12.150.00	D	152	26	G1/2"	*	10	*	8



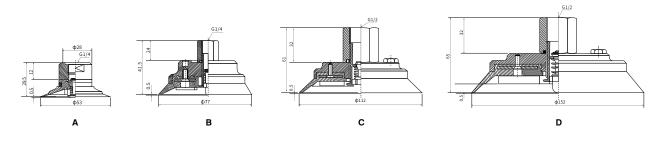
Round flat suction cup, suitable for gripping and moving with vacuum, objects with flat surfaces, offers good stability and minimal displacement. Recommended for applications with force parallel to grip plane, suitable for moving glass, wood, steel and plastic sheets. Internal reinforcements prevent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

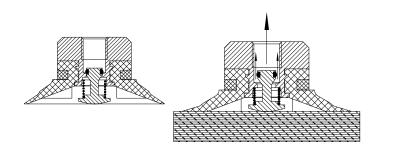
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	Code V=Version	Volume cm ³	Lifting f	orce in vertical dir	ection (N) 📩	Lifting f	orce in parallel di	rection (N)	Maight (g)
	N=NBR / S=Silicone	volume cm	-20 kPa	-60 kPa	-90 kPa	-20 kPa	-60 kPa	-90 kPa	Weight (g)
	19VTP 18.020.00	1	6	15	18.7	5	7.95	8.45	3.1
	19VTP. 0.18.025.00	1.1	9.2	19.3	24.9	7.95	8.95	10	3.6
	19VTP. 0.18.030.00	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
2	19VTP. 0.14.050.00	10	37	74	96	24	40	50	27.9
	19VTP. <b>1</b> 4.075.00	20	80	201	272	60	110	140	121.3
	19VTP. 0.12.110.00	70	141	418.5	562	140	248	299.7	245.3
	19VTP 12.150.00	160	300	845	1098	250	600	800	605

Material	Color	Hardness °Shore A	Working temperature °C
NBR	Black	55	-20 110
Silicone	Red	50	-40 200

#### Round flat suction cup with touch valve





Code V=Version N=NBR / S=Silicone	Drawing
19VTP.N.27.050.00	A
19VTP.N.27.075.00	В
19VTP.N.28.110.00	С
19VTP.N.28.150.00	D
19VTP.S.27.050.00	A
19VTP.S.27.075.00	В
19VTP.S.28.110.00	С
19VTP.S.28.150.00	D



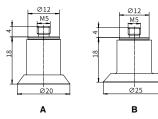
When the suction cup is not in contact with the workpiece, the touch valve closes the suction avoiding loss of flow rate.

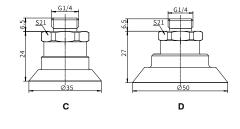
When the suction cup is not in contact with the workpiece, the touch valve is activated by opening the suction and ensuring normal operation of the suction cup.



#### Flat round bellows suction cup for plastic film







Code	Drawing
19VTF.S.05.020.00	А
19VTF.S.05.025.00	В
19VTF.S.14.035.00	С
19VTF.S.14.050.00	D

PLASTIC PACKAGING

SUCTION CUPS

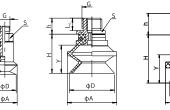
Specially designed for opening plastic bags. Suitable for handling thin and delicate objects, such as plastic films or paper. The thin and adaptable lip together with the internal plugs avoid damages to the film during the suction phase.

Í	Codo	Maluma am ³	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Steeles (mm)	
	Code Volume cm ³		-60 kPa	-60 kPa	Stroke (mm)	Weight (g)
	19VTF.S.05.020.00	1	1 10 6		1,5	4,6
	19VTF.S.05.025.00	1,6	25	21	1,5	5,0
	19VTF.S.14.035.00	2,1	38	32,5	1,5	10,0
	19VTF.S.14.050.00	6	92	76	2	25,0
		Materia	al Color Hardness °Shore	A Working temperature °C		

Material	Color	Hardness °Shore A	Working temperature °C
Silicone	Blue	40	-40 200

#### Round bellows suction cup



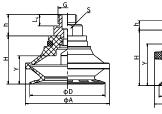


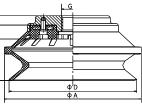
в

N= 19\ 19\

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D

с

Code V=Version =NBR / S=Silicone	Drawing	D	А	н	G	L _G	h	s	Y
VTS. 0.05.005.15	A	5,8	6,2	9,2	M5	3,5	7,5	7	3,6
VTS. <b>V</b> .05.010.15	A	11	12	16	M5	3,5	7,5	7	7
VTS. <b>V</b> .05.015.15	A	15,5	17,5	19,5	M5	3,5	7,5	7	10
VTS. <b>V</b> .18.020.15	В	22	24	19	G1/8	6	7,8	13	9
VTS. <b>V</b> .18.030.15	С	34	36	26	G1/8	6	12	17	19
VTS. <b>V</b> .18.040.15	С	43	46	28	G1/8	6	12	17	20
VTS. <b>V</b> .14.050.15	С	53	58	35	G1/4	9	17	24	20
VTS. V.12.075.15	D	78	83	37	G1/4	*	13	*	27
VTS. <b>V</b> .12.110.15	D	115	124	54	G1/2	*	9	*	38,5
VTS 🛛 12 150 15	D	155	166	71	G1/2	*	10	*	44,5



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.

Code V=Version	Volume cm ³	Lifting force in vertical direction (N)						
N=NBR / S=Silicone	volume cm [°]	-20 kPa	-60 kPa	-90 kPa	Weight (g)			
19VTS. 05.005.15	0.05	0.295	0.786	0.99	2			
19VTS. <b>0</b> .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. <b>V</b> .18.020.15	2.7	5.8	10.6	15	5			
19VTS. <b>V</b> .18.030.15	10	13	25	28	13.6			
19VTS. <b>V</b> .18.040.15	15	22.5	42	50.2	20.2			
19VTS. <b>1</b> 4.050.15	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	Color	Hardness °Shore A	Working temperature °C
NBR	Black	55	-20 110
Silicone	Red	50	-40 200

14

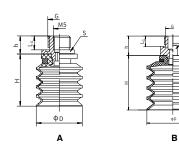
Table of lifting forces

Suction cups Series 1900 Vacuum technology Catalogue



#### Long bellows suction cup





Code V=Version N=NBR / S=Silicone	Drawing	D	н	G	L _G	h	S
19VTS.V.18.020.45	A	20	23	G1/8	6	7,8	13
19VTS.V.18.030.45	В	30	32	G1/8	6	12	17
19VTS.V.18.040.45	В	40	42	G1/8	6	12	17
19VTS.V.14.050.45	В	50	52	G1/4	9	17	24

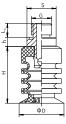


Long bellows suction cup which, due to its shape, makes it possible to compensate for differences in height. Its upward movements are particularly suitable for the separation of thin products, and suitable for handling food packed in plastic bags and for fragile objects. This suction cup is not suitable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

Volume cm ³	-20 kPa		Weight (g)		
		-60 kPa	weight (g)		
4	0.3	0.6	3.9		
13	0.6	1.55	12.4		
27	1.05	2.15	19.8		
55	1.68	4.22	38.3		
Color	Hardness °Shore A	Working tem	perature °C		
3lack	55	-20	110		
Red	50	-40	-40 200		
5	5 27	27         1.05           5         55         1.68           Color         Hardness *Shore A           Black         55	27         1.05         2.15           5         55         1.68         4.22           Color         Hardness °Shore A         Working tem           Black         55         -20		



FOOL



Code	Drawing	D	Н	h	L _g	G	S
19VTS.S.14.030.35	Α	30	36,5	6	9	G1/4	19
19VTS.S.38.040.35	Α	40	40	6	10	G3/8	22
19VTS.S.12.050.35	Α	50	55	6	10	G1/2	28

Α

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.

Code		Volume cm ³	Lifting force in vertical d	irection (N)	Weight (g)
Cou	-	volume cm	-60 kPa	Weight (g)	
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	Co	olor	Hardness °Shore A	Working ten	nperature °C
Silicone	R	ed	40	-40	. 200



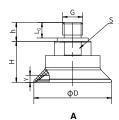
#### High friction round suction cup



OILY

SLIP

METAL SHEET



Code	Drawing	D	Н	G	L _G	h	S	Y
19GTN.N.14.030.00	Α	32	19,5	G1/4	12	13,5	16	2,7
19GTN.N.14.040.00	Α	42	22	G1/4	12	13,5	17	3,7
19GTN.N.14.050.00	Α	52	28	G1/4	12	13,5	22	4,7
19GTN.N.14.060.00	Α	62,5	31	G1/4	12	13,5	22	6
19GTN.N.14.080.00	A	83	34,5	G1/4	12	13,5	22	6
19GTN.N.14.100.00	Α	102	36,5	G1/4	12	13,5	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.

Code	Volume cm ³	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (g)
		-60 kPa	-60 kPa	-60 kPa	
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

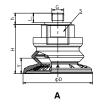
Material	Color	Hardness °Shore A	Working temperature °C
NBR	Orange	60	-20 110

#### High friction round bellows suction cup



OILY

SLIP RESISTANCE



Code	Drawing	D	Н	G	L _G	h	S	Y
19GTS.N.14.022.15	Α	22	25	G1/4	12	13,5	16	5,5
19GTS.N.14.030.15	Α	32	28	G1/4	12	13,5	17	9,5
19GTS.N.14.040.15	Α	42	28,5	G1/4	12	13,5	17	10
19GTS.N.14.050.15	Α	52	36,2	G1/4	12	13,5	22	11,5
19GTS.N.14.060.15	Α	62,5	41	G1/4	12	13,5	22	14,5
19GTS.N.14.080.15	Α	82	49,5	G1/4	12	13,5	22	22,5
19GTS.N.14.100.15	Α	103	55	G1/4	12	13,5	22	25

High friction round bellows suction cup suitable 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.

Code	Volume cm ³	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (g)
		-60 kPa	-60 kPa	-60 kPa	
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	Color	Hardness °Shore A	Working temperature °C		
NBR	Orange	60	-20 110		

Suction cups Series 1900

Vacuum technology

Catalogue

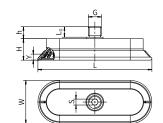
#### High friction oval suction cup



OILY

SLIP RESISTANCE

METAL SHEET



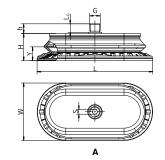
	Α												
Code	Drawing	L	W	Н	G	L _G	h	S	Y				
19GEN.N.14.JxD.00	A	50	16	19,5	G1/4	12	13,5	5	3				
19GEN.N.14.AxH.00	A	84	24	15,5	G1/4	12	13,5	5	5				
19GEN.N.14.BxL.00	A	93	33	16	G1/4	12	13,5	5	5				
19GEN.N.14.CxN.00	A	113	43	21,5	G1/4	12	13,5	5	6				
19GEN.N.14.FxO.00	A	123	65	18	G1/4	12	13,5	5	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.

Code	Volume cm ³	Lifting for vertical direc	tion (N)	Lifting force in parallel direction	(N) 📇	Lateral force on oily surface (N)	Weight (g)	
			a	-60 kPa		-60 kPa		
19GEN.N.14.JxD.0	2	33		24		12	17	
19GEN.N.14.AxH.0	0 5	78		38		35	23	
19GEN.N.14.BxL.0	0 10	125		77		60	24	
19GEN.N.14.CxN.0	0 25	200		188		118	47	
19GEN.N.14.FxO.0	0 35	312		254		170	70	
	Material		Hardne	ess °Shore A	Work	ing temperature °C		
	NBR	Orange		60		-20 110		

#### Oval high-friction bellows suction cup





Code	Drawing	L	W	н	G	L _G	h	S	Y
19GES.N.14.BxF.15	A	62	31	20	G1/4	12	13,5	5	6
19GES.N.14.CxH.15	A	82	41	22,7	G1/4	12	13,5	5	8,8
19GES.N.14.ExN.15	A	112	57	29	G1/4	12	13,5	5	12,5
19GES.N.14.GxR.15	A	143	70,5	33	G1/4	12	13,5	5	17

High friction oval bellows suction cup suitable 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.

Code	Volume cm ³	Lifting force in vertical direction (N)	Lifting force in parallel direction (N)	Lateral force on oily surface (N)	Weight (g)	
		-60 kPa	-60 kPa	-60 kPa		
19GES.N.14.BxF.15	8.7	53	60	50	41.9	
19GES.N.14.CxH.15	5 22	110	118	101	51.5	
19GES.N.14.ExN.15	57	197	200	183	102.1	
19GES.N.14.GxR.15	i 108	275	295	267	138.9	

Material	Color	Hardness °Shore A	Working temperature °C		
NBR	Orange	60	-20 110		

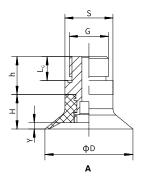


Suction cups

Series 1900



LONG



Code	Drawing	D	Н	G	h	L _G	Y	S
19VTN.P.18.030.00	A	31	10,5	G1/8	7,8	6	2	13
19VTN.P.18.040.00	A	41	14	G1/8	12	6	2,5	17

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 big advantage of this suction cup, is that the material it's made of, polyurethane, lasts longer than other materials, has optimum wear resistance, good flexibility and Polyurethane suction cups are mark resistant.

Code	Volume cm ³	Lifting fo	orce in vertical di	rection (N) 📥	Lifting for	Woight (g)		
Code		-20 kPa	-60 kPa	-90 kPa	-20 kPa	-60 kPa	-90 kPa	Weight (g)
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	Color	Hardness °Shore A	Working temperature °C
PU	Yellow	40	10 50

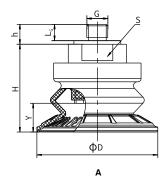
#### Round bellows suction cup made of polyurethane

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OILY



SLIP RESISTA



Code	Drawing	D	н	G	L _G	h	S	Y
19VTS.P.14.030.15	A	32	28	G1/4	12	13,5	17	7
19VTS.P.14.040.15	A	42	29	G1/4	12	13,5	17	9
19VTS.P.14.050.15	A	51,5	37	G1/4	12	13,5	22	12,5
19VTS.P.14.060.15	A	64	41,5	G1/4	12	13,5	22	15
19VTS.P.14.080.15	A	84	49,5	G1/4	12	13,5	22	23
19VTS.P.14.100.15	A	103	55	G1/4	12	13,5	22	22

Round bellows suction cup made of polyurethane, suitable 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's 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.

Oada	Maluma and	Lifting fo	orce in vertical di	rection (N) 📥	Lifting for	rce in parallel dir	ection (N) 📇	
Code	Volume cm ³	-20 kPa	-60 kPa	-90 kPa	-20 kPa	-60 kPa	-90 kPa	Weight (g)
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

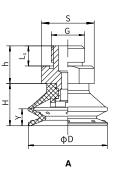
Material	Color	Hardness °Shore A	Working temperature °C
PU	Blu	70	10 50

Table of lifting forces

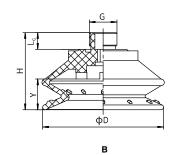
PNEUMAX

#### Round bellows suction cup made of polyurethane





Code	Drawing	D	Н	G	h	L _G	Y	S
19VTS.P.18.030.15	Α	31,5	16,8	G1/8	12	6	6,6	17
19VTS.P.18.040.15	A	42	22,4	G1/8	12	6	8,8	17
19VTS.P.38.050.15	A	52,5	29,3	G3/8	13	10	12,3	24



Code	Drawing	D	н	G	L _G	Y	S
19VTS.P.38.070.15	В	73	46,5	G3/8	10	16,5	*



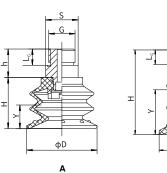
Round bellows suction cup made of polyurethane, suited for movement of pieces of various size and shape and where level compensation is necessary, such as when withdrawing from loaders. The big advantage of this suction cup, is that the material it's made of, polyurethane, lasts longer than other materials,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

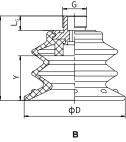
	Code	Volume cm ³	Lifting fo	rce in vertica	I direction (N) 📥	Weight (g)
	Code	volume cm ²	-20 kPa	-60 kPa	-90 kPa	
	19VTS.P.18.030.15	10	13	30	37	10.3
	19VTS.P.18.040.15	15	22.5	60	75	17.3
	19VTS.P.38.050.15	32	34	86	100	33.4
	19VTS.P.38.070.15	108	74	165	225	60.6
Materia	ial Color	На	rdness °Shore A		Working temp	erature °C
PU	Yellow		40		10 5	50



#### Round bellows suction cup made of polyurethane







Code	Drawing	D	н	G	h	L _G	Y	S
19VTS.P.18.020.25	A	21	14,8	G1/8	7,8	6	4,5	13
19VTS.P.18.030.25	A	30	21,3	G1/8	7,8	6	8	13
19VTS.P.14.040.25	A	40	28,4	G1/4	12	6	10,6	17
19VTS.P.38.050.25	A	50	35,5	G3/8	18	10	13,4	24
19VTS.P.38.070.25	В	70	58,5	G3/8	*	10	18,6	*

Table of lifting forces



Round bellows suction cup made of polyurethane, suitable 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's 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.

Oada	Code Volume cm ²	V-1	Lifting fo	orce in vertical di	rection (N) 📩	
Code		volume cm [°]	-20 kPa	-60 kPa	-90 kPa	Weight (g)
19VTS.P.18.0	020.25	1.18	4.5	7	10	4.2
19VTS.P.18.0	030.25	9	10	19	25	6.9
19VTS.P.14.0	040.25	15	15	32	50	18.2
19VTS.P.38.0	050.25	30	35	58	79	32.6
19VTS.P.38.0	070.25	75	72	125	150	60.5
Material	Color		Hardness °Sho	ore A	Working t	emperature °C

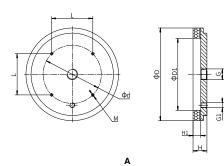
Material	Color	Hardness °Shore A	Working temperature °C
PU	Green	55	10 50

Suction cups Series 1900



#### Foam rubber round suction cup





Code	Drawing	D	D1	Н	H1	G1	L	м	d	G
19VTN.G.14.040.00	Α	40	20	25	15	-	-	-	-	G1/4
19VTN.G.14.064.00	Α	64	40	25	15	-	-	-	40	G1/4
19VTN.G.38.092.00	A	92	64	26	15	-	-	4-M5	70	G3/8
19VTN.G.12.127.00	A	127	92	30	15	G1/8	70	4-M5	-	G1/2

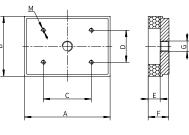


Foam rubber round suction cup is made from a special mixture called "NR", which has a density that allows for gripping even on very rough and irregular surfaces, and allows its elasticity to be maintained even after several working cycles. Especially suited for moving loads with coarse or very rough surfaces such as: sawn, bush-hammered orflamed 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.

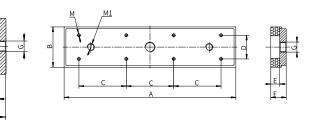
	Code	Lifting force in vertical dire	ction (N) 📥	Weight (g)	
	Code	-60 kPa			
	19VTN.G.14.040.0	0 7.8		33.4	
	19VTN.G.14.064.0	0 35		82.4	
	19VTN.G.38.092.0	0 85		197.8	
	19VTN.G.12.127.0	0 175	175		
Material	Color	Hardness °Shore A	Workin	g temperature '	
Foam rubber "NR"	Orange	30		-20 80	

#### Foam rubber rectangular suction cup





Α



в

Code	Drawing	Α	В	С	D	Е	F	G	М	M1
19VRN.G.14.FxR.00	A	135	60	80	40	15	26	G1/4	4-M5	-
19VRN.G.14.HxN.00	A	107	75	60	40	15	26	G1/4	4-M5	-
19VRN.G.12.RxS.00	В	290	140	80	100	15	26	G1/2	8-M5	2-M12

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, nonslip 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 oiled surfaces.

		Ooda	Lifting force in v	ertical direction (N) 📥	Mainht (a)	
forces		Code		kPa	Weight (g)	
2		19VRN.G.14.FxR.0	3 00	30	231,7	
R IIII		19VRN.G.14.HxN.0	90	90	236,7	
		19VRN.G.12.RxS.0	00 7	06	1175,1	
פ						-
ane	Material	Color	Hardness °Shor	re A Wo	orking tempera	ature °C
	Foam rubber "N	IR" Orange	30		-20 80	



# **LEVEL COMPENSATORS**

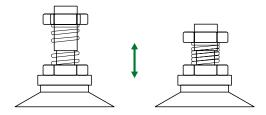
Range of compensators with external or internal spring. Anti-rotation version is available to guarantee maximum precision and reliability in positioning.



#### Criteria of choice and functionality

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:

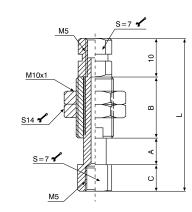
- · Compensator with external spring
- Compensator with internal spring
- Anti-rotation compensator with internal spring



#### Series 1900

Standard level compensator M5 - internal spring



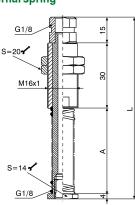


Code	Α	В	С	L	Weight (g)
19P05.S.07.I	7	19	7	43	18.7
19P05.S.15.I	15	23	27	75	28.2
19P05.S.20.I	20	36	7	73	28.8

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	Α	L	Weight (g)
19P18.S.10.E	20	69	85
19P18.S.30.E	50	99	111.5
19P18.S.50.E	70	119	123.3

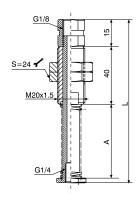
<u>G1/8</u>	1	
		12
<u>S=20</u>	<b>AU</b>	ß
<u>G1/8</u>		۲
<u>S=14</u>		4

Code	Α	В	L	Weight (g)
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

19P14.S.20.E

19P14.S.50.E

G1/8		
		15
<u>S=24</u>		
M20x1.5		+
G1/4		<
<u></u>	<u>al</u>	<b>+</b>

Code	Α	В	L	Weight (g)
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

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.

Α

35 95

70 130

Weight (g)

172.5

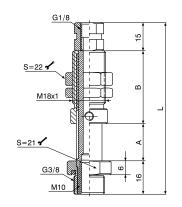
218.3

-EVEL COMPENSATORS



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



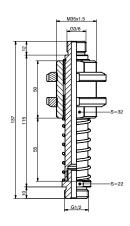


Code	Α	В	L	Weight (g)
19P38.N.10.I	10	28	69	112.3
19P38.N.20.I	20	39	90	134.7
19P38.N.30.I	30	50	111	158.2
19P38.N.50.I	50	70	151	204.9

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.

#### Standard level compensator G1/2"



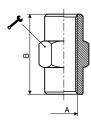


Code	Weight (g)
19P12.S.55.E	470 g

The standard level compensator G1/2" 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.

#### Sleeves for antirotation level compensators

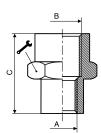




	Code	Α	В	پ ^ع ر	Weight (g)
10	0338	G3/8"	23	22	34.9

#### Sleeves for antirotation level compensators

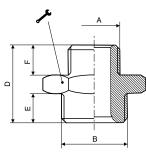




Code	Α	В	С	۶	Weight (g)
1061838	G1/8"	G3/8"	20	22	27.4
1061438	G1/4"	G3/8"	23	22	30.5
1063812	G3/8"	G1/2"	27.5	26	35.1

#### Cylindrical nipples for compensators





Code	А	В	D	E	F	<u>بر</u>	Weight (g)
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

PREUMAX

# **VACUUM GENERATORS**

Wide range of single stage and multistage vacuum generators with compact design and high reliability.



#### Range

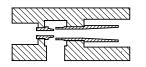
The PNEUMAX range consists of single-stage and multistage equipment of various sizes and types; the single-stage generators use the Venturi effect in a single medium/high throughput nozzle and promptly generate vacuum, flow rate and suction values that are suitable for medium/light applications. Multistage 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.

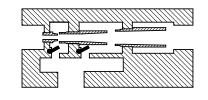
#### Types

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.



Single stage section **2) Multistage** with or without integrated functions, with pneumatic or electropneumatic control, for de-localised assembly and for controlling groups of suction cups.



Multistage section

#### Advantages:

- Limited air consumption to moments of use.
- Installation directly proximate to the suction cups.
- Short response times and high capacity.
- No limit to applications.
- Reduced weight and dimensions.
- High reliability.





37 39 G1/8", G1/4", G3/8"



Series 1900 High flow - G3/8", G1/2", G3/4"

51

57

Series 1900 Adjustable vacuum generator conveyor

#### Multistage vacuum generators



28

#### **Multifunction vacuum generators**



Series 1900

70

#### Modular multifunction vacuum generators



Series 1900

75

#### Accessories and spare parts for multifunction vacuum generators "SE" - "ME"



Connector

Mini solenoid valve 15 mm

80

80



**Digital vacuum switch** 

**Closing plate** 

80

81

**/ACUUM GENERATORS** 

#### Performance and application

The single stage vacuum generator operates using the Venturi principle. By feeding compressed air into port 1 of the generator, a depression (Vacuum) is generated at port 2 with the air being drawn from port 2 discharged out at port 3. When the compressed supply to port 1 is interrupted, the suction (Vacuum) at port 2 is lost. The optimum inlet pressure is different for each type of single stage generator which ranges from 1 - 6 bar. These generator are generally used in conjunction with suction cups for gripping and the handling of porous and non-porous objects with limited suction flow required.

#### Adjustable version

Based on the Venturi principle, these differ from traditional ones, infact they have an ejector with a much larger diameter, and are adjustable. This feature makes possible to change the device's flow rate and degree of vacuum without affecting the inlet pressure.



Single stage vacuum generators

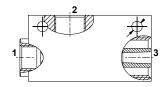
Series 1900

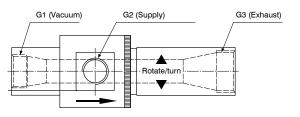
stage generators, robust Single reliable and compact suitable for applications which need the required degree of vacuum to be reached quickly with high flow rates.

Vacuum technology

Catalogue

generators





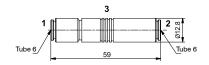


#### Series 1900

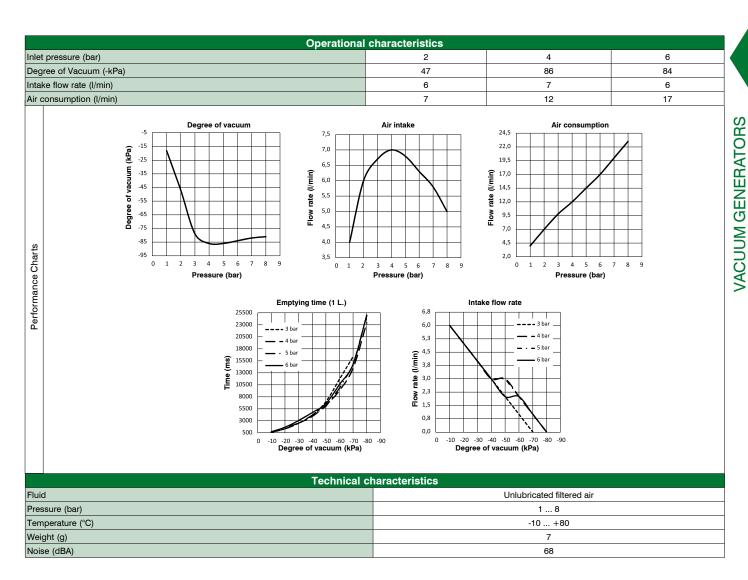
Single stage vacuum generator T06







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 advantages in terms of system layout and simplicity.



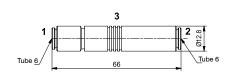
29



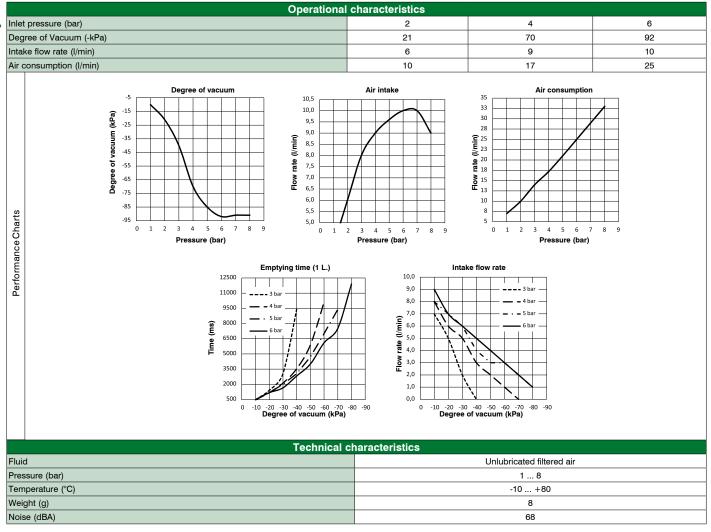
#### Ordering code

19T06.S.07.HV.C0





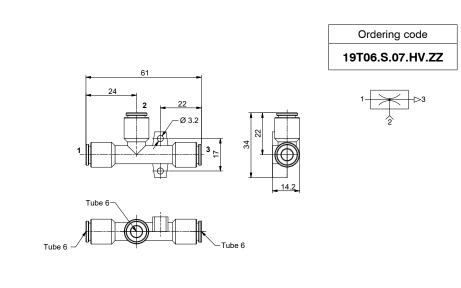
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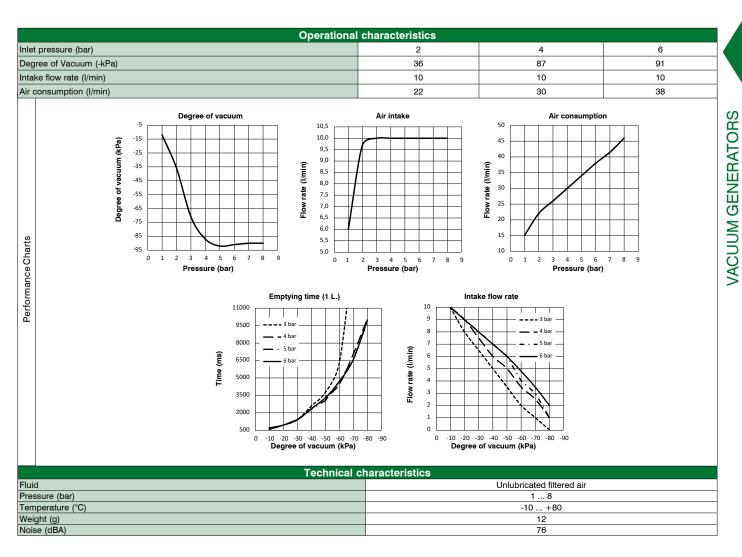
VACUUM GENERATORS

PNEUMAX

Single stage vacuum generator T06



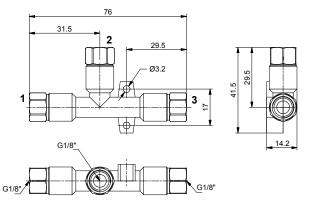
Single stage generators, robust and reliable, with compact dimensions and suitable for applications that need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle they have the vacuum connection orthogonal to the axis of supply and outlet. They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





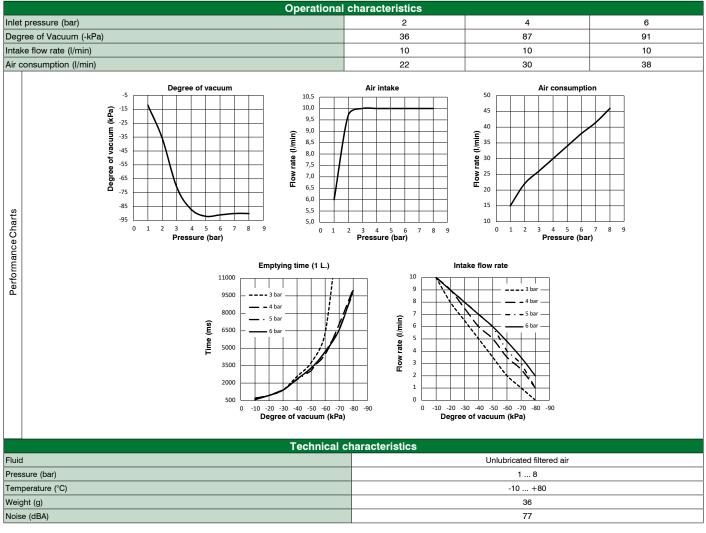
## Ordering code







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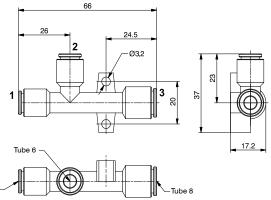


Accessories			
19S18.S	Silencer G1/8"		





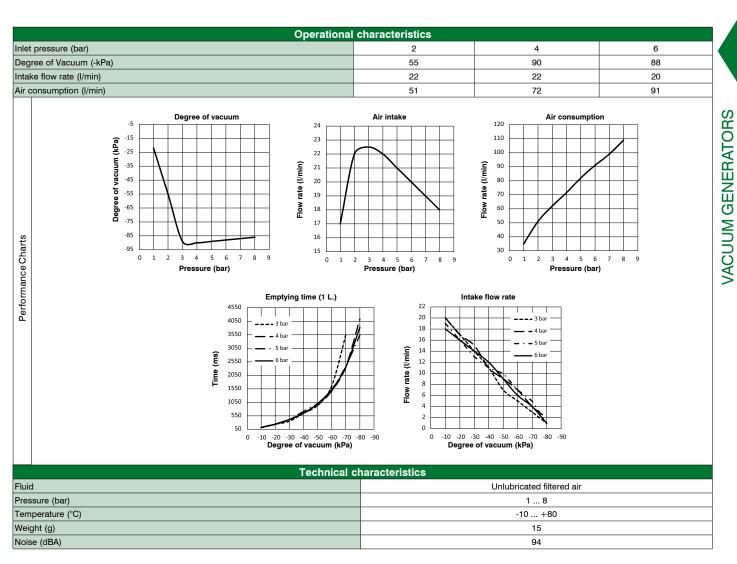
Tube 6



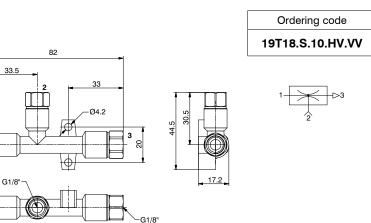


Ordering code 19T06.S.10.HV.ZY

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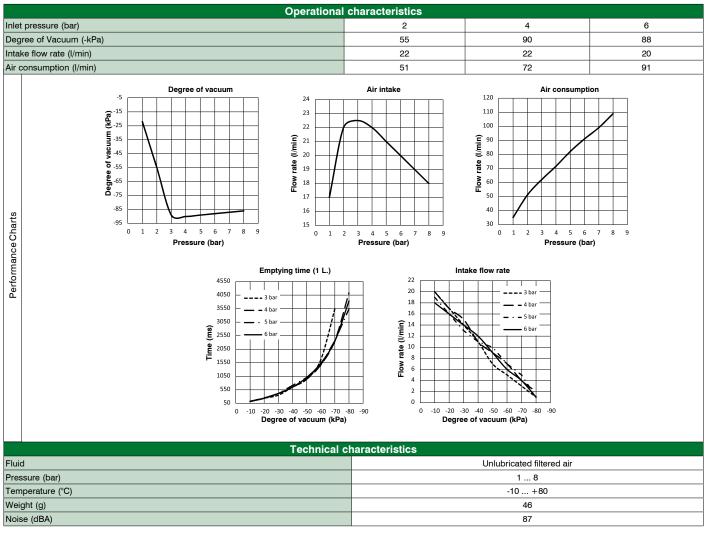






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G1/8

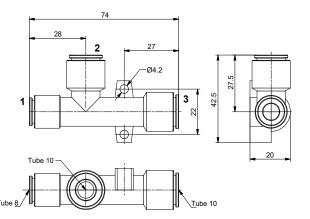


Accessories				
19S18.S	Silencer G1/8"			

VACUUM GENERATORS



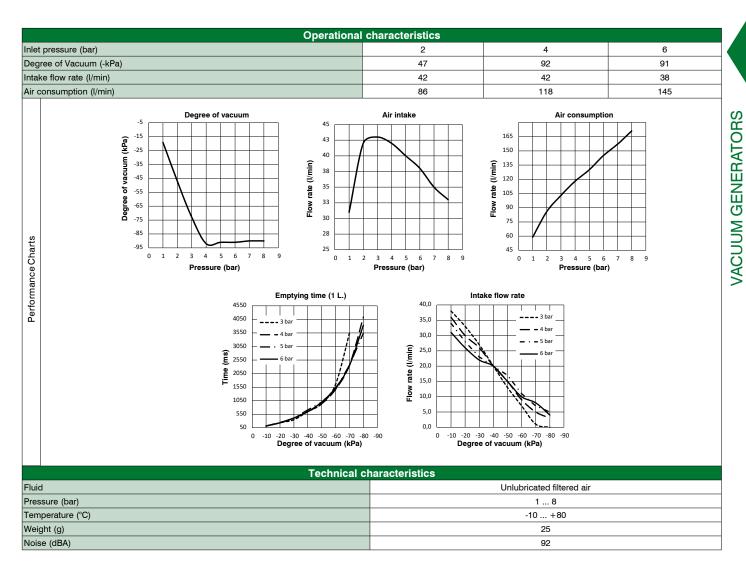






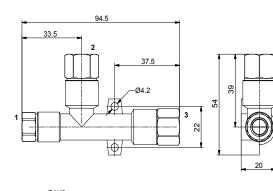
Ordering code 19T10.S.13.HV.XX

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.



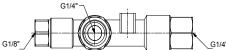




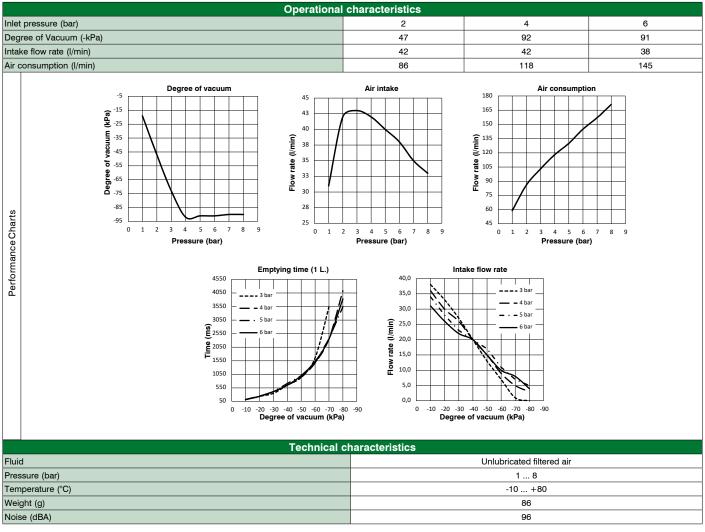




Ordering code 19T14.S.15.HV.UU



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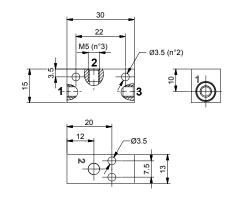


Accessories					
19S14.S	Silencer G 1/4"				



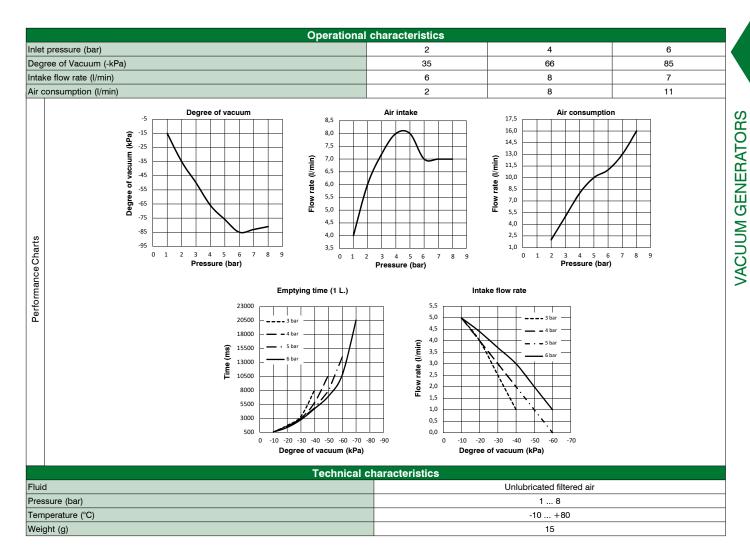
Ordering code 19M05.S.05.SS.00





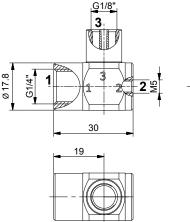


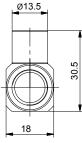
Single stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle they have the vacuum connection orthogonal to the axis of supply and outlet. They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







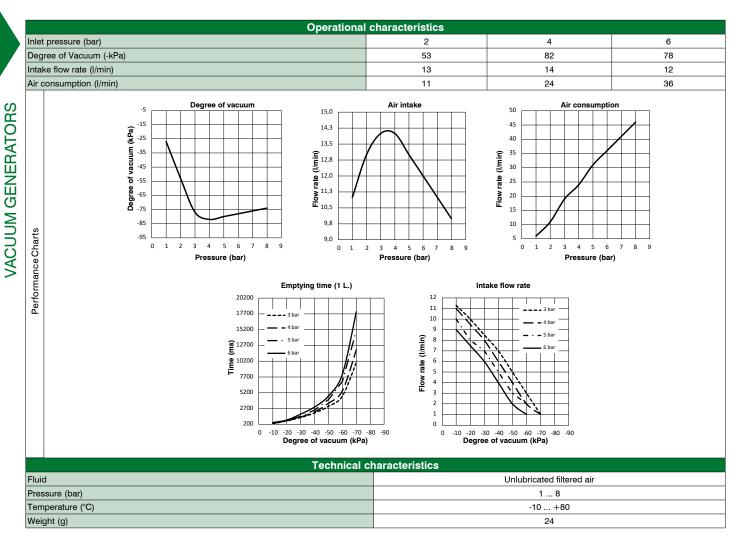






Ordering code

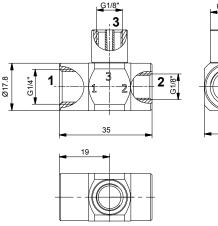
Single stage generators, with operation based on the Venturi principle; their main feature is the presence of feed pressure and connection for the vacuum on the same axis. This makes it possible to connect the suction cups directly to the generator or through the suction cup holder, so therefore still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

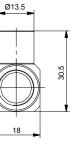


Accessories				
19S18.S	Silencer G1/8"			







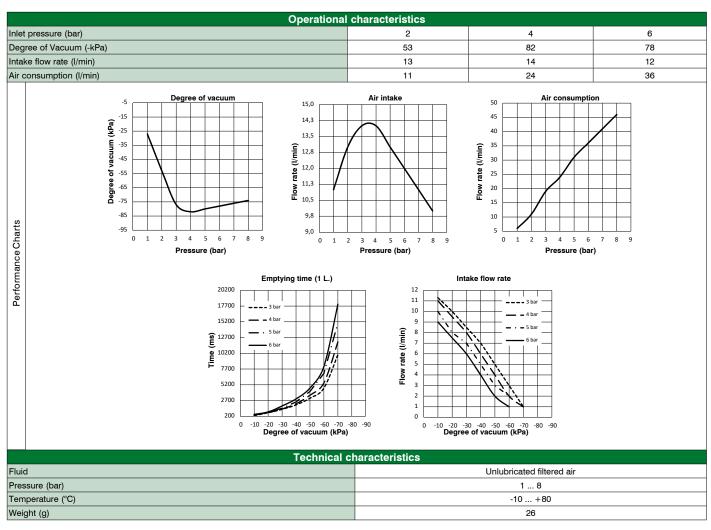




Ordering code

19M18.S.08.SS.L0

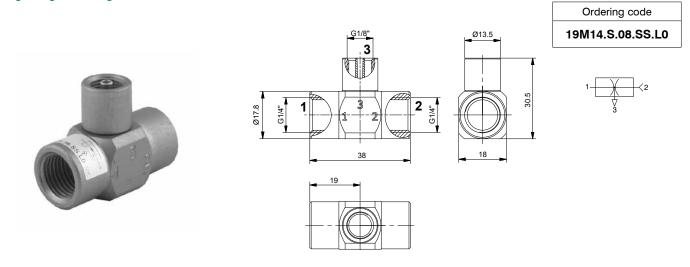
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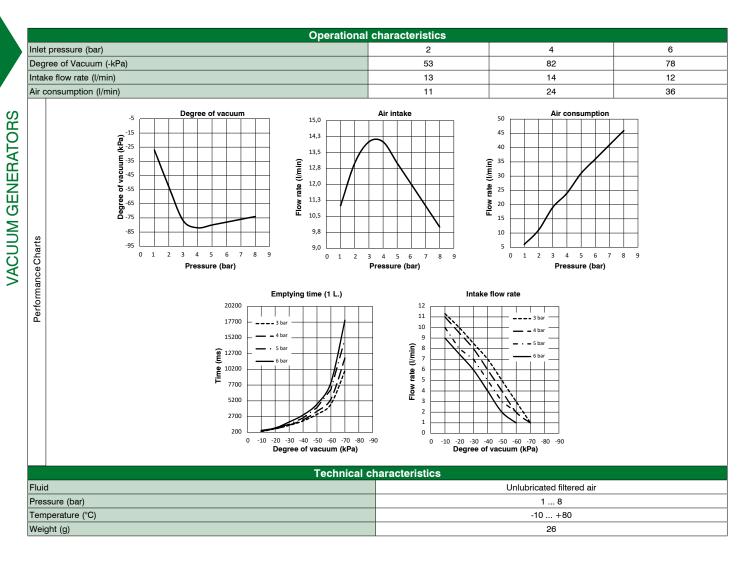
Accessories						
19S18.S Silencer G1/8"						

VACUUM GENERATORS





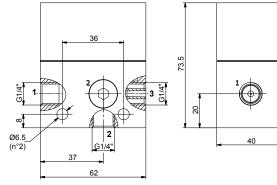
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Accessories				
19S18.S	Silencer G1/8"			

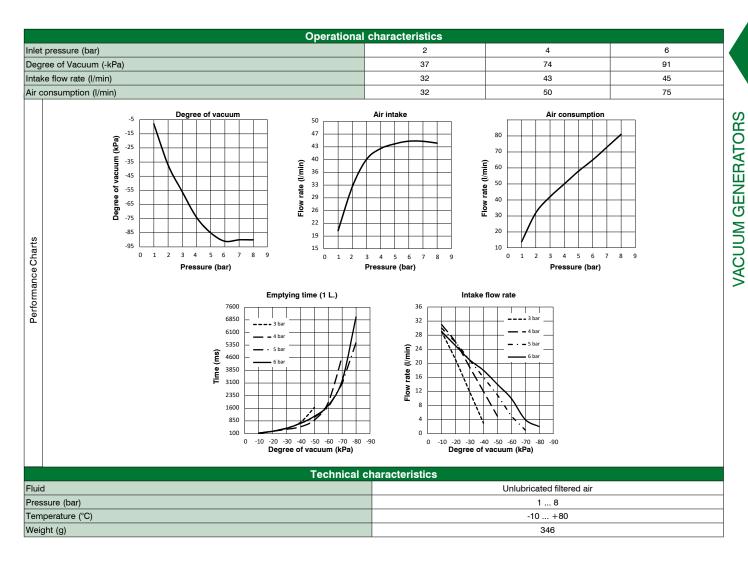
Ordering code 19M14.S.10.SS.E0







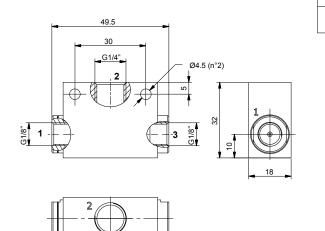
Single stage generators derived from standard traditional single-stage generators, complete with automatic release system. The pressure supply, in addition to generating the defined vacuum through the Venturi principle, supplies a chamber which serves as a pressure accumulator. When the supply stops,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

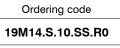


Accessories					
19S14.S	Silencer G1/4"				



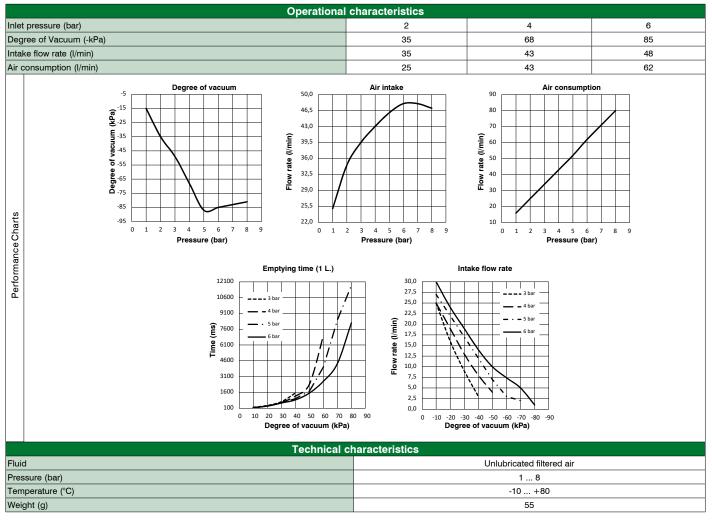








Single stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle they have the vacuum connection orthogonal to the axis of supply and outlet. They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



Accessories				
19S18.S	Silencer G1/8"			

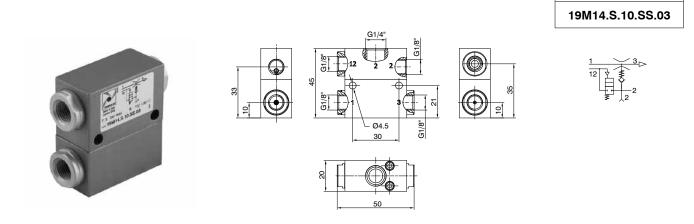
VACUUM GENERATORS

42

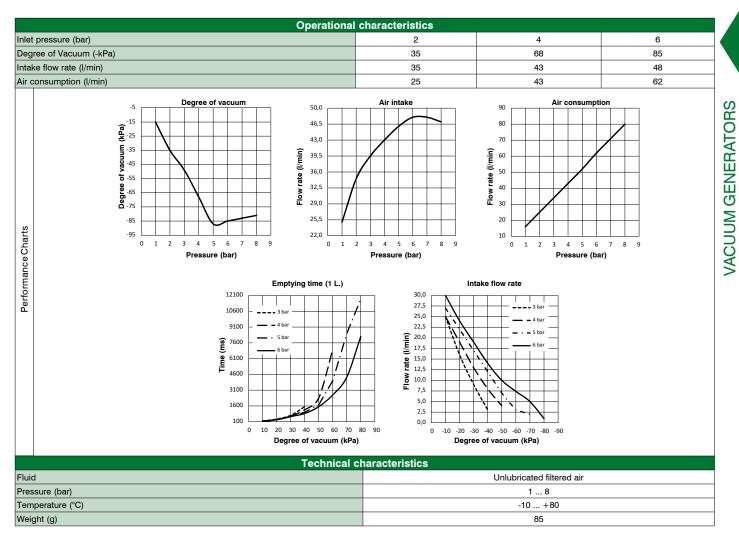


Ordering code

### Single stage vacuum generator with built in vacuum retaining valve



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 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 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.

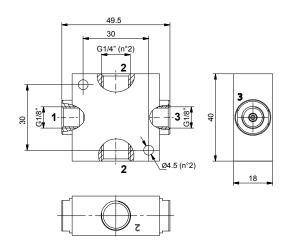


Accessories					
19S18.S	Silencer G1/8"				

43





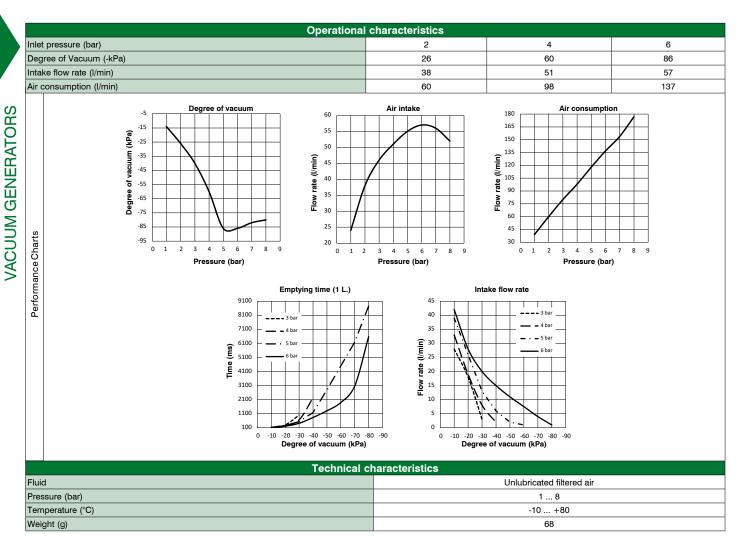




Ordering code



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.



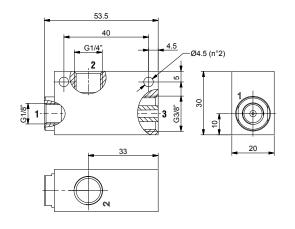
Accessories				
19S18.S	Silencer G1/8"			



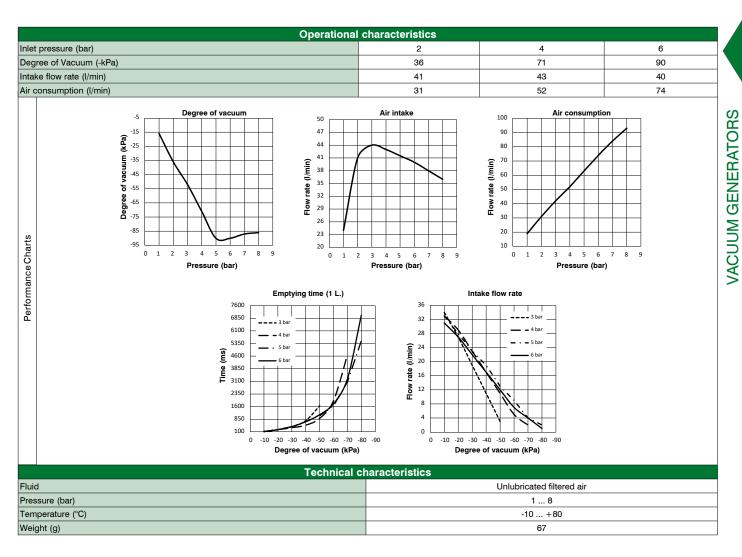
Ordering code

Single stage vacuum generator G1/4"





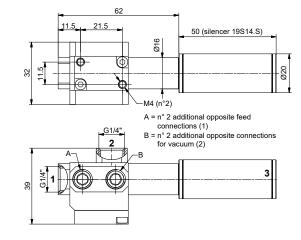
Single stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle they have the vacuum connection orthogonal to the axis of supply and outlet. They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

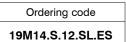


Accessories						
19S38.S Silencer G3/8"						



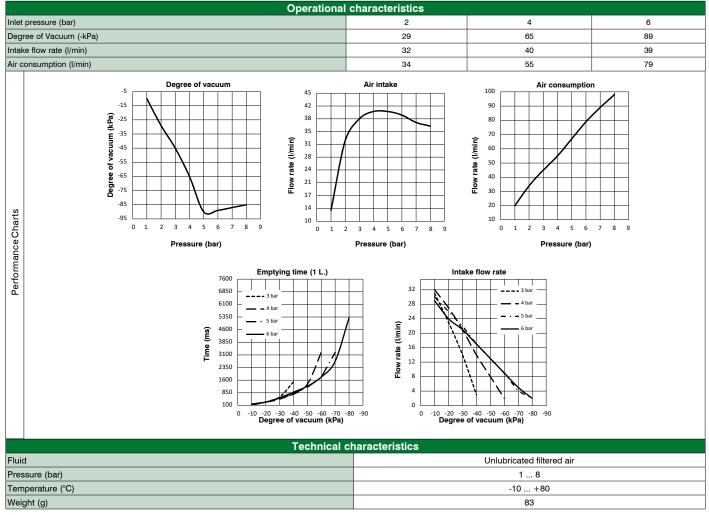








High-performance compact generator for high frequency applications; the presence of the integrated ejector ensures release capacity in the shortest possible time. The fact of it being extremely lightweight allows its application directly onto the robot gripping arms and/or mobile applications. Available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

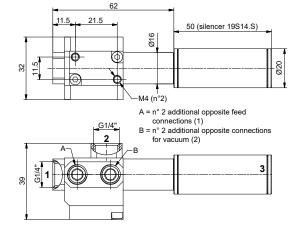




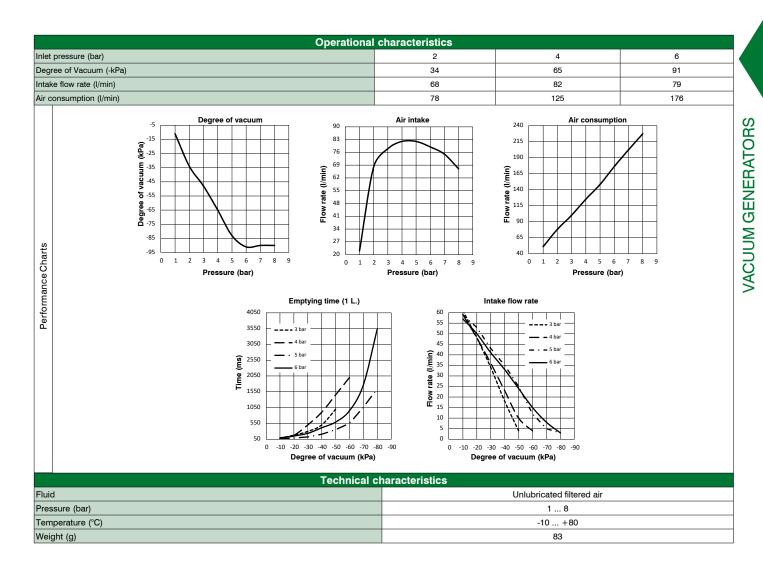






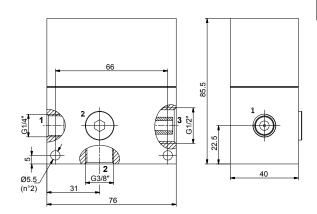


High-performance compact generator for high frequency applications; the presence of the integrated ejector ensures release capacity in the shortest possible time. The fact of it being extremely lightweight allows its application directly onto the robot gripping arms and/or mobile applications. Available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





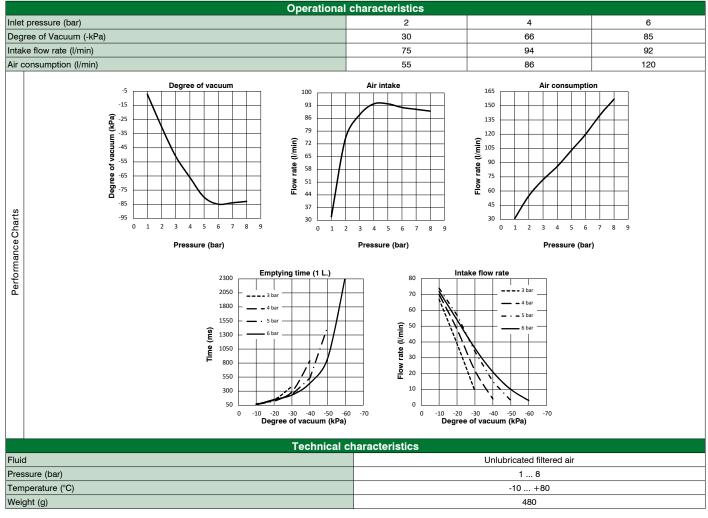






Ordering code

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.

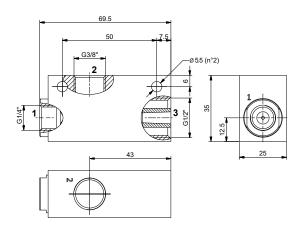


Accessories					
19S12.R	Silencer G1/2"				

VACUUM GENERATORS



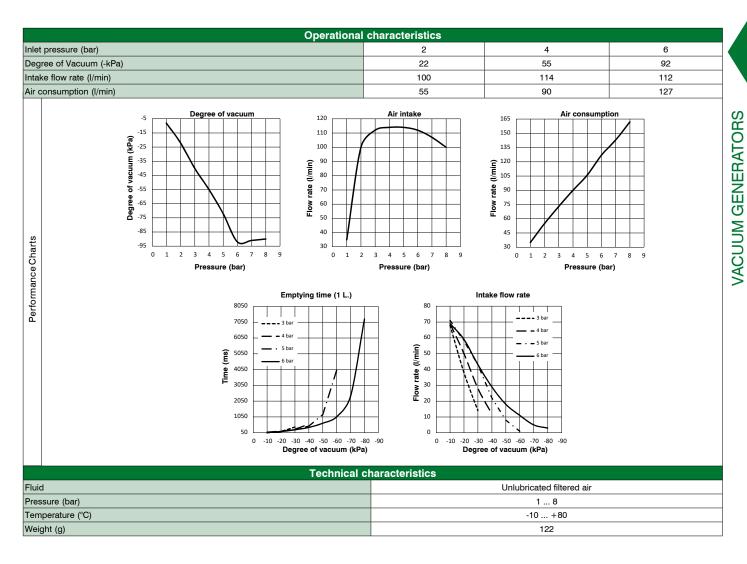






Ordering code 19M38.S.15.SS.00

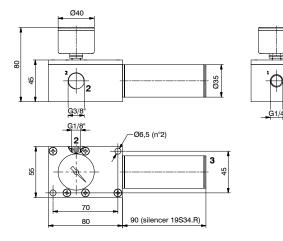
Single stage generators, robust and reliable, with compact dimensions and suitable for applications which need the required degree of vacuum to be reached quickly with limited air flows. Operating on the Venturi principle they have the vacuum connection orthogonal to the axis of supply and outlet. They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

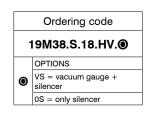


Accessories					
19S12.R	Silencer G1/2"				



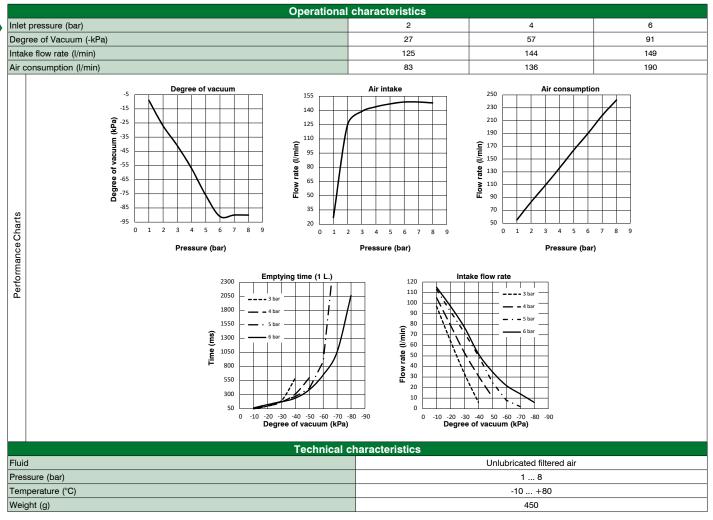








Single stage generator with high suction capacity due to a pair of nozzles mounted in parallel; they are particularly quiet thanks to a free-flow type silencer, standard-fitted with a vacuum gauge, and allows direct connection with a vacuum switch or alternatively a solenoid valve for quick detachment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



VACUUM GENERATORS

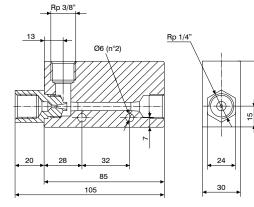
9



### High-flow single stage vacuum generator G3/8"

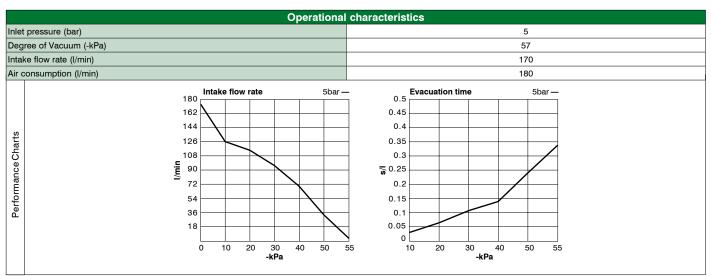
### Ordering code







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. Suitable for use in dusty environments and in applications where a large suction capacity and an average degree of vacuum are required (57 - kPa).



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

Inlet	Air consumption	Evacuati	on time (s	Degree of Vacuum				
pressure (bar)	(l/min)'	10	20	30	40	50	55	max. (-kPa)
5	180	0.029	0.062	0.105	0.138	0.246	0.338	57

Technical characteristics						
Fluid	Unlubricated filtered air					
Pressure (bar)	1 6					
Temperature (°C)	0 +60					
Weight (g)	327					
Noise (dBA)	72					

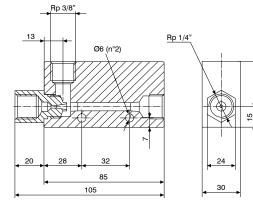
Acces	sories
19S12.S	Silencer G1/2"



### High-flow single stage vacuum generator G3/8"

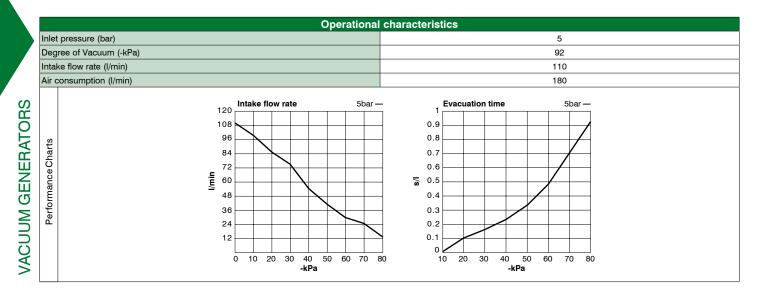
### Ordering code 19M38.S.20.HH.00







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. Suitable for use in dusty environments and in applications where a large suction capacity and a high degree of vacuum are required (92-kPa).



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

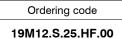
Inlet	Air consumption	Evad	uation t	ime (s/l)	at diffe	rent lev	els of va	cuum (-	kPa)	Degree of Vacuum			
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	max. (-kPa)			
5	180	0.043	0.1	0.167	0.23	0.338	0.492	0.707	0.923	92			

Technical characteristics							
Fluid	Unlubricated filtered air						
Pressure (bar)	1 6						
Temperature (°C)	0 +60						
Weight (g)	327						
Noise (dBA)	72						

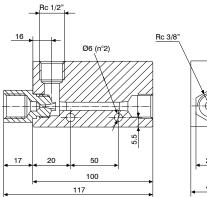
Acces	sories
19S12.S	Silencer G1/2"

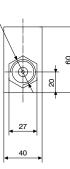


### High-flow single stage vacuum generator G1/2"



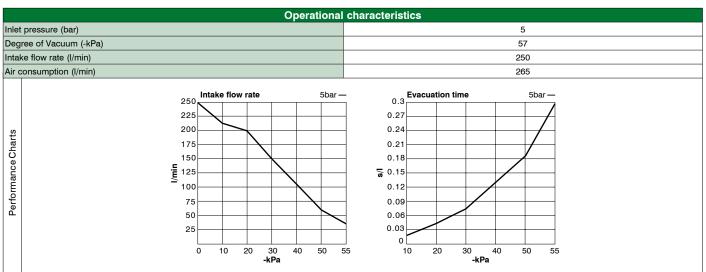








Single stage high suction power generators operating using a single large Venturi nozzle; particularly silent thanks to a free-low silencer which is mounted separately. Suitable for use in dusty environments and in applications where a large suction capacity and an average degree of vacuum are required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



Inlet	Air consumption	Evacua	ation time	Degree of Tuouum					
pressure (bar)	(l/min) [*]	0	10	20	30	40	50	55	max. (-kPa)
5	265	250	215	200	150	105	60	36	57
Inlet	Air consumption	Evacua	ation time	e (s/l) at	different	levels of	f vacuum	ı (-kPa)	Degree of Vacuum

pressure (bar)         (l/min)'         10         20         30         40         50         55         max. (-kPa)           5         265         0.021         0.046         0.076         0.123         0.184         0.3         57	Inlet	Air consumption	Evacual		Degree of Vacuum				
5         265         0.021         0.046         0.076         0.123         0.184         0.3         57	pressure (bar)	(l/min)'	10	20	30	40	50	55	max. (-kPa)
	5	265	0.021	0.046	0.076	0.123	0.184	0.3	57

Technical characteristics						
Fluid	Unlubricated filtered air					
Pressure (bar)	1 6					
Temperature (°C)	0 +60					
Weight (g)	660					
Noise (dBA)	75					

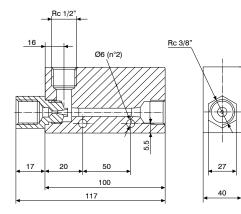
Acces	sories
19S34.R	Silencer G3/4"



### High-flow single stage vacuum generator G1/2"

### Ordering code

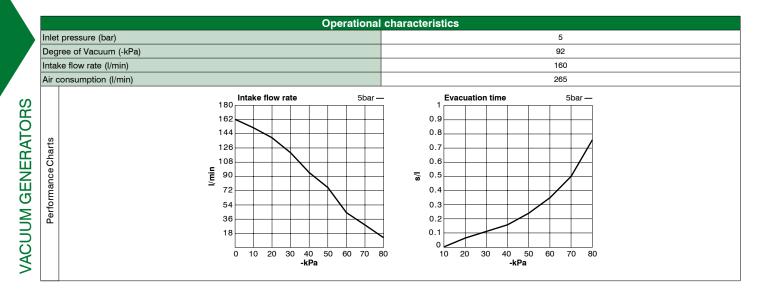






20

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. Suitable for use in dusty environments and in applications where a large suction capacity and a high degree of vacuum are required (92-kPa).



pressure (bar) (l/min) 0 10 20 30 40 50 60 70 80 m	
	ax. (-kPa)
5         265         160         155         140         120         95         72         47         28         15	92

Inlet	Air consumption	Evad	cuation t	ime (s/l)	at diffe	rent lev	els of va	cuum (-	kPa)	Degree of Vacuum
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	max. (-kPa)
5	265	0.03	0.069	0.112	0.168	0.241	0.345	0.494	0.753	92

Technical cl	naracteristics
Fluid	Unlubricated filtered air
Pressure (bar)	1 6
Temperature (°C)	0 +60
Weight (g)	660
Noise (dBA)	75

Accessories	
19S34.R	Silencer G3/4"

30

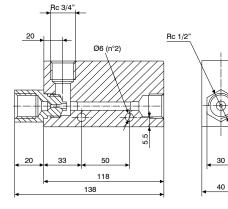
20



### High-flow single stage vacuum generator G3/4"

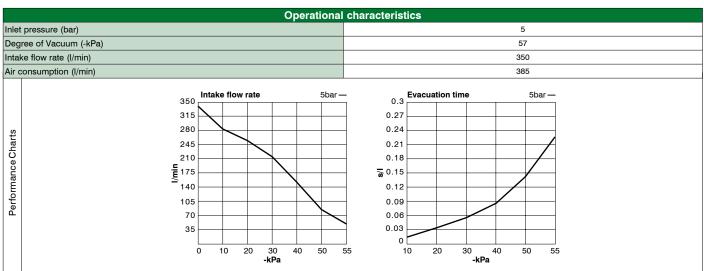
Ordering code







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. Suitable for use in dusty environments and in applications where a large suction capacity and an average degree of vacuum are required (57 - kPa).



pressure (bar)         (l/min)         0         10         20         30         40         50         55         max. (-kPa)           5         385         350         295         267         215         150         85         41         57	Inlet	Air consumption	Evacua	tion time	e (s/l) at	different	levels of	f vacuum	(-kPa)	Degree of Vacuum
5         385         350         295         267         215         150         85         41         57	pressure (bar)	(l/min)	0	10	20	30	40	50	55	max. (-kPa)
	5	385	350	295	267	215	150	85	41	57

Inlet	Air consumption	Evacuati	on time (s	/I) at diffe	rent levels	of vacuu	m (-kPa)	Degree of Vacuum
pressure (bar)	(l/min)'	10	20	30	40	50	55	max. (-kPa)
5	385	0.017	0.035	0.058	0.086	0.132	0.219	57

Technical cl	naracteristics
Fluid	Unlubricated filtered air
Pressure (bar)	1 6
Temperature (°C)	0 +60
Weight (g)	774
Noise (dBA)	75

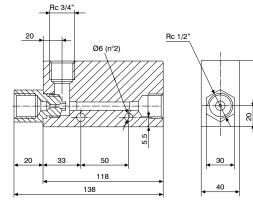
Acces	sories
19S34.R	Silencer G3/4"



### High-flow single stage vacuum generator G3/4"

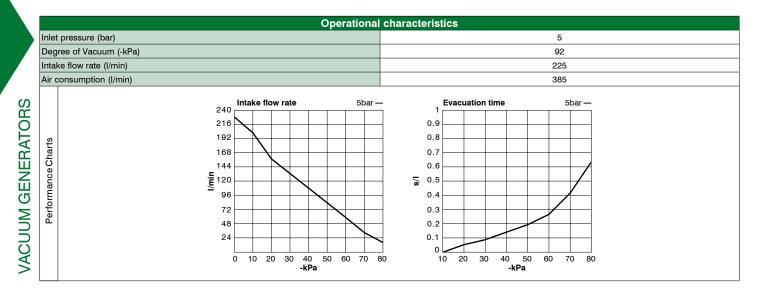
### Ordering code 19M34.S.30.HH.00







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. Suitable for use in dusty environments and in applications where a large suction capacity and a high degree of vacuum are required (92-kPa).



pressure (bar) (I/min) 0 10 20 30 40 50 60 70 80 (-kPa)	Inlet	Air consumption	Eva	cuatior	n time (	s/I) at c	lifferen	t levels	of vac	uum (-k	Pa)	Degree of
	pressure (bar)	(l/min)	0	10	20	30	40	50	60	70	80	Vacuum max. (-kPa)
5         385         225         200         160         135         105         78         55         33         19         92	5	385	225	200	160	135	105	78	55	33	19	92

Inlet	Air consumption	Evac	cuation t	ime (s/l)	at diffe	rent lev	els of va	cuum (-	kPa)	Degree of Vacuum max.
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	(-kPa)
5	385	0.029	0.058	0.092	0.136	0.196	0.265	0.406	0.625	92

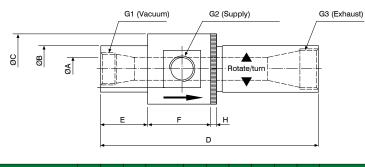
Technical cl	naracteristics					
Fluid	Unlubricated filtered air					
Pressure (bar)	1 6					
Temperature (°C)	0 +60					
Weight (g)	774					
Noise (dBA)	75					

Acces	sories
19S34.R	Silencer G3/4"



### Adjustable vacuum generator conveyor





Code	ØA	ØВ	ØC	D	Е	F	н	G1	G2	G3	Weight (g)
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 inlet 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.

Operational characteristics								
4 6 (Max. 7)								
84								
3390								
2550								

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

Acc	essories	Description
19S14.S	Silencer G1/4"	for 19M14.S.00.SS.RG
19S12.R	Silencer G1/2"	for 19M38.S.00.SS.RG
19S34.R	Silencer G3/4"	for 19M12.S.00.SS.RG
19S10.R	Silencer G1"	for 19M34.S.00.SS.RG



## Multistage vacuum generators

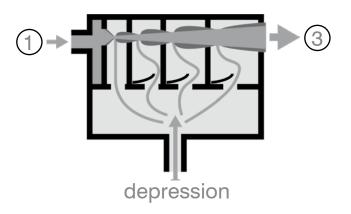
Compact generators, composed of several modules according to the required performance to obtain high suction capacity with low consumption and high vacuum degrees.



### Performance and application

The multistage vacuum generators base their operating characteristics on the Venturi principle. The compressed air is manipulated to flow at high speed in port 1 which constitutes the first stage of the vacuum generator and in the subsequent stages, following the entrainment of the surrounding air, a depression is created.

The advantage of multistage vacuum generator is in the optimization of the kinetic energy. Injecting the compressed air through multiple nozzles generates an improve volumetric flow rate (Compared to a single stage unit) whilst using a lower consumption of compressed air.

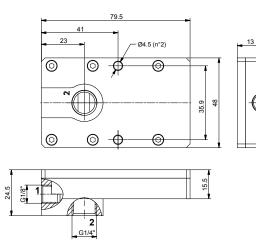




### Series 1900

Multistage vacuum generator G1/4"



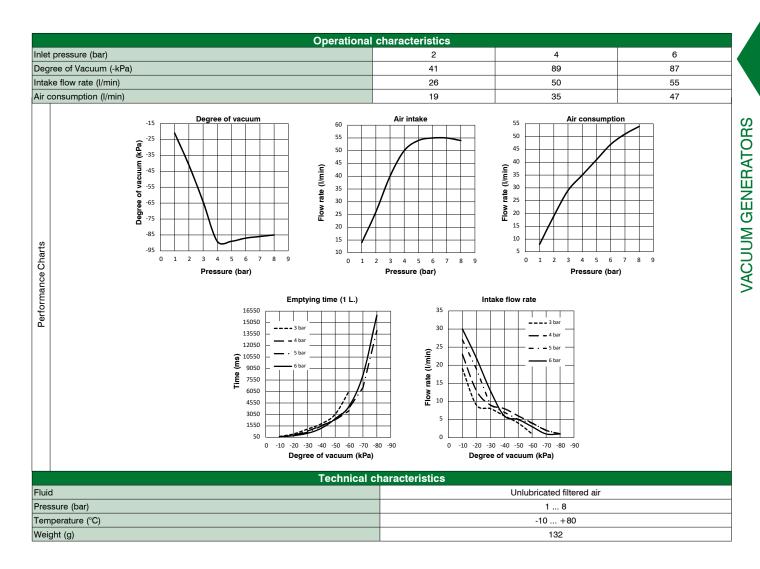




Ordering code

19M14.M.09.SS.00

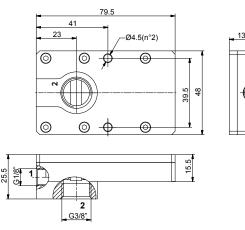
As a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the soundabsorbent material inside of them.

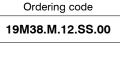




### Multistage vacuum generator G3/8"

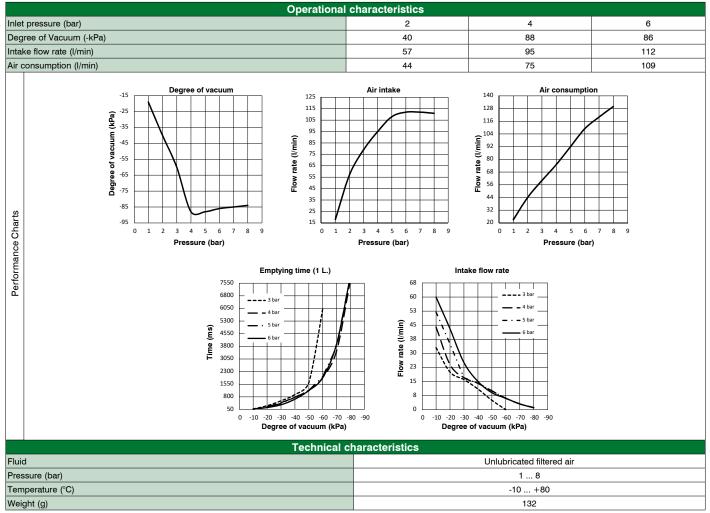








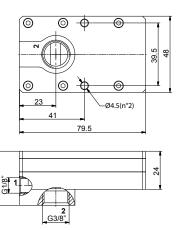
As a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the soundabsorbent material inside of them.

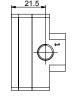




Multistage vacuum generator G3/8"





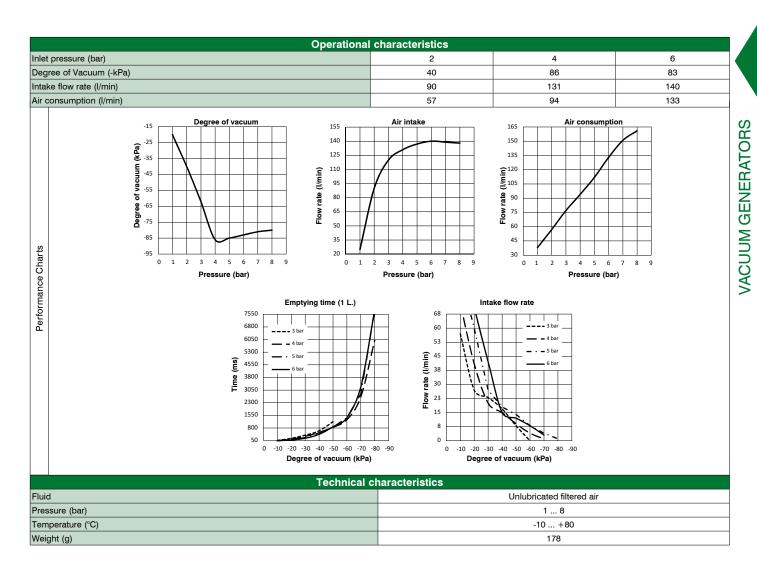




Ordering code 19M38.M.15.SS.00

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 soundabsorbent material inside of them.

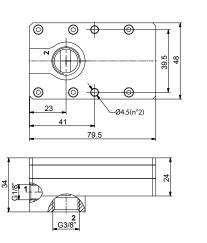
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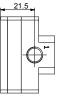




Multistage vacuum generator G3/8"





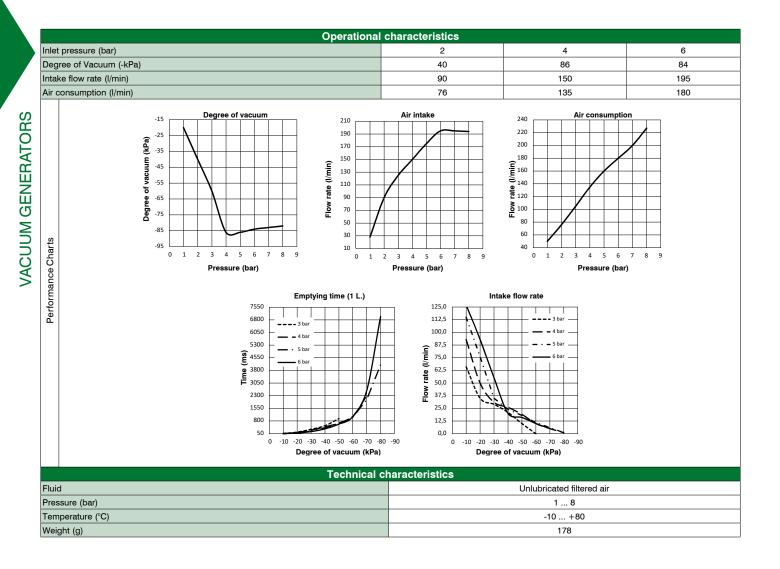




Ordering code

19M38.M.18.SS.00

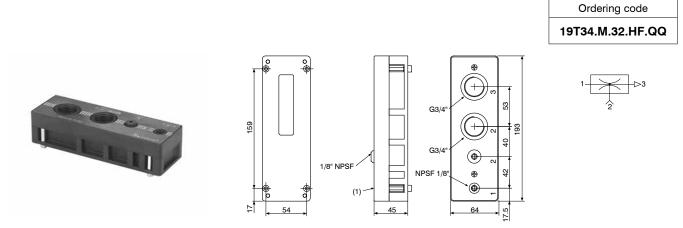
As a function of the modules (nozzles 2-4- 6-8) used, offer exactly the right performance for the most varied of industrial applications. They ensure a low level of noise thanks to the soundabsorbent material inside of them.



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IC PNEUMAX



Operational	characteristics					
Optimum inlet pressure (bar)	3.4					
Inlet pressure (bar)	3.4 / 6					
Degree of Vacuum (-kPa)	89 / 92					
Intake flow rate (I/min)	360 / 420					
Air consumption (I/min)	116 / 185					
Star	4 3.6 3.2 2.8 2.4 5 2 1.6 1.2 0.8 0.4 0					
-kPa	-kPa					

Inlet	Air consumption	Eva	cuatio	n time	(s/l) a	t diffe	rent le	evels c	of vacu	um (-	kPa)	Degree of Vacuum
pressure (bar)	(l/min)՝	0	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

Inlet	Air consumption	Evac	uation	Degree of Vacuum							
pressure (bar)	(l/min)՝	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

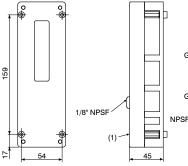
Technical characteristics									
Fluid	Unlubricated filtered air								
Inlet pressure (bar)	3,4 6								
Noise (dBA)	93								
Temperature (°C)	-20 +80								
Material	PPS, SS, PA, NBR								
Weight (g)	675								

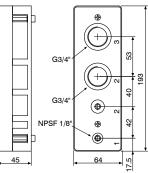
Accessories								
19S34.R Reduced silencer G3/4"								
19S34.S	Silencer G3/4"							



### Multistage high flow vacuum generator G3/4"







6bar

50 -kPa

60 70 80 90

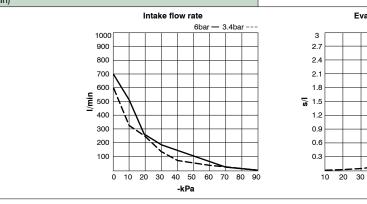
40

- 3.4bar ---

### Ordering code



Operational characteristics								
Optimum inlet pressure (bar)	3.4							
Inlet pressure (bar)	3.4 / 6							
Degree of Vacuum (-kPa)	89 / 92							
Intake flow rate (I/min)	600 / 700							
Air consumption (I/min)								
Intake flow rate	Evacuation time							



Inlet	Air consumption	Eva	cuatio	Degree of Vacuum								
pressure (bar)	(l/min)	0	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

Inlet	Air consumption	Evac	-kPa)	Degree of Vacuum							
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	90	max. (-kPa)
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 characteristics									
Fluid	Unlubricated filtered air								
Max. inlet pressure (bar)	3,4 6								
Noise (dBA)	92								
Temperature (°C)	-20 +80								
Material	PPS, SS, PA, NBR								
Weight (g)	675								

Accessories									
19S34.R	Reduced silencer G3/4"								
19S34.S	Silencer G3/4"								

Performance Charts

+

+

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64

33

7.5

193

G3/4"

G3/4'

NPSF 1/8

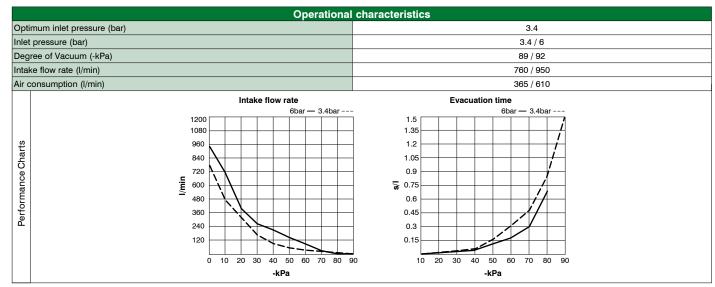
### Multistage high flow vacuum generator G3/4"

Ordering code

PNEUMAX

### 19T34.M.46.HF.QQ





1/8" NPSF

(1)

65

159

17

54

Inlet	Air consumption	Eva	cuatio	kPa)	Degree of Vacuum max.							
pressure (bar)	(l/min) [']	0	10	20	30	40	50	60	70	80	90	vacuum max. (-kPa)
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

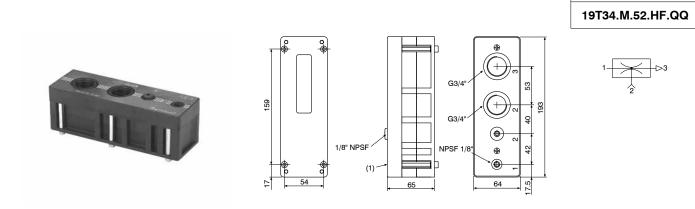
Inlet	Air consumption											
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	90	Vacuum max. (-kPa)	
3.4	365	0.012	0.029	0.058	0.095	0.18	0.31	0.46	0.89	1.5	92	
6	610	0.009	0.019	0.045	0.075	0.13	0.18	0.31	0.70	/	89	

Technical	Technical characteristics									
Fluid	Unlubricated filtered air									
Max. inlet pressure (bar)	3,4 6									
Noise (dBA)	93									
Temperature (°C)	-20 +80									
Material	PPS, SS, PA, NBR									
Weight (g)	837									

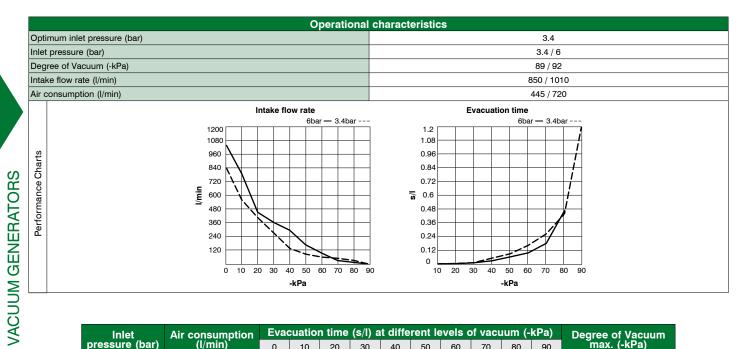
Accessories									
19S34.R	Reduced silencer G3/4"								
19S34.S	Silencer G3/4"								



### Multistage high flow vacuum generator G3/4"



Ordering code



Inlet	Air consumption	Evad	cuatio	n time	(s/l) a	it diffe	rent le	evels o	of vacu	um (-	kPa)	Degree of Vacuum
pressure (bar)	(l/min)	0	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

Inlet	Air consumption	Evac	uation	Degree of Vacuum							
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	90	max. (-kPa)
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	characteristics
Fluid	Unlubricated filtered air
Max. inlet pressure (bar)	3,4 6
Noise (dBA)	88
Temperature (°C)	-20 +80
Material	PPS, SS, PA, NBR
Weight (g)	837

Accessories									
19S34.R	Reduced silencer G3/4"								
19S34.S	Silencer G3/4"								

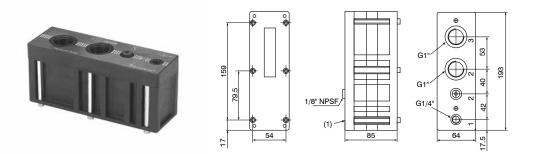
### Multistage high flow vacuum generator G1"

Ordering code

PNEUMAX

-⊳3

### 19TG1.M.58.HF.PP



#### **Operational characteristics** 3.4 Optimum inlet pressure (bar) Inlet pressure (bar) 3.4 / 6 Degree of Vacuum (-kPa) 89 / 92 Intake flow rate (I/min) 1150 / 1400 545 / 780 Air consumption (I/min) Intake flow rate Evacuation time 6bar — 3.4bar ---6bar — 3.4bar -1500 1 1350 0.9 Performance Charts 0.8 1200 1050 0.7 900 0.6 l/min 750 0.5 s/ 600 0.4 450 0.3 300 0.2 150 0.1 0 10 20 0 10 20 30 40 50 60 70 80 90 30 40 50 60 70 80 90 -kPa -kPa

Inlet	Air consumption	Evad	cuation	n time	(s/l) a	t diffe	rent le	evels c	of vacu	um (-	kPa)	Degree of Vacuum
pressure (bar)	(l/min)	0	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

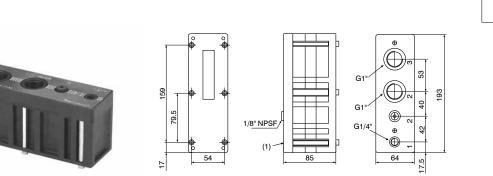
Inlet	Air consumption	Evac	uation	-kPa)	Degree of Vacuum						
pressure (bar)	(l/min)	10	20	30	40	50	60	70	80	90	max. (-kPa)
3.4	545	0.006	0.015	0.029	0.052	0.085	0.145	0.202	0.330	1	92
6	780	0.005	0.013	0.026	0.045	0.062	0.115	0.194	0.56	/	89

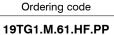
Technical	characteristics
Fluid	Unlubricated filtered air
Max. inlet pressure (bar)	3,4 6
Noise (dBA)	92
Temperature (°C)	-20 +80
Material	PPS, SS, PA, NBR
Weight (g)	1075

Accessories						
19S10.R	Reduced silencer G 1"					



### Multistage high flow vacuum generator G1"





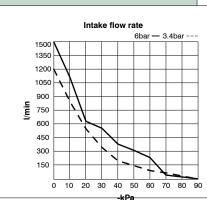


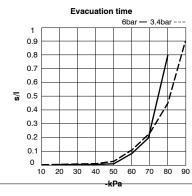
### **Operational characteristics**

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









Inlet	Air consumption	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum	
pressure (bar)	(l/min)՝	0	10	20	30	40	50	60	70	80	90	max. (-kPa)
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

Inlet	Air consumption	Evacuation time (s/l) at different levels of vacuum (-kPa)									Degree of Vacuum
pressure (bar)	(l/min)'	10	20	30	40	50	60	70	80	90	max. (-kPa)
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 characteristics						
Fluid	Unlubricated filtered air					
Max. inlet pressure (bar)	3,4 6					
Noise (dBA)	88					
Temperature (°C)	-20 +80					
Material	PPS, SS, PA, NBR					
Weight (g)	1075					

Accessories						
19S10.R	Reduced silencer G 1"					



# Multifunction vacuum generators

Vacuum units that can control a complete vacuum gripping system.



VACUUM GENERATORS

The range of multifunction vacuum generators are available in two versions, the "SE" & "ME". The 'SE' can be installed as "stand alone" whilst the 'ME' version can be assembled with intermediate modules creating a multi position manifold which uses 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:

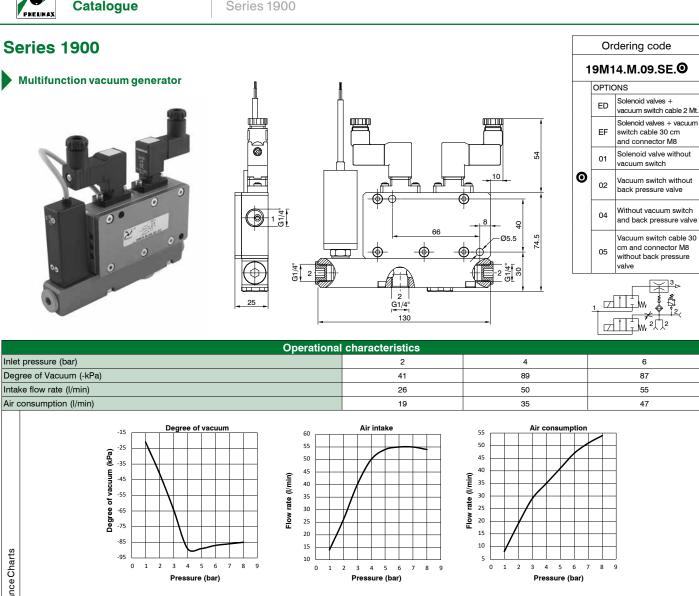
- A solenoid pilot valve for controlling the compressed air being supplied
- A solenoid pilot valve for controlling the compressed air from the bellows
- A vacuum switch with display for controlling and monitoring the system
- A flow regulator with setting screw for regulating the air of the bellows
- 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.

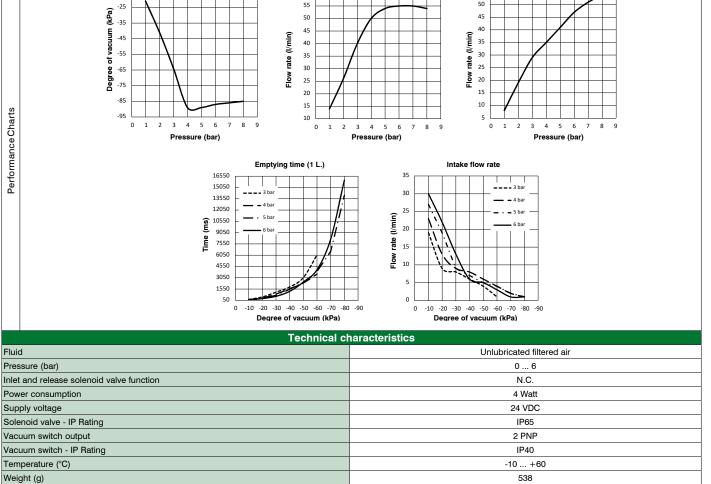
By activating the supply solenoid pilot valve, the generator creates vacuum that can be used, and when the maximum preset value is reached, the vacuum switch kicks in and, through the control solenoid pilot valve, cuts off the air supply and restores it when the vacuum value drops below the minimum set 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.

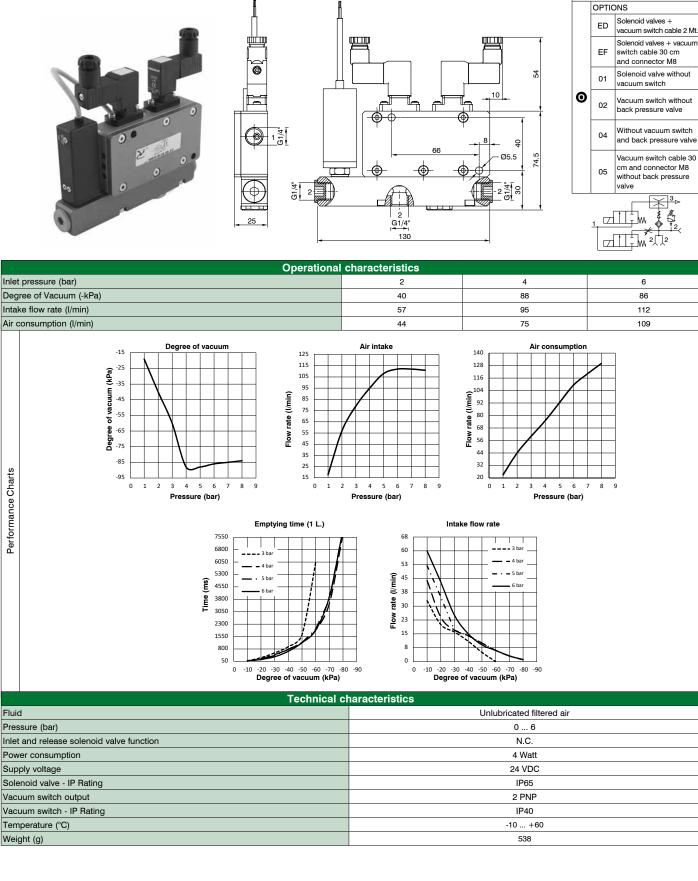








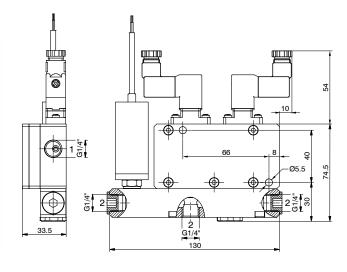
Multifunction vacuum generator

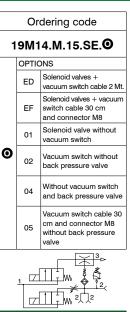




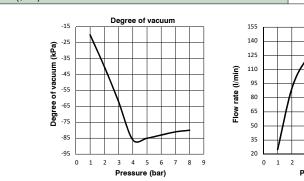


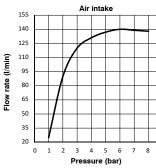


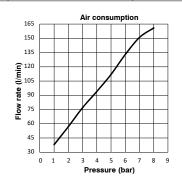




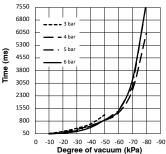
Operational characteristics				
Inlet pressure (bar) 2 4 6				
Degree of Vacuum (-kPa)	40	86	83	
Intake flow rate (I/min)	90	131	140	
Air consumption (I/min)	57	94	133	

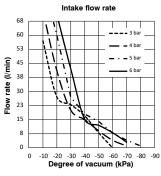












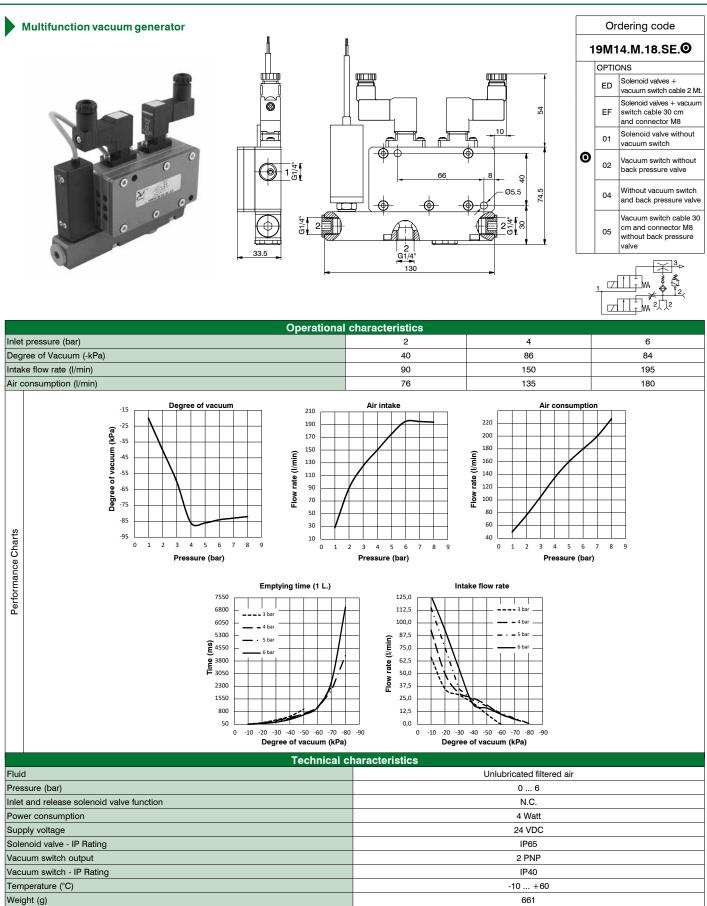
9

Cechnical characteristic

Technical characteristics			
Fluid	Unlubricated filtered air		
Pressure (bar)	0 6		
Inlet and release solenoid valve function	N.C.		
Power consumption	4 Watt		
Supply voltage	24 VDC		
Solenoid valve - IP Rating	IP65		
Vacuum switch output	2 PNP		
Vacuum switch - IP Rating	IP40		
Temperature (°C)	-10 +60		
Weight (g)	661		

Performance Charts





VACUUM GENERATORS



# Modular multifunction vacuum generators

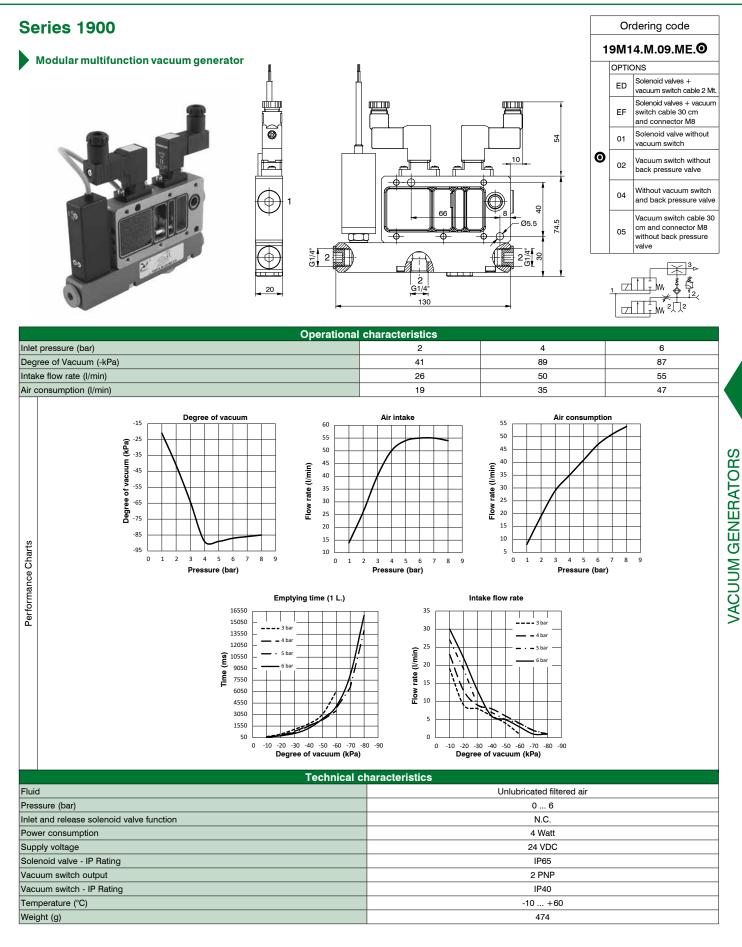
The intermediate "ME" multistage and multifunction vacuum generators are not autonomous and must be hooked up to the "SE" units to operate.

They have been 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.



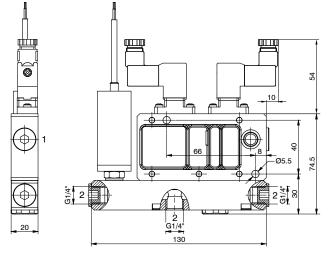


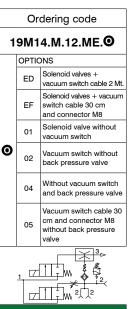
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



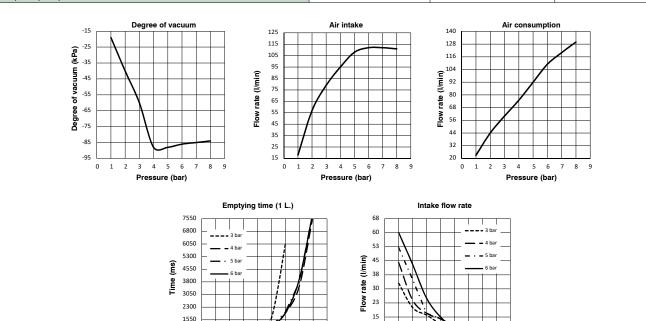
## Modular multifunction vacuum generator







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



0 -10 -20 -30 -40 -50 -60 -70 -80 -90 Degree of vacuum (kPa)

8 0

**Technical characteristics** Unlubricated filtered air Fluid Pressure (bar) 0 ... 6 Inlet and release solenoid valve function N.C. Power consumption 4 Watt 24 VDC Supply voltage Solenoid valve - IP Rating IP65 Vacuum switch output 2 PNP Vacuum switch - IP Rating IP40 Temperature (°C) -10 ... +60 Weight (g) 474

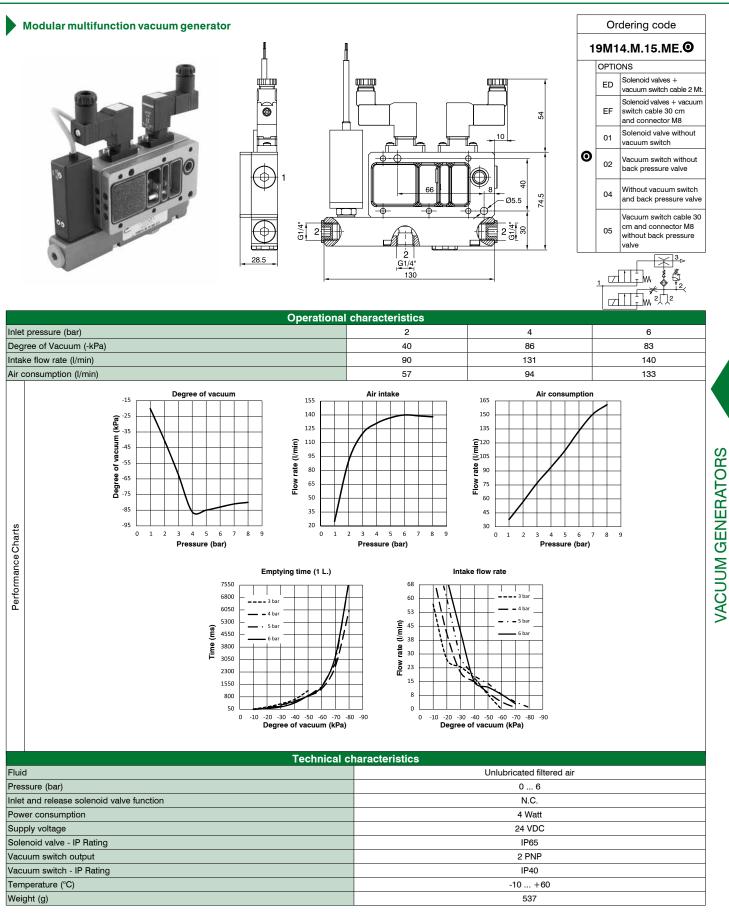
-20 -30 -40 -50 -60 -70 -80 -90 Degree of vacuum (kPa)

1550 800

50 -10

Performance Charts



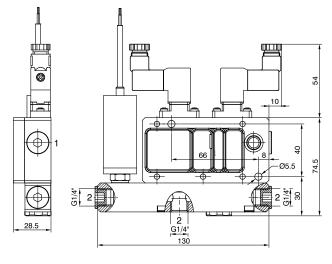


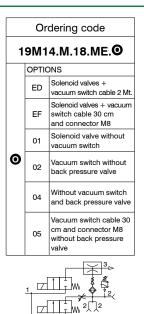
77



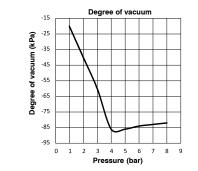
## Modular multifunction vacuum generator

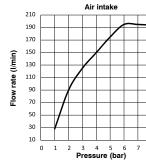


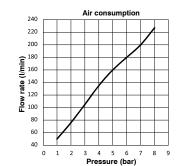




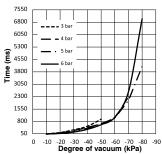
Operational characteristics					
Inlet pressure (bar) 2 4 6					
Degree of Vacuum (-kPa)	40	86	84		
Intake flow rate (I/min)	90	150	195		
Air consumption (I/min)	76	135	180		

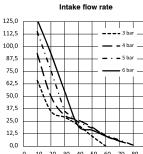












8

9

0 -10 -20 -30 -40 -50 -60 -70 -80 -90 Degree of vacuum (kPa)

echnical characteristics

Flow rate (I/min)

recipical characteristics			
Fluid	Unlubricated filtered air		
Pressure (bar)	0 6		
Inlet and release solenoid valve function	N.C.		
Power consumption	4 Watt		
Supply voltage	24 VDC		
Solenoid valve - IP Rating	IP65		
Vacuum switch output	2 PNP		
Vacuum switch - IP Rating	IP40		
Temperature (°C)	-10 +60		
Weight (g)	537		

Performance Charts

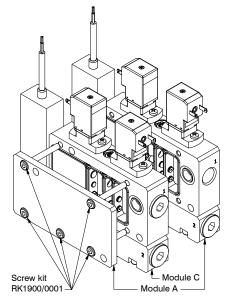


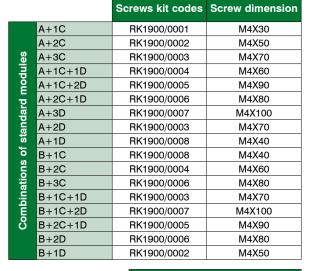
### Modular vacuum systems

"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.

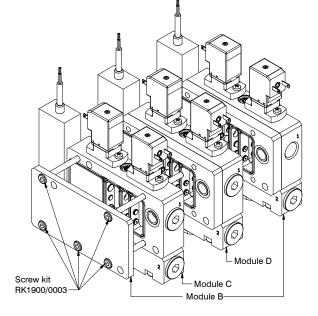
With standard screw kits up to 4 vacuum units A+1C+1D can be assembled together independently but, with use of threaded bars, the manifold can be expanded to many more positions.

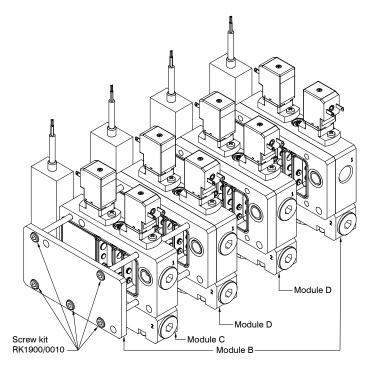
Below are a number of examples showing ways the manifold can be put together.





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

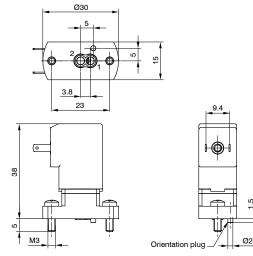






# Mini solenoid valve 15 mm





-22

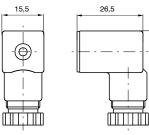




Technical characteristics		
Fluid	Unlubricated filtered air	
Pressure (bar)	06	
Function	N.C.	
Flow rate (NI/m)	185	
Operating voltage	24 VDC	
Power	4 Watt	
Class of insulation	F (155 °C)	
IP Rating	IP65 (with connector) - IP00 (with Faston)	
Temperature (°C)	-5 +50	
Weight (g)	35.5	

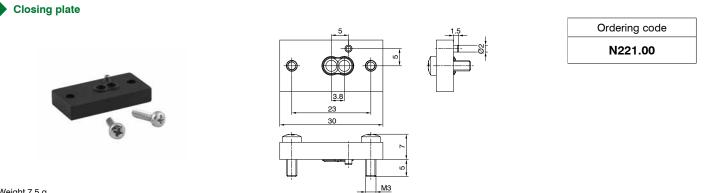
# Connector





35

Ordering code 315.11.00



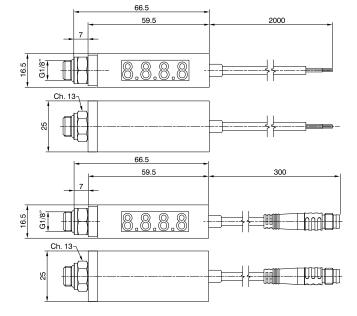
Weight 7.5 g

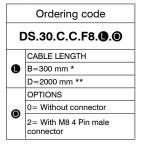
Weight 13 g



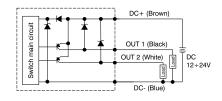
# Digital vacuum switch







		Technical features
Working pressure range		-100.0 100.0 kPa
Regulation pressure range		-100.0 100.0 kPa
Maximum supported pressure		300 kPa
Allowed fluids		Air, non-corrosive gases, non-combustible gases
	kPa	0.1
	2 kgf/cm ²	0.001
	bar	0.001
Pressure calibration sensitivity	psi	0.01
	InHg	0.1
	mmHg	1
	mmH ₂ O	0.1
Supply voltage		From 12 to 24 VDC ± 10%
Current consumption		≤ 60 mA
Digital output		PNP N.O. 2 outputs Maximum load current: 80 mA Maximum supply voltage: 30 VDC Voltage drop: ≤1 V
Repeatability (Digital output)		± 0.2% Full Scale ± 1 digit
Digital output Type of hysteresis Hysteresis		Fixed
		0.003 bar
Response time		≤2,5 ms (anti-interference function: 24 ms, 192 ms 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		$\pm$ 2% F. S. $\pm$ 1 digit (at ambient temperature of 25°C $\pm$ 3°C)
Indicator		LED green (output1) LED red (output2)
	IP Rating	IP40
	Ambient temperature	Operational: 0°C 50°C, Storage: -20°C 60°C (without ice or condensation)
	Ambient humidity	Operational/Storage: 35 85% (without condensation)
Ingress protection rating	Supported voltage	1000 VAC in 1-min. (between body and cable)
	Insulation resistance	50MΩ min. (at 500 VDC, between body and cable)
	Vibration	Total amplitude 1.5 mm. or 10 G, 10 Hz - 55 Hz - 10 Hz 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 67 g (with 2 metres of cable)





# VALVES AND SOLENOID VALVES

Wide range of valves and solenoid valves with aluminium or technopolymer body, suitable for applications with high flow rates required

The experience gained over the years, resulting of collaboration with our customers and continuous research and development on materials and technologies, has allowed Pneumax to offer a wide range of valves and solenoid valves specially designed and manufactured for vacuum. Pneumax products are able to provide high performance in applications of very demanding industrial sectors, often characterized by hard environmental conditions.

The possibility of using different materials for the various components, from technopolymer to aluminum to stainless steel, allows to create a range of valves and solenoid valves ideal for applications in different operating conditions, ranging from the management of dusty fluids to applications in the food sector.

The attention to detail in the design phase with a deep focus on the correct dimensional ratio between the connections and the orifices, allowing to minimize the pressure drops and thus guaranteeing the maximum suction flow rate.

The Pneumax offer includes shut-off valves, poppet valves, solenoid valves and pad valves.



Index	Index		
Shut-off valv	/es		
	Series 1900	84	

# Valves and solenoid valves poppet system

Series 700	85		Series T771	100
Series T772-773	92	8	Series N776	105

# Solenoid coils



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

# Pad valves



Series PVA

110

108



Series PVV

112

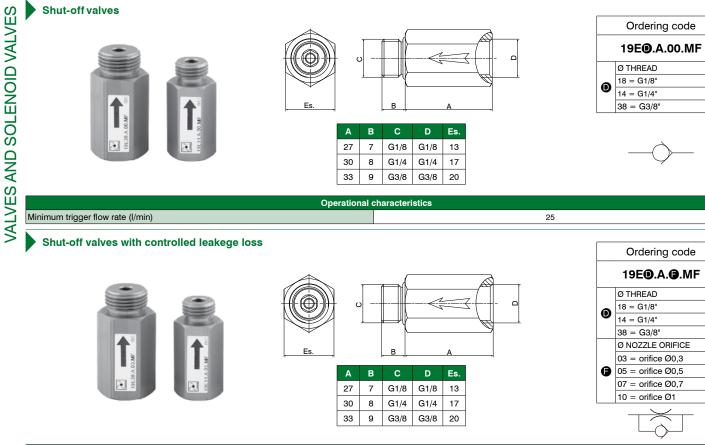
# Shut-off valves Series 1900

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 not fully adherent to it.

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.

25



**Operational characteristics** 

For electrical actuation a normal M2 microsolenoid is



# Valves and solenoid valves poppet system Series 700

Valves and solenoid valves poppet system for vacuum applications with high flow rates.

These are manufactured only in 3/2 and 2/2 versions, either normally closed or normally open.

pen. used in the case of control via air and a special M2/V microsolenoid is used when control is via vacuum.

Selection of the right type and connection to the pump requires some knowledge and skill.

# **Construction characteristics**

	G3/8"	G1/2"- G3/4"	G1"	G1 1/2"
Body	Aluminium	Zinc alloy	Aluminium	Aluminium
Actuators rod		Stainless steel		
Bottom plates		Aluminium		
Piston seals	NBR			
Springs	Stainless steel			
Poppets	NBR			
Pistons	Aluminium			

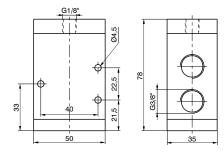
# Use and maintenance

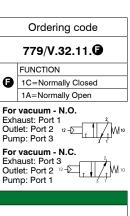
These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation inside. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. When the self feeding version is used in the solenoid valves, check that the supply flow rate is greater than or equal to that of use, otherwise switch to the version with external pilot. The ordering codes refer to solenoid valves with "M2" or "M2/V" mechanicals mounted. The solenoid coils are not included and have to be ordered separately (see summary page for solenoid coils).Certified solenoid coils are also available **Sum** 

# Series 700







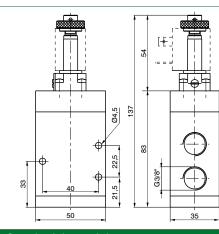


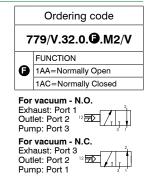
### Weight 360 g

Operational characteristics		
Fluid	Vacuum	
Minimum piloting pressure (bar)	2	
Temperature °C	-10 +70	
Orifice size (mm)	10	
Working port size	G3/8"	
Pilot port size	G1/8"	
Response time according to ISO 12238 energised (ms)	1C = 12 - 1A = 13	
Response time according to ISO 12238 de-energised (ms)	1C = 46 - 1A = 48	

# Solenoid-Spring-Self feeding







Vacuum

# Weight 420 g

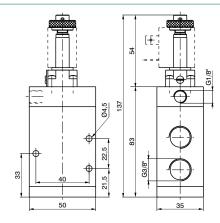
Fluid

# **Operational characteristics**

Temperature °C	-10 +50
Orifice size (mm)	10
Working port size	G3/8"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	1AC = 26 - 1AA = 16
Response time according to ISO 12238 de-energised (ms)	1AC = 9 - 1AA = 11

# Solenoid-Spring-External feeding







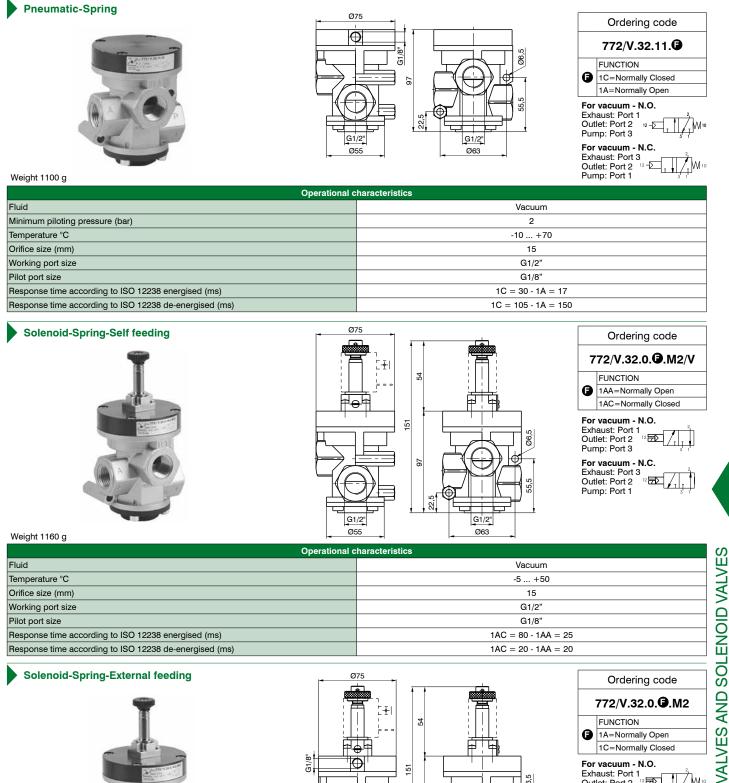
### Exhaust: Port 1 Outlet: Port 2 Pump: Port 3 Mic For vacuum - N.C.



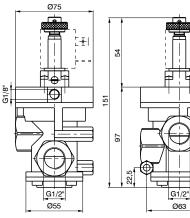
### Weight 420 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-10 +50
Orifice size (mm)	10
Working port size	G3/8"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	1C = 10 - 1A = 11
Response time according to ISO 12238 de-energised (ms)	1C = 35 - 1A = 36
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice	











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For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

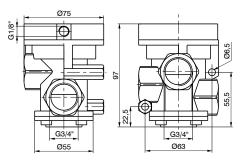
### Weight 1160 g

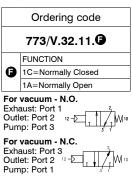
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G 1/2"
Pilot port size	G 1/8"
Response time according to ISO 12238 energised (ms)	1C = 25 - 1A = 15
Response time according to ISO 12238 de-energised (ms)	1C = 95 - 1A = 140



# **Pneumatic-Spring**





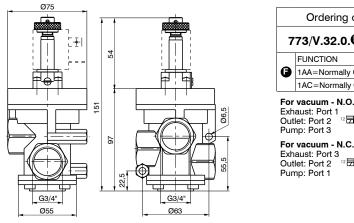


### Weight 990 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +70
Orifice size (mm)	20
Working port size	G3/4"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	1C = 30 - 1A = 17
Response time according to ISO 12238 de-energised (ms)	1C = 105 - 1A = 145

## Solenoid-Spring-Self feeding







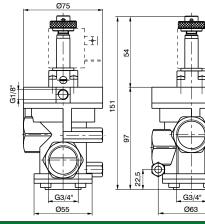
12

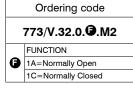
# Weight 1050 g

Vacuum
-5 +50
20
G3/4"
G1/8"
1AC = 75 - 1AA = 33
1AC = 13 - 1AA = 22

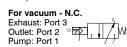
# Solenoid-Spring-External feeding







For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

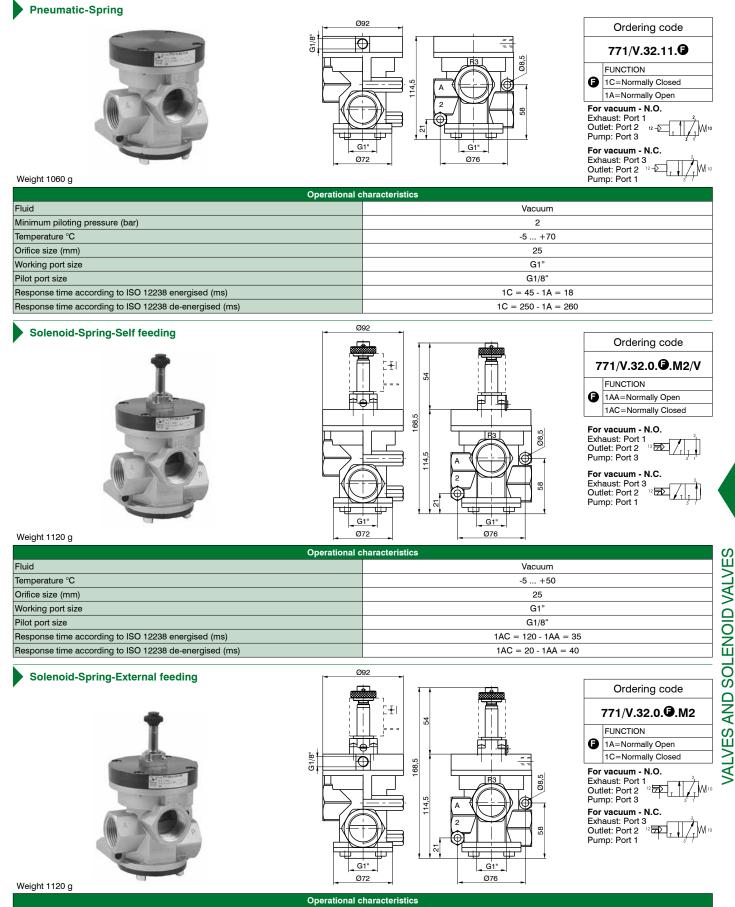


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Wainht 1000 m

weight 1050 g		
Operational characteristics		
Fluid	Vacuum	
Minimum piloting pressure (bar)	2	
Temperature °C	-5 +50	
Orifice size (mm)	20	
Working port size	G3/4"	
Pilot port size	G1/8"	
Response time according to ISO 12238 energised (ms)	1C = 25 - 1A = 13	
Response time according to ISO 12238 de-energised (ms)	1C = 95 - 1A = 140	
88 Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice		



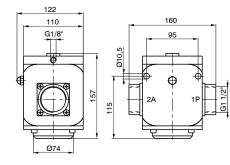


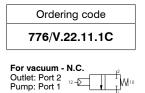
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G1"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	1C = 45 - 1A = 17
Response time according to ISO 12238 de-energised (ms)	1C = 250 - 1A = 325



# **Pneumatic-Spring**





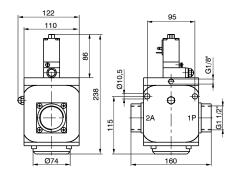


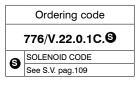
# Weight 3950 g Normally Closed

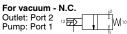
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +70
Orifice size (mm)	38
Working port size	G1 1/2"
Pilot port size	G1/8"

# Solenoid-Spring







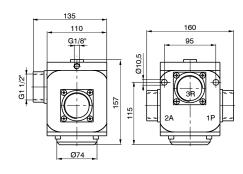


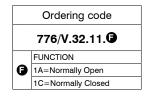
# Weight 4450 g External feeding Normally closed

	Operational characteristics	
)	Fluid	Vacuum
	Minimum piloting pressure (bar)	2
	Temperature °C	-5 +50
:	Orifice size (mm)	38
	Working port size	G1 1/2"
	Pilot port size	G1/8"

# Pneumatic-Spring

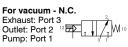






For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2¹² M 10





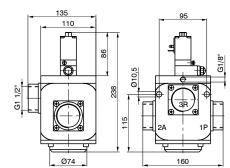
Weight 3900 g

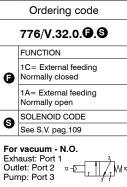
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +70
Orifice size (mm)	38
Working port size	G1 1/2"
Pilot port size	G1/8"



# Solenoid-Spring







For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2¹²-2 Pump: Port 1

Weight 4500 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	38
Working port size	G1 1/2"
Pilot port size	G 1/8"



Valves and solenoid valves poppet system Series T772-773

# Valves and solenoid valves poppet system Series T772-773

Valves and solenoid valves poppet system G1/2 "and G3/4" made of high resistance thermoplastic material.

The use of thermoplastic materials has made possible to obtain significantly reduced weights respect to the zamak version and, most importantly, a cost optimization.

The use of a rolling diaphragm in place of the traditional piston, allowed to eliminate friction and wear on the seal.

Except for the versions with an external vacuum supply and normally open self feeding vacuum. There is an additional seal provided on the piston which isolates the diaphragm connection 3 this makes it possible to improve the functionality of the valve. For versions with microsolenoid 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 MP version of the solenoid actuator requires an external air or vacuum supply. The MV version uses a self feeding vacuum.

# **Construction characteristics**

Body, operator and end cover	High resistance technopolymer
Seals and poppets	Oil resistant rubber (NBR)
Piston and shaft	Acetal resin
Springs	AISI 302 stainless steel
Diaphragm	Oil resistant rubber (NBR)



# PREUNAX

# Use and maintenance

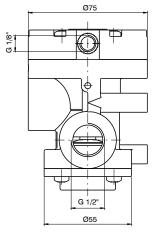
These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation inside. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. When the self feeding version is used in the solenoid valves, check that the supply flow rate is greater than or equal to that of use, otherwise switch to the version with external pilot. The ordering codes refer to solenoid valves with "MP" or "MV" mechanicals mounted. The solenoid coils are not included and have to be ordered separately (see General Catalogue, Series 300, Section 1) with the exception of the bistable versions which already have solenoid coils 24V DC (N331.0A). Certified solenoid coils are also available **CN** (see Series 300).

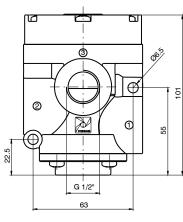


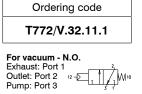
# Series T700

# **Pneumatic-Spring**









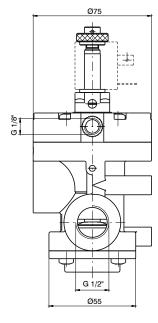
For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2 ¹² - 2 Pump: Port 1 12-12 M 10

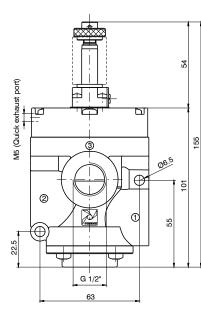
# Weight 350 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G1/2"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 50 - N.O. = 27
Response time according to ISO 12238 de-energised (ms)	N.C. = 150 - N.O. = 195

# Solenoid-Spring-Self feeding











# For vacuum - N.C.

Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

### Weight 390 g

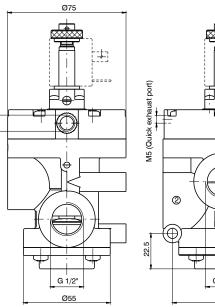
Operational characteristics	
Vacuum	
-5 +50	
15	
G1/2"	
G1/8"	
1AC = 55 - 1AA = 33	
1AC = 30 - 1AA = 38	

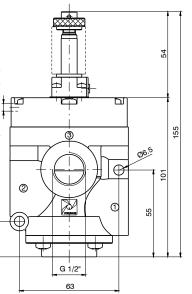


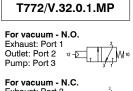
# Solenoid-Spring-External feeding



G 1/8







Ordering code

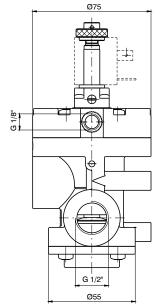
Context: Port 2 Outlet: Port 2 Pump: Port 1

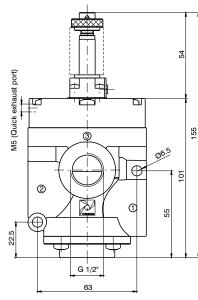
### Weight 390 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G1/2"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 42 - N.O. = 22
Response time according to ISO 12238 de-energised (ms)	N.C. = 135 - N.O. = 175

# Solenoid-Spring-Self feeding







# Ordering code T772/VS.32.0.1.MP

For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

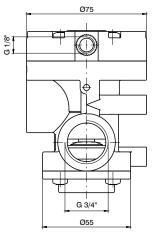
### Weight 390 g

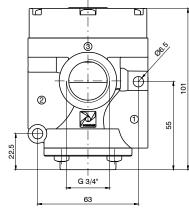
Operational characteristics	
Vacuum	
2,5	
-5 +50	
15	
G 1/2"	
G 1/8"	
= 43 - N.O. = 25	
= 37 - N.O. = 42	

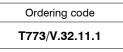


# Pneumatic-Spring









For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2

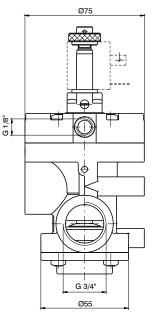
For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

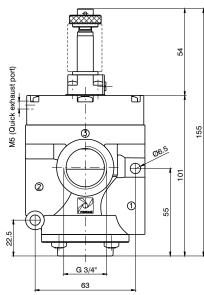
### Weight 330 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	20
Working port size	G3/4"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 28 - N.O. = 50
Response time according to ISO 12238 de-energised (ms)	N.C. = 190 - N.O. = 150

# Solenoid-Spring-Self feeding







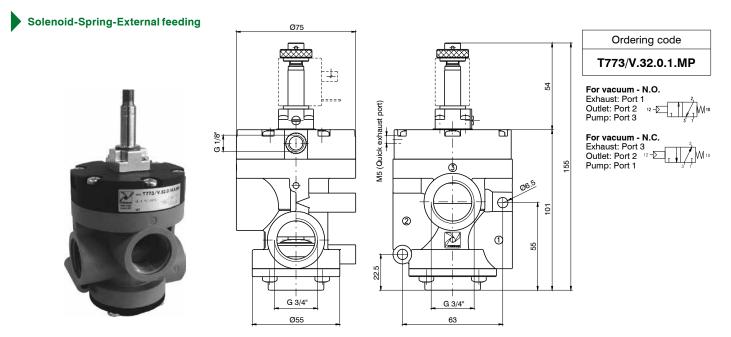
T773/V.32.0. O.MV FUNCTION O 1AA=Normally Open 1AC=Normally Closed For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1 For vacuum - N.C. Exhaust: Port 2  $\overbrace{T_{1}}^{2}$   $\overbrace{T_{1}}^{2}$   $\overbrace{T_{1}}^{2}$   $\overbrace{T_{1}}^{2}$ Pump: Port 3

Ordering code

Weight 370 g

Operational characteristics	
Fluid	Vacuum
Temperature °C	-5 +50
Orifice size (mm)	20
Working port size	G3/4"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	1AC = 35 - 1AA = 32
Response time according to ISO 12238 de-energised (ms)	1AC = 30 - 1AA = 80



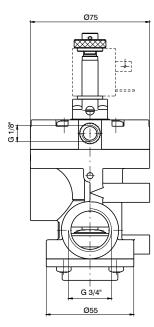


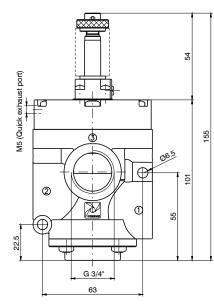
### Weight 350 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	20
Working port size	G3/4"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 25 - N.O. = 40
Response time according to ISO 12238 de-energised (ms)	N.C. = 175 - N.O. = 145

# Solenoid-Spring-External feeding with quick exhaust







# T773/VS.32.0.1.MP

Ordering code

For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

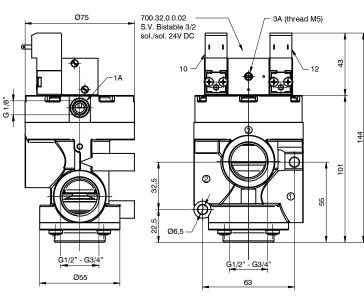
For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	20
Working port size	G3/4"
Pilot port size	G1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 25 - N.O. = 42
Response time according to ISO 12238 de-energised (ms)	N.C. = 40 - N.O. = 38



# Bistable version for vacuum G1/2"





# T772/V.32.0.1.BP For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1 $^{12} \overline{\text{Dr}_{1}} \sqrt{1} \overline{\text{dr}_{10}} \overline{\text{Dr}_{1}} \sqrt{1} \sqrt{1} \sqrt{1}$

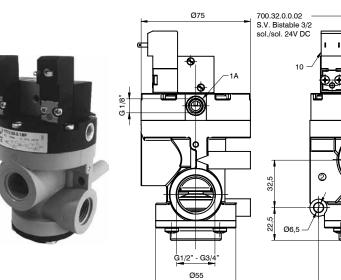
Ordering code

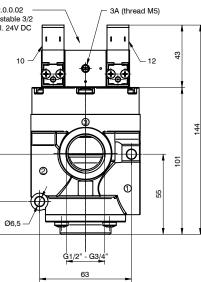
For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

# Weight 550 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G 1/2"
Pilot port size	G 1/8"

# Bistable version for vacuum G3/4"





# Ordering code

For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

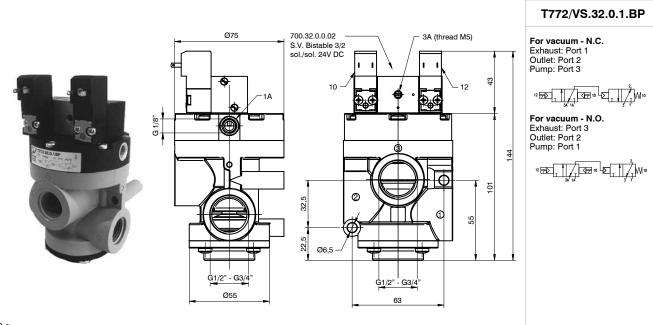
### Weight 550 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G 3/4"
Pilot port size	G 1/8"



Ordering code

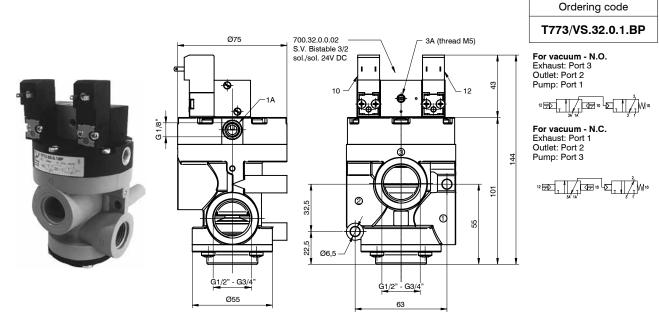
Bistable version for vacuum G1/2" with quick exhaust



### Weight 550 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G 1/2"
Pilot port size	G 1/8"

Bistable version for vacuum G3/4" with quick exhaust



### Weight 550 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	15
Working port size	G3/4"
Pilot port size	G1/8"

# Valves and solenoid valves poppet system Series T771

The series of valves and solenoid valves poppet system G1" complete the range of technopolymer valves T700 series.



Even for this version, 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 cost optimization.

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.

With the exception of the normally open (N.O.) self feeding vacuum version. In this case an additional seal is provided on the piston which isolates the diaphragm connection 3, which improves the functionality of the valve.

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 MP version of the solenoid actuator requires an external vacuum supply. The MV version uses a self feeding vacuum. Double versions are also available, equipped with a solenoid valve 3/2 Solenoid-Solenoid complete with 15mm 24V DC microactuators (code N331.0A).



# **Construction characteristics**

Body, operator and end cover	High resistance technopolymer
Seals and poppets	Oil resistant rubber (NBR)
Piston and shaft	Acetal resin
Springs	AISI 303 stainless steel
Diaphragm	Oil resistant rubber (NBR)

# Use and maintenance

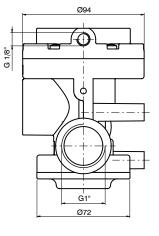
These valves and solenoid valves have an average service life of approximately 10 - 15 million cycles under optimum conditions of usage. They do not need to be lubricated to operate well, but good filtration is recommended to prevent dirt accumulation inside. Ensure that the conditions of use are consistent with the indicated limits, pressure, temperature, etc. Take care to protect the discharge outlets of the valves in the presence of dirt and powder. When the self feeding version is used in the solenoid valves, check that the supply flow rate is greater than or equal to that of use, otherwise switch to the version with external pilot. The ordering codes refer to solenoid valves with "MP" or "MV" mechanicals mounted. The solenoid coils are not included and have to be ordered separately (see General Catalogue, Series 300, Section 1) with the exception of the bistable versions which already have solenoid coils 24V DC (N331.0A). Certified solenoid coils are also available **CN** (see Series 300).

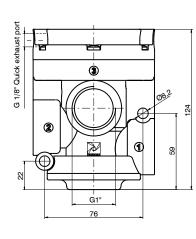


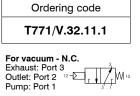
# Series T771

# Pneumatic-Spring









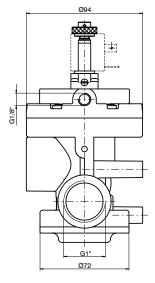
For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

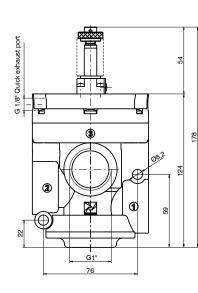
### Weight 480 g

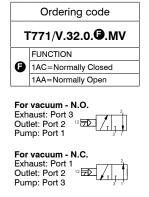
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G 1"
Pilot port size	G 1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 55 - N.O. = 19
Response time according to ISO 12238 de-energised (ms)	N.C. = 320 - N.O. = 450

# Solenoid-Spring-Self feeding







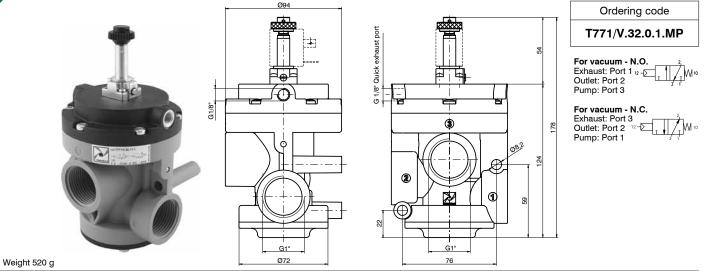


Weight 520 g

Operational characteristics	
Fluid	Vacuum
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G 1"
Pilot port size	G 1/8"
Response time according to ISO 12238 energised (ms)	1AC = 100 - 1AA = 80
Response time according to ISO 12238 de-energised (ms)	1AC = 60 - 1AA = 60



# Solenoid-Spring-External feeding



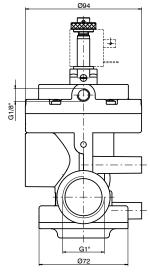
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G 1"
Pilot port size	G 1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 50 - N.O. = 19
Response time according to ISO 12238 de-energised (ms)	N.C. = 315 - N.O. = 450

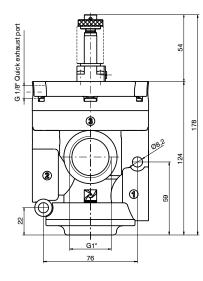
# Solenoid-Spring-External feeding with quick exhaust

# Ordering code

T771/VS.32.0.1.MP







For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

Weight 520 g

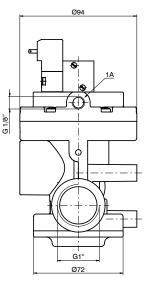
5 5	
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G 1"
Pilot port size	G 1/8"
Response time according to ISO 12238 energised (ms)	N.C. = 50 - N.O. = 19
Response time according to ISO 12238 de-energised (ms)	N.C. = 50 - N.O. = 70

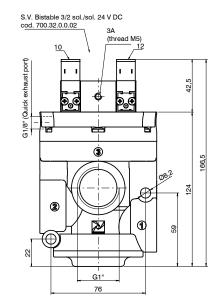


Valves and solenoid valves poppet system Series T771

### Bistable version for vacuum G1"







# Ordering code **T771/V.32.0.1.BP**

For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

Imp: Port 3

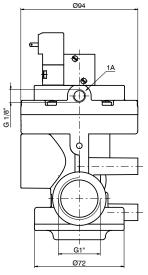
For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

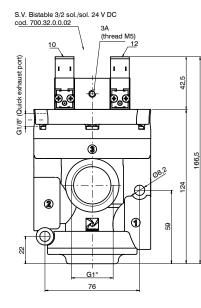
Weight 680 g

Operational characteristics	
Vacuum	
2,5	
-5 +50	
25	
G1"	
G1/8"	

### Bistable version for vacuum G1" with exhaust







# Ordering code

T771/VS.32.0.1.BP

For vacuum - N.O. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1

For vacuum - N.C. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

Weight 680 g

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2,5
Temperature °C	-5 +50
Orifice size (mm)	25
Working port size	G1"
Pilot port size	G1/8"

There is an additional seal on the piston that insulates

connection 3, making it possible to have normally open

versions and self feeding versions with vacuum.



# Valves and solenoid valves poppet system Series N776

Aluminium body, available with G1 1/2" connections, 3/2 and 2/2 N.C. and N.O. versions.

N776 valves mount rolling diaphragm in place of the traditional pistons, thus eliminating friction and wear on the seals.

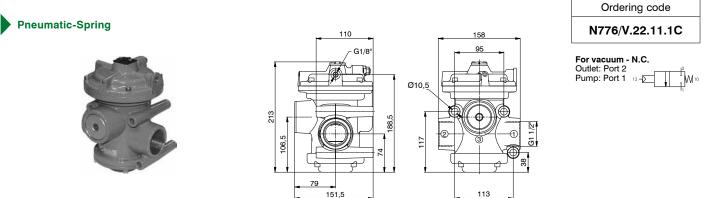
# **Construction characteristics**

Die casting aluminium
Oil resistant rubber (NBR)
Acetal resin
Stainless steel
Stainless steel
Oil resistant rubber (NBR)

# Use 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. When the self feeding version is used in the solenoid valves, check that the supply flow rate is greater than or equal to that of use, otherwise switch to the version with external pilot. The actuation mechanicals are the M3R (Mechanics CNOMO) with two position manual control. The solenoid coils are not included and have to be ordered separately (see series 300 solenoid coils MB 22mm and solenoid coils CNOMO MC 30mm). Certified solenoid coils are also available **CNOMO** (see Series 300).

# Series N776

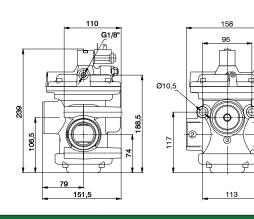


# Weight 3178 g Normally Closed

Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +70
Orifice size (mm)	38
Working port size	G1 1/2"
Pilot port size	G1/8"

# Solenoid-Spring







# Self feeding

For vacuum - N.C. Outlet: Port 2

# External feeding For vacuum - N.C. Outlet: Port 2 Pump: Port 1¹²

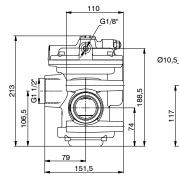
t т , М10

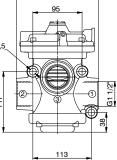
# Weight 3238 g

Vacuum
2
-5 +70
38
G1 1/2"
G1/8"

# **Pneumatic-Spring**







158

88

# Ordering code N776/V.32.11.1

For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3

For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1 M 10

# Weight 3168 g Normally Closed / Normally Open

Normany Glosed / Normany Open	
Operational characteristics	
Fluid	Vacuum
Minimum piloting pressure (bar)	2
Temperature °C	-5 +70
Orifice size (mm)	38
Working port size	G1 1/2"
Pilot port size	G 1/8"
106 Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice	



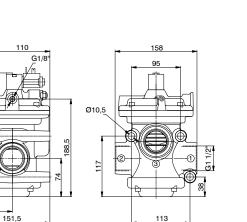
239 2

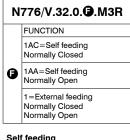
15

79

106,5

#### Solenoid-Spring





Ordering code

Vacuum technology

Catalogue

Self feeding For vacuum - N.C. Exhaust: Port 3 Outlet: Port 2 Pump: Port 1 12 20 /

Self feeding For vacuum - N.O. Exhaust: Port 1 Outlet: Port 2 Pump: Port 3 12

External feeding For vacuum - N.C. - N.O. Exhaust: Port 3 (N.C.) or 1 (N.O.) Outlet: Port 2 (N.C. and N.O.) Pump: Port 1 (N.C.) or 3 (N.O.)



Weight 3228 g

Operational characteristics						
Fluid	Vacuum					
Minimum piloting pressure (bar)	2 (external feeding version)					
Temperature °C	-5 +50					
Orifice size (mm)	38					
Working port size	G1 1/2"					
Pilot port size	G 1/8"					

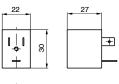


# **Solenoid coils**

#### Solenoid coils (for Series 771, 772, 773, 779, T772, T773, T771 and N776)

**Standard Version** 







Weight 52 g

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						

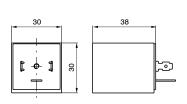
* Use only with M2/9 ** low consumption

# Version c Wus

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 H						
UMB 58	230/50-60 Alternating current 50/60 Hz						

## Solenoid coils (for Series N776)

AND DC 4W ALS SC/4801C	10
and Ce	



#### **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							

# Version C SU

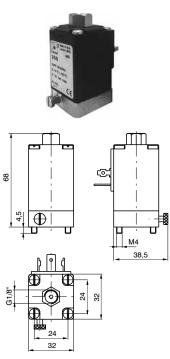
Ordering code	Available voltages							
UMC 5	24 D.C. Direct current							
UMC 56	24/50-60 Alternating current 50/60 Hz							
UMC 57	110 120/50-60 Alternating current 50/60 Hz							
UMC 58	230/50-60 Alternating current 50/60 Hz							

Weight 110 g

VALVES AND SOLENOID VALVES



## Solenoid valve (for Series 776)



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					

Versione c 🗣 us

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							
US 58	230/50-60 Alternating current 50/60 Hz						

Weight 220 g

Normally Closed (N.C.)

7,m 



# Pad valves Series PVA

Pad valves are one of the more functional and efficient solutions for intercepting fluids.



The valves are composed of a bronze body, 2 ways, 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 characteristics**

Rear eye, piston and rod bushing	Anodised aluminium					
Cylinder	Aluminium alloy anodised					
Spring	Zinc plated steel					
Pneumatic cylinder seals	NBR (FPM for variants with seals in contact with fluid in FPM or PTFE)					
Seals in contact with fluid	NBR, FPM, PTFE					
Piston rod	Chromed stainless steel					
Bushing, bushing pad, nut pad	Brass					

# **Technical characteristics**

Pneumatic cylinder fluid	Filtered air. No lubrication needed, if applied it shall be continuous
Valve fluid	Vacuum - air intake
Actuator - Maximum working pressure (bar)	10
Pad Valve - Maximum working pressure (-kPa)	101,3
Temperature °C, Non magnetic piston, NBR seals	-10 +70
Non magnetic piston, FPM seals	-10 +150
Non magnetic piston, PTFE seals	-10 +150
Magnetic piston, NBR, FPM, PTFE seals	-10 +70

F= PTFE



#### **Series PVA** Ordering code PVA.B.@.@.T.@.@ G н М "T" body version pad valve ACTING DE= Double acting ۵ SC= Normally closed SA= Normally open Δ PISTON N= Non magnetic ш M= Magnetic CONNECTIONS O A= G1/4" ∢ B= G3/8" C= G1/2" • D= G3/4" E= G1" F= G1 1/4" ш G= G1 1/2" H= G2" N SEALS N= NBR ۵ V= FPM F

	Table of dimensions											Technical data					
	Non	magr	netic	Mag	netic p	licton									Actuator (Ø)	Valvola (Ø)	Peso (g)
		piston		wayi	ielic p	iston									40	13,5	350
Connection (N)	Α	С	D	Α	С	D	В	Е	F	G	н	L	М	Ρ	40	13,5	350
G1/4	93,5	77,5	41	97,5	81,5	45	16	10,25		32,5	28,5	64	47	25	40	15	400
G3/8	93,5	77,5	41	97,5	81,5	45	16	10,25		32,5	28,5	64	47	25	63	20,5	850
G1/2	93,5	78	41	99,5	82	45	17,5	10,25		32,5	28,5	68	47	30	63	25	1100
G3/4	105	83	41	113	90	48	22	11,25	G1/8	44	40	79	70	36	63	30	1400
G1	117	89	41	125	101	53	28	11,25	G1/8	44	40	94	70	44	80	38	2100
G1 1/4	131	103	48	136	108	53	28	11,25		44	40	110	70	55	80	49,5	3000
G1 1/2	154	118	57	166	130	69	36	13,75		56	49	120	90	60			
G2	169	124	57	181	136	69	45	13,75		56	49	140	90	73			

2-way valves, for interception of fluids, pneumatically actuated by a compact double or single acting cylinder with 360° swivel connections, NBR, FPM or PTFE seals in contact with the fluid. The barrel profile allows the use of magnetic sensors PNEUMAX code "1500._", "RS._", "RS._", "HS._", for sensor slot type "A" (see section 3, magnetic sensors series "SA" of the Pneumax General Catalogue).



# Pad valves Series PVV

The PVV series vacuum valves are one of the most functional and efficient solutions for vacuum control, specifically designed for applications where large suction capacities is required. Thanks to the vacuum breaker function they are particularly suitable for handling applications.



The valves are made for the 3 ways body in aluminum or bronze and at the top a double-acting compact cylinder for actuation.

# **Construction characteristics**

Valve body	G2" - Anodised aluminium
Seals	NBR
Valve drain filter	Steel/Paper
Cylinder support	Anodised aluminium alloy
Cylinder	Anodised aluminium alloy
Cylinder seals	NBR
Cylinder piston rod material	C43 chromed

# **Operational characteristics**

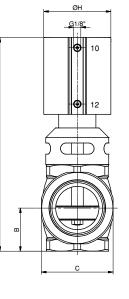
Valve fluid	Vacuum		
Orifice size	ø DN see the table		
Temperature	-5°C +70°C		
Working pressure (-kPa) 101,3			
Cylinder fluid	Compressed air filtered and non lu	bricated, if lubricated must be continuos	
Cylinder bore	G2" =	= ø 63 mm	
	G2-1/2" - G3" - G4" = ø 80 mm		
Working pressure (bar)	2 6		
	1500		
	RS		
The lines profile of the ordinder ellows use of magnetic concers.	HS		
The liner profile of the cylinder allows use of magnetic sensors:	1580	With adapter 1580.01F	
	MRS	With adapter 1580.01F	
	MHS	With adapter 1580.01F	

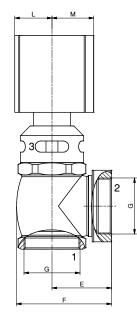


# **Series PVV**









	Ordering code			
PV	PVV.@.DE.@.L.@.N.@			
	BODY MATERIAL			
0	A = Aluminium			
	B = Bronze			
	PISTON			
0	N = Non magnetic			
	M = Magnetic			
	CONNECTION			
	H = G 2"			
Θ	L = G 2"1/2			
	M = G 3"			
	N = G 4"			
	EXHAUST			
6	F = Silenced			
	L = Free			

Table of dimensions										
Size	Α	В	С	DN	E	F	G	Н	L	М
G2"	175	52,5	93	42	72	119	G2"	70	40	44
G2"1/2	290	58	96	50	80	128	G2"1/2	90	50	56
G3"	335	68	96	50	87	142	G3"	90	50	56
G4"	365	83	135	66	102	170	G4"	90	50	56

Slot for sensors

2-way valves to control 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 characteristics				
Body valve	G 2" - Anodised aluminium			
	G 2"1/2 - G 3" - G 4" - Bronze			
Spool support	Anodised aluminium			
Shutter washers	Anodised aluminium			
Seals	NBR			
Filter	Steel/Paper			
Cylinder support	Anodised aluminium			
Body cylinder	Anodised aluminium			
Rear end cap	Anodised aluminium			
Piston	Anodised aluminium			
Rod cylinder	C43 chromed			
Cylinder connections	Orientable			
Screws	Zinc plated steel			

Operational characteristics				
Valve fluid	Vacuum			
Outlet diameter	Ø DN (see the table)			
Exhaust diameter	Ø DS (see the table)			
Temperature	-5°C +70°C			
Fluid cylinder	Air filtered (if lubricated must be continuous)			
Bore cylinder	G2 - Ø63 G2 ½ - G3 - G4 - Ø80			
Pressure cylinder	2 6 bar			
Available sensors	"1500" - "1580*" - "MRS*" - "MHS*" (* with adapter code 1580.01F)			



# REGULATORS

The Pneumax range of regulators include high precision manual regulators and electronic proportional pressure regulators air-vacuum or vacuum-vacuum versions, available in 3 sizes with flow rates of 7; 1.100 or 4.000 NI/min.







Series 1700

115

117

# **Proportional regulators**



**Series 1900** Air-vacuum versions



Series 1900 Vacuum-vacuum version 122



# Manual regulator Series 1700

Vacuum degree regulation for applications requiring high stability and accuracy.



It have the function of regulating the negative vacuum pressure, keeping it stable at set value regardless of flow and variations in the degree of vacuum in the primary network. The units are of a double diaphragm construction and have been designed to exploit to their advantage any existing pressure differential between the

**Regulator for vacuum** 

secondary depression and atmospheric pressure. The degree of vacuum is obtained by rotating the adjusting knob, rotating it clockwise to increase the amount of vacuum and anti clockwise to decrease it. They are used in all centralized systems where regardless of the vacuum in the main network a lower vacuum level is required for other applications.

#### Ordering code M30x1.5 171S2B000V 5 121,3 φ φ G1/4 G1/4' G1/8' 74.3 G1/8" 265 35 REGULATORS Example: 171S2B000V Regulator for vacuum G1/4" 80 70 70 Adjustment characteristic 60 (-kPa) 60 50 Flow rate chart (+Pa) 05 (-/acmin 40 40 acuum 30 30 Regulated 20 20 10 0 40 45 50 55 60 65 70 80 80 100 120 140 160 180 Flow rate (NI/min) Input va uum (-kPa) **Construction characteristics Technical characteristics** Connections G1/4" Precision in keeping the set pressure value. 101 Max. working pressure (-kPa) Sensitivity combined with high flow rate of the downstream overpressure Working temperature °C -5 ... +50 discharge valve. High flow rate with very low pressure drop. Pressure gauge connections G1/8" Setting knob can be locked using pressure into the desired position. Weight (g) 400 Body made of light alloy. Mounting position indifferent Two attachments for vacuum gauge with a cap equipped with a gasket. Ring nut for panel mounting. Max. fitting torque (Nm) 25 Once the reducer has been placed under vacuum, air intake through the appropriate Fluid Filtered air 20 µm orifice. Diameter of panel mounting orifice (mm) 30



# Proportional regulators Series 1900

Electronic proportional pressure regulator with closed Loop. Air-vacuum and vacuum-vacuum versions.

Modern industrial applications require increasingly high performances from their pneumatic components. For example, the speed and thrust of a pneumatic cylinder, or the torque of a rotary actuator may need to be varied. These parameters often need to be modified dynamically while an operation is running.

This solution can be obtained by employing a proportional pressure regulator Series 1700 available in 3 sizes with flow rates of 7; 1.100 or 4.000 NI/min.

The model that manage the positive pressure that controls a vacuum generator and the negative pressure are then added to this range.

# **Application fields**

Typical applications will include the necessity to dynamically control the force of an actuator, be it thrust or torque or the degree of vacuum. Examples include: closing systems, painting systems, tensioning systems, packaging systems, pneumatic braking systems, force control for welding grippers, thickness compensation systems, balancing systems, laser cutting, pressure transducers for the control of modulating valves, test benches for system testing, force control for buffers on polishers, management of force exerted by suction cups in handling applications and management of the force exerted by the vacuum in the autoclaves.

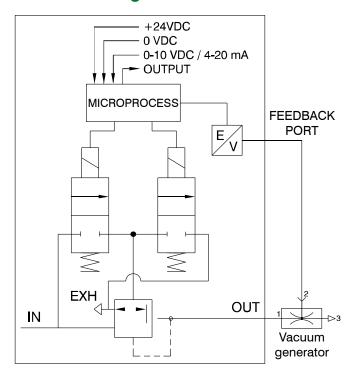
Regulators Series 1900

# Series 1900 air-vacuum version

# **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.

# **Functional diagram**

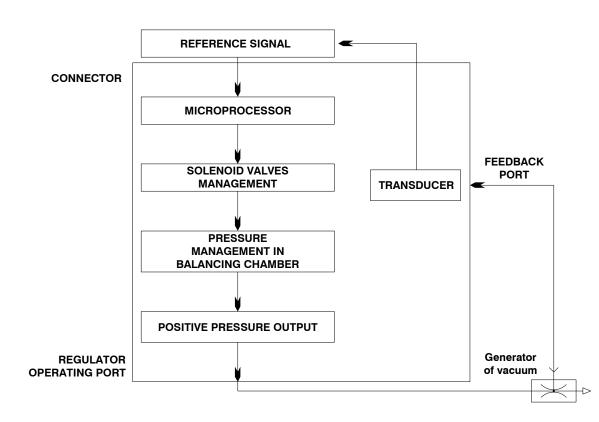


Vacuum technology

Catalogue

# **CLOSED LOOP diagram (internal control circuit)**

The proportional regulator is known as a CLOSED LOOP regulator because a pressure transducer in the circuit transmits a continuous analog signal to the microprocessor, which compares the reference value with the detected value and supplies the control solenoid values accordingly.





#### CHARACTERISTICS

Pneumatic				
Fluid	5 micron filtered and dehumidified air			
Input minimum pressure	As a fu	As a function of the type of vacuum generator		
Input max pressure		10 bar		
Output pressure		0 9 bar		
Nominal flow rate from 1 to 2	Size 0	Size 1	Size 3	
(6 bar Δp 1 bar)	7 NI/min	1.100 NI/min	4.000 NI/min	
Discharge flow rate (at 6 bar with overpressure of 1 bar)	7 NI/min	1.300 NI/min	4.500 NI/min	
Air consumption	< 1 NI/min	< 1 NI/min	< 1 NI/min	
Supply connection	M5	G1/4	G1/2	
Service connection	M5	G1/4	G1/2	
Discharge connection	Ø1,8	G1/8	G3/8	
Maximum tightening torque for connections	3 Nm	15 Nm	15 Nm	

Electric				
Supply voltage		24 VDC $\pm$ 10% (stabilized with ripple<1%)		
Current consumption in standby		70 mA		
Current consumption with actuated S	S.V.	400 mA		
**Reference signal Voltage Current	*0 10 V *0 5 V *1 5 V			
	Current	*4 20 mA *0 20 mA		
**Innut impedance	Voltage	10 kΩ		
**Input impedance	Current	250 Ω		
**Digital inputs		24 VDC ± 10%		
**Digital output		24 VDC PNP (max current 50 mA)		

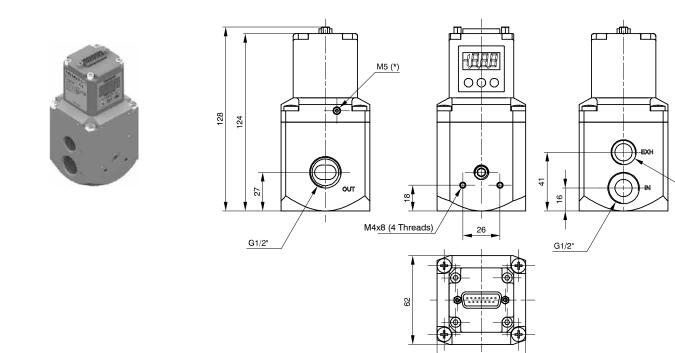
Functional				
Linearity	± Insensitivity			
Hysteresis	± Insensitivity			
Repeatability	± Insensitivity			
Sensitivity	0,01 bar			
Assembly position	Indifferent			
IP Rating	IP65 (with casing fitted)			
Ambient temperature	-5°C 50°C / 23°F 122°F			

Constructional				
Body	Anodised aluminum			
Shutters	Brass with vulcanised NBR			
Diaphragm	Cloth-covered rubber			
Seals	NBR			
Cover for electrical part	Technopolymer			
Springs	AISI 302			
W/-:	Size 0	Size 1	Size 3	
Weight	168 g	360 g	850 g	

* Selectable by keyboard or by RS-232 ** Valid only for devices with analog input

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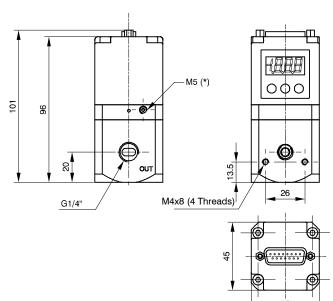
* EXTERNAL FEEDBACK INPUT CONNECTION

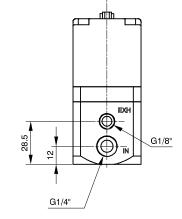


## SIZE 3

* EXTERNAL FEEDBACK INPUT CONNECTION





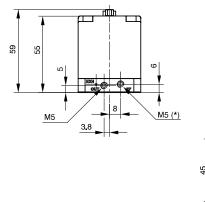


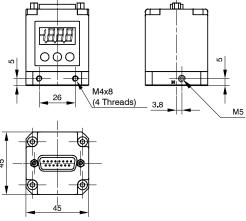
# SIZE 1

SIZE 0

* EXTERNAL FEEDBACK INPUT CONNECTION









G3/8"

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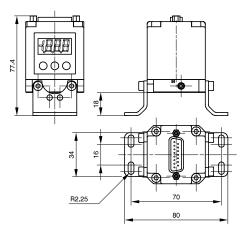


## **Mounting options**

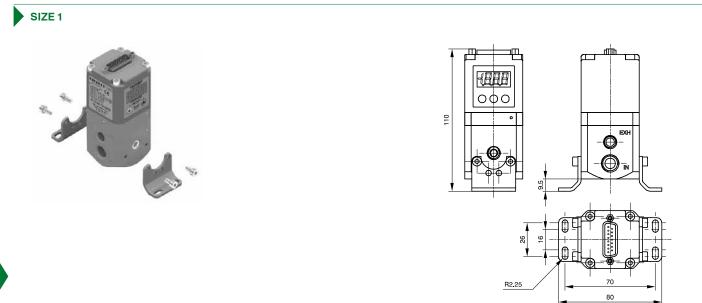
In addition to the possibility of fastening it directly to the wall using the M4 apertures present on the body, there is also the option of using the fastening bracket code 170M5 as can be seen in the figures shown below.





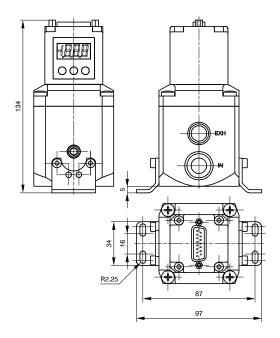


* EXTERNAL FEEDBACK INPUT CONNECTION



* EXTERNAL FEEDBACK INPUT CONNECTION





* EXTERNAL FEEDBACK INPUT CONNECTION



#### Installation/ Operation



# PNEUMATIC CONNECTION

The compressed air is connected by means of M5 threaded holes (for size 0 regulators), G 1/4" threaded holes (for size 1 regulators) and G 1/2" threaded holes (for size 3 regulators) on the body.

Before making the connections, eliminate any impurities in the connecting pipes to prevent chippings or dust entering the unit. Do not supply the circuit with more than 10 bar pressure and make sure that the compressed air is dried (excessive condensate could cause the appliance to malfunction) and filtered at 5 micron. The minimum supply pressure required depends on the characteristics of the vacuum generator.

If a silencer is applied to the discharge path the unit response time may change; periodically check that the silencer is not blocked and replace it if necessary.



# ELECTRICAL CONNECTION

For the electrical connection a SUB-D 15-pole female is used. Wire in accordance with the wiring diagram shown below. Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE



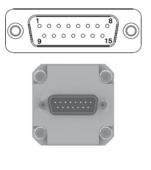
# NOTES ON OPERATION

If the electric supply is interrupted, the outlet pressure is maintained at the set value. However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves.

In order to discharge the circuit downstream, zero the reference, make sure that the display shows a pressure value equal to zero and then disconnect the electric power supply.

A version of the device is available that exhausts the downstream circuit when the power supply is removed. (Option "A" at the end of the ordering code). If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the reference signal being sent. In this case the system will intervene to interrupt the control of the solenoid valves. Every twenty seconds, the unit will start the reset procedure until standard operating conditions have been restored.

### TOP VIEW OF THE REGULATOR CONNECTOR



	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**

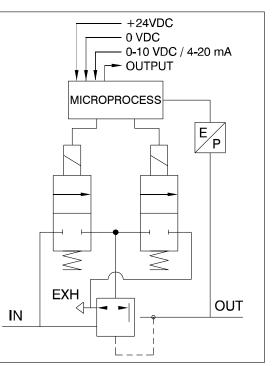


# Series 1900 vacuum-vacuum version

# Product description

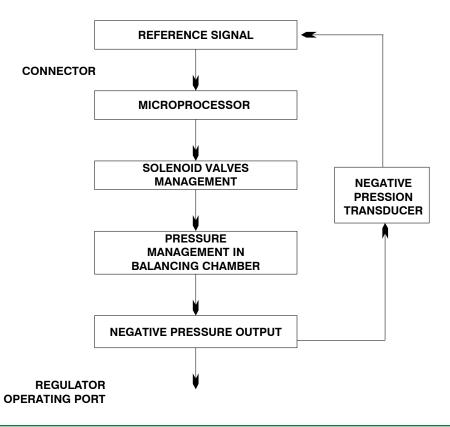
The connections of the regulator require the aperture for supply and discharge to be on one side and the aperture for use on the opposite side. On the other two remaining sides there are apertures of G1/8" that are plugged with removable plugs, however it is possible to connect a vacuum gauge or vacuum sampling for an additional remote vacuum switch. The control solenoid valves, the negative pressure sensor and the management electronics are located in the upper part of the regulator. The regulator is available in only one size, 1, with flow rate 170 l/min and the possibility to select commands: Voltage (T) Current (C).

# **Functional diagram**



# **CLOSED LOOP diagram (internal control circuit)**

The proportional regulator is known as a CLOSED LOOP regulator because a pressure transducer in the circuit transmits a continuous analog signal to the microprocessor, which compares the reference value with the detected value and supplies the control solenoid valves accordingly.







Pneumatic				
Fluid	5 micron filtered, without oil and dehumidified air			
Input minimum pressure	-10 kPa			
Input max pressure	-101 kPa			
Adjustment range	-1090 kPa			
Flow rate	170 l/min			
Air consumption	< 1 NI/min			
Supply connection	G 1/4			
Service connection	G 1/4			
Discharge connection	G 1/8			
Maximum tightening torque for connections	15 Nm			

Electric				
Supply voltage		24 VDC $\pm$ 10% (stabilized with ripple<1%)		
Current consumption in standby		70 mA		
Current consumption with actuated S	.V.	400 mA		
**Reference Signal		*0 10 V *0 5 V *1 5 V		
	Current	*4 20 mA *0 20 mA		
**Innut impedance	Voltage	10 kΩ		
**Input impedance	Current	250 Ω		
**Digital inputs		24 VDC ± 10%		
**Digital output		24 VDC PNP (max current 50 mA)		

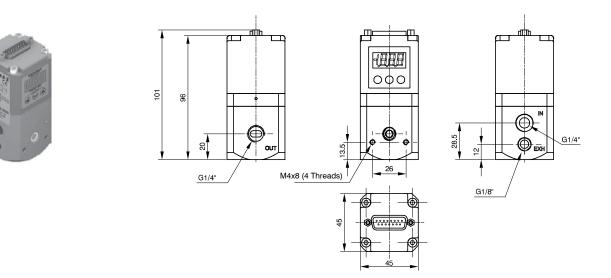
Functional					
Linearity -3 kPa					
Hysteresis	-3 kPa				
Repeatability	-3 kPa				
Sensitivity	-1 kPa				
Assembly position	Indifferent				
IP Rating	IP65 (with casing fitted)				
Ambient temperature	-5°C 50°C / 23°F 122°F				

Constructional				
Body Anodised aluminum				
Shutters Brass with vulcanised NBR				
Diaphragm	Cloth-covered rubber			
Seals	NBR			
Cover for electrical part	Technopolymer			
Springs	AISI 302			
Weight	Size 1			
	360 g			

* Selectable by keyboard or by RS-232 ** Valid only for devices with analog input



SIZE 1

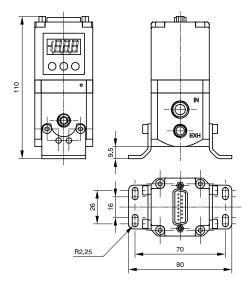


#### **Mounting options**

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.







# Vacuum technology Catalogue



#### Installation/ Operation



# PNEUMATIC CONNECTION

G 1/4 threaded holes provide for the pneumatic connection in the body of the vaccum generator. Before connecting the pipes, remove any debris, in order to prevent chippings or dust from entering the unit. It is recommended to properly check that the suction air is filtered to 5 microns. The negative minimum supply pressure required depends on the features of the vacuum generator. If a silencer is connected to the discharge port, the response time of the unit may vary; it is recommended to periodically check

that the silencer is not clogged or to replace it, if necessary.



# **ELECTRICAL CONNECTION**

For the electrical connection a SUB-D 15-pole female is used. Wire in accordance with the wiring diagram shown below. Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE



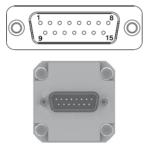
# NOTES ON OPERATION

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 (-0.10 kPa Max), and then cut off the electrical power supply.

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.

#### TOP VIEW OF THE REGULATOR CONNECTOR



	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**



# 191E2N._.D.0000.V

MANAGEMENT

- C = Current signal (4-20 mA / 0-20 mA)
- T = Voltage signal (0-10 V / 0-5 V / 1-5 V)



#### PRESSURE RANGE 0000 = from 10 to 90 -kPa

# Sign Straight connector 5300.F15.00.00 Straight connector + Casing IP65 * 5300.F15.00.03 Straight connector + Cable 3 meters 5300.F15.00.05 Straight connector + Cable 5 meters 5300.F15.00.00 Connector 90° + Casing IP65 * 5300.F15.90.03 Connector 90° + Cable 3 meters 5300.F15.90.03 Connector 90° + Cable 3 meters 5300.F15.90.05 Connector 90° + Cable 5 meters

* Without cable

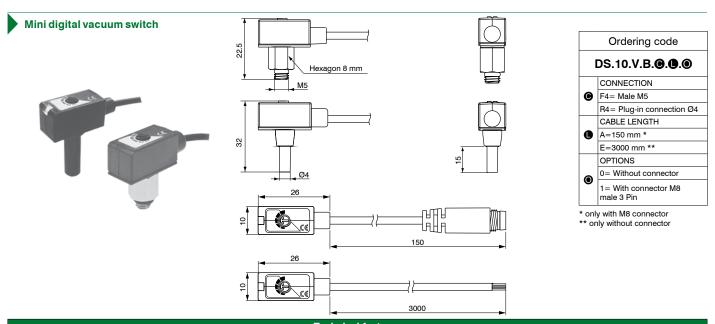


PREUMAX

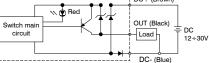
# **ACCESSORIES AND INSTRUMENTS**

Vacuum switch, vacuum gauge, silencers and ilters

# **Series DS**



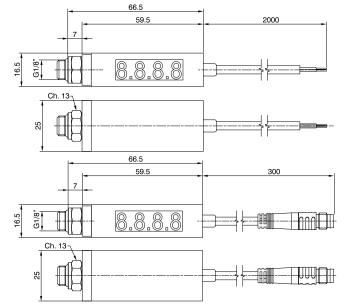
Technical features							
Working pressure range		0100.0kPa					
Regulation pressure range		0100.0kPa					
Maximum supported pressure		600 kPa					
Allowed fluids		Air, non-corrosive gases, non-combustible gases					
Supply voltage		From 12 to 30 VDC ±10%					
Current consumption		≤ 10 mA					
Digital output		PNP N.O. 1 outputs Maximum load current: 80 mA Maximum supply voltage: 30 VDC Voltage drop: ≤0.8V					
Repeatability (Digital output)		± 1% Full Scale					
Distribution in the	Type of hysteresis	Fixed					
Digital output	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)					
	IP Rating	IP40					
	Ambient temperature	Operational: 0°C 60°C, Storage: -20°C 70°C (without ice or condensation)					
Ingress protection rating	Ambient humidity	Operational/Storage: 35 85% (without condensation)					
	Vibration	Total amplitude 1.5 mm, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and 2					
	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°C 50°C					
Type of connection Male M5x0.8, Plug-in connection Ø4		Male M5x0.8, Plug-in connection Ø4					
Electrical cable		Oilproof cable, 3 wires (0.18mm ² ), Ø2.6 mm					
Weight		Approximately 50 g (with 3 metres of cable)					
Output circuit wiring sch	Swit	tch main irrcuit Load T 10: 20/					

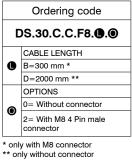




## Digital vacuum switch

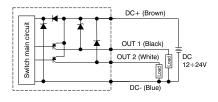






		Technical features				
Working pressure range		-100.0 100.0 kPa				
Regulation pressure range		-100.0 100.0 kPa				
Maximum supported pressure		300 kPa				
Allowed fluids		Air, non-corrosive gases, non-combustible gases				
kPa		Air, non-contosive gases, non-compusible gases				
	2 kgf/cm ²	0.001				
		0.001				
	bar psi					
Pressure calibration sensitivity		0.01				
	InHg	0.1				
	mmHg	1				
<b>0</b>	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: 80 mA Maximum supply voltage: 30 VDC Voltage drop: ≤1V				
Repeatability (Digital output)		± 0.2% Full Scale ± 1 digit				
D'allaha ka k	Type of hysteresis	Fixed				
Digital output	Hysteresis	0.003 bar				
Response time		≤2,5 ms (anti-interference function: 24 ms, 192 ms and 768 ms selectable)				
Protection from short circuit at o	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)				
	IP Rating	IP40				
	Ambient temperature	Operational: 0 50°C, Storage: -20°C 60°C (without ice or condensation)				
	Ambient humidity	Operational/Storage: 35 85% (without condensation)				
Ingress protection rating	Supported voltage	1000 VAC in 1-min. (between body and cable)				
	Insulation resistance	50M $\Omega$ min. (at 500VDC, between body and cable)				
	Vibration	Total amplitude 1.5 mm. or 10 G, 10 Hz - 55Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z				
	Impacts/shocks	980 m/s ² (100G), 3 times in each direction of X, Y and Z				
Temperature characteristics		±2% Full Scale in a range between 0°C 50°C				
Type of connection		G1/8 (Swivel)				
Electrical cable		Oil resistant cable				
Weight		Approximately 67 g (with 2 metres of cable)				

#### Output circuit wiring scheme





## Panel-mounted digital vacuum switch

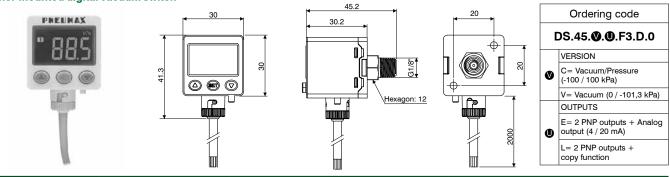
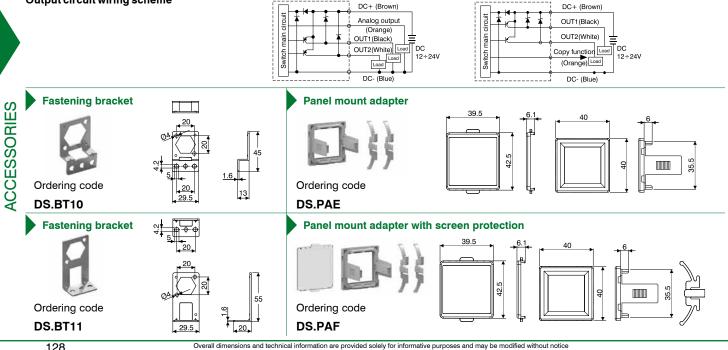


Image: Provide and a set of the	Technical features							
Regulation pressure range         -100.0 m. 100.0 kPa         0100.0 kPa           Maximum supported pressure         300 kPa         300 kPa           Allowed fluids         Air, non-corrosive gases, non-combustible gases         0.1           Allowed fluids         0.1         0.001           bar         0.001         0.001           bar         0.001         0.001           Supply voltage         0.01         0.01           Current consumption         40 m. 4(wthout load)         0.01           Supply voltage         40 m. 4(wthout load)         0.01           Digital output         Yes         40 m. 4(wthout load)           Digital output         Type of hysteresis         Setable           Potection from short circuit at output         Type of hysteresis         Setable           Potection from short circuit at output         Present         2.5 ms (anti-interference function: Sns, 100 ms, 250 ms, 500 ms, 500 ms and 150 ms selectable)           Indicator precision         1/2 else fs. 1/2 fight (red/green)         1/2 else fs. 1/2 fight (red/green)           Indicator precision         1/2 else fs. 1/2 fight (red/green)         1/2 else fs.			DS.45.C. <b>0</b> .F3.D.0 (Composite) DS.45.V. <b>0</b> .F3.D.0 (Vacuum)					
Maximum supported pressure         300 kPa           Allowed fluids         Air, non-corrosive gases, non-combustible gases           Allowed fluids         0.1           Pressure calibration sensitivity         2 kg/cm ² Dear         0.001           supply voltage         0.01           Current consumption         0.01           Supply voltage         From 12 to 24 VDC           Current consumption         Supply voltage           Digital output         PPP N0.2 outputs           Repeatability (Digital output)         PPP N0.2 curputs           Repeatability (Digital output)         2.2% Full Scale ± 1 digit           Digital output         Type of hysteresis         Settable           Digital output         From curvet is to 0.000 har         Present           Digital output         Settable         Present           Digital output         Curvet is to 0.000 har         Present           Digital output         Curvet is to 0.000 har         Present           Digital output         Curvet is to 0.000 har <td>Working pressure range</td> <td></td> <td>-100.0 100.0 kPa</td> <td>0100.0 kPa</td>	Working pressure range		-100.0 100.0 kPa	0100.0 kPa				
Allowed fluids         Air, non-corrosive gases, non-combustible gases           Allowed fluids         0.1           2 kgf.cm ⁻¹ 0.01           bar         0.001           bar         0.001           bar         0.001           psi         0.001           InHg         0.01           Supply voltage         From 12 to 24 VDC           Current consumption         <40 mA (without load)	Regulation pressure range		-100.0 100.0 kPa	0100.0 kPa				
KPa         0.1           2 kgf(cm ² )         0.001           bar         0.001           psi         0.001           InHg         0.01           Supply voltage         0.01           Current consumption         ≤40 mA (without load)           Digital output         PPN N.2. 2 outputs           Repeatability (Digital output)         Type of hysteresis           Gesponse time         Set 25,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 100 ms and 1500 ms selectable)           Protection from short circuit at output         Type of hysteresis           Maximum load current: 12 form 0.001 to 0.068 bar           Response time         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 1000 ms and 1500 ms 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 precision         ±2% F.S. ±1 digit           Indicator precision         12% form 0.000 kar 12 V or 0.000 supply at 24 V Minimum load resistance: 500           Analog output         Insert temperature           Ingress protection rating         IPA fait gesponse: 1000 VAC in timin. (between body and cable)           Insult oresistance:         1000 VAC in timin. (between	Maximum supported pressure		300	kPa				
Pressure calibration sensitivity         2 kgf(cm ³ )         0.001           bar         0.001           bar         0.001           psi         0.001           lnHg         0.01           Supply voltage         From 12 to 24 VDC           Current consumption         ≤40 mA (without load)           PMP NO. 2 outputs         Maximum supply voltage; 24 VDC           Output         Type of hysteresis           Bigital output         1 ± 0.2% Full Scale ± 1 digit           Voltage drop; ± 1.5V         Settable           Bigital output         Type of hysteresis           Hysteresis         ffrom 0.001 to 0.006 bar           Response time         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Display With 3 1/2 digits (red/green)           Indicator         £2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Present           Display         Display With 3 1/2 digits (red/green)           Indicator         LED orange (output)           Analog output         Output current 4 20 m ± 2.5% F. S. Linearity: ± 1% F. S.           Ingress protection rating         IP Rating <td>Allowed fluids</td> <td></td> <td>Air, non-corrosive gases</td> <td>non-combustible gases</td>	Allowed fluids		Air, non-corrosive gases	non-combustible gases				
Pressure calibration sensitivity         bar         0.001           psi         0.01         0.01           Supply voltage         0.01         0.01           Supply voltage         From 12 to 24 VDC         0.01           Current consumption         ≤ 40 mA (without load)         PN N.0.2 outputs           Digital output         PN N.0.2 outputs         Maximum supply voltage: 24 VDC           Supply voltage torus         Voltage torus         Voltage torus           Bepeatability (Digital output)         Type of hysteresis         Settable           Digital output         Type of hysteresis         Settable           Protection from short circuit at output         Free function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Settable         Settable           Display         Display with 31 (2 digits (ed/green)         ±2% F. S. ±1 digit           Indicator precision         ±2% F. S. ±1 digits (ed/green)         ±2% F. S.           Indicator precision         100 uptu errent: 4		kPa	0.1					
psi         0.01           InHg         0.1           Supply voltage         0.1           Current consumption         ≤ 40 mA (without load)           Digital output         Maximum load current: 125 mA Maximum load current: 125 mA Maximum supply voltage: 24 VDC           Digital output         Type of hysteresis           Biggital output         ± 0.2% Full Scale ± 1 digit           Digital output         Type of hysteresis           Hysteresis         Settable           Hysteresis         from 0.001 to .008 bar           Response time         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Present           Display with 3 1/2 digits (red/green)         ±2% F. S. ±1 digit           Indicator         LED orange (output)! LED orange (output)! LED orange (output)!           Analog output         Maximum load resistance: 500           Ingress protection rating         IPB Fis           Ambient temperature         Operationsi: 0°C 50°C, Storage: -10°C 60°C (without core condensation)           Ambient temperature         Operationsi: 0°C 50°C, Storage: -10°C 60°C (without condensation)           Ingress protection rating         IPB Fis           Ambient temperature         Operationsi: 0°C 50°C, Stora		2 kgf/cm ²	0.001					
InHg         0.1           Supply voltage         From 12 to 24 VDC           Current consumption         ≤ 40 mK (without load)           Digital output         PNP N.O. 2 outputs Maximum load current: 125 mA Maximum load current: 125 mA Maximum supply voltage: 24 VDC Voltage drop: 51.5V           Repeatability (Digital output)         ± 0.2% Full Scale ± 1 digit           Digital output         Type of hysteresis           Maximum supply voltage: 24 VDC Voltage drop: 51.5V           Response time         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Present           Display         Display with 31 /2 digit (red/green)           Indicator precision         ± 2% F. S. ± 1 digit           Indicator precision         Line arity: ±1% F. S.           Analog output         Infinitium load resistance: 500           Maximum load resistance: 500         Curperational: 0°C	Pressure calibration sensitivity	bar	0.0	01				
Supply voltage         From 12 to 24 VDC           Current consumption         ≤40 mA (without load)           Digital output         PNP N.O.2 outputs           Maximum load current: 125 mA Maximum load current: 125 mA Maximum load current: 125 mA Maximum load current: 125 mA Maximum load current: 125 mA           Digital output         Type of hysteresis           Digital output         Type of hysteresis           PNP N.O.2000 bar         Settable           Protection from short circuit at output         Settable           Display         Settable           Display         Display with 3.1/2 digits (red/green)           Indicator precision         ±2% F. S. 1.1 digit           Indicator precision         LED orange (output)           Analog output         UP Resent           Analog output         Output current 4 20 m # ±2.5% F. S.           Maximum load resistance: 500 supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 500           Ingress protection rating         IP Rating           Ambient temperature         Operation/Storage: 3 65% (without cord condensation)           Ambient humidity         Operation/Storage: 10°C 60°C (without could on 20.4)           Supported voltage         1000 VAC in 11mi, lettween body and cable)           Insulation resistance         50MAQ (at 500 VDC, between body and cable)		psi	0.0	01				
Current consumption         ≤40 mA (without load)           PNP N.O. 2 outputs         PNP N.O. 2 outputs           Digital output         Maximum load current: 125 mA Maximum load set 1 digit           Digital output         Type of hysteresis Hysteresis         Settable           Protection from short circuit at output         Settable         Non ma, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Present         Display with 3 1/2 digits (red/green)           Indicator precision         12.2% F.S. ±1 digit         Idigit           Indicator precision         LiDeanty: ±1% F.S.         Lineanty: ±1% F.S.           Analog output         If Pating         Output current 4 20 mA ±2.5% F.S. Lineanty: ±1% F.S.           Analog output         If Pating         If Pating         If Pating           Ambient temperature         Operations! CrC 50°C, Storage: -10°C 60°C (without condensation)         Minimum load resistance: 500           Ingress protection rating         If Pating         If Pating         If Pating           Ambient temperature         Operation?CrC 50°C, Storage: -10°C 60°C (without condensation)         Minimum load c		InHg	0.	1				
Digital output         PNP N.O. 2 outputs Maximum load current: 125 mA Maximum supply voltage; 24 VDC Voltage drop: ≤1.5V           Repeatability (Digital output)         ± 0.2% Full Scale ± 1 digit           Digital output         Type of hysteresis           Hysteresis         5           Protection from short circuit at output         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         Present           Display         Display with 3 1/2 digits (red/green)           Indicator         ±2% F.S. ±1 digit           Indicator         LED orange (output1) LED orange (output2)           Analog output         Quety current: 4 20 mA ±2.5% F.S. Linearity: ±1% F. S.           Maximum load resistance: 500         S00 supply at 24 V Minimum load resistance: 500           Ingress protection rating         IP Rating           Ingress protection rating         IP Rating           Ingress protection rating         Supported voltage           Insulation resistance         50MQ (at 500 VDC, between body and cable)           Insulation resistance         50MQ (15 00 VDC, between body and cable)           Insulation resistance         50MQ (15 00 VDC, between body and cable)           Insulation resistance         50MQ (15 00 VDC, between body and cable)           Vibration	Supply voltage		From 12 t	o 24 VDC				
Digital output         Maximum load current: 125 mA Maximum supply voltage: 24 VDC Voltage drop: 51.5V           Repeatability (Digital output)         ± 0.2% Full Scale ± 1 digit           Digital output         1 fype of hysteresis           Bigital output         1 fype of hysteresis           Maximum load current: 1.25 mA Mysteresis         1 digit           Protection from short circuit at output         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Protection from short circuit at output         0 Diplay           Indicator precision         ±2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)           Analog output         1 Diplay           Analog output         0 Diplay (at 12 digits (red/green)           Indicator         2 Maximum load resistance: 2500 supply at 12 V and 600Ω supply at 24 V Miximum load resistance: 2500 supply at 12 V and 600Ω supply at 24 V Miximum load resistance: 2500           Ingress protection rating         IP Rating           Ingress protection rating         IP Rating           Insulation resistance         0 Operation/Storage: 35 65% (without condensation)           Insulation resistance         50MQ (at 500 VDC, between body and cable)      <	Current consumption		≤40 mA (w	thout load)				
Digital output       Maximum supply voltage: 24 VDC Voltage drop: ≤1.5V         Repeatability (Digital output)       ± 0.2% Full Scale ± 1 digit         Digital output       Type of hysteresis         Hysteresis       from 0.001 to 0.008 bar         Response time       ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms 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 precision       Cutput current: 420 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       Present         Indicator       Output current: 420 mA ±2.5% F. S.         Indicator       Cutput current: 420 mA ±2.5% F. S.         Indicator       Present         Indicator       Present         Indicator       Present         Indicator       0utput current: 420 mA ±2.5% F. S.         Indicator       Indicator         Indicator       Present         Indicator       Present         Indicator          Indicator          Indicator          Indicator          Indicator      <			PNP N.O.	2 outputs				
Maximum supply voitage: 24 VDC Voltage drop: ≤1.5V         Repeatability (Digital output)       ± 0.2% Full Scale ± 1 digit         Digital output       Type of hysteresis         Maximum Supply Voitage: 24 VDC         Ingress protection from short circuit at output       Settable         Protection from short circuit at output       ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)         Protection from short circuit at output       Present         Display introduct in the interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)         Protection from short circuit at output       Present         Display with 3 1/2 digits (red/green)         Indicator       £2% F. S. ±1 digit         Indicator       LED orange (output1) LED orange (output2)         Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       Output current: 4 20 mA ±2.5% F. S.         Ingress protection rating       IP Rating         Ambient temperature       Operation/Storage: 35 85% (without condensation)         Ambient humidity       Operation/Storage: 35 85% (without condensation)         Ingress protection rating       Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       S0MQ (at 500 VDC, between body and cable)       Impacts/shocks	Digital output							
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: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms 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 (output) LED orange (output2)           Output current: 4 20 m ±2.5% F. S. Linearity: ±1% F. S.         Linearity: ±1% F. S.           Analog output         Weakinum load resistance: 50Ω         IP65           Ambient temperature         Operational: 0°C 50°C, Storage: 3 65% (without condensation)           Supported voltage         1000 VAC in 1min. (between body and cable)           Insultion resistance         50MΩ (a 500 VDC, between body and cable)           Insultion resistance         50MΩ (a 500 VDC, between body and cable)           Insultion resistance         50MΩ (a 500 VDC, between body and cable)           Insultion resistance         50MΩ (a 685P), M5 female           Vibration         Total amplitude 1.5 mm or 10 G, 10Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Temperature ch	Digital output							
Digital output         Type of hysteresis Hysteresis         Settable from 0.001 to 0.008 bar           Response time         ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 1000 ms and 1500 ms 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: 420 mA ±2.5%, F. S. Linearity: ±1%, F. S.           Analog output         IP Rating           Ingress protection rating				•				
Digital output       Hysteresis       from 0.001 to 0.008 bar         Response time       ≤2,5 ms (anti-interference function: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms 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 20 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       Maximum load resistance: 50Ω         Maximum load resistance: 50Ω       S00°C (without cor or ondensation)         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without condensation)         Ambient temperature       Operational: 0°C 50°C, Storage: 35 85% (without condensation)         Ambient temperature       Operation/Storage: 35 85% (without condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Insulation resistance       50MΩ (at 500 VDC, betwe	Repeatability (Digital output)							
Impleme       Segonse time       Segonse time         Protection from short circuit at output       Segonse time       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 20 mA ±2.5%, F. S. Linearity: ±1%, F. S. Linearity: ±1%, F. S. Linearity: ±1%, F. S. Maximum load resistance: 2500 supply at 24 V Minimum load resistance: 500         Ingress protection rating       IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Maximum load resistance:       50MQ (at 500 VDC), between body and cable)         Insulation resistance       50MQ (at 500 VDC), between body and cable)         Insulation resistance:       50MQ (at 500 VDC), between body and cable)         Impacts/shocks       100 m/s² (10 G), 3 times in each direction of X, Y and Z         Temperature characteristics       ±2.5% Full Scale in a range between 0°C 50°C         Type of connection       Gil/8 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)	Digital output	· · · ·						
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)         Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       IP Rating         IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Ambient numidity       Operation/Storage: 35 85% (without condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MQ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ±2.5% Full Scale in a range between 0°C 50°C         Type of connection       G1/8 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)		Hysteresis						
Display       Display with 3 1/2 digits (red/green)         Indicator precision       ±2% F. S. ±1 digit         Indicator       LED orange (output1) LED orange (output2)         Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       Maximum load resistance: 250Ω supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 50Ω         IP Rating       IP65         Ambient temperature       Operation/Storage: 35 85% (without ice or condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ±2.5% F. Supple 4 (20 G), 3 times in each direction of X, Y and Z         Temperature characteristics       ±2.5% Cull Scale in a range between 0°C 50°C         Type of connection       G1/8 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)	Response time							
Indicator precision       ±2% F. S. ±1 digit         Indicator       LED orange (output1) LED orange (output2)         Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S.       Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S.         Analog output       Maximum load resistance: 2500 Supply at 12 V and 6000 supply at 24 V Minimum load resistance: 500         IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C (without ice or condensation)         Ambient humidity       Operation/Storage: 35 85% (without condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Instation resistance       50MΩ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ±2.5% Full Scale in a range between 0°C 50°C         Type of connection       G1/8 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)		utput						
Indicator       LED orange (output1) LED orange (output2)         Analog output       Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S. Maximum load resistance: 250Ω supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 50Ω         Ingress protection rating       IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ±2.5% Full Scale in a range between 0°C 50°C         Type of connection       G118 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)								
Analog output       Output current: 4 20 mA ±2.5% F. S. Linearity: ±1% F. S. Maximum load resistance: 250Ω supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 50Ω         IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Ambient humidity       Operational: 0°C 50°C, Storage: 35 85% (without condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ±2.5% Full Scale in a range between 0°C 50°C         Type of connection       G118 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)	· · · · · · · · · · · · · · · · · · ·		·					
Analog output       Linearity: ±1% F. S. Maximum load resistance: 250Ω supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 50Ω         IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Ambient humidity       Operational: 0°C 50°C, Storage: -10°C 60°C (without condensation)         Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)         Vibration       Total amplitude 1.5 mm or 10 G, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       100 m/s² (10 G), 3 times in each direction of X, Y and Z         Type of connection       G118 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)	Indicator							
Analog output       Maximum load resistance: 250Ω supply at 12 V and 600Ω supply at 24 V Minimum load resistance: 50Ω         IP Rating       IP65         Ambient temperature       Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)         Ambient humidity       Operational: 0°C 50°C, Storage: -10°C 60°C (without condensation)         Ingress protection rating       Supported voltage       1000 VAC in 1min. (between body and cable)         Insulation resistance       50MΩ (at 500 VDC, between body and cable)       Vibration         Vibration       Total amplitude 1.5 mm or 10 G, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics       ± 2.5% Full Scale in a range between 0°C 50°C         Type of connection       G118 (BSPP), M5 female         Electrical cable       Oil resistant cable (internal 0.15 mm²)								
Image: Minimum load resistance: 50Ω         Minimum load resistance: 50Ω         Image: Minimum load resistance: 50Ω         Ambient temperature         Ambient humidity         Operation/Storage: 35 60°C (without ice or condensation)         Ambient humidity         Supported voltage         Insulation resistance         Minimum load resistance         Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z         Temperature characteristics         Temperature characteristics         Type of connection         Electrical cable	Analog output							
Ambient temperature         Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)           Ambient humidity         Operation/Storage: 35 85% (without condensation)           Supported voltage         1000 VAC in 1min. (between body and cable)           Insulation resistance         50MΩ (at 500 VDC, between body and cable)           Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)								
Ambient humidity         Operation/Storage: 35 85% (without condensation)           Ingress protection rating         Supported voltage         1000 VAC in 1min. (between body and cable)           Insulation resistance         50MΩ (at 500 VDC, between body and cable)           Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)		IP Rating	IP	65				
Ingress protection rating         Supported voltage         1000 VAC in 1min. (between body and cable)           Insulation resistance         50MΩ (at 500 VDC, between body and cable)           Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Impacts/shocks         100 m/s² (10 G), 3 times in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)		Ambient temperature	Operational: 0°C 50°C, Storage: -10°	C 60°C (without ice or condensation)				
Insulation resistance         50MΩ (at 500 VDC, between body and cable)           Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Impacts/shocks         100 m/s² (10 G), 3 times in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)		Ambient humidity	Operation/Storage: 35 8	5% (without condensation)				
Vibration         Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z           Impacts/shocks         100 m/s² (10 G), 3 times in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)	Ingress protection rating	Supported voltage	1000 VAC in 1min. (bet	ween body and cable)				
Impacts/shocks         100 m/s² (10 G), 3 times in each direction of X, Y and Z           Temperature characteristics         ±2.5% Full Scale in a range between 0°C 50°C           Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)		Insulation resistance	50MΩ (at 500 VDC, be	ween body and cable)				
Temperature characteristics     ±2.5% Full Scale in a range between 0°C 50°C       Type of connection     G1/8 (BSPP), M5 female       Electrical cable     Oil resistant cable (internal 0.15 mm²)		Vibration	Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz sca	nning for 1 minute, 2 hours in each direction of X, Y and Z				
Type of connection         G1/8 (BSPP), M5 female           Electrical cable         Oil resistant cable (internal 0.15 mm²)		Impacts/shocks						
Electrical cable Oil resistant cable (internal 0.15 mm ² )	Temperature characteristics	line and the second second	±2.5% Full Scale in a range between 0°C 50°C					
	Type of connection		G1/8 (BSPP), M5 female					
Weight Approximately 86 g (with 2 metres of cable)	Electrical cable		Oil resistant cable (internal 0.15 mm ² )					
	Weight		Approximately 86 g (with 2 metres of cable)					

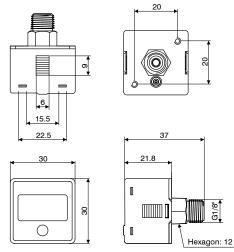
#### Output circuit wiring scheme





#### Digital battery vacuum gauge

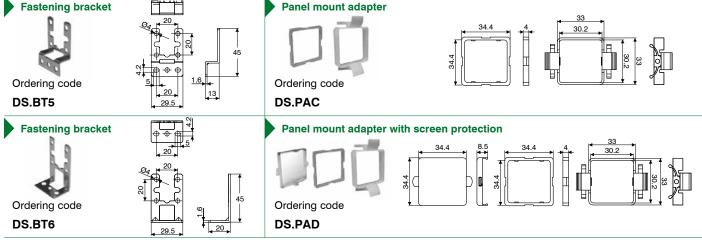






DS.60.V.I.F1.F.0

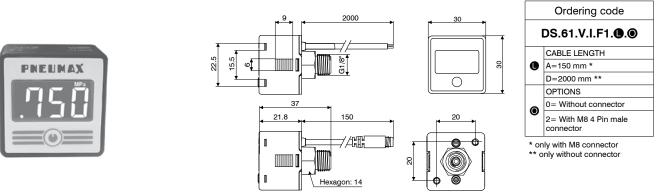
		Caratteristiche tecniche				
Working pressure range		0100.0 kPa				
Regulation pressure range		0100.0 kPa				
Maximum supported pressure		300 kPa				
Allowed fluids		Air, non-corrosive gases, non-combustible gases				
	kPa	0.1				
	bar	0.01				
Pressure calibration sensitivity	psi	0.1				
	mmHg	1				
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		$\pm$ 2% F.S. $\pm$ 1 digit (at ambient temperature of 25°C $\pm$ 3°C)				
	IP Rating	IP65 (only with connected air tube)				
	Ambient temperature	Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)				
Ingress protection rating	Ambient humidity	Operational/Storage 35 85% (without condensation)				
	Vibration	Total amplitude 1.5 mm or 10 G,10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z				
	Impacts/shocks	100 m/s ² (10G), 3 times in each direction of X, Y and Z				
Temperature characteristics		±2% Full Scale in a range between 0°C 50°C				
Type of connection R1/8, M5 female		R1/8, M5 female				
Weight		Approximately 40 g				
Fastening bracket		Panel mount adapter				



ACCESSORIES



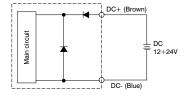
#### Digital vacuum gauge

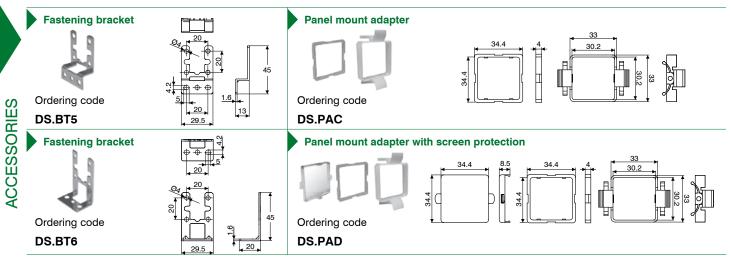


#### **Technical features**

Working pressure range		0100.0 kPa				
Regulation pressure range		0100.0 kPa				
Maximum supported pressure		300 kPa				
Allowed fluids		Air, non-corrosive gases, non-combustible gases				
	kPa	1				
Pressure calibration sensitivity	2 kgf/cm ²	0.01				
Pressure calibration sensitivity	bar	0.01				
	psi	0.1				
Supply voltage	Supply voltage From 12 to 24 VDC ± 10%					
Current consumption		10 mA				
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)					
	IP Rating	IP65 (only with connected air tube)				
	Ambient temperature	Operational: 0°C 50°C, Storage: -10°C 60°C (without ice or condensation)				
	Ambient humidity	Operation/Storage: 35 85% (without condensation)				
Ingress protection rating	Supported voltage	1000 VAC in 1 min. (between body and cable)				
	Insulation resistance	50M $\Omega$ (at 500 VDC, between body and cable)				
	Vibration	Total amplitude 1.5 mm or 10G, 10 Hz - 55 Hz - 10 Hz scanning for 1 minute, 2 hours in each direction of X, Y and 2				
Impacts/shocks		100 m/s ² (10G), 3 times in each direction of X, Y and Z				
Temperature characteristics		±2% Full Scale in a range between 0°C 50°C				
Type of connection		R1/8, M5 female				
Electrical cable		Oil resistant cable (internal 0.15 mm ² )				
Weight		Approximately 60 g (with 2 metres of cable) and approximately 40 g (with M8 4 pin male connector)				
с						

#### Output circuit wiring scheme





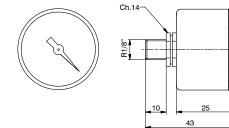
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# Series 1900

#### Vacuum Gauge







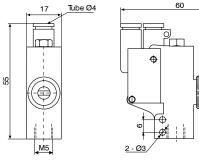
Ordering code

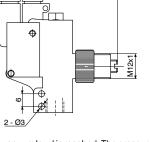
17070A.V

Technical features					
Fluid Unlubricated filtered air					
Scale (-kPa)	0 100				
Temperature (°C)	-10 80				
Weight (g)	56				

#### Pneumatic vacuum switch





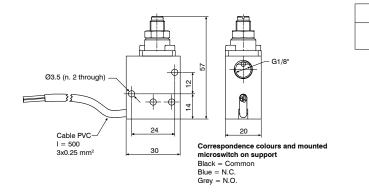


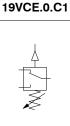
Vacuum switch whose function is, depending on the model, to turn a pneumatic signal on or off when a certain vacuum level is reached. The pressure differential that exists between the maximum value set and the restoration value cannot be adjusted. Especially recommended for the control of vacuum generators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

Code	19TR4.C 19TR4.A		Function	Settable
Type of contact	N.C. (Normally closed)	N.O. (Normally open)		
Pressure (bar)	1.5	~ 8	N.C.	
Actuation threshold can be set (-kPa)	15 ~ 95	10 ~ 95	closed)	P/.
Hysteresis (kPa)	12	3	]	3
Temperature (°C)	+60°C			
Weight (g)	4	14	(Normally	
Connections for vacuum	Ν	15	open)	P- /

#### Electromechanical vacuum switch







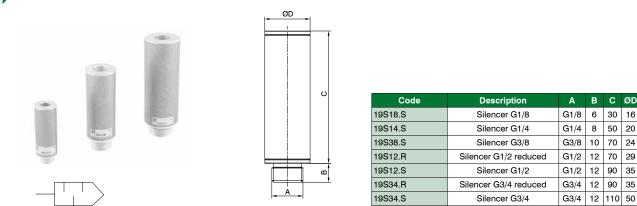
Ordering code

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				
IP Rating	IP67				
Weight (g)	62,5				



#### **High efficiency silencers**



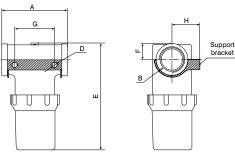
The use of sound-absorbing material enclosed in appropriate aluminium containers made it possible to create this range of silencers which significantly lower air noisein the vacuum generator discharge stage.

19S10.R

Noise reduction: from -13 to -20 dBA Working temperature: from -20 to +100 °C

#### Vertical filters





Silencer G1 reduced

в

6

8 50 20

10 70 24

12 90 35

12 90 35

G1

12 110 50

14 110 50

ØD

30 16

Weight (g)

10

21

35

46

83

86

144

144

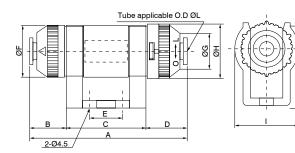
Code	Description	Flow rate (I/min)	Volume (cm ³ )	Α	В	D	E	F	G	Weight (g)
19F38.V.00	Filter G3/8"	150	45	76	2-G3/8	2 - Ø6.5	71.3	14	45	70
19F12.V.00	Filter G1/2"	900	195	91	2-G1/2	2 - Ø8.5	131.5	16	50	168
19F34.V.00	Filter G3/4"	900	205	91	2-G3/4	2 - Ø8.5	139	18.5	50	170
19F10.V.00	Filter G1"	2520	495	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	Α	В	С	D	E	ØF	ØG	ØН	1	J	К	ØL	Weight (g)
19F04.L.01	Tube 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	Tube 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	Tube Ø6 - 50 l/min	67	15,5	34	17,5	14	22	15,6	23,1	27	24	35	6	26
19F08.L.02	Tube Ø8 - 50 l/min	67	15,5	34	17,5	14	22	15,6	23,1	27	24	35	8	24

# Filter elements

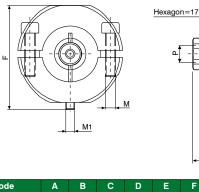
Code	Description						
RK1900/0020	Filter element for 19F04.L.01 and 19F06.L.01						
RK1900/0021	Filter element for 19F06.L.02 and 19F08.L.02						

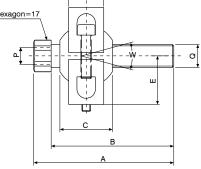
Line filters can handle very fine powders and contaminants without interfering with the intake flow rate. Thanks to the small dimensions they can be installed directly on the suction cups or on the vacuum pipework, and since they have automatic connections, wiring operations are facilitated. Degree of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

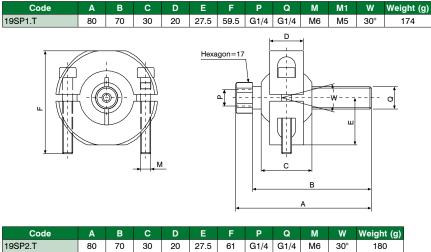


## Suction Cup Support









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



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