Catalogue

Fluid Control

Solutions for industrial
and life science applications

CAMOZZI

Automation

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2 > Proportional technology

3 > Air treatment and fluid control

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Camozzi Solutions for Fluids

Fluid Control

Solutions for industrial and life science applications

Aside from the line of pneumatic and electric components for automation, Camozzi also invests in fluid control technologies. The Fluid Control department has been created to respond to the needs of an ever more complex and innovative market both in the industrial and in the life science sector.

FOCUS ON MAXIMISING CUSTOMER BENEFITS

TOTAL QUALITY MANAGEMENT

LEAN MANUFACTURING PHILOSOPHY

The ability to combine experience in the design and mechanical processing of components for the fluid power sector with electronic and digital expertise, and in the selection and machining of both metallic and polymeric materials, together with the skills of the CRC (Camozzi Research Centre) on the most advanced technologies, makes Camozzi the ideal partner to develop high added value solutions.
A network of subsidiaries and distributors serving more than 70 countries guarantees constant assistance in every part of the world.

C E R T I F I C A T I O N

DNV BUSINESS ASSURANCE

PRODUCTION QUALITY MANAGEMENT CERTIFICATE/ TECHNICAL ASSESSMENT CERTIFICATE FOR AN INTERMEDIATE STAGE OF MANUFACTURE

CAMOZZI S.P.A

Pressure control valve for fluids in haemodialysis equipment

CERTIFICAZIONE DI SISTEMA DI GESTIONE
DNV·GL
ISO 9001 = ISO 14001

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Camozzi Solutions for Fluids

Fluid Control

Camozzi: total quality of products and processes

For more than 50 years, Camozzi has developed products and processes based on the principles of Total Quality. In order to guarantee the best quality in all production phases, Camozzi has created controlled atmosphere environments and an ISO 7 cleanroom for the assembly of products and for solutions that require extreme cleanliness and the elimination of all organic or inorganic contaminants. Ultrasonic cleaning equipment and inspection equipment that makes use of UV blacklight enables us to supply components that can be used with aggressive liquids and highly flammable gases like oxygen.

INDUSTRIAL

MICRO_CONTROLS

GENERAL PURPOSE

PROCESS: CONTROL & REGULATION

LIFE SCIENCE

BIOTECHNOLOGY

MEDICAL DEVICE

MINIATURIZATION

PROPORTIONAL TECHNOLOGY

MEDIA ISOLATION AND GENERAL PURPOSE

- **HIGH SPEED**
- **HIGH FLOW**
- **HIGH PRESSURE**
- **VACUUM**
- **HIGH PRECISION AND REPEATABILITY**
- **PWM SYSTEMS**

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APPLICATIONS FOR THE INDUSTRIAL SECTOR

1 MICRO_CONTROLS

The miniaturized components for fluid control, characterized by low power consumption, reduced weight and dimensions with an ergonomic design, satisfy the needs of numerous application sectors in the industry.

- Integrated and light Automation
- Handling
- Micro-dosing
- Dispensation
- Mobile electronics
- Printers
- Coating applicators
- Semiconductors
- Laser devices
- Aerospace

2 GENERAL PURPOSE

The integration of fluid-dynamic components, valves and solenoid valves that manage liquid and gaseous fluids, with components for pneumatic automation is essential in industrial applications that require innovative technologies and components.

- Air treatment
- Cleaning machines and equipment
- Sterilisation
- Textiles
- Packaging and printing
- Moulding
- Automotive
- Food&Beverage
- Renewable energy and tool machinery
- Waste and paint processes
- Air-conditioning, heating and cooling
- Humidification

3 PROCESS: CONTROL & REGULATION

For toxic or aggressive fluids or in order to demand high intervention speeds, the choice of the component is often determined by factors like safety, anti-pollution or durability of machines, instruments and industrial plants.

- Water and wastewater treatment
- Water supply facilities
- Peripherical process for food and pharmaceutical industries
- Sanitary appliances
- Biogas and fuel cell
- Chemical and petrochemical equipment
- Water purification and osmosis
- Filling and PET process

APPLICATIONS FOR THE LIFE SCIENCE SECTOR

1 BIOTECHNOLOGY

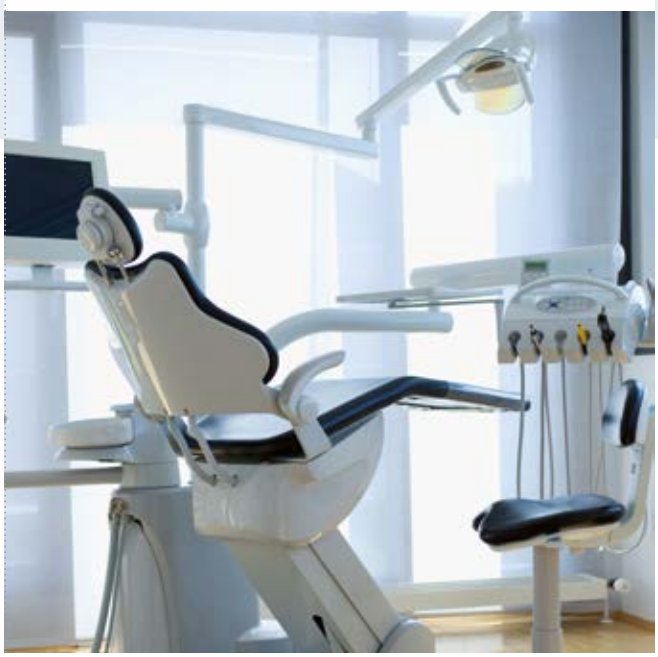
The combination of fluid dynamic components and technologically advanced equipment enables us to develop customized solutions for manufacturers of analytical and diagnostic instruments.

- Clinical diagnostic
- Molecular diagnostic
- Clinical chemistry
- Hematology
- Electrophoresis
- Immunology
- Pathogen detection
- Elemental analysis
- Molecolar analysis
- Separation analysis
- Liquid chromatography
- Gas chromatograph
- Drug discovery
- Flow cytometry
- DNA/RNA synthesis
- Microbiology equipments

2 MEDICAL DEVICE

Internal laboratories, equipped with cutting edge instruments to conduct application tests as well as specific tests required by the customer, allow us to produce components that satisfy the requirements of life science in terms of material compatibility and specific legislation.

- Dental equipment
- Anaesthesia
- Ventilator
- Incubators
- Dialysis equipment
- Hospital sterilizers
- Vacuumtherapy
- Pressotherapy
- Ophtalmology
- Oxygentherapy
- Oxygen concentrators
- Pressure measurement
- Surgery equipment
- Dosing and dispensing
- Infusion equipment
- Emergency ventilator
- Oxy & medical gas discovery



INNOVATION

Cutting-edge technologies to guarantee maximum reliability

The expertise of our technicians and Business Development Managers enables us to provide specific solutions for the "Industrial" and "Life Science" markets that make use of the most innovative technological platforms available on the market.
A large range of modular products is studied and realized, while optimizing their design and performances.
Maximum reliability is guaranteed through tests performed on 100% of the products, respecting the regulations of the sector and the specifications of the client.

MINIATURIZATION

Today, in medical devices and diagnostic-analytical instruments the current prevailing trends are the miniaturization of the components, that is essential for the application in machines or instruments that, being used in studies or laboratories. Camozzi can provide individual components, such as 8, 10 or 15mm miniature size pilot, as well as complete systems incorporating separating membrane valves, proportional valves, servo-valves, regulators and pneumatic actuators.

Advantages:
- Reduction of dimensions for use in compact machines and instruments.
- Reduction of moving volumes to enable higher speed and longer life of the internal parts of the valve.
- Reduction of consumption of the coils to save energy and enable direct operation from a PLC.
- Reduction of weight for use in manipulators or portable instruments.
- Reduction of insertion noise for use in closed or silent environments or operating rooms.

PROPORTIONAL TECHNOLOGY

Precision, repeatability and sensitivity are the main characteristics being pursued by our technical teams involved in the development of Series K8P and LRP (for pressure control) and Series AP and LRW (for flow control). Besides the vast scientific applications, the need for instruments to control microflow and the use of components at very low power has allowed us to study new technologies that offer "Energy-saving Piezo-solutions".

Main characteristics:

- High flow performance
- High insertion speed
- Resistant to aggressive fluids
- Self-cleaning
- A life of more than 50 million cycles
- Low void volume
- High precision and repeatability
- Sensitivity in the control of low flows
- Flow performance: from 0.5 l/min to 250 l/min
- Operating pressure: vacuum - 10 bar
- Connections: M5 - 1/8 - 1/4
- Nominal diameter: from 0.2mm to 6.5mm
- Materials in contact with the fluid: PPS, Delrin, AISI 303 and 430, Brass, Polyamide, Kalrez, FKM
- Operating temperatures: -10°C to +120°C

MEDIA ISOLATION AND GENERAL PURPOSE

Camozzi develops solutions for the control of fluids, like solenoid valves with a separating membrane (MSF). In clinical diagnostics, where reliability is key, solenoid valves with a separating membrane are used in the analysis of blood, serum and urine and in the handling of samples and reagents as well as the washing and treatment of waste material. In analytical chemistry, the analysis of elements is the basis for the research of materials. The MSF solenoid valves and the micro pumps represent the core of instruments dedicated to environmental monitoring, water analysis and food quality control.

Main characteristics:

- High flow performance
- High insertion speed
- Resistant to aggressive fluids
- Self-cleaning
- A life of more than 20 million cycles
- Low void volume
- High precision and repeatability
- Sensitivity in the control of low flows
- Fluids: biological and aggressive liquids and gases
- Flow performance: from 0.5 l/min to 5000 l/min
- Operating pressure: vacuum - 20 bar
- Connections: flange - M5, from 1/8 to 2"
- Nominal diameter: from 0.2mm to 50mm
- Materials in contact with the fluid: PPS, Delrin, AISI 316, brass, aluminium, Peek, Polyamide 6/6, Kalrez, Polyurethane, FKM, NBR
- Operating temperatures: -10°C to +120°C

THE FLUID CONTROL RANGE

A large range of standard and customized solutions

Camozzi proposes a broad range of customized solutions for the control of liquid and gaseous fluids, united by a combination of modern and functional design with high performance for miniaturized solenoid valves, components with proportional technology, PWM and PCM, solutions with fluid separation membrane for the control of aggressive fluids, latch systems, systems with integrated sensors to control pressure, flow and position.

The application of "Lean Philosophy" in the management of all internal processes and activities allows to assure a highly flexible production, while the thorough technical knowledge of the Camozzi Research Centre enables to provide customized solutions that integrate electronics and mechanics, developed by closely cooperating with the client.

PRODUCTS

Standard components

Directly operated micro solenoid valves - 8mm (Series K8)

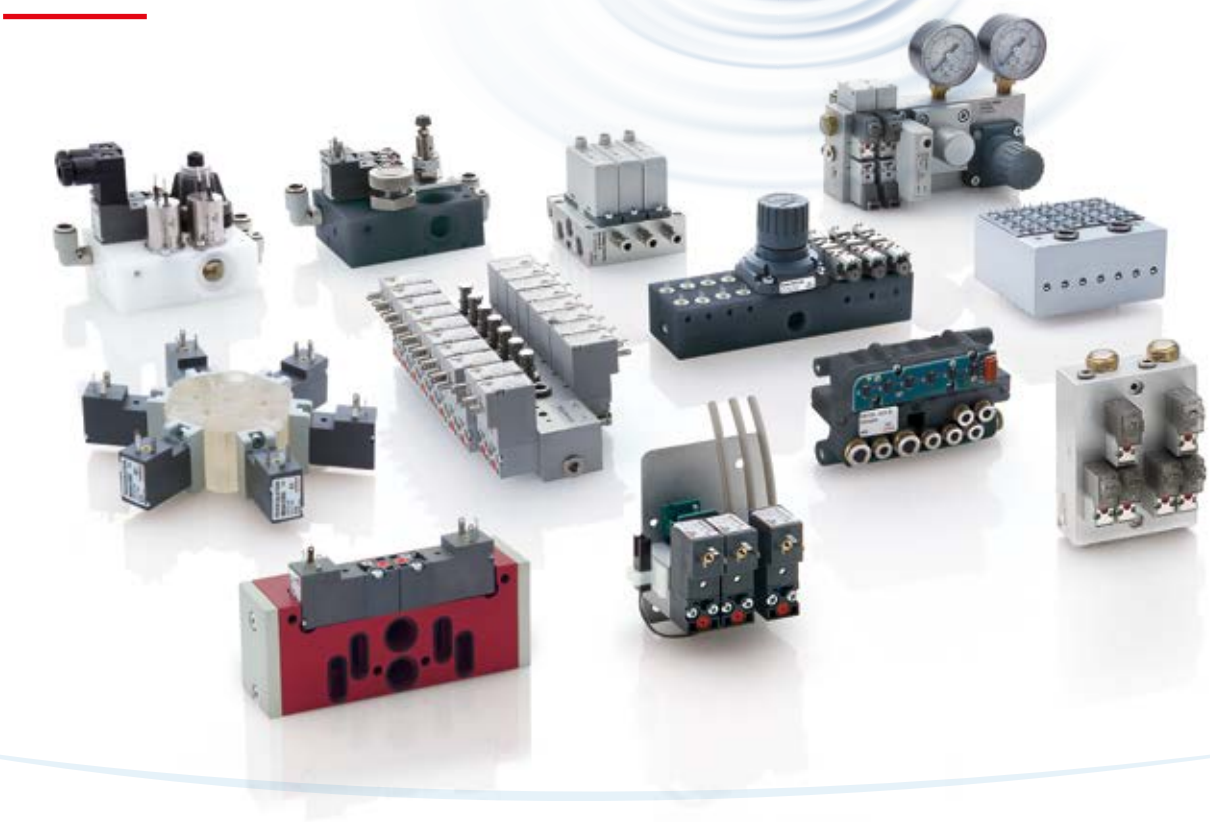
Directly operated solenoid valves - 10mm (Series KN)

Directly operated solenoid valves - 15mm (Series PD and PL)

High flow valves (Series 8 cartridge and pneumatically operated valves)

PRODUCTS

Customized solutions



Directly operated solenoid valves - 22mm
(Series A)

Solenoid valves with fluid separation membrane
(Series PDV and K8DV)

Proportional valves
(Series AP, CP and K8P)

Process valves
(Series CFB INOX and Series A)

Series K8 directly operated solenoid valves

2/2-way - Normally Closed (NC) and Normally Open (NO)
3/2-way - Normally Closed (NC) and Normally Open (NO)
3/2-way - Universal (UNI)

The universal (UNI) version enables to mix two different gaseous fluids or to select the path of the gaseous fluid in the pneumatic circuit.

- Compact design
- High performances
- Manifold mounting
- Long life
- Version for use with oxygen available

Thanks to their particular design these valves can be used in applications where very compact solutions are required as well as high performances.
Series K8 is used to control actuators or very small devices and it is suitable for portable equipments thanks to low power consumption, reduced weight and dimensions.

GENERAL DATA

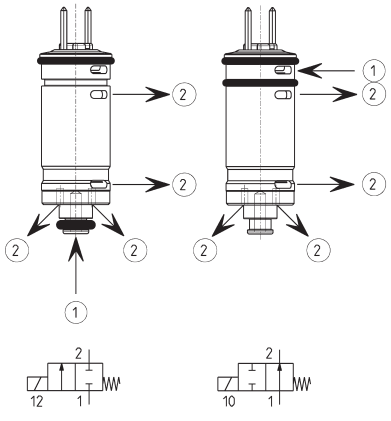
TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 2/2 NO - 3/2 NO - 3/2 UNI
Operation	direct acting poppet type
Pneumatic connections	manifold cartridge
Nominal diameter	0.5 - 0.7 mm
Nominal flow	see kv
Flow efficient kv (l/min)	0.08 - 0.15
Operating pressure	-1 ÷ 3 ... 7 bar
Operating temperature	0°C ÷ 50°C
Media	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas
Response time (ISO 12238)	ON <10 msec – OFF <10 msec
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	brass - stainless steel - PBT technopolymer
Seals	FKM
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - 6 V DC - other voltages on demand
Voltage tolerance	±10%
Power consumption	0.6 W
Duty cycle	ED 100%
Electrical connection	2 Pin 0.5 x 0.5 spacing 4 mm
Protection class	IP00
Special versions available on demand	To order the version for use with oxygen, please add OX1 at the end of the standard code.

CODING EXAMPLE

K8	0	00	-	3	0	3	-	K	2	3	

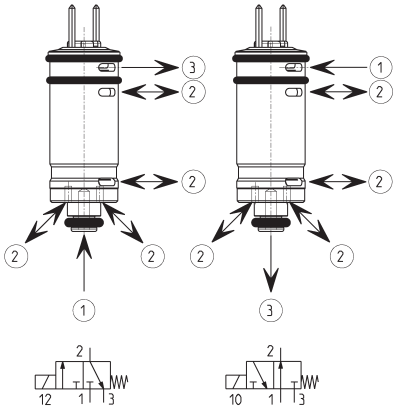
K8	SERIES
0	BODY DESIGN: 0 = single valve
00	NUMBER OF POSITIONS: 00 = valve without seat
3	NUMBER OF WAYS - FUNCTIONS: 0 = single base 3 = 3-way NC 4 = 3-way NO 5 = 2-way NC 6 = 2-way NO 7 = 3-way UNI
0	MATERIALS AND SEALS: 0 = poppet, FKM seals
3	NOMINAL DIAMETER: 3 = Ø 0.5 mm (max pressure 7 bar) 5 = Ø 0.7 mm 6 = Ø 0.5 mm (max pressure 4 bar)
K	MATERIALS: K = stainless steel body, brass cage
2	ELECTRICAL CONNECTION: 2 = pin interface size 4 mm
3	VOLTAGE - POWER CONSUMPTION: 1 = 6V DC - 0.6 W 2 = 12V DC - 0.6 W 3 = 24V DC - 0.6 W 5 = 5V DC - 0.6 W
	OPTIONS: = standard OX1 = for use with oxygen (non volatile residual less than 550 mg/m²)

AVAILABLE FUNCTIONS



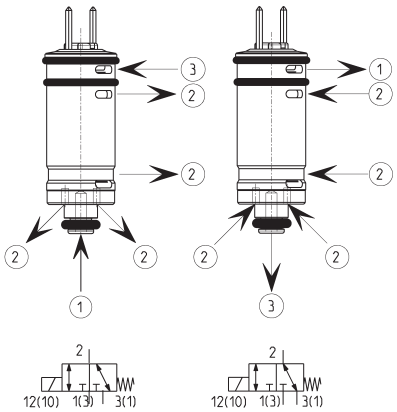
2/2 NC 2/2 NO

1 = supply
2 = inlet



3/2 NC 3/2 NO

1 = supply
2 = inlet
3 = exhaust



3/2 UNI (mix.) 3/2 UNI (sel.)

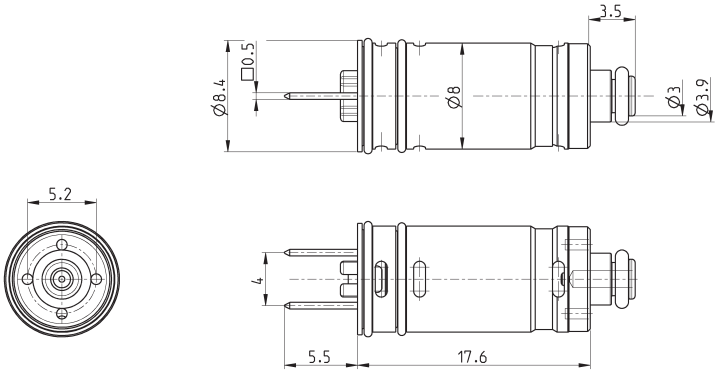
1 = supply
2 = inlet
3 = exhaust

The 3/2 UNI version can be used also for 3/2 NC or 3/2 NO functions.

8 mm solenoid valve, 2/2-way NC, NO - 3/2 NC, NO, UNI

NOTE TO THE TABLE:

* to complete the code add VOLTAGE - POWER CONSUMPTION (see the CODING EXAMPLE)

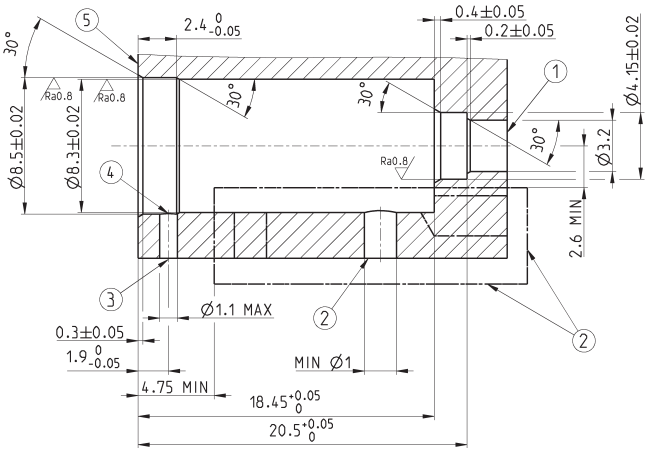


Mod.	Function	Orifice Ø (mm)	kv (l/min) 1 → 2	Qn (Nl/min) 1 → 2	kv (l/min) 2 → 3	Qn (Nl/min) 2 → 3	Min÷max pressure (bar)
K8000-503-K2*	2/2 NC	0.5	0.08	5	-	-	1 ÷ 7
K8000-506-K2*	2/2 NC	0.5	0.08	-	-	-	-1 ÷ 4
K8000-505-K2*	2/2 NC	0.7	0.15	-	-	-	-1 ÷ 3
K8000-603-K2*	2/2 NO	0.6	0.10	6.5	-	-	1 ÷ 7
K8000-303-K2*	3/2 NC	0.5	0.08	5	0.10	6.5	1 ÷ 7
K8000-306-K2*	3/2 NC	0.5	0.08	-	0.10	-	-1 ÷ 4
K8000-305-K2*	3/2 NC	0.7	0.15	-	0.10	-	-1 ÷ 3
K8000-403-K2*	3/2 NO	0.6	0.10	6.5	0.08	5	1 ÷ 7
K8000-405-K2*	3/2 NO	0.6	0.10	6.5	0.15	9.5	1 ÷ 7
K8000-703-K2*	3/2 UNI	0.5	0.08	-	0.10	-	0 ÷ 3
K8000-705-K2*	3/2 UNI	0.7	0.15	-	0.10	-	-1 ÷ 2

8 mm solenoid valve seat, 2/2-way NC, NO - 3/2 NC, NO, UNI

Note: better performances can be achieved if the valve seat holes are in line with the respective valve holes.

LEGEND:
1 = Port 1
2 = Port 2
3 = Port 3
4 = Free from burrs
5 = Surface to be aligned with the upper surface of the valve reinforcement

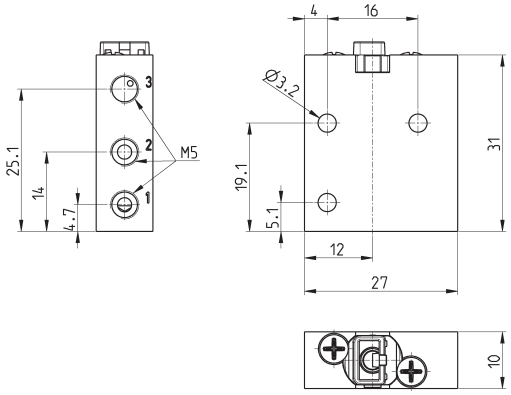


FUNCTION	2/2 NC	2/2 NO	3/2 NC	3/2 NO	3/2 UNI (mix.)	3/2 UNI (sel.)
PORT 1	Inlet	-	Inlet	Exhaust	Inlet	Outlet
PORT 2	Outlet	Outlet	Outlet	Outlet	Outlet	Inlet
PORT 3	-	Inlet	Exhaust	Inlet	Inlet	Outlet

Single body for Series K8 solenoid valve

Material: anodized aluminium
Pneumatic connections: M5 threads

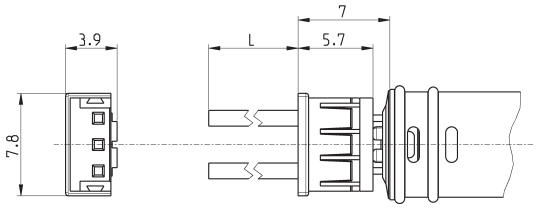
NOTE: to be used only with the electrical connector Mod. 120-J...



Mod.
K8303/14C

Connector Mod. 120-..

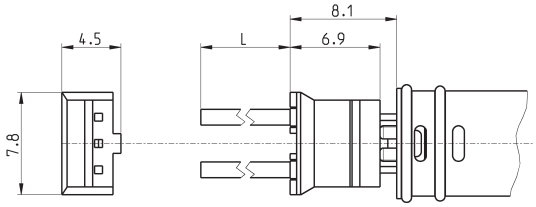
Cable section: 0.25 mm²
Cable external diameter: 1.2 mm
Material for the cable insulation: PVC



Mod.	description	colour	L = cable length (mm)	cable holding
120-803	crimped cable	white	300	crimping
120-806	crimped cable	white	600	crimping

Connector with flying leads Mod. 120-J...

Flying leads section: 0.25 mm²
Flying lead external diameter: 1.2 mm
Material for the flying leads insulation: PVC



Mod.	description	colour	L = cable length (mm)	cable holding
120-J803	crimped cable connector J	white	300	crimping
120-J806	crimped cable connector J	white	600	crimping

Series K8B
pilot operated solenoid valves

2/2-way - Normally Closed (NC) and Normally Open (NO)
3/2-way - Normally Closed (NC) and Normally Open (NO)

- Compact design
- High flow
- Manifold mounting
- Long life

Thanks to their low power consumption and light weight Series K8B solenoid valves are particularly suitable for use with portable equipment too.

Series K8B pilot operated solenoid valves represent the evolution of Series K8 which has been equipped with a flow amplifier. Their particular design makes these valves ideal for use in applications requiring very compact solutions and high flow.

GENERAL DATA

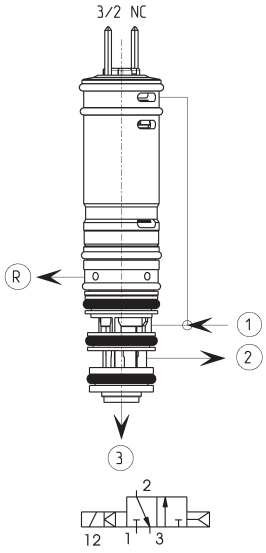
TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 2/2 NO - 3/2 NO
Operation	pilot operated poppet type
Pneumatic connections	manifold cartridge - M7 threads - on subbase with M3 screws
Nominal diameter	3.6 mm
Nominal flow	180 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	2.8
Operating pressure	1 ÷ 7 bar
Operating temperature	0°C ÷ 50°C
Media	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas
Response time (ISO 12238)	ON <15 msec – OFF <15 msec
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	brass - stainless steel - PBT technopolymer - aluminium
Seals	FKM
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - 6 V DC - other voltages on demand
Voltage tolerance	±10%
Power consumption	0.6 W
Duty cycle	ED 100%
Electrical connection	2 Pin 0.5 x 0.5 pitch 4mm - JST connector with flying leads L = 300mm
Protection class	IP00
Special versions available on demand	

CODING EXAMPLE

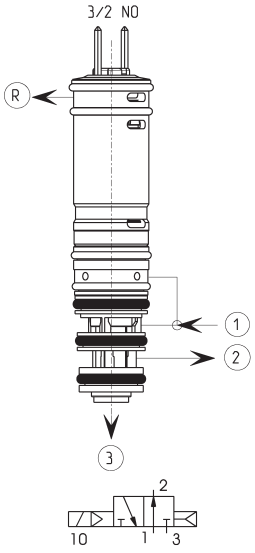
K8B	C5	4	00	-	D4	3	2	N	-	N	00	1A	C003

K8B	SERIES
C5	BODY DESIGN: C0 = body with interface for subbase C3 = threaded body C5 = cartridge
4	NUMBER OF WAYS - FUNCTIONS: 1 = 2/2-way NC 2 = 2/2-way NO 4 = 3/2-way NC 5 = 3/2-way NO
00	PNEUMATIC CONNECTIONS: 00 = cartridge 03 = M7 18 = K8B-type interface, 2-way 19 = K8B-type interface, 3-way
D4	NOMINAL DIAMETER: D4 = Ø 3.6mm
3	SEALS MATERIALS: 3 = FKM
2	BODY MATERIALS: 1 = aluminium 2 = brass
N	MANUAL OVERRIDE: N = not foreseen
N	FIXING ACCESSORIES: N = not foreseen P = screws for plastics M = screws for metal
00	OPTION: 00 = no option
1A	ELECTRICAL CONNECTION: 1A = only pins, pitch 4mm 1B = JST connector, pitch 4mm
C003	VOLTAGE - POWER CONSUMPTION: C001 = 6V DC (0.6 W) C002 = 12V DC (0.6 W) C003 = 24V DC (0.6 W)

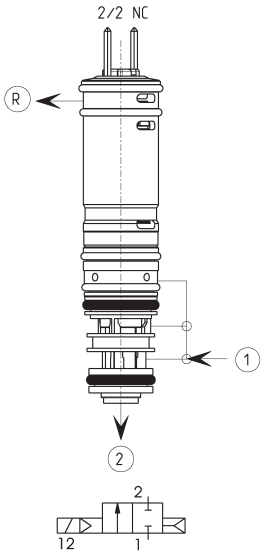
AVAILABLE FUNCTIONS



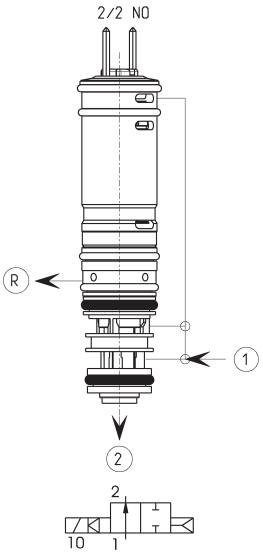
1 = supply
2 = inlet
3 = exhaust
R = K8 exhaust



1 = supply
2 = inlet
3 = exhaust
R = K8 exhaust

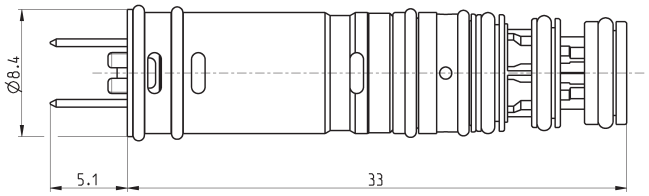


1 = supply
2 = inlet
R = K8 exhaust



1 = supply
2 = inlet
R = K8 exhaust

8 mm solenoid valve, 2/2 and 3/2-way NC and NO

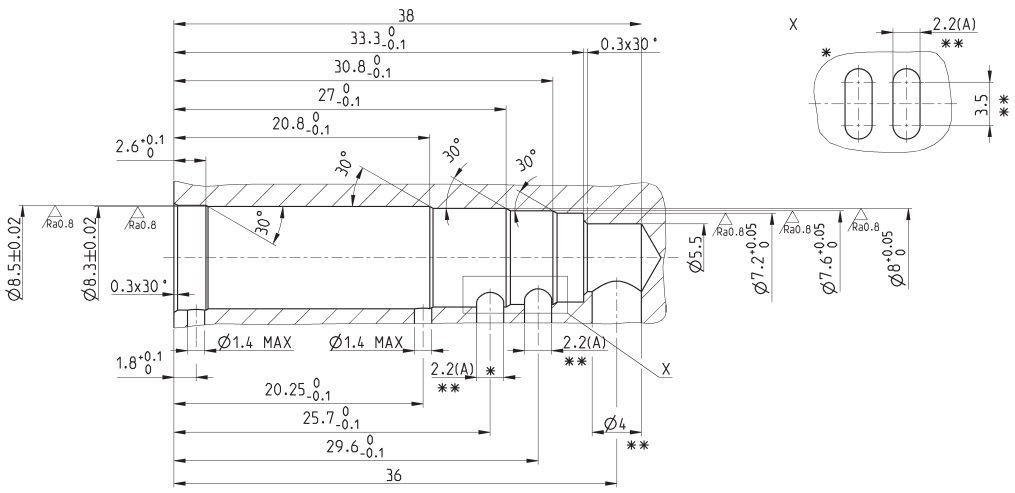


Mod.	Function	NOTE
K8BC5100-D432N-N001A*	2/2 NC	* enter the required voltage (see the coding example)
K8BC5200-D432N-N001A*	2/2 NO	* enter the required voltage (see the coding example)
K8BC5400-D432N-N001A*	3/2 NC	* enter the required voltage (see the coding example)
K8BC5500-D432N-N001A*	3/2 NO	* enter the required voltage (see the coding example)

8 mm solenoid valve seat, 2/2 and 3/2-way NC and NO

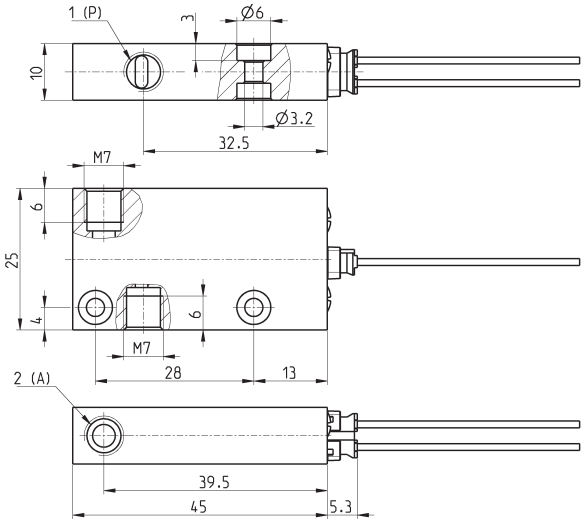
* = FOR THE 2/2 VERSION THIS OPERATION HAS NOT TO BE PERFORMED

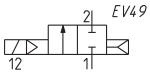
** = TO ACHIEVE DECLARED PERFORMANCE IT IS NECESSARY TO HAVE
A PASSAGE SECTION FOR THE SUPPLY AND EXHAUST PORTS
OF 12.5 mm², WHICH IS EQUAL TO A Ø4 mm

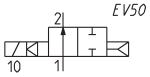


Body with threaded ports, 2/2-way NC and NO

Supplied with:
1x connector with flying leads
Mod. 120-J803 (300mm)



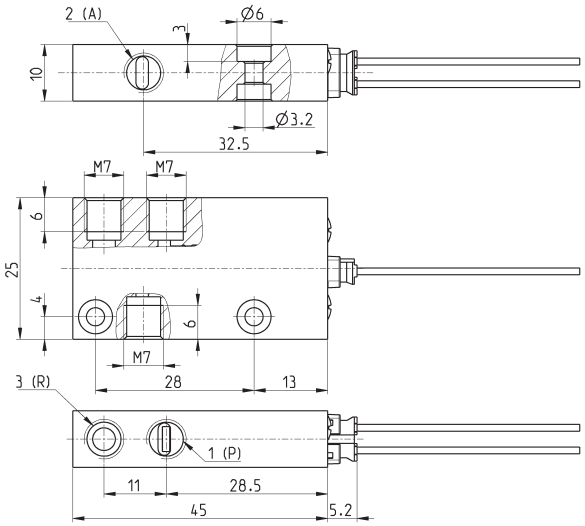


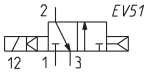


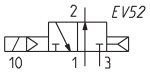
Mod.	Function	Symbol	NOTE
K8BC3103-D431N-N001B*	2/2 NC	EV49	* enter the required voltage (see the coding example)
K8BC3203-D431N-N001B*	2/2 NO	EV50	* enter the required voltage (see the coding example)

Body with threaded ports, 3/2-way NC and NO

Supplied with:
1x connector with flying leads
Mod. 120-J803 (300mm)



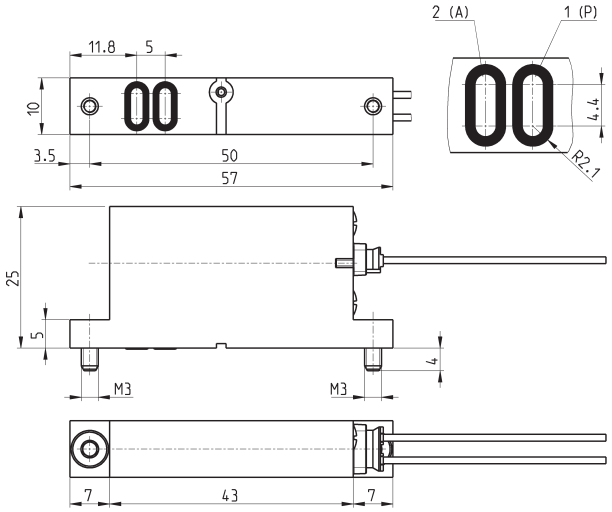


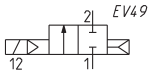


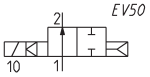
Mod.	Function	Symbol	NOTE
K8BC3403-D431N-N001B*	3/2 NC	EV51	* enter the required voltage (see the coding example)
K8BC3503-D431N-N001B*	3/2 NO	EV52	* enter the required voltage (see the coding example)

Body for subbase, 2/2-way NC and NO

Supplied with:
1x connector with flying leads
Mod. 120-J803 (300mm)
2x interface seals
2x screws M3x6 UNI 5931
(for M version)
or
2x screws M3x6 UNI 10227
(for P version)



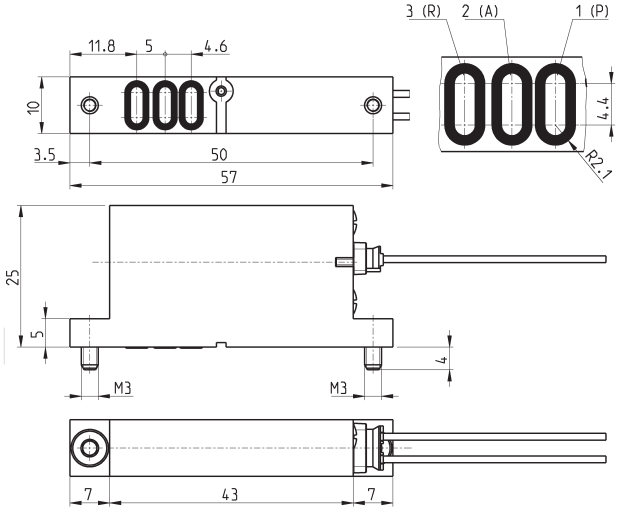


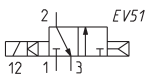


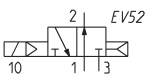
Mod.	Function	Symbol	NOTE
K8BC0118-D431N-*001B**	2/2 NC	EV49	* enter the type of screws - ** enter the required voltage (see the coding example)
K8BC0218-D431N-*001B**	2/2 NO	EV50	* enter the type of screws - ** enter the required voltage (see the coding example)

Body for subbase, 3/2-way NC and NO

Supplied with:
1x connector with flying leads
Mod. 120-J803 (300mm)
3x interface seals
2x screws M3x6 UNI 5931
(for M version)
or
2x screws M3x6 UNI 10227
(for P version)



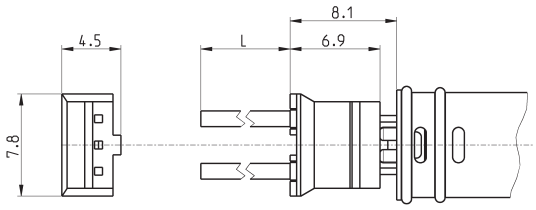




Mod.	Function	Symbol	NOTE
K8BC0419-D431N-*001B**	3/2 NC	EV51	* enter the type of screws - ** enter the required voltage (see the coding example)
K8BC0519-D431N-*001B**	3/2 NO	EV52	* enter the type of screws - ** enter the required voltage (see the coding example)

Connector with flying leads Mod. 120-J...

Flying leads section: 0.25 mm²
Flying lead external diameter: 1.2 mm
Material for the flying leads insulation: PVC



Mod.	description	colour	L = cable length (mm)	cable holding
120-J803	crimped cable connector J	white	300	crimping
120-J806	crimped cable connector J	white	600	crimping

Series K8DV directly operated solenoid valves with fluid separation membrane

New

2/2-way - Normally Closed (NC)

- Very compact design and reduced weight
- High flow performances
- Very low internal volume
- Suitable to be applied in medical equipment and analytical instruments

To choose the most suitable model for a specific application, check the chemical compatibility of the medium to control with the available materials of body and seals.

The K8DV solenoid valve was born to meet all the demands to shut off aggressive or heat sensitive fluids. Thanks to a fluid separation membrane, the fluid is isolated from all internal metal parts of the solenoid valve and avoids heating, even if minimum, generated by the solenoid positioned above.

GENERAL DATA

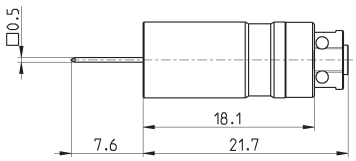
TECHNICAL FEATURES	
Function	2/2 NC
Operation	directly operated with fluid separation membrane
Pneumatic connections	cartridge for manifold or flanged for subbase
Nominal diameter	0.7 mm
Flow efficient kv (l/min)	0.1
Operating pressure	0 ÷ 2.1 bar
Operating temperature	5 ÷ 50°C
Media	liquids / aggressive or inert gases
Response time (ISO 12238)	ON ≤ 10 ms - OFF ≤ 15 ms
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PEEK
Seals	FKM - EPDM
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - 6 V DC - 5 V DC - 3 V DC - other voltages on demand
Voltage tolerance	±10%
Power consumption	0.6 W
Duty cycle	ED 100%
Electrical connection	2 Pins 0.5 x 0.5 spacing 4 mm
Protection class	IP00

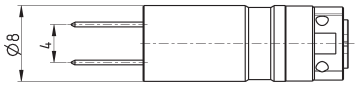
CODING EXAMPLE

K8DV	C	00	-	5	0	5	-	G	2	3

K8DV	SERIES
C	TYPE OF BODY: C = cartridge version 0 = flanged version
00	NUMBER OF POSITIONS: 00 = valve without housing
5	NUMBER OF WAYS - FUNCTIONS: 5 = 2-way NC
0	SEAL MATERIAL: 0 = FKM 4 = EPDM
5	NOMINAL DIAMETER: 5 = Ø 0.7 mm
G	BODY MATERIAL: G = PEEK
2	ELECTRICAL CONNECTION: 2 = interface pin size 4 mm
3	VOLTAGE - POWER CONSUMPTION: 1 = 6V DC - 0.6 W 2 = 12V DC - 0.6 W 3 = 24V DC - 0.6 W 4 = 3V DC - 0.6 W 5 = 5V DC - 0.6 W

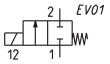
Solenoid valve with fluid separation membrane, cartridge version





DRAWING LEGEND:
1 = inlet
2 = outlet

NOTE TO THE TABLE:
* to complete the code add VOLTAGE - POWER CONSUMPTION(see the CODING EXAMPLE)

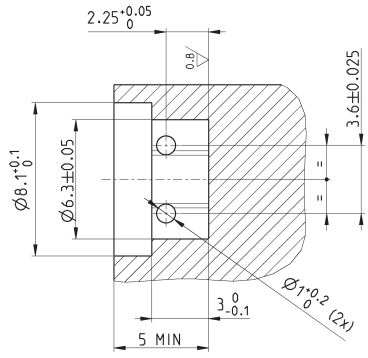


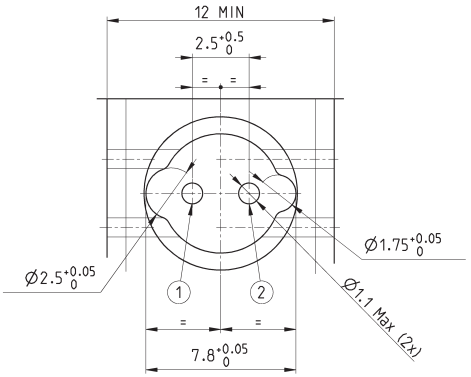
Mod.	Nominal diameter Ø (mm)	kv (l/min)	Min÷max pressure (bar)	Body material	Seal material
K8DVC00-505-G2*	0.7	0.1	0 ÷ 2.1	PEEK	FKM
K8DVC00-545-G2*	0.7	0.1	0 ÷ 2.1	PEEK	EPDM

Solenoid valve seat, cartridge version

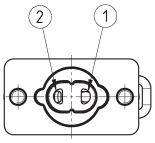
DRAWING LEGEND:

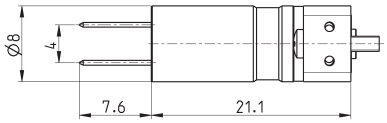
1 = supply
2 = inlet

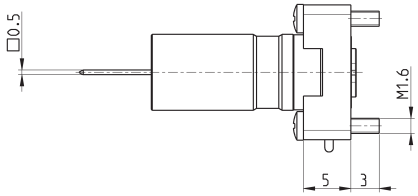


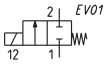


Solenoid valve with fluid separation membrane, flanged version









DRAWING LEGEND:
1 = supply
2 = inlet

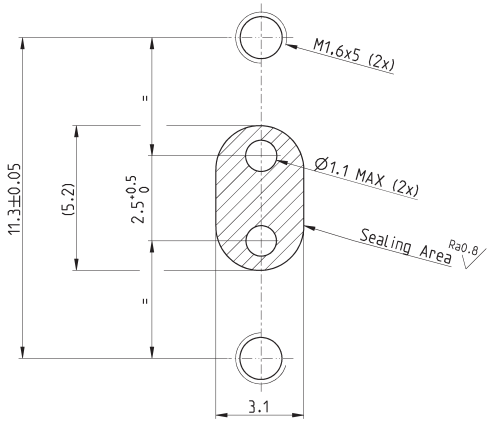
NOTE TO THE TABLE:
* to complete the code add VOLTAGE - POWER CONSUMPTION (see the CODING EXAMPLE)

Mod.	Nominal diameter Ø (mm)	kv (l/min)	Min÷max pressure (bar)	Body material	Seal material
K8DV000-505-G2*	0.7	0.1	0 ÷ 2.1	PEEK	FKM
K8DV000-545-G2*	0.7	0.1	0 ÷ 2.1	PEEK	EPDM

Mounting pad of the flanged solenoid valve

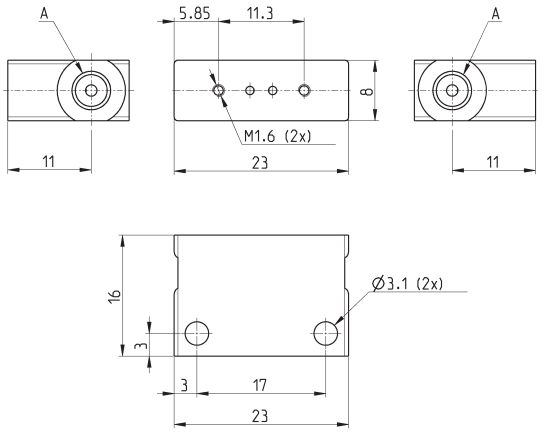
DRAWING LEGEND:

1 = inlet
2 = outlet



Single sub base for flanged version

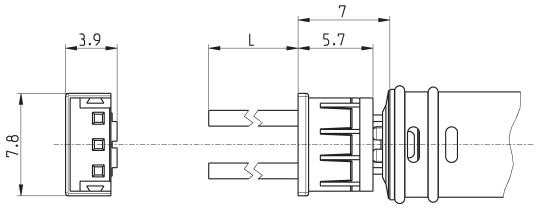
Material: PEEK
Pneumatic connections: M5 or 1/4-28 UNF threads



Mod.	A (pneumatic connections)
K8DV0001-1/4	1/4 - 28 UNF
K8DV0001-M5	M5

Connector Mod. 120-..

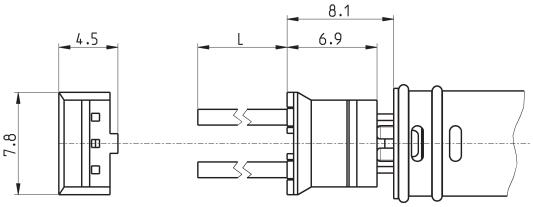
Cable section: 0.25 mm²
Cable external diameter: 1.2 mm
Material for the cable insulation: PVC



Mod.	description	colour	L = cable length (mm)	cable holding
120-803	crimped cable	white	300	crimping
120-806	crimped cable	white	600	crimping

Connector with flying leads Mod. 120-J...

Flying leads section: 0.25 mm²
Flying lead external diameter: 1.2 mm
Material for the flying leads insulation: PVC

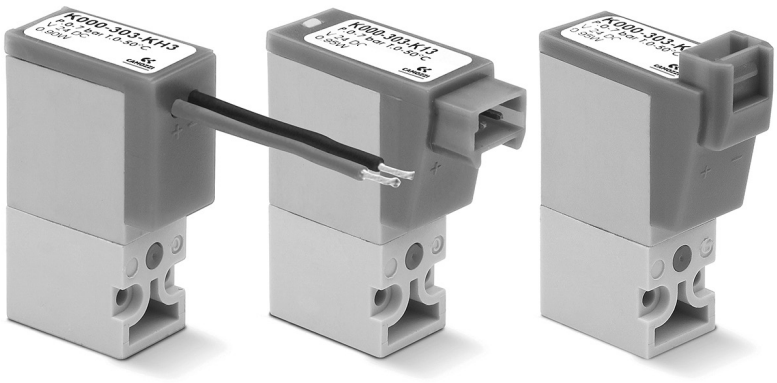


Mod.	description	colour	L = cable length (mm)	cable holding
120-J803	crimped cable connector J	white	300	crimping
120-J806	crimped cable connector J	white	600	crimping

Series K
directly operated solenoid valves

New models

2/2-way - Normally Closed (NC)
3/2-way - Normally Closed (NC) and Normally Open (NO)



- Low power consumption
- Compact design
- Version for use with oxygen available

The Series K directly operated solenoid valves can be mounted on single sub-bases or manifolds.
Thanks to the same mounting pad 2/2-way and 3/2-way versions can be installed on the same manifold.
The manual override is available only for the 3/2-way versions.

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 3/2 NO
Operation	direct acting poppet type
Pneumatic connections	on subbase by means of screws
Nominal diameter	0.6 ... 1 mm
Nominal flow	see the kv
Flow coefficient kv (l/min)	0.12 ... 0.30
Operating pressure	0 ÷ 3 ... 7 bar
Operating temperature	0°C ÷ 50°C
Media	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas
Response time	ON <10 msec – OFF <10 msec
Manual override	monostable button (for 3/2 version only)
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	NBR or FKM
Internal parts	stailess steel
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - 6 V DC - other voltages on demand
Voltage tolerance	±10%
Power consumption	1 W
Duty cycle	ED 100%
Electrical connection	connector - thin cabels L = 300 mm
Protection class	IP50
Special versions available on demand	

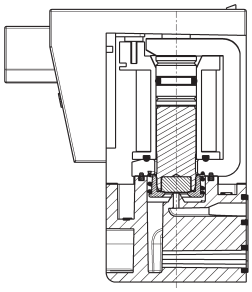
CODING EXAMPLE

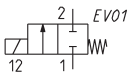
K	0	00	-	3	0	3	-	K	2	3	

K	SERIES		
0	BODY DESIGN: 0 = single sub-base (only M5) or interface 1 = manifold		
00	NUMBER OF POSITIONS: 00 = interface 01 = single base (only M5) 02 ÷ 99 = manifold number of positions		
3	NUMBER OF WAYS - FUNCTIONS: 0 = manifold or single base 1 = 2-way NC 1 = 2-way NC electric part revolved by 180°	3 = 3-way NC 5 = 3-way NC electric part revolved by 180°	4 = 3-way NO 6 = 3-way NO electric part revolved by 180°
0	PORTS: 0 = interface 2 = M5 side outlets		
3	NOMINAL DIAMETER: 2 = Ø 0.6 mm 3 = Ø 0.65 mm 5 = Ø 1.0 mm		
K	MATERIALS: F = PBT body, FKM poppet K = PBT body, HNBR poppet (available for 3/2 version only)		
2	ELECTRICAL CONNECTION: 1 = 90° connection with protection and led 2 = 90° connection with protection 3 = 90° connection	B = in-line connection with protection and led C = in-line connection with protection D = in-line connection	F = cable (300mm) with protection and led G = cable (300mm) with protection H = cable only (300mm)
3	SOLENOID VOLTAGE: 1 = 6V DC - 1W 2 = 12V DC - 1W 3 = 24V DC - 1W		
	FIXING: = with screws for mounting on plastics M = with screws for mounting on metal		
	OPTIONS: = standard OX1 = for use with oxygen (non volatile residual less than 550 mg/m²) OX2 = for use with oxygen (non volatile residual less than 33 mg/m²)		

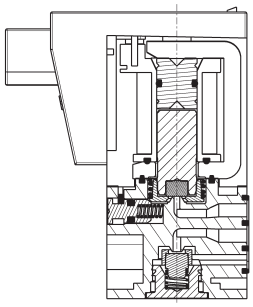
Series K solenoid valve, 2/2- and 3/2-way

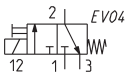
2/2 NC





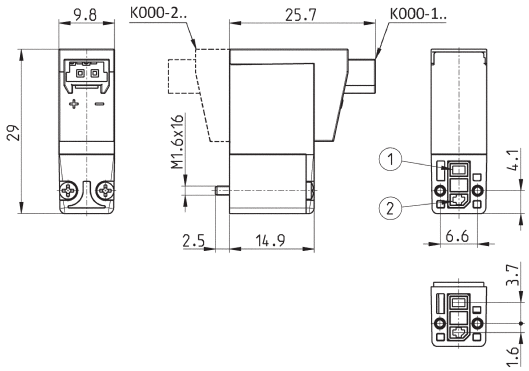
3/2 NC



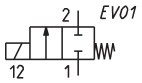


2/2-way NC solenoid valve (90° electrical connection)

Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)



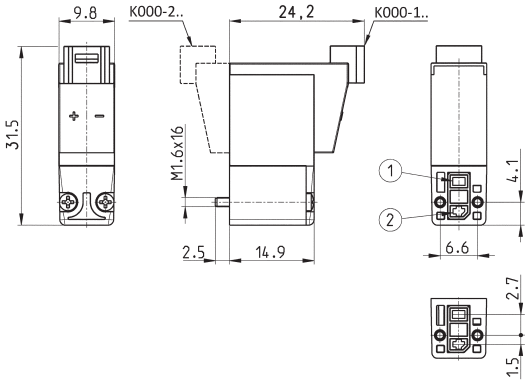
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-102-F1*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-F2*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-F3*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-105-F1*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-F2*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-F3*	2/2 NC	1	0.30	-	0 ÷ 3



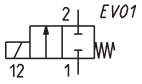
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

2/2-way NC solenoid valve (in-line electrical connection)

Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)

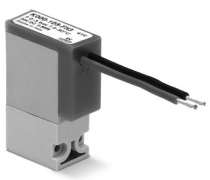


Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-102-FB*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-FC*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-FD*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-105-FB*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-FC*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-FD*	2/2 NC	1	0.30	-	0 ÷ 3

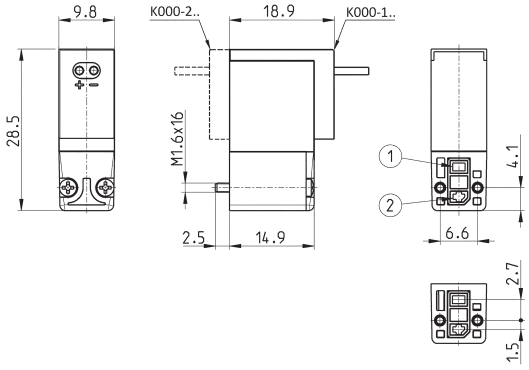


* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

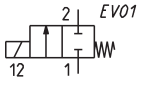
2/2-way NC solenoid valve (with cable 300 mm)



Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)



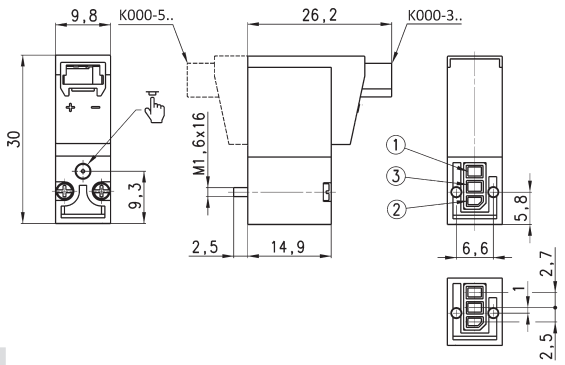
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-102-FF*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-FG*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-102-FH*	2/2 NC	0.6	0.15	10	0 ÷ 7
K000-105-FF*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-FG*	2/2 NC	1	0.30	-	0 ÷ 3
K000-105-FH*	2/2 NC	1	0.30	-	0 ÷ 3



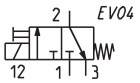
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NC solenoid valve (90° electrical connection)

Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)



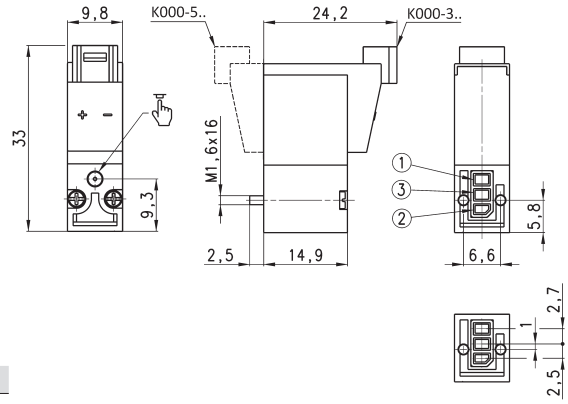
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-303-K1*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-F1*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-K2*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-F2*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-K3*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-F3*	3/2 NC	0.6	0.12	8	0 ÷ 7



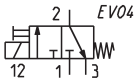
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NC solenoid valve (in-line electrical connection)

Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)



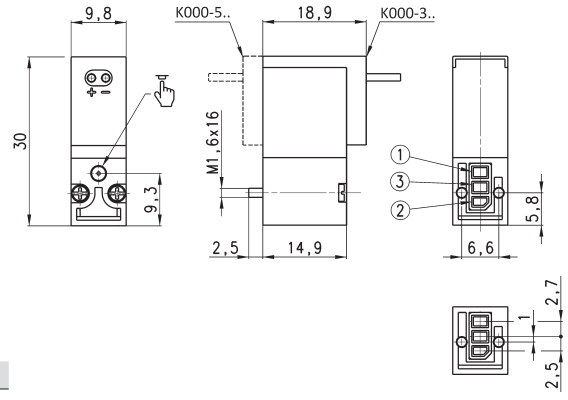
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-303-KB*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FB*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-KC*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FC*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-KD*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FD*	3/2 NC	0.6	0.12	8	0 ÷ 7



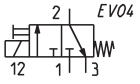
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NC solenoid valve (with cable 300 mm)

Supplied with:
1x interface seal
2x screws M1.6x16
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)



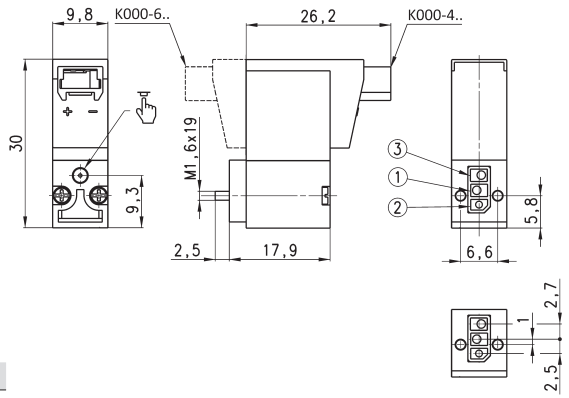
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-303-KF*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FF*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-KG*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FG*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-KH*	3/2 NC	0.6	0.12	8	0 ÷ 7
K000-303-FH*	3/2 NC	0.6	0.12	8	0 ÷ 7



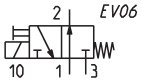
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NO solenoid valve (90° electrical connection)

Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals for NO version
2x screws M1.6x19
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)
If no interface is needed, use screws M1.6x16 Mod.
K303/61 for plastics or K303/61M for metal.



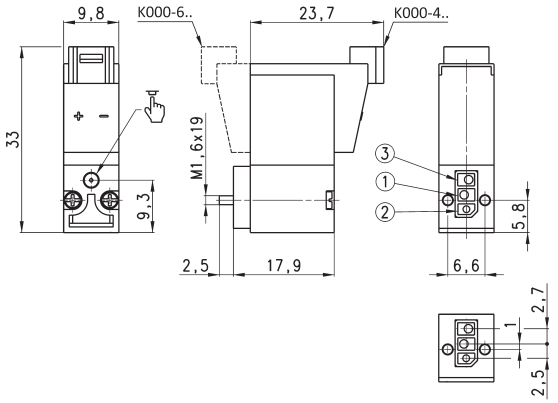
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-403-K1*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-F1*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-K2*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-F2*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-K3*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-F3*	3/2 NO	0.8	0.20	-	0 ÷ 5



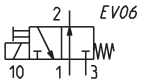
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NO solenoid valve (in-line electrical connection)

Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals for NO version
2x screws M1.6x19
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)
If no interface is needed, use screws M1.6x16 Mod.
K303/61 for plastics or K303/61M for metal.



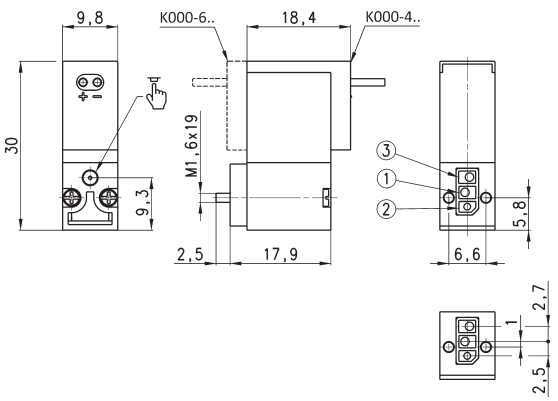
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-403-KB*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FB*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-KC*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FC*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-KD*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FD*	3/2 NO	0.8	0.20	-	0 ÷ 5



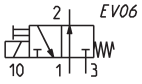
* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way NO solenoid valve (with cable 300 mm)

Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals for NO version
2x screws M1.6x19
(UNI 10227 for mounting on plastics or
UNI 7687 for mounting on metal)
If no interface is needed, use screws M1.6x16 Mod.
K303/61 for plastics or K303/61M for metal.

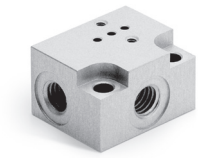


Mod.	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)
K000-403-KF*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FF*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-KG*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FG*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-KH*	3/2 NO	0.8	0.20	-	0 ÷ 5
K000-403-FH*	3/2 NO	0.8	0.20	-	0 ÷ 5

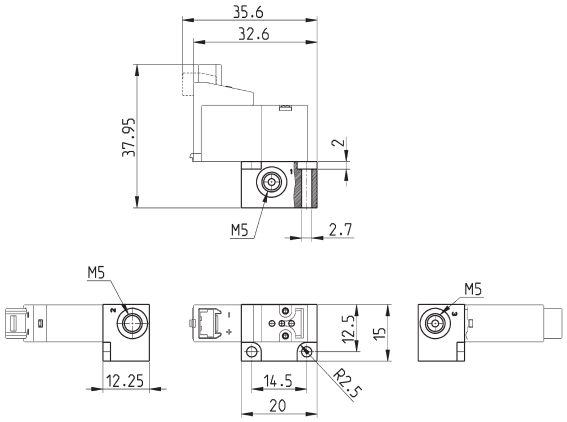


* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

Single sub-base



Note: use solenoid valves with mounting screws on metal interfaces (see codification).

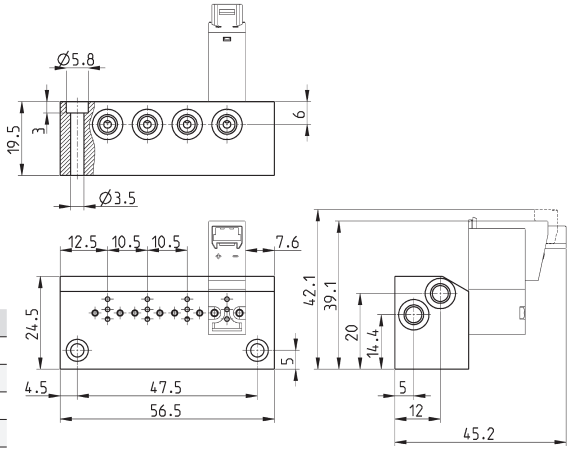


Mod.
K001-02

Manifold Mod. K1**-02

** Number of positions
With side outlets and conveyed inlet and exhaust.

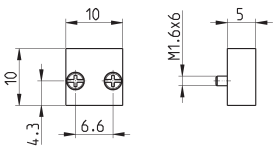
Note: use solenoid valves with mounting screws on metal interfaces (see codification).



Mod.	A	B	Number of ports
K102-02	35.5	26.5	2
K103-02	46	37	3
K104-02	56.5	47.5	4
K105-02	67	58	5
K106-02	77.5	68.5	6
K107-02	88	79	7
K108-02	98.5	89.5	8
K109-02	109	100	9
K110-02	119.5	110.5	10

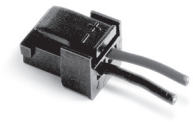
Excluder tap

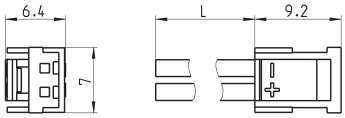
Supplied with:
1x excluder tap
1x interface seal
2x screws M1.6x6 UNI 7687 (mounting on metal)



Mod.
K000-TP

Connector Mod. 121-8..

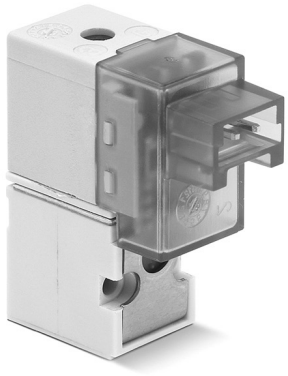


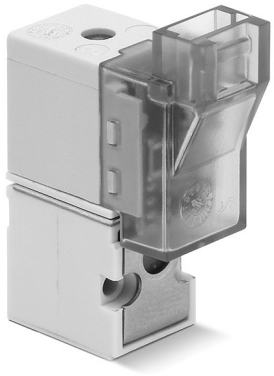


Mod.	description	colour	L = cable length (mm)	cable holding
121-803	crimped cable	black	300	crimping
121-806	crimped cable	black	600	crimping
121-810	crimped cable	black	1000	crimping
121-830	crimped cable	black	3000	crimping

Series KN and KN High Flow directly operated solenoid valves

3/2-way - Normally Closed (NC) and Normally Open (NO)
2/3-way - Universal (UNI)





- Low energy consumption
- Compact design
- High Flow
- ISO 15218 Interface
- Version for use with oxygen available

Thanks to its low energy consumption and to its compact design, the KN miniaturized solenoid valve can be used in industrial and scientific applications.

The Series KN directly operated solenoid valves are available also in the high flow version (KN High Flow).

GENERAL DATA

TECHNICAL FEATURES	
Function	3/2 NC - 3/2 NO - 3/2 UNI
Operation	direct acting poppet type
Pneumatic connections	on subbase with ISO 15218 interface by means of screws
Nominal diameter	0.65 ... 1.1 mm
Nominal flow	10 ... 25 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.15 ... 0.39
Operating pressure	0 ÷ 3 ... 7 bar
Operating temperature	0°C ÷ 50°C
Media	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas
Response time	ON <10 msec - OFF <10 msec
Manual override	monostable button
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	FKM, NBR
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	5 ... 24 V DC - other voltages on demand
Voltage tolerance	1.3/0.25 ... 4/1 W (inrush/holding)
Power consumption	ED 100%
Duty cycle	connector
Electrical connection	IP50
Protection class	
Special versions available on demand	

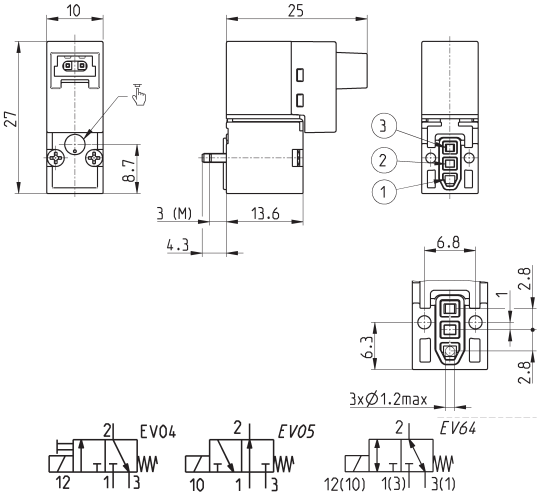
CODING EXAMPLE

KN	0	00	-	3	0	3	-	K	1	3	

KN	SERIES
0	BODY DESIGN: 0 = single valve
00	NUMBER OF POSITIONS: 00 = interface
3	NUMBER OF WAYS - FUNCTIONS: 3 = 3/2-way NC 4 = 3/2-way NO 7 = 3/2-way UNI
0	PORTS: 0 = single valve
3	NOMINAL DIAMETER / MAX PRESSURE: 3 = Ø 0.65 mm - version NC/NO P.Max 7bar; version UNI P.Max 4bar 5 = Ø 1.1 mm - max pressure 7 bar 6 = Ø 1.1 mm - max pressure 3 bar - version NC/NO P.Max 3bar; version UNI P.Max 1.5bar
K	MATERIALS: F = PBT body, FKM poppet seal, FKM other seals K = PBT body, FKM poppet seal, NBR other seals
1	ELECTRICAL CONNECTION: 1 = 90° connection with protection and led B = in-line connection with protection and led
3	VOLTAGE - POWER CONSUMPTION: 2 = 12 V DC - 1.3/0.25 W 3 = 24 V DC - 1.3/0.25 W 5 = 5 V DC - 4/1 W 6 = 6 V DC - 4/1 W 7 = 12 V DC - 4/1 W 8 = 24 V DC - 4.1 W
	FIXING: = with screws for mounting on plastics M = with screws for mounting on metal
	OPTIONS: = standard OX2 = for use with oxygen (non volatile residual less than 33 mg/m²)

3/2-way solenoid valve - 90° electrical connection

Supplied with:
1x interface seal
2x screws Ø1.6x16 UNI 10227
(fixing for plastics, standard)
or
2x screws M1.6x14.7 UNI 7687
(fixing for metal, M option)

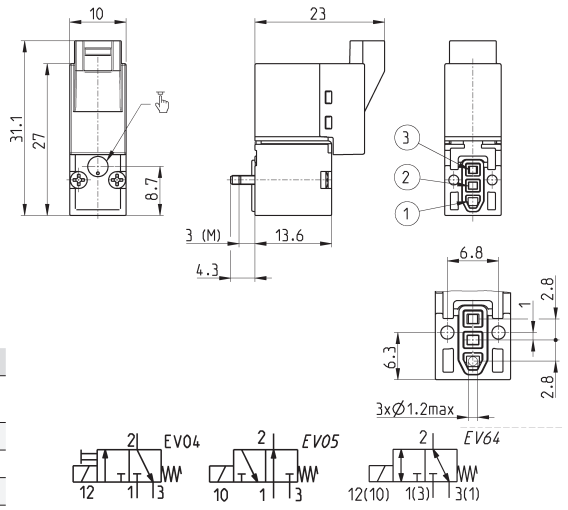


Mod.	Function	Orifice Ø (mm)	kv (l/ min)	Qn (Nl/ min)	Min÷max pressure (bar)	Power consumption (W)	Symb.
KN000-303-K1*	3/2 NC	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV04
KN000-303-F1*	3/2 NC	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV04
KN000-305-F1*	3/2 NC	1.1	0.39	25	3 ÷ 7	4 / 1	EV04
KN000-306-F1*	3/2 NC	1.1	0.39	-	0 ÷ 3	4 / 1	EV04
KN000-403-F1*	3/2 NO	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV05
KN000-706-F1*	3/2 UNI	1.1	0.39	-	0 ÷ 1.5	4 / 1	EV64

* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

3/2-way solenoid valve - in-line electrical connection

Supplied with:
1x interface seal
2x screws Ø1.6x16 UNI 10227
(fixing for plastics, standard)
or
2x screws M1.6x14.7 UNI 7687
(fixing for metal, M option)

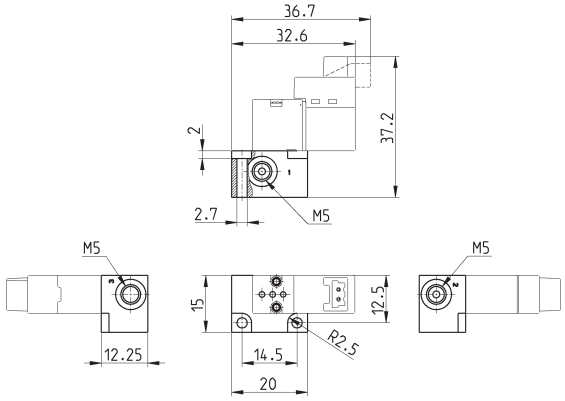


Mod.	Function	Orifice Ø (mm)	kv (l/ min)	Qn (Nl/ min)	Min÷max pressure (bar)	Power consumption (W)	Symb.
KN000-303-KB*	3/2 NC	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV04
KN000-303-FB*	3/2 NC	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV04
KN000-305-FB*	3/2 NC	1.1	0.39	25	3 ÷ 7	4 / 1	EV04
KN000-306-FB*	3/2 NC	1.1	0.39	-	0 ÷ 3	4 / 1	EV04
KN000-403-FB*	3/2 NO	0.65	0.15	10	0 ÷ 7	1.3 / 0.25	EV05
KN000-706-FB*	3/2 UNI	1.1	0.39	-	0 ÷ 1.5	4 / 1	EV64

* add VOLTAGE - POWER CONSUMPTION (see CODING EXAMPLE)

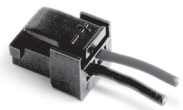
Single sub-base

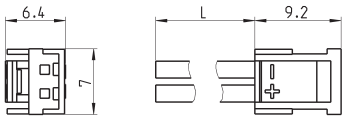
Note: use solenoid valves with mounting screws on metal interfaces (see codification).



Mod.
KN01-02

Connector Mod. 121-8..



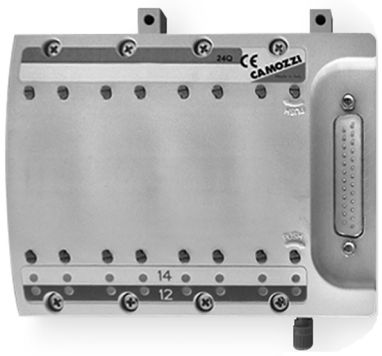


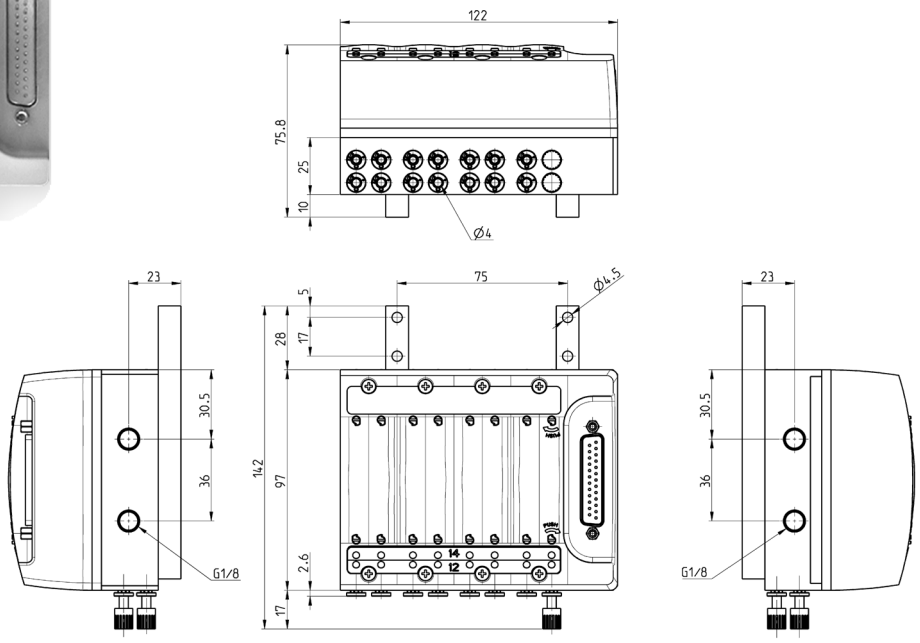
Mod.	description	colour	L = cable length (mm)	cable holding
121-803	crimped cable	black	300	crimping
121-806	crimped cable	black	600	crimping
121-810	crimped cable	black	1000	crimping
121-830	crimped cable	black	3000	crimping

Example of SERIES KN MANIFOLD VERSION - Max 16 positions on demand

Pneumatics and electronics integrated
Valve functions: 2x2/2 - 2x3/2
Pneumatic modularity
10mm valve width

Several solutions of electrical connection.
Modules for digital inputs can be connected.



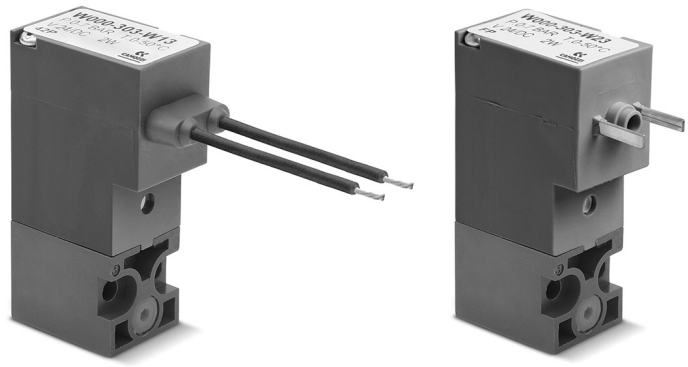


TECHNICAL FEATURES

Pneumatic connections	tube collet ø 4 mm
Nominal diameter	0.65 mm
Nominal flow	10 Nl/min (single solenoid valve)
Operating pressure	0 ÷ 7 bar
Operating temperature	0 ÷ +50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Seals	HNBR, NBR (FKM on demand)
Voltage	24 V DC
Voltage tolerance	±10%
Power consumption	1.3 W (inrush), 0.25 W (holding)
Duty cycle	ED 100%
Electrical connection	Multipole-PNP / Individual / Fieldbus

Series W
directly operated solenoid valves

3/2-way - Normally Closed (NC), Normally Open (NO)



- Can be mounted on a single base (M5 connections) or on manifold (M5 connections or cartridge ø 3 and 4).
- Electrical connection with cables or in compliance to DIN EN 175 301-803-C standard

Series W directly operated solenoid valves are available as 3/2-way either NC or NO. Both versions can be mounted on single sub-bases or manifolds and they are equipped with a manual override which make the plants setting easier.

GENERAL DATA

TECHNICAL FEATURES	
Function	3/2 NC - 3/2 NO
Operation	direct acting poppet type
Pneumatic connections	on subbase with ISO 15218 interface by means of screws
Nominal diameter	0.8 ... 1.5 mm
Nominal flow	14 ... 35 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.23 ... 0.54
Operating pressure	0 ÷ 5 ... 10 bar
Operating temperature	0°C ÷ 50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time (ISO 12238)	ON <10 msec - OFF <15 msec
Manual override	monostable button
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	PU, NBR, (FKM on demand)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	12 V DC - 24 V DC - 48 V DC
Voltage tolerance	±10%
Power consumption	2 W - 1 W (24 V DC only)
Duty cycle	ED 100%
Electrical connection	with connector DIN EN 175 301-803-C (8 mm) - cables L = 300 mm
Protection class	IP65 with connector
Special versions available on demand	

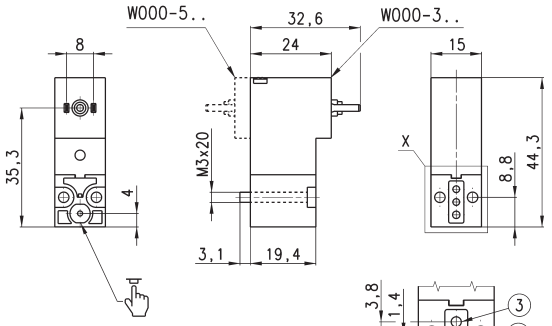
CODING EXAMPLE

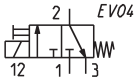
W	0	00	-	3	0	3	-	W	2	3	

W	SERIES
0	BODY DESIGN: 0 = single sub-base (only M5) or interface 1 = single manifold 2 = double manifold
00	NUMBER OF POSITIONS: 00 = interface 01 = single base (M5 only) 02 ÷ 99 = manifold number of positions
3	NUMBER OF WAYS - FUNCTIONS: 0 = manifold or single sub-base 3 = 3-way NC 4 = 3-way NO 5 = 3-way NC electric part revolved by 180° 6 = 3-way NO electric part revolved by 180°
0	VALVE PORTS: 0 = interface MANIFOLD PORTS (for Series W, P and PN): 2 = M5 side 3 = tube ø 3 side 4 = tube ø 4 side 6 = M5 rear ports 7 = ø 3 tube rear ports 8 = ø 4 tube rear ports
3	NOMINAL DIAMETER - MAX PRESSURE 1 = ø 0,8 (1W) 10 bar (NC) 24V only 3 = ø 1,5 (2W) 7 bar (NC) 5 bar (NO) 5 = ø 1,1 NC (2W) 10 bar (NC) ø 0,9 NO (2W) 10 bar (NO)
W	MATERIALS: W = technopolymer PBT body, FKM poppet seal, other seals in NBR (FKM on demand)
2	ELECTRICAL CONNECTION: 1 = cables (L = 300 mm) 2 = DIN EN 175 301-803-C (8 mm)
3	SOLENOID VOLTAGE: 2 = 12V DC 3 = 24V DC 4 = 48V DC
	FIXING: = with screws for metal (standard) P = with screws for plastics

3/2-way NC solenoid valve, DIN EN 175 301-803-C (8 mm)

Supplied with:
1x interface seal
2x screws M3x20 UNI 8112
(fixing for metal, standard)
or
2x screws M3x23 UNI 10227
(fixing for plastics, P option)

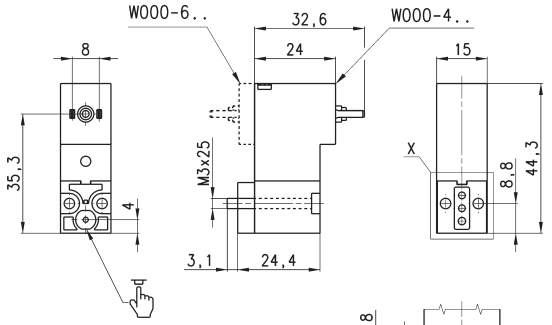


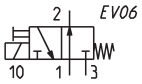


Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
W000-305-W23	1.1	0.39	25	0 ÷ 10
W000-303-W23	1.5	0.54	35	0 ÷ 7
W000-305-W24	1.1	0.39	25	0 ÷ 10
W000-303-W24	1.5	0.54	35	0 ÷ 7

3/2-way NO solenoid valve, DIN EN 175 301-803-C (8 mm)

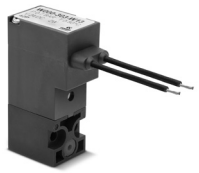
Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals
2x screws M3x25 UNI 8112 (for standard version)



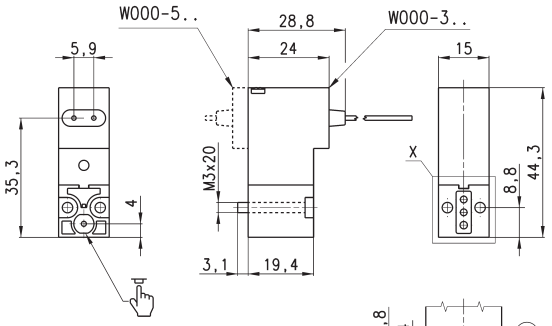


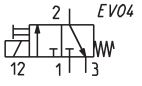
Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
W000-405-W23	0.9	0.23	15	0 ÷ 10
W000-403-W23	1.5	0.39	-	0 ÷ 5
W000-405-W24	0.9	0.23	15	0 ÷ 10
W000-403-W24	1.5	0.39	-	0 ÷ 5

3/2-way NC solenoid valve with cables of 300mm



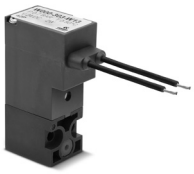
Supplied with:
1x interface seal
2x screws M3x20 UNI 8112
(fixing for metal, standard)
or
2x screws M3x23 UNI 10227
(fixing for plastics, P option)



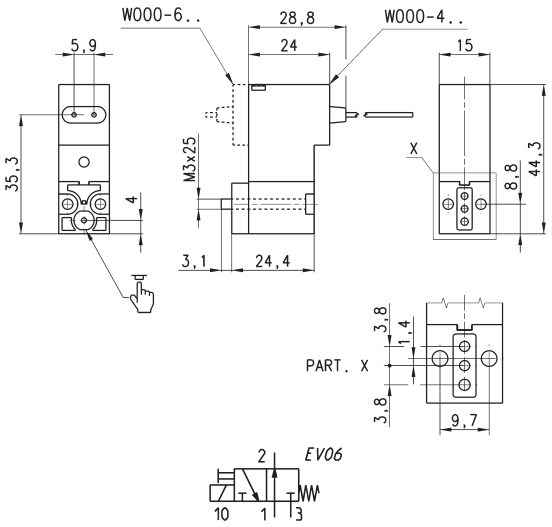


Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
W000-305-W13	1.1	0.39	25	0 ÷ 10
W000-303-W13	1.5	0.54	35	0 ÷ 7

3/2-way NO solenoid valve with cables of 300mm

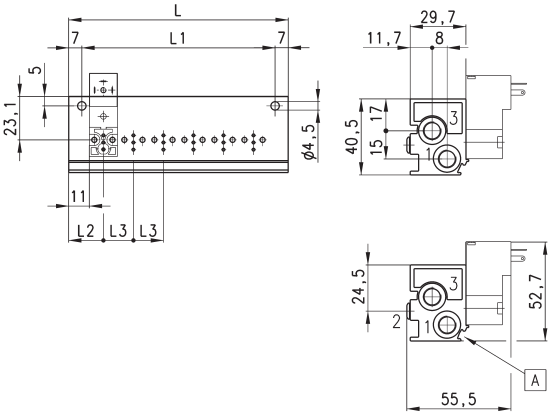


Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals
2x screws M3x25 UNI 8112 (for standard version)



Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
W000-405-W13	0.9	0.23	15	0 ÷ 10
W000-403-W13	1.5	0.39	25	0 ÷ 5

Single manifold with rear outlets



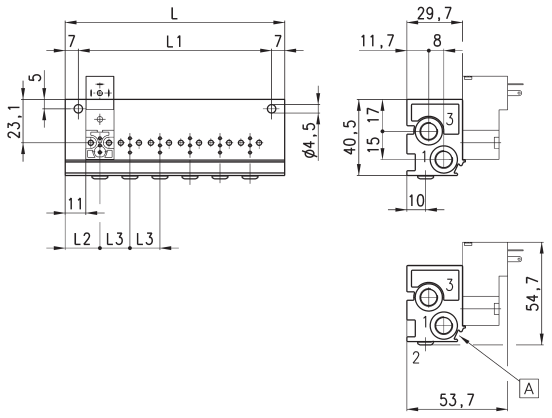
DIMENSIONS							
Mod.	N° Valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Single manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.

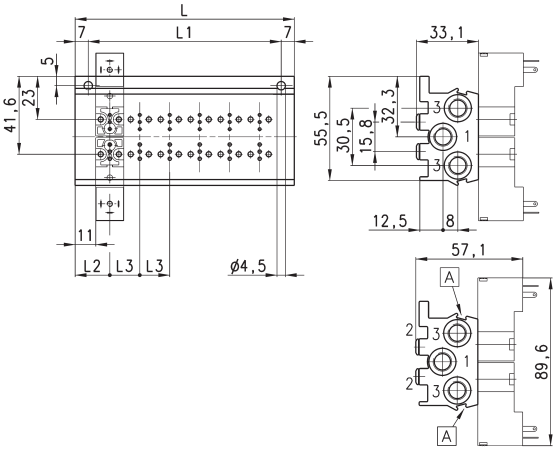


DIMENSIONS							
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with rear outlets



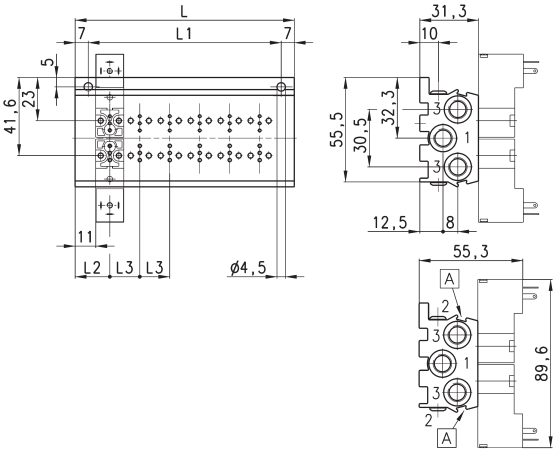
DIMENSIONS							
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.



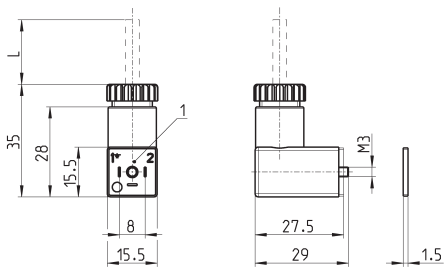
DIMENSIONS							
Mod.	Nr valves	L	LI	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Connector Mod. 126-... DIN EN 175 301-803-C (8 mm)

To be used in all DC valves with voltages from 6 to 110 V.

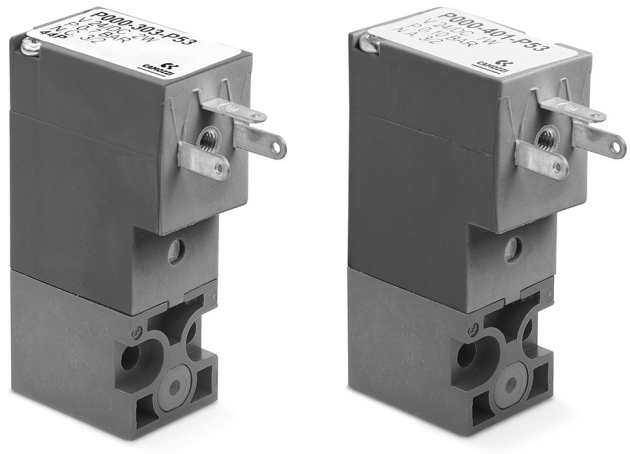


Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
126-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
126-800	connector, without electronics	black	-	-	PG7	0.3 Nm
126-701	connector, varistor + Led	transparent	24 V AC/DC	-	PG7	0.3 Nm

1 = 90° adjustable connector

Series P
directly operated solenoid valves

3/2-way - Normally Closed (NC) and Normally Open (NO)



» Can be mounted on a single base (M5 connections) or on manifold (M5 connections or cartridge ø 3 and 4).

Series P directly operated mini-solenoid valves are available as 3/2-way, either NC or NO. Both versions can be mounted on single bases or on manifolds and they are equipped with a manual override which makes the plants setting easier.

Please note that all Series P solenoid valves are supplied with direct current (DC).
To operate in alternating current (AC), it is necessary to use the connector with bridge rectifier Mod. 125-900.

GENERAL DATA

TECHNICAL FEATURES	
Function	3/2 NC - 3/2 NO
Operation	direct acting poppet type
Pneumatic connections	on subbase with ISO 15218 interface by means of screws
Nominal diameter	0.8 ... 1.5 mm
Nominal flow	14 ... 35 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.21 ... 0.54
Operating pressure	0 ÷ 3 ... 10 bar
Operating temperature	0°C ÷ 50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time (ISO 12238)	ON <10 msec - OFF <15 msec
Manual override	monostable button
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	FKM, NBR (FKM on demand)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	12 ... 110 V DC - 24 ... 110 V AC 50/60 Hz
Voltage tolerance	±10%
Power consumption	2 W - 1 W (24 V DC only)
Duty cycle	ED 100%
Electrical connection	with industrial standard connector (9.4 mm)
Protection class	IP65 with connector
Special versions available on demand	

CODING EXAMPLE

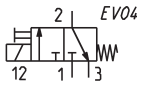
P	0	00	-	3	0	3	-	P	5	3	

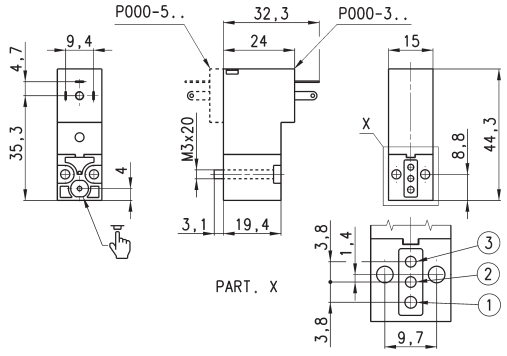
P	SERIES
0	BODY DESIGN: 0 = single sub-base (M5 only) or interface 1 = single manifold 2 = double sided manifold
00	NUMBER OF POSITIONS: 00 = interface 01 = single base (M5 only) 02 ÷ 99 = manifold number of positions
3	NUMBER OF WAYS - FUNCTIONS: 0 = manifold or single base 3 = 3-way NC 4 = 3-way NO 5 = 3-way NC electric part revolved by 180° 6 = 3-way NO electric part revolved by 180°
0	VALVE PORTS: 0 = interface (for single valve only) MANIFOLD PORTS (for Series W, P and PN): 2 = M5 side port 3 = ø 3 tube side port 4 = ø 4 tube side port 6 = M5 rear ports 7 = ø 3 tube rear ports 8 = ø 4 tube rear ports
3	NOMINAL DIAMETER - MAX PRESSURE 1 = ø 0,8 (1W) 10 bar (NC) 24V only 3 = ø 1,5 (2W) 7 bar (NC) 5 bar (NO) 5 = ø 1,1 NC (2W) 10 bar (NC) ø 0,9 NO (2W) 10 bar (NO) 6 = ø 1,5 NC (2W) 3 bar (NC) *
P	MATERIALS: P = technopolymer PBT body, FKM poppet seal, other seals in NBR (FKM on demand)
5	ELECTRICAL CONNECTION: 5 = industrial standard connection (9.4 mm)
3	SOLENOID VOLTAGE: B = 24V 50/60 Hz 2 = 12V DC 6 = 110V DC C = 48V 50/60 Hz 3 = 24V DC D = 110V 50/60 Hz 4 = 48V DC
	FIXING: = with screws for metal (standard) P = with screws for plastics

* Voltage tolerance from +10% to -25%

3/2-way NC solenoid valve

Supplied with:
1x interface seal
2x screws M3x20 UNI 8112
(fixing for metal, standard)
or
2x screws M3x23 UNI 10227
(fixing for plastics, P option)

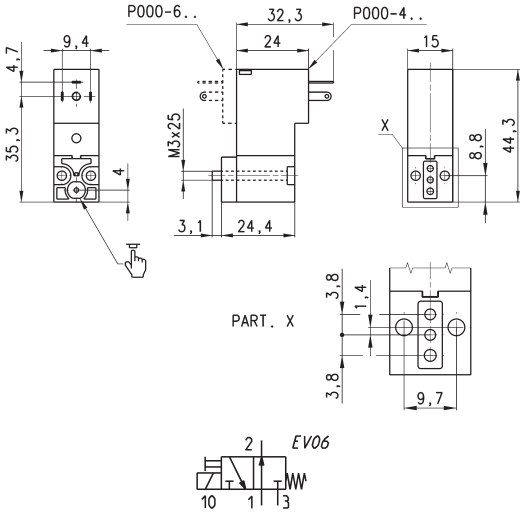




Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
P000-301-P53	0,8	0.21	14	0 ÷ 10
P000-303-P53	1,5	0.54	35	0 ÷ 7
P000-305-P53	1,1	0.39	25	0 ÷ 10
P000-306-P53	1,5	0.54	-	0 ÷ 3

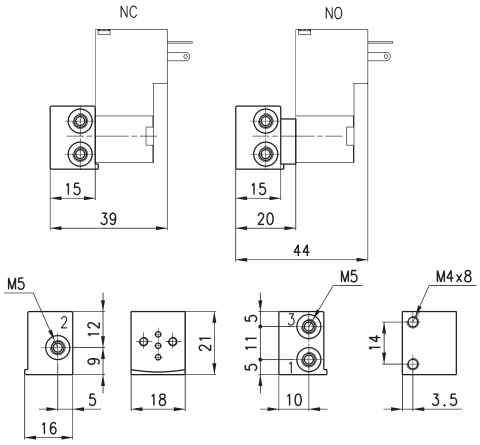
3/2-way NO solenoid valve

Supplied with:
1x interface for NO version
(connections 1 and 3 are inverted)
2x interface seals
2x screws M3x25 UNI 8112 (for standard version)



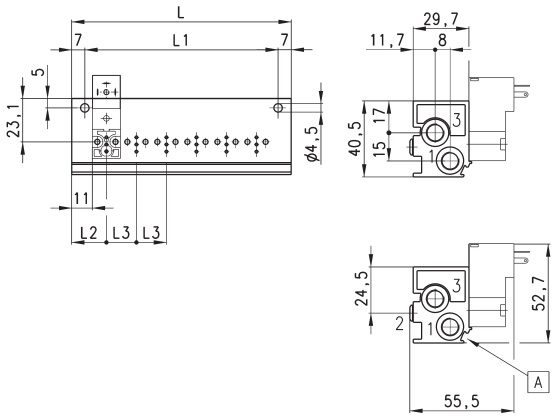
Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
P000-405-P53	0.9	0.23	15	0 ÷ 10
P000-403-P53	1.5	0.54	-	0 ÷ 5

Single sub-base



Mod.
P001-02

Single manifold with rear outlets



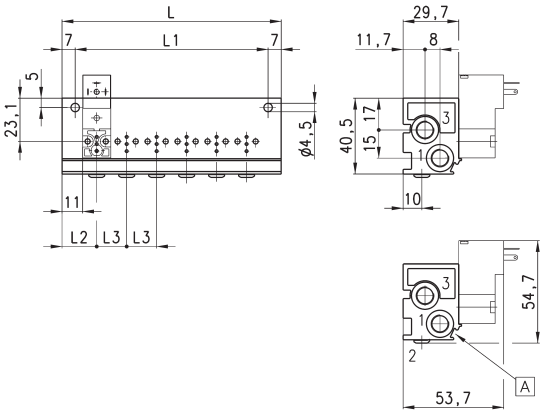
DIMENSIONS							
Mod.	N° Valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Single manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.

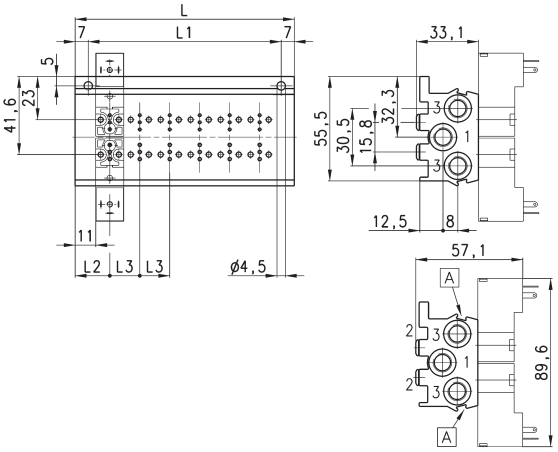


DIMENSIONS							
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with rear outlets



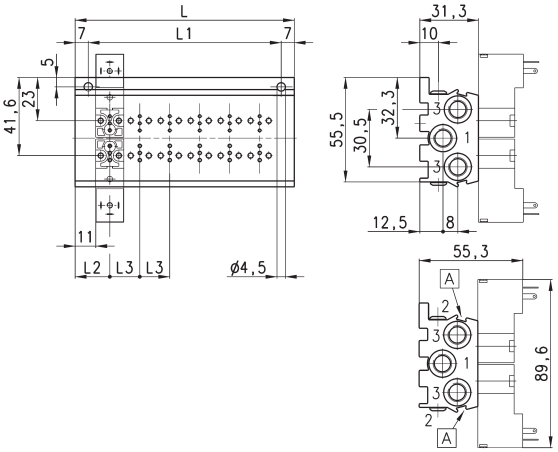
DIMENSIONS							
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.



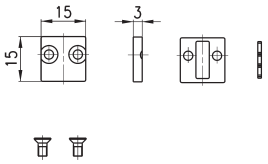
DIMENSIONS							
Mod.	Nr valves	L	LI	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

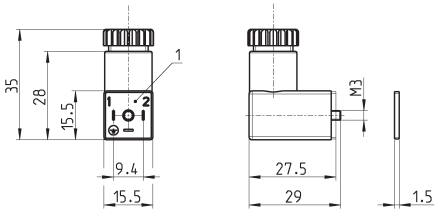
Excluder tap

Supplied with:
1x excluder tap
1x interface seal
2x screws



Mod.
P000-TP

Industrial standard (9.4 mm) connector Mod. 125-...

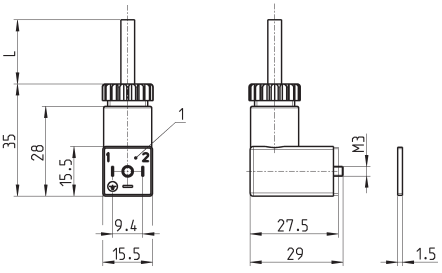


Mod.	description	colour	working voltage	cable holding	tightening torque
125-601	connector, diode + Led	transparent	10/50 V DC	PG7	0.3 Nm
125-701	connector, varistor + Led	transparent	24 V AC/DC	PG7	0.3 Nm
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Industrial standard (9.4 mm) connector Mod. 125-... with cable

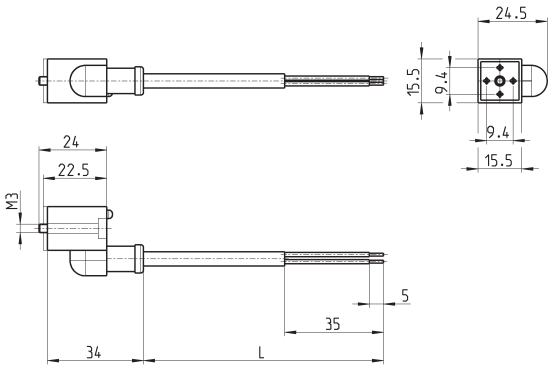
The internal rectifier circuit of the connector Mod. 125-900 allows to use solenoid valves with different AC voltage, even if the voltage indicated on the solenoid valve is DC.



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-501-2	moulded cable with diode + Led	black	10/50 V DC	2000 mm	-	0.3 Nm
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
125-601-2	pre-wired cable, diode + Led	transparent	10/50 V DC	2000 mm	PG7	0.3 Nm
125-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.3 Nm
125-900	pre-wired cable with voltage rectifier	black	6 V - 110 V AC/DC	2000 mm	PG7	0.3 Nm

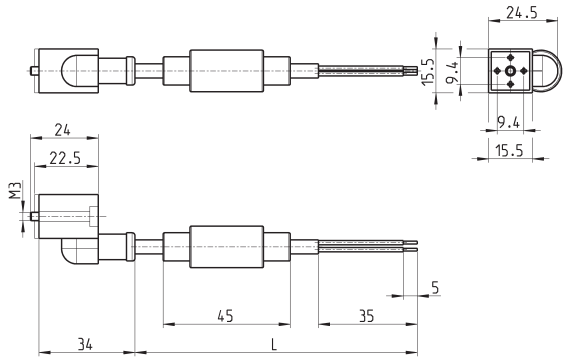
1 = 90° adjustable connector

Industrial standard (9.4 mm) in-line connectors with cable



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-503-2	in-line moulded cable, with diode + Led	black	24 V DC	2000 mm	-	0.3 Nm
125-503-5	in-line moulded cable, with diode + Led	black	24 V DC	5000 mm	-	0.3 Nm
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

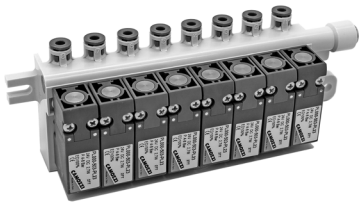
Industrial standard (9.4 mm) in-line connectors with bridge rectifier

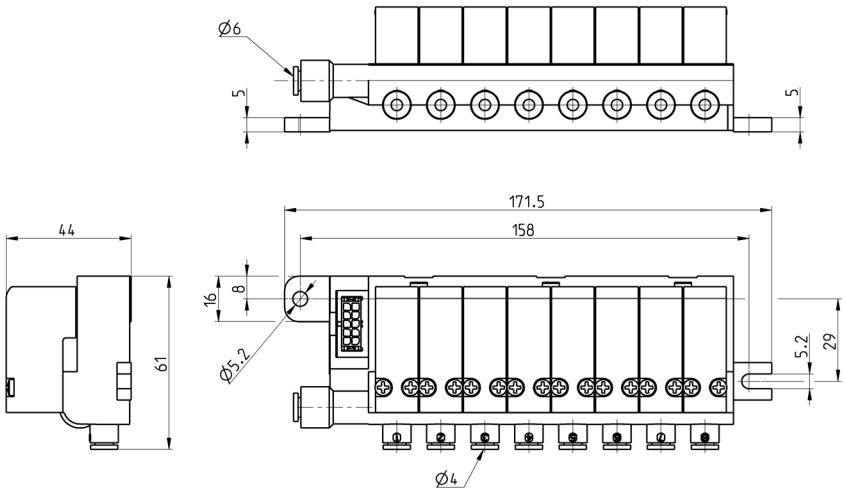


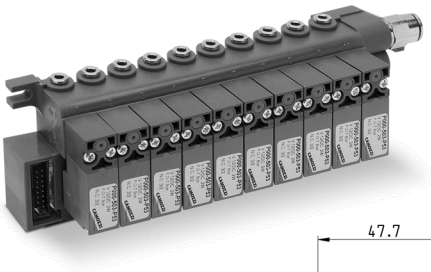
Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-903-2	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	2000 mm	-	0.3 Nm
125-903-5	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	5000 mm	-	0.3 Nm

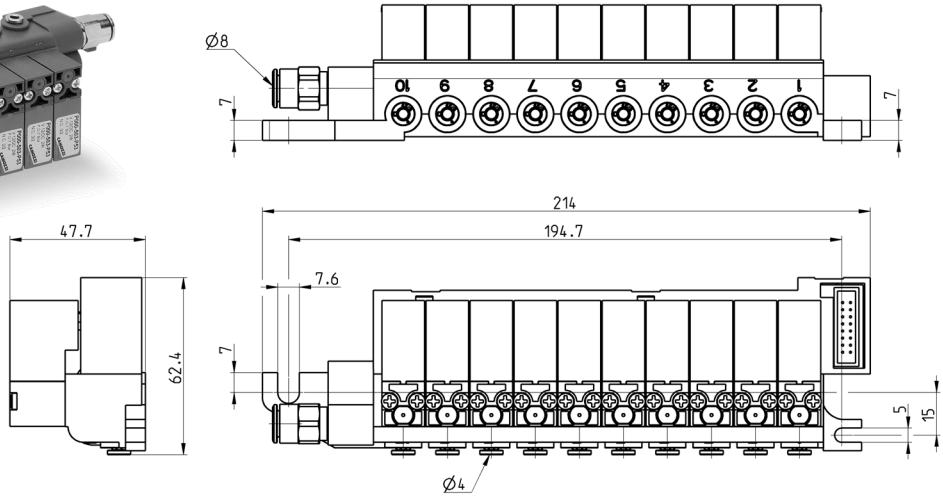
SERIES P MANIFOLD VERSION

Plug-In system based on Series P solenoid valves
Valve functions: 3/2 NC
Feasible versions: 8, 10 positions
Valve width: 15mm
Multipole electrical connection
Flexible assembly
Easy installation









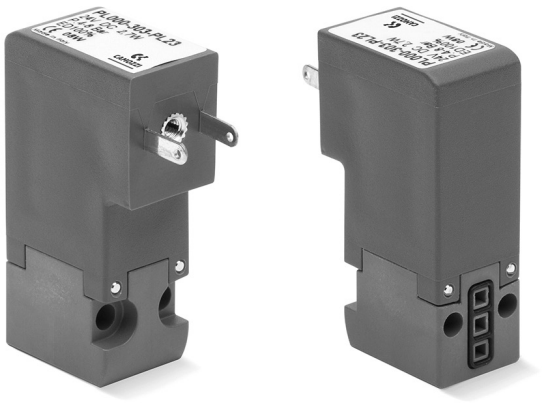
Pneumatic connections	tube* collect inlet and exhaust ø 8 mm - outlets ø 4 mm	* it is recommended to use tube Mod. TPC 4/2 (PU 98°Sh). For further information see Camozzi catalogue, section 4.4.15.
Nominal diameter	1.5 mm	
Nominal flow	35 Nl/min (single solenoid valve)	
Operating pressure	0 ÷ 7 bar	
Operating temperature	0 ÷ +50°C	
Medium	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas	

Seals	FKM, NBR (FKM on demand)

Voltage	24 V DC
Voltage tolerance	±10%
Power consumption	2 W
Duty cycle	ED 100%
Electrical connection	Multipole

Series PL
directly operated solenoid valves

3/2-way - Normally Closed (NC)



» Can be mounted on a single base (M5 connections) or on manifold (M5 connections or cartridge ø 3 and 4)

Series PL directly operated mini-solenoid valves are available in the NC version and can be mounted on single bases or on manifolds.

Please note that all Series PL solenoid valves are supplied with direct current (DC).
To operate in alternating current (AC), it is necessary to use the connector with bridge rectifier Mod. 125-900.

GENERAL DATA

TECHNICAL FEATURES	
Function	3/2 NC
Operation	direct acting poppet type
Pneumatic connections	on subbase with ISO 15218 interface by means of screws
Nominal diameter	1.5 mm
Nominal flow	35 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.54
Operating pressure	0 ÷ 3.5 or 4 ÷ 8 bar
Operating temperature	0°C ÷ 50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time	ON <10 msec - OFF <15 msec
Manual override	not foreseen
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	FKM, NBR
Internal parts	stainless steel, NBR
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - other voltages on demand
Voltage tolerance	±10%
Power consumption	2.7 W
Duty cycle	ED 100%
Electrical connection	with industrial standard connector (9.4 mm)
Protection class	IP65 with connector
Special versions available on demand	

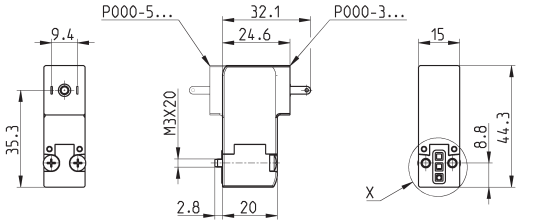
CODING EXAMPLE

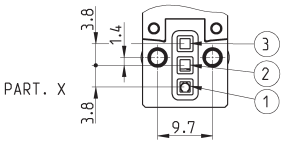
PL	0	00	-	3	0	3	-	PL	2	3	

PL	SERIES
0	BODY DESIGN: 0 = single sub-base (M5 only) or interface 1 = single manifold 2 = double sided manifold
00	NUMBER OF POSITIONS: 00 = interface 01 = single base (M5 only) 02 ÷ 99 = manifold number of positions
3	NUMBER OF WAYS - FUNCTIONS: 0 = manifold or single base 3 = 3-way NC 5 = 3-way NC electric part revolved by 180°
0	VALVE PORTS: 0 = interface (for single valve only) MANIFOLD PORTS: 2 = M5 side port 3 = ø 3 tube side port 4 = ø 4 tube side port 6 = M5 rear ports 7 = ø 3 tube rear ports 8 = ø 4 tube rear ports
3	NOMINAL DIAMETER: 3 = Ø 1.5 mm (Pressure 4 ÷ 8 bar) 6 = Ø 1.5 mm (Pressure 0 ÷ 3.5 bar)
PL	MATERIALS: PL = technopolymer PBT body, FKM poppet seal, other seals in NBR
2	ELECTRICAL CONNECTION: 2 = industrial standard connection (9.4 mm)
3	VOLTAGE - POWER CONSUMPTION: 2 = 12 V DC 2.7W 3 = 24 V DC 2.7W
	FIXING: = with screws for metal (standard) P = with screws for plastics

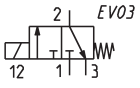
3/2-way NC solenoid valve

Supplied with:
1x interface seal
2x screws M3x20 UNI 8112
(fixing for metal, standard)
or
2x screws M3x23 UNI 10227
(fixing for plastics. P option)

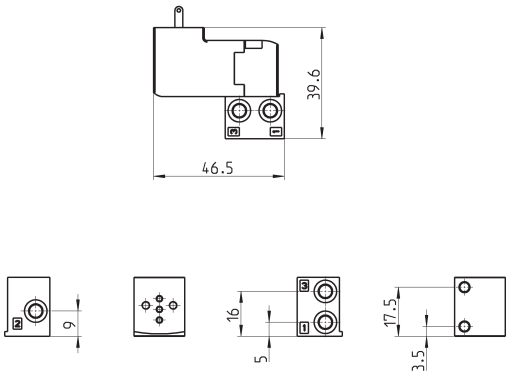




Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
PL000-303-PL23	1.5	0.54	35	4 ÷ 8
PL000-503-PL23	1.5	0.54	35	4 ÷ 8
PL000-306-PL23	1.5	0.54	-	0 ÷ 3.5
PL000-506-PL23	1.5	0.54	-	0 ÷ 3.5

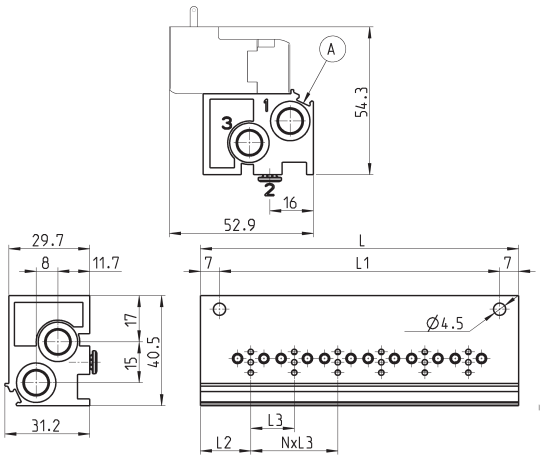


Single sub-base



Mod.
P001-02

Single manifold with rear outlets



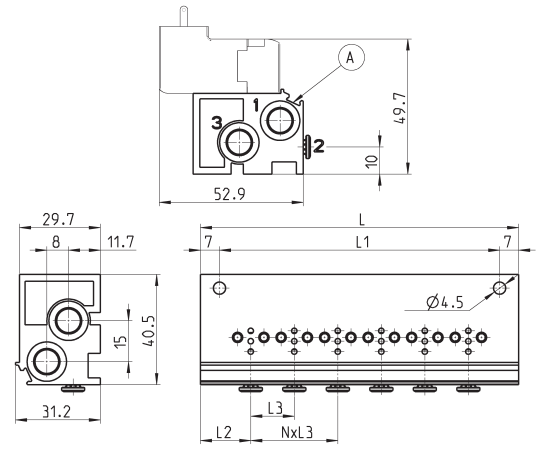
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Single manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.

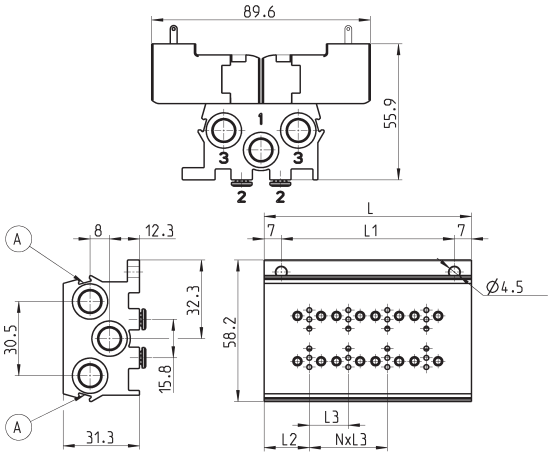


Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with rear outlets



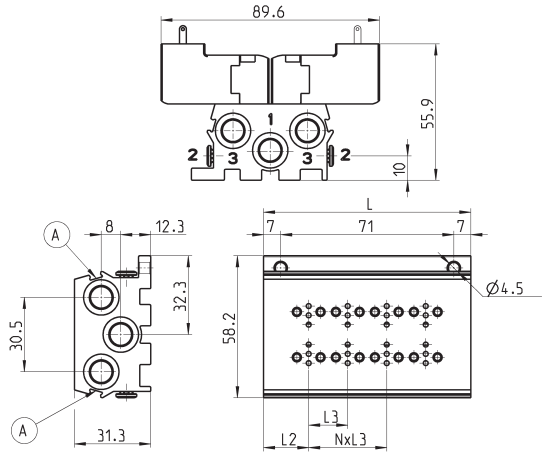
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.



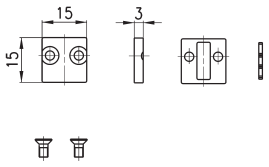
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

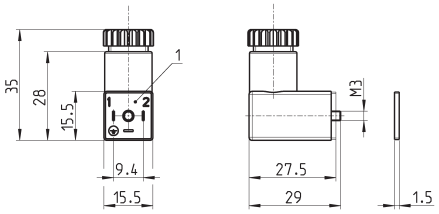
Excluder tap

Supplied with:
1x excluder tap
1x interface seal
2x screws



Mod.
P000-TP

Industrial standard (9.4 mm) connector Mod. 125-...

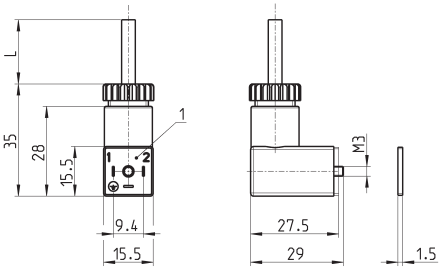


Mod.	description	colour	working voltage	cable holding	tightening torque
125-601	connector, diode + Led	transparent	10/50 V DC	PG7	0.3 Nm
125-701	connector, varistor + Led	transparent	24 V AC/DC	PG7	0.3 Nm
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Industrial standard (9.4 mm) connector Mod. 125-... with cable

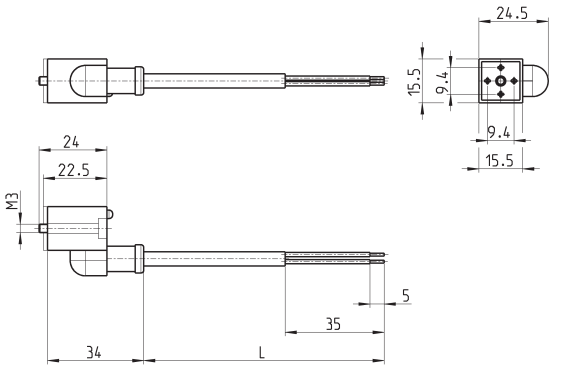
The internal rectifier circuit of the connector Mod. 125-900 allows to use solenoid valves with different AC voltage, even if the voltage indicated on the solenoid valve is DC.



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-501-2	moulded cable with diode + Led	black	10/50 V DC	2000 mm	-	0.3 Nm
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
125-601-2	pre-wired cable, diode + Led	transparent	10/50 V DC	2000 mm	PG7	0.3 Nm
125-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.3 Nm
125-900	pre-wired cable with voltage rectifier	black	6 V - 110 V AC/DC	2000 mm	PG7	0.3 Nm

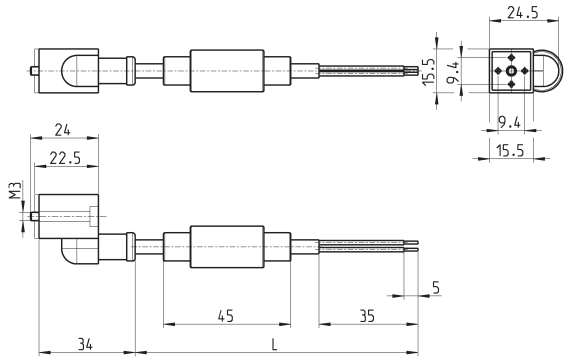
1 = 90° adjustable connector

Industrial standard (9.4 mm) in-line connectors with cable



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-503-2	in-line moulded cable, with diode + Led	black	24 V DC	2000 mm	-	0.3 Nm
125-503-5	in-line moulded cable, with diode + Led	black	24 V DC	5000 mm	-	0.3 Nm
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

Industrial standard (9.4 mm) in-line connectors with bridge rectifier



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-903-2	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	2000 mm	-	0.3 Nm
125-903-5	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	5000 mm	-	0.3 Nm

Series PN
directly operated solenoid valves

3/2-way - Normally Closed (NC)

- Can be mounted on a single base (M5 connections) or on manifold (M5 connections or cartridge ø 3 and 4)
- Compact design suitable for use in reduced mounting space

Series PN directly operated solenoid valves are available as 3/2-way NC.
They are equipped with a manual override which makes the plants setting easier and they can be mounted on single bases or on manifolds.

Please note that all Series PN solenoid valves are supplied with direct current (DC).
To operate in alternating current (AC), it is necessary to use the connector with bridge rectifier Mod. 125-900.

GENERAL DATA

TECHNICAL FEATURES	
Function	3/2 NC
Operation	direct acting poppet type
Pneumatic connections	on subbase with ISO 12238 interface by means of screws
Nominal diameter	0.8 mm
Nominal flow	12 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.19
Operating pressure	0 ÷ 10 bar
Operating temperature	0°C ÷ 50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time (ISO 12238)	ON <10 msec - OFF <15 msec
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PBT technopolymer
Seals	PU, NBR, (FKM on demand)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	24 ... 205 V DC
Voltage tolerance	±10%
Power consumption	2 W - 1 W (24 V DC only)
Duty cycle	ED 100%
Electrical connection	with industrial standard connector (9.4 mm)
Protection class	IP65 with connector
Special versions available on demand	

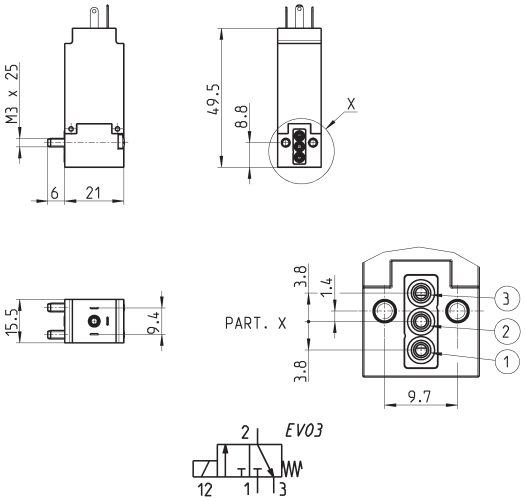
CODING EXAMPLE

PN	0	00	-	3	0	1	-	P	5	3	

PN	SERIES
0	BODY DESIGN: 0 = single sub-base 1 = single manifold 2 = double sided manifold
00	NUMBER OF POSITIONS: 00 = interface 01 = single base (M5 only) 02 ÷ 99 = manifold number of positions
3	NUMBER OF WAYS - FUNCTIONS: 0 = manifold or single base 3 = 3-way NC
0	VALVE PORTS: 0 = interface (for single valve only) MANIFOLD PORTS (for Series W, P and PN): 2 = M5 side port 3 = ø 3 tube side port 4 = ø 4 tube side port 6 = M5 rear ports 7 = ø 3 tube rear ports 8 = ø 4 tube rear ports
1	NOMINAL DIAMETER - MAX PRESSURE 1 = ø 0,8 (1W) 10 bar (NC) 24V only
P	MATERIALS: P = PBT body, PU poppet seal
5	ELECTRICAL CONNECTION: 5 = industrial standard connection (9.4 mm)
3	SOLENOID VOLTAGE: 3 = 24V DC 4 = 48V DC 6 = 110V DC 7 = 205V DC
	FIXING: = standard for the mounting on plastic interfaces M = with screws for the mounting on metal interface (on demand)

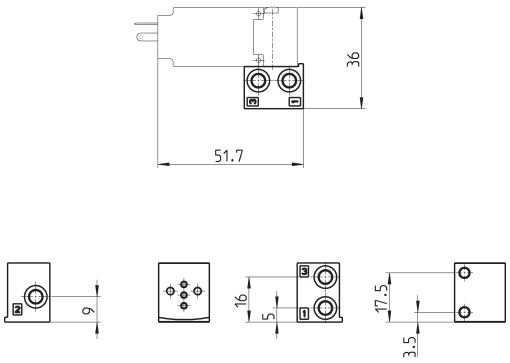
3/2-way NC solenoid valve

Supplied with:
1x interface seal
2x screws



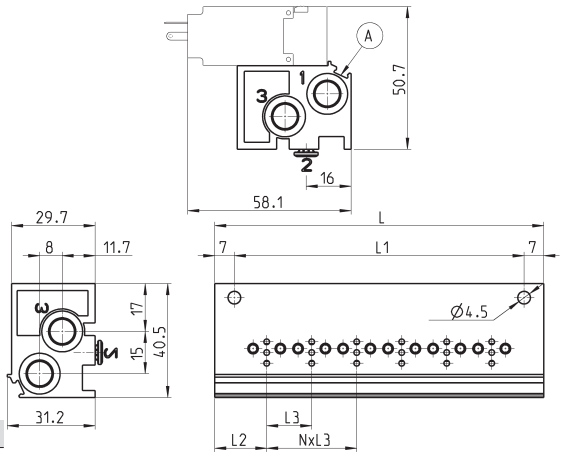
Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
PN000-301-P53	0.8	0.18	12	0 ÷ 10

Single sub-base



Mod.
P001-02

Single manifold with rear outlets



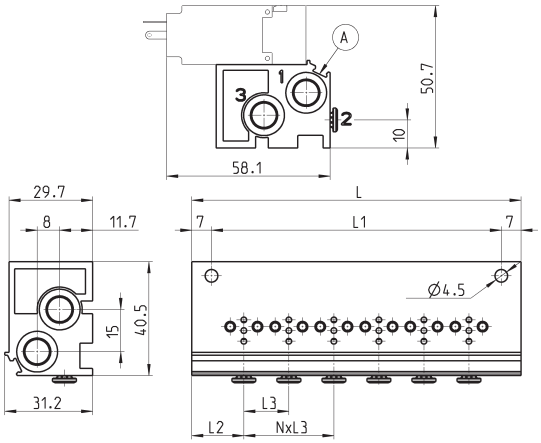
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Single manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.

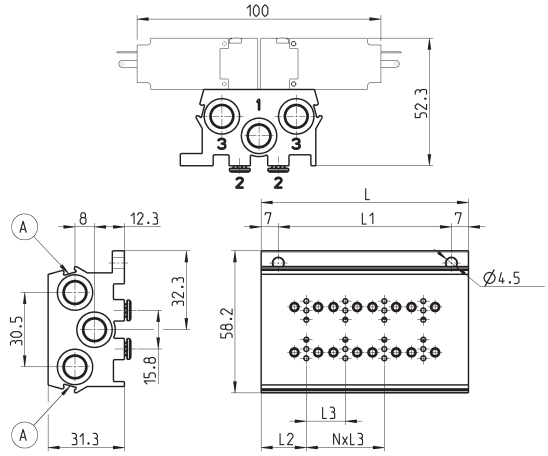


Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P102-0*	2	53	39	18,5	16	G1/8	G1/8
P103-0*	3	69	55	18,5	16	G1/8	G1/8
P104-0*	4	85	71	18,5	16	G1/8	G1/8
P105-0*	5	101	87	18,5	16	G1/8	G1/8
P106-0*	6	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with rear outlets



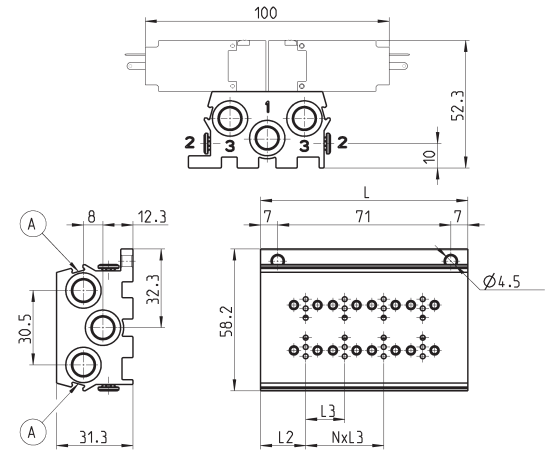
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

Double sided manifold with front outlets

This manifold is arranged to be fixed through DIN 46277/3 guide together with the accessory PCF-E520.



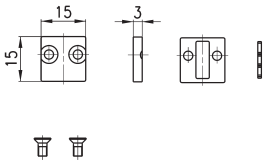
Mod.	Nr valves	L	L1	L2	L3	1 (P)	3 (R)
P204-0*	4	53	39	18,5	16	G1/8	G1/8
P206-0*	6	69	55	18,5	16	G1/8	G1/8
P208-0*	8	85	71	18,5	16	G1/8	G1/8
P210-0*	10	101	87	18,5	16	G1/8	G1/8
P212-0*	12	117	103	18,5	16	G1/8	G1/8

* = see the type of PORTS in the CODING EXAMPLE TABLE.

A = groove for electric connection identification

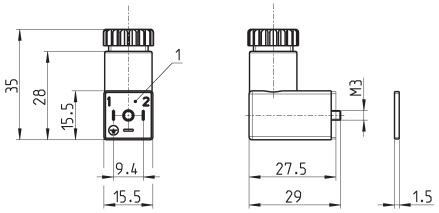
Excluder tap

Supplied with:
1x excluder tap
1x interface seal
2x screws



Mod.
P000-TP

Industrial standard (9.4 mm) connector Mod. 125-...

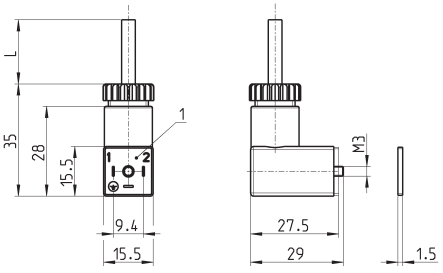


Mod.	description	colour	working voltage	cable holding	tightening torque
125-601	connector, diode + Led	transparent	10/50 V DC	PG7	0.3 Nm
125-701	connector, varistor + Led	transparent	24 V AC/DC	PG7	0.3 Nm
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Industrial standard (9.4 mm) connector Mod. 125-... with cable

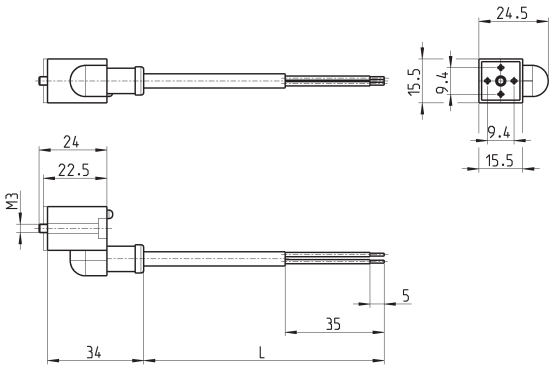
The internal rectifier circuit of the connector Mod. 125-900 allows to use solenoid valves with different AC voltage, even if the voltage indicated on the solenoid valve is DC.



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-501-2	moulded cable with diode + Led	black	10/50 V DC	2000 mm	-	0.3 Nm
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
125-601-2	pre-wired cable, diode + Led	transparent	10/50 V DC	2000 mm	PG7	0.3 Nm
125-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.3 Nm
125-900	pre-wired cable with voltage rectifier	black	6 V - 110 V AC/DC	2000 mm	PG7	0.3 Nm

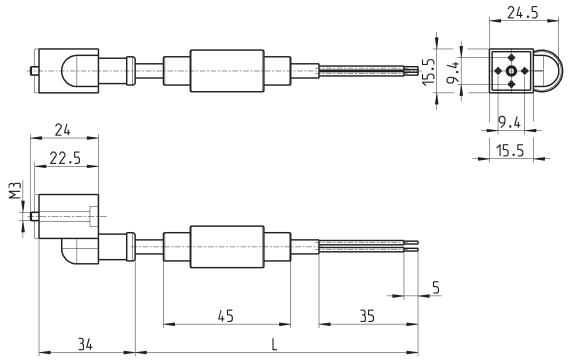
1 = 90° adjustable connector

Industrial standard (9.4 mm) in-line connectors with cable



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-503-2	in-line moulded cable, with diode + Led	black	24 V DC	2000 mm	-	0.3 Nm
125-503-5	in-line moulded cable, with diode + Led	black	24 V DC	5000 mm	-	0.3 Nm
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

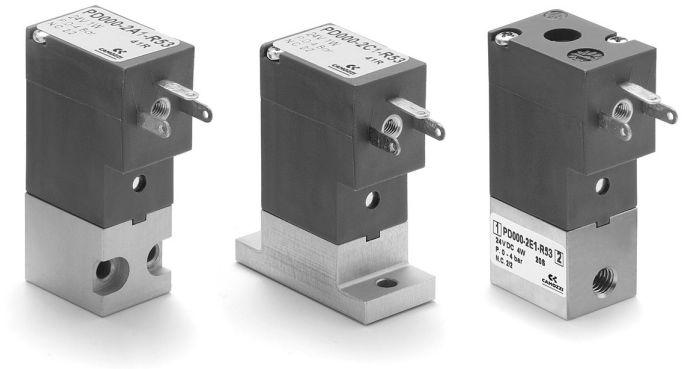
Industrial standard (9.4 mm) in-line connectors with bridge rectifier



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-903-2	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	2000 mm	-	0.3 Nm
125-903-5	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	5000 mm	-	0.3 Nm

Series PD
directly operated solenoid valves

2/2-way - Normally Closed (NC)



This directly operated solenoid valve is available as 2/2-way, NC, in several sizes and in three different versions.

Please note that all Series PD solenoid valves are supplied with direct current (DC).
To operate in alternating current (AC), it is necessary to use the connector with bridge rectifier Mod. 125-900.

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC
Operation	direct acting poppet type
Pneumatic connections	on subbase by means of M3 screws - M5 threads
Nominal diameter	0.8 ... 2.5 mm
Nominal flow	25 ... 125 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.39 ... 1.93
Operating pressure	-0.9 ÷ 4 ... 12 bar
Operating temperature	0°C ÷ 50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time	<15 ms
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	brass, anodized aluminium
Seals	NBR, (FKM on demand)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - other voltages on demand
Voltage tolerance	1 and 2 W ±10% - 4 W ±5%
Power consumption	1 ... 4 W
Duty cycle	ED 100% (1 and 2 W) - ED 50% (4W) see the ED definition diagram
Electrical connection	with industrial standard connector (9.4 mm)
Protection class	IP65 with connector
Special versions available on demand	

CODING EXAMPLE

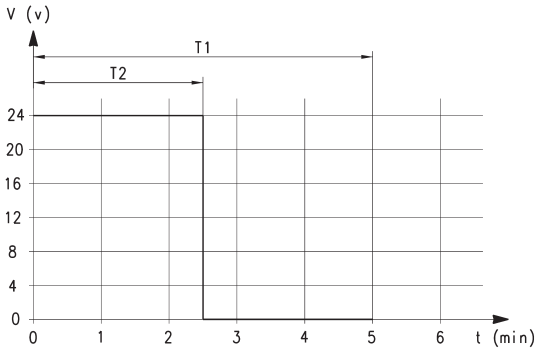
PD	0	00	-	2	A	1	-	R	5	3	

PD	SERIES
0	BODY DESIGN: 0 = single body
00	NUMBER OF POSITIONS: 00 = interface
2	NUMBER OF WAYS - FUNCTIONS: 2 = 2-way NC
A	BODY MATERIALS AND VALVE PORTS: A = aluminium body, rear pneumatic interface C = aluminium body, low pneumatic interface E = brass body, M5 ports (for ø up to 1.6mm)
1	NOMINAL DIAMETER: 1 = ø 0.8 2 = ø 1.2 3 = ø 1.6 4 = ø 2 5 = ø 2.5
R	POPPET SEAL MATERIALS: R = NBR F = FKM (on request)
5	ELECTRICAL CONNECTION: 5 = industrial standard connection (9.4 mm)
3	SOLENOID VOLTAGE: 1 = 12V DC 1W 2 = 12V DC 2W 3 = 24V DC 1W 5 = 24V DC 2W 8 = 24V DC 4W
	FIXING: = with screws for metal (standard) P = with screws for plastics

ED definition diagram

Operating factor lower than 50%

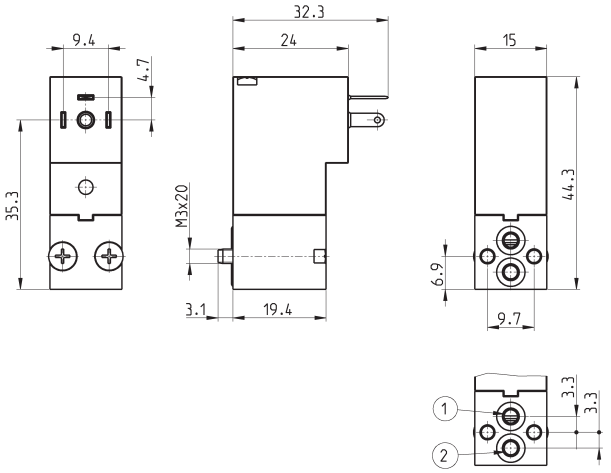
T1 = cycle time (5 minutes max)
T2 = energizing time
t = time (minutes)
V = working voltage (volt)
ED = T2/T1 x 100

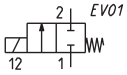


2/2-way NC solenoid valve, rear pneumatic interface

Supplied with:
2x OR seals
2x screws M3x20 UNI 8112
(fixing for metal, standard)
or
2x screws M3x23 UNI 10227
(fixing for plastics, P option)

For use with vacuum invert channel 1 and channel 2.



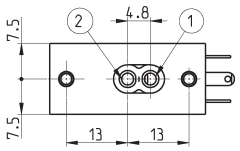


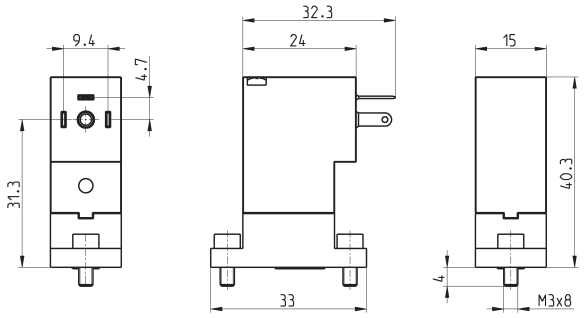
Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)	Power consumption (W)	ED (%)
PD000-2A1-R51	0.8	0.39	25	0 ÷ 12	1	100
PD000-2A1-R53	0.8	0.39	25	0 ÷ 12	1	100
PD000-2A2-R52	1.2	0.54	35	0 ÷ 12	2	100
PD000-2A2-R55	1.2	0.54	35	0 ÷ 12	2	100
PD000-2A3-R52	1.6	0.70	45	0 ÷ 7	2	100
PD000-2A3-R55	1.6	0.70	45	0 ÷ 7	2	100
PD000-2A4-R58	2	1.31	85	0 ÷ 6	4	50
PD000-2A5-R58	2.5	1.93	-	0 ÷ 4	4	50

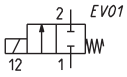
2/2-way NC solenoid valve, low pneumatic interface

Supplied with:
1x seal
2x screws M3x8 UNI 5931

For use with vacuum invert channel 1 and channel 2.



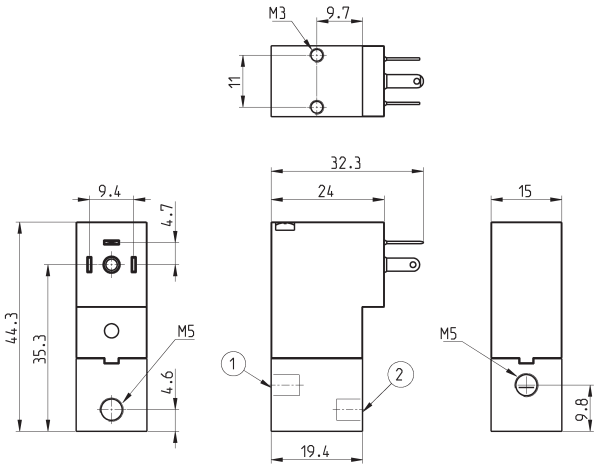


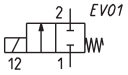


Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)	Power consumption (W)	ED (%)
PD000-2C1-R51	0.8	0.39	25	0 ÷ 12	1	100
PD000-2C1-R53	0.8	0.39	25	0 ÷ 12	1	100
PD000-2C2-R52	1.2	0.54	35	0 ÷ 12	2	100
PD000-2C2-R55	1.2	0.54	35	0 ÷ 12	2	100
PD000-2C3-R52	1.6	0.70	45	0 ÷ 7	2	100
PD000-2C3-R55	1.6	0.70	45	0 ÷ 7	2	100
PD000-2C4-R58	2	1.31	85	0 ÷ 6	4	50
PD000-2C5-R58	2.5	1.93	-	0 ÷ 4	4	50

2/2-way NC solenoid valve, M5 ports

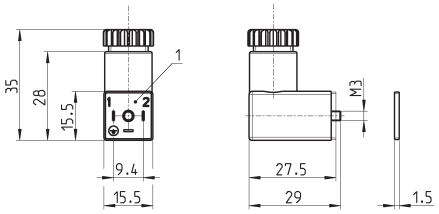
For use with vacuum invert channel 1 and channel 2.





Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)	Power consumption (W)	ED (%)
PD000-2E1-R51	0.8	0.39	25	0 ÷ 12	1	100
PD000-2E1-R53	0.8	0.39	25	0 ÷ 12	1	100
PD000-2E2-R52	1.2	0.54	35	0 ÷ 12	2	100
PD000-2E2-R55	1.2	0.54	35	0 ÷ 12	2	100
PD000-2E3-R52	1.6	0.70	45	0 ÷ 7	2	100
PD000-2E3-R55	1.6	0.70	45	0 ÷ 7	2	100

Industrial standard (9.4 mm) connector Mod. 125-...

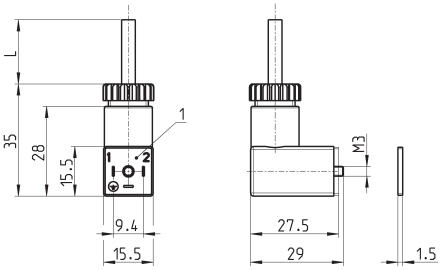


Mod.	description	colour	working voltage	cable holding	tightening torque
125-601	connector, diode + Led	transparent	10/50 V DC	PG7	0.3 Nm
125-701	connector, varistor + Led	transparent	24 V AC/DC	PG7	0.3 Nm
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Industrial standard (9.4 mm) connector Mod. 125-... with cable

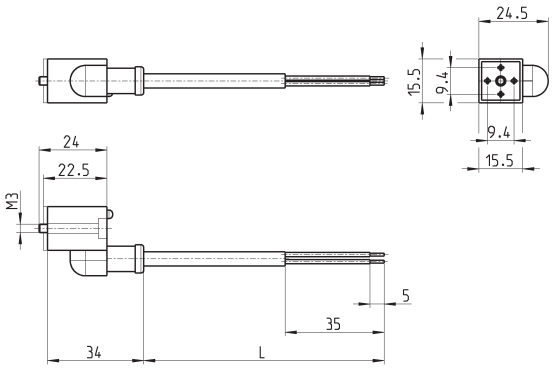
The internal rectifier circuit of the connector Mod. 125-900 allows to use solenoid valves with different AC voltage, even if the voltage indicated on the solenoid valve is DC.



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-501-2	moulded cable with diode + Led	black	10/50 V DC	2000 mm	-	0.3 Nm
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
125-601-2	pre-wired cable, diode + Led	transparent	10/50 V DC	2000 mm	PG7	0.3 Nm
125-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.3 Nm
125-900	pre-wired cable with voltage rectifier	black	6 V - 110 V AC/DC	2000 mm	PG7	0.3 Nm

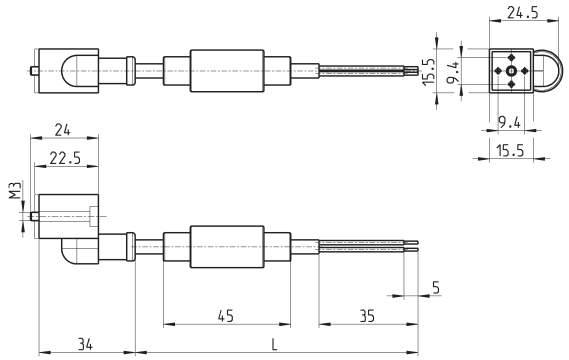
1 = 90° adjustable connector

Industrial standard (9.4 mm) in-line connectors with cable



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-503-2	in-line moulded cable, with diode + Led	black	24 V DC	2000 mm	-	0.3 Nm
125-503-5	in-line moulded cable, with diode + Led	black	24 V DC	5000 mm	-	0.3 Nm
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

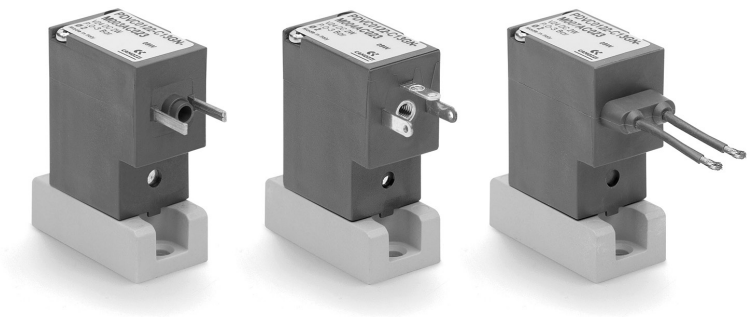
Industrial standard (9.4 mm) in-line connectors with bridge rectifier



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-903-2	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	2000 mm	-	0.3 Nm
125-903-5	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	5000 mm	-	0.3 Nm

Series PDV
directly operated solenoid valves with fluid separation membrane

2/2-way - Normally Closed (NC)



- Suitable to be used with neutral or aggressive fluids
- Suitable for specific applications on medical and analytical equipment or instruments
- Compact design

To choose the most suitable model for a specific application, check the chemical compatibility of the medium to control with the available materials of body and seals.

Series PDV directly operated solenoid valve is available with several nominal diameters and in three different versions according to the electrical connection.
Moreover, the fluid separation membrane protects the medium from extreme changes of temperature due to heating of the solenoid.

GENERAL DATA

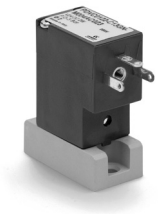
TECHNICAL FEATURES	
Function	2/2 NC
Operation	directly operated with fluid separation membrane
Pneumatic connections	on subbase by means of M3 screws
Nominal diameter	0.8 ... 2 mm
Nominal flow	see kv
Flow coefficient kv (l/min)	0.25 ... 0.8
Operating pressure	0 ... 7 bar
Operating temperature	10°C ÷ 50°C
Media	gas and liquids: air, water, reagents, solvents, etc...
Response time (ISO 12238)	≤ 15 ms
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	PEEK
Seals	FKM - EPDM
ELECTRICAL FEATURES	
Voltage	24 V DC - 12 V DC - other voltages on request
Voltage tolerance	±10%
Power consumption	2 W
Duty cycle	ED 100%
Electrical connection	industrial standard (9.4 mm), DIN EN 175 301-803-C (8 mm), cable L = 300 mm
Protection class	IP65 with connector
Special versions available on request	

CODING EXAMPLE

PDV	C0	1	22	-	B7	3	G	N	-	M	00	4A	C023

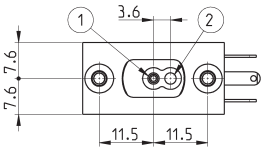
PDV	SERIES
C0	BODY DESIGN: C0 = body with interface for subbase
1	NUMBER OF WAYS - FUNCTIONS: 1 = 2/2-way NC
22	PNEUMATIC CONNECTIONS: 22 = PDV-type interface, 2-way
B7	NOMINAL DIAMETER: A7 = ø 0.8 mm B3 = ø 1.2 mm B7 = ø 1.6 mm C1 = ø 2.0 mm
3	SEAL MATERIAL: 3 = FKM 4 = EPDM
G	BODY MATERIAL: G = PEEK
N	MANUAL OVERRIDE: N = not foreseen
M	FIXING ACCESSORIES: M = screws for metal
00	OPTIONS: 00 = none
4A	ELECTRICAL CONNECTION: 3A = DIN EN 175 301-803-C (8 mm) 4A = industrial standard (9.4 mm) 7A = cables (L = 300 mm) 3C = DIN EN 175 301-803-C (8 mm) with coil rotated 180° 4C = industrial standard (9.4 mm) with coil rotated 180° 7C = cables (L = 300 mm) with coil rotated 180°
C023	VOLTAGE - POWER CONSUMPTION: C017 = 6V DC 2W C020 = 12V DC 2W C023 = 24V DC 2W

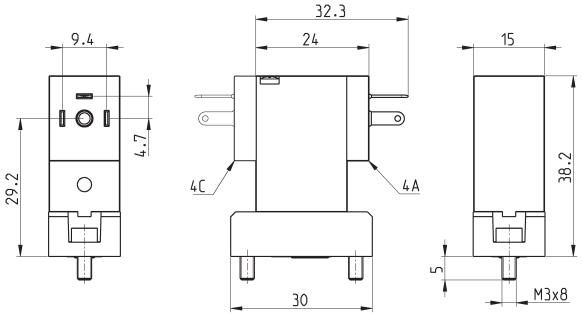
2/2 NC solenoid valve, industrial standard (9.4 mm)



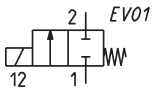
Supplied with:
1x seal
2x M3x8 UNI 5931 screws

NOTE IN THE TABLE BELOW:
* to complete the code, add ELECTRICAL CONNECTION (4A or 4C options) and VOLTAGE (see CODING EXAMPLE)





NOTE IN THE DRAWING:
1 = INLET PORT
2 = OUTLET PORT



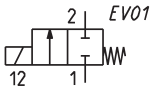
Mod.	Orifice Ø (mm)	kv (l/min)	Min/max pressure (bar)	Max back pressure (bar)	Body material	Seal material
PDVC0122-A73GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	FKM
PDVC0122-A74GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	EPDM
PDVC0122-B33GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	FKM
PDVC0122-B34GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	EPDM
PDVC0122-B73GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	FKM
PDVC0122-B74GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	EPDM
PDVC0122-C13GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	FKM
PDVC0122-C14GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	EPDM

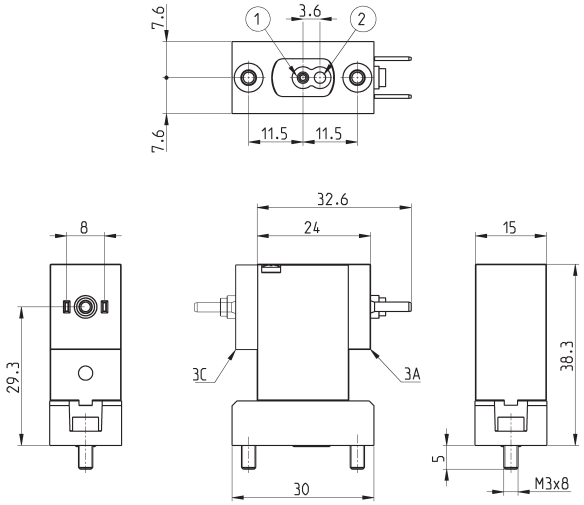
2/2 NC solenoid valve, DIN EN 175 301-803-C (8 mm)

Supplied with:
1x seal
2x M3x8 UNI 5931 screws

NOTE IN THE TABLE BELOW:
* to complete the code, add
ELECTRICAL CONNECTION
(3A or 3C options)
and VOLTAGE
(see CODING EXAMPLE)

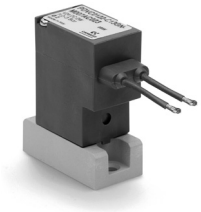
NOTE IN THE DRAWING:
1 = INLET PORT
2 = OUTLET PORT





Mod.	Orifice Ø (mm)	kv (l/min)	Min/max pressure (bar)	Max back pressure (bar)	Body material	Seal material
PDVC0122-A73GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	FKM
PDVC0122-A74GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	EPDM
PDVC0122-B33GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	FKM
PDVC0122-B34GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	EPDM
PDVC0122-B73GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	FKM
PDVC0122-B74GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	EPDM
PDVC0122-C13GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	FKM
PDVC0122-C14GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	EPDM

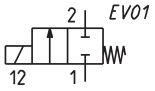
2/2 NC solenoid valve, electrical connection with 300mm cable

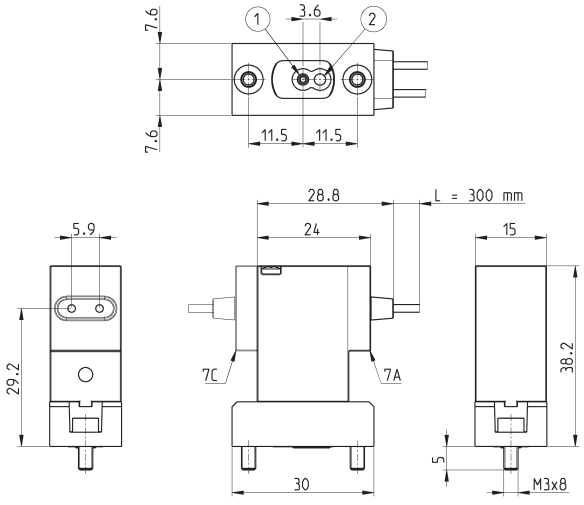


Supplied with:
1x seal
2x M3x8 UNI 5931 screws

NOTE IN THE TABLE BELOW:
* to complete the code, add
ELECTRICAL CONNECTION
(7A or 7C options)
and VOLTAGE
(see CODING EXAMPLE)

NOTE IN THE DRAWING:
1 = INLET PORT
2 = OUTLET PORT

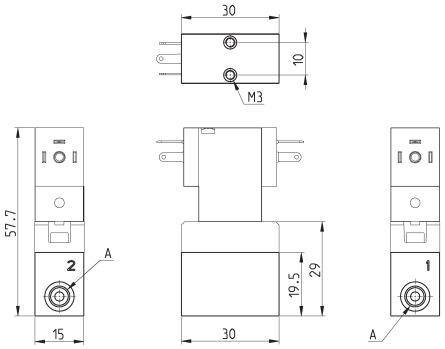




Mod.	Orifice Ø (mm)	kv (l/min)	Min/max pressure (bar)	Max back pressure (bar)	Body material	Seal material
PDVC0122-A73GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	FKM
PDVC0122-A74GN-M00*	0.8	0.25	0 ÷ 7.0	1.2	PEEK	EPDM
PDVC0122-B33GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	FKM
PDVC0122-B34GN-M00*	1.2	0.55	0 ÷ 4.5	1.2	PEEK	EPDM
PDVC0122-B73GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	FKM
PDVC0122-B74GN-M00*	1.6	0.65	0 ÷ 4.0	1.2	PEEK	EPDM
PDVC0122-C13GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	FKM
PDVC0122-C14GN-M00*	2.0	0.80	0 ÷ 3.0	1.2	PEEK	EPDM

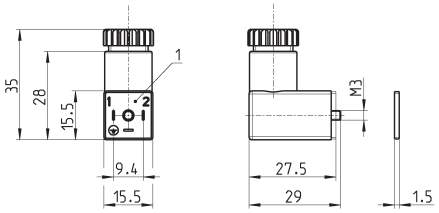
Single subbase for Series PDV solenoid valve

Material: PEEK
Pneumatic connections: M5 or 1/4-28 UNF



Mod.	A (pneumatic connections)
PDV001-1/4	1/4 - 28 UNF
PDV001-M5	M5

Industrial standard (9.4 mm) connector Mod. 125-...

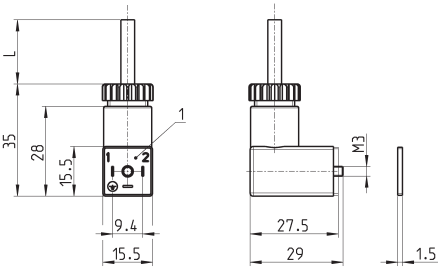


Mod.	description	colour	working voltage	cable holding	tightening torque
125-601	connector, diode + Led	transparent	10/50 V DC	PG7	0.3 Nm
125-701	connector, varistor + Led	transparent	24 V AC/DC	PG7	0.3 Nm
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Industrial standard (9.4 mm) connector Mod. 125-... with cable

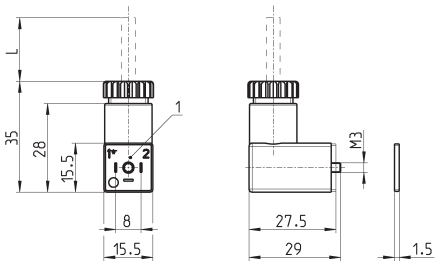
The internal rectifier circuit of the connector Mod. 125-900 allows to use solenoid valves with different AC voltage, even if the voltage indicated on the solenoid valve is DC.



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-501-2	moulded cable with diode + Led	black	10/50 V DC	2000 mm	-	0.3 Nm
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
125-601-2	pre-wired cable, diode + Led	transparent	10/50 V DC	2000 mm	PG7	0.3 Nm
125-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.3 Nm
125-900	pre-wired cable with voltage rectifier	black	6 V - 110 V AC/DC	2000 mm	PG7	0.3 Nm

1 = 90° adjustable connector

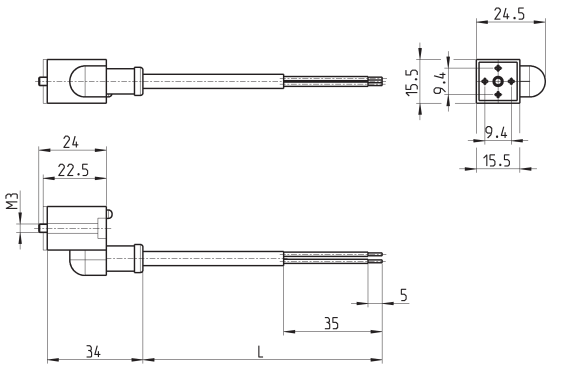
Connector Mod. 126-... DIN EN 175 301-803-C (8 mm)



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
126-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm
126-800	connector, without electronics	black	-	-	PG7	0.3 Nm
126-701	connector, varistor + Led	transparent	24 V AC/DC	-	PG7	0.3 Nm

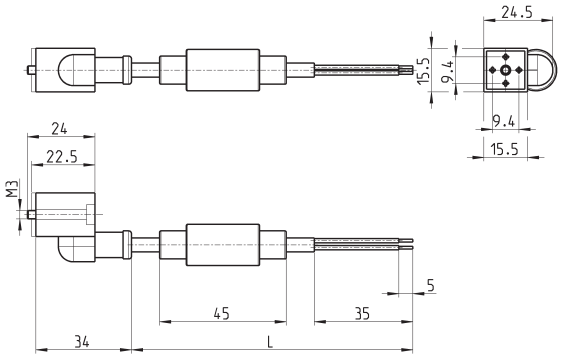
1 = 90° adjustable connector

Industrial standard (9.4 mm) in-line connectors with cable



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-503-2	in-line moulded cable, with diode + Led	black	24 V DC	2000 mm	-	0.3 Nm
125-503-5	in-line moulded cable, with diode + Led	black	24 V DC	5000 mm	-	0.3 Nm
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

Industrial standard (9.4 mm) in-line connectors with bridge rectifier



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-903-2	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	2000 mm	-	0.3 Nm
125-903-5	in-line moulded cable with voltage rectifier	black	6 V - 230 V AC/DC	5000 mm	-	0.3 Nm

Series A
directly operated solenoid valves

2/2-way - Normally Closed (NC) and Normally Open (NO)
3/2-way - Normally Closed (NC) and Normally Open (NO)

- Ports: M5, G1/8, R1/8, cartridge ø4
- Bistable version also available (with magnetic memory)

Series A solenoid valves are of the directly operated type and can be used with dry or lubricated air. They are available in the 2/2 and 3/2-way versions with normally closed (NC) or normally open (NO) operation.
As shown in the following tables, they are supplied in different versions according to the type of body, threaded ports and orifice. They can thus satisfy various operating and installation requirements.

The solenoid can be easily and quickly replaced without interfering with the pressurised part of the valve.
On the same mechanical part different types of solenoids can be interchanged. The choice of solenoids determines the performance of the solenoid valve in terms of consumption and pressure.

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 2/2 NO - 3/2 NO
Operation	direct acting poppet type
Pneumatic connections	M5, G1/8, R1/8 threads - ø4 fitting - CNOMO interface
Nominal diameter	1.5 ... 2.5 mm
Nominal flow	40 ... 130 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	0.62 ... 2.0
Operating pressure	-0.9 ... 15 bar
Operating temperature	0°C ÷ 60°C (with dry air -20°C)
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time	ON <15 msec - OFF <25 msec
Manual override	see tables
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	nickel-plated brass - PBT technopolymer
Seals	HNBR, FKM
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	12 ... 110 V DC - 24 ... 380 V AC 50/60 Hz
Voltage tolerance	±10% (DC) / -15% ÷ +10% (AC)
Power consumption	3 ... 5 W (DC) / 3.5 ... 7 VA (AC)
Duty cycle	ED 100%
Electrical connection	F (155°C)
Protection class	DIN 43650 connector, (A, B Shape) IP65 with connector
Special versions available on demand	

CODING EXAMPLE

A	3	3	1	-	0	C	2	-	U7	7

A SERIES

3 BODY DESIGN:
1 = base (24x24 mm) interface rotatable through 360°
2 = base (24x24 mm) fixed interface
3 = threaded body
4 = rapid exhaust body
5 = base with ISO standard interface, fixed body in technopolymer
6 = (16x16 mm) interface rotatable through 360°
A = single manifold
B = 2-part manifold
C = 3-part manifold
D = 4-part manifold
E = 5-part manifold
F = 6-part manifold
G = 7-part manifold
H = 8-part manifold
K = 9-part manifold
L = 10-part manifold
M = 11-part manifold
N = 12-part manifold
P = 13-part manifold
R = 14-part manifold
S = 15-part manifold

3 NUMBER OF PORTS:
2 = 2 way
3 = 3 way

1 FUNCTION:
1 = NC
2 = NO
3 = NO in line

0 PORTS:

	1	2	3
0	M5	M5	M5
1	G1/8	G1/8	M5
3	M5	R1/8	M5
4	M5	R1/8	M5 with manual override
A	swivel O-ring interface		M5
B	fixed O-ring interface		M5
C	G1/8	cartridge Ø 4	M5

C NOMINAL DIAMETER:
C = Ø 1,5
D = Ø 2
E = Ø 2,5

2 BODY MATERIAL:
2 = nickel-plated brass
3 = technopolymer

U7 ENCAPSULATING MATERIAL / SOLENOID DIMENSIONS:
A8 = PPS / 30 x 30
G7 = PA / 22 x 22
G8 = PA / 30 x 30 (24 V DC only)
G9 = PA / 22 x 58
H8 = PA 6 V0 / 30 x 30
U7 = PET / 22 x 22

7 SOLENOID VOLTAGE (see the dedicated section 2.35)

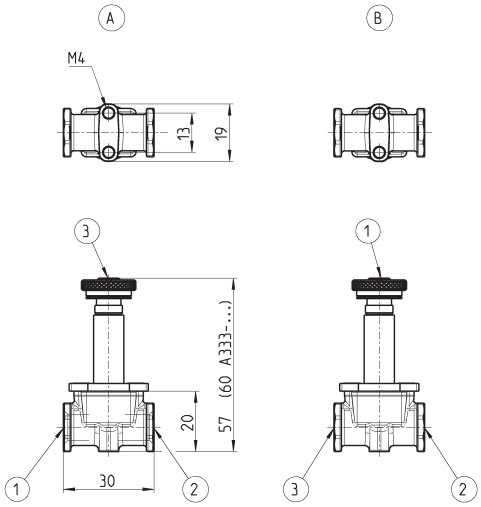
TABLE FOR THE COUPLING BETWEEN SOLENOIDS AND VALVES

Valve function 2/2: for vacuum application connect the vacuum in "2"
Valve function 3/2: for vacuum application connect the vacuum in "1"
Note: for solenoid Mod. G90 (2/2 NO) contact our technical department

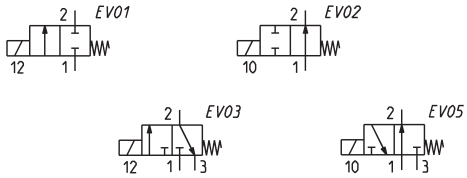
Mod.	Solenoids 3W working pressure (bar)	Solenoids 4-5 W working pressure (bar)	Solenoids 3,5 VA working pressure (bar)
	allowed pressure with solenoids DC - 3 W	allowed pressure with solenoids DC - 4-5 W	allowed pressure with solenoids AC - 3,5 VA
Valve function 2/2 NC			
A321-0C2	- 0,9 ÷ 8	- 0,9 ÷ 15	- 0,9 ÷ 15
A321-1C2	- 0,9 ÷ 8	- 0,9 ÷ 15	- 0,9 ÷ 15
A321-1D2	- 0,9 ÷ 4	- 0,9 ÷ 9	- 0,9 ÷ 9
A321-1E2	- 0,9 ÷ 1	- 0,9 ÷ 6	- 0,9 ÷ 6
Valve function 2/2 NO			
A322-0C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A322-1C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
Valve function 3/2 NC			
A331-0C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A331-1C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A331-3C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A331-4C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A431-1C2	2 ÷ 10	2 ÷ 10	2 ÷ 10
A531-BC2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
A631-AC2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
AA31-0C2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
AA31-0C3	2 ÷ 8	- 0,9 ÷ 8	- 0,9 ÷ 8
AA31-CC2	2 ÷ 10	- 0,9 ÷ 10	- 0,9 ÷ 10
AA31-CC3	2 ÷ 8	- 0,9 ÷ 8	- 0,9 ÷ 8
Valve function 3/2 NO			
A332-0C2	- 0,9 ÷ 7	- 0,9 ÷ 7	- 0,9 ÷ 7
A332-1C2	- 0,9 ÷ 7	- 0,9 ÷ 7	- 0,9 ÷ 7
A333-0C2	- 0,9 ÷ 6	-	- 0,9 ÷ 9
A333-1C2	- 0,9 ÷ 6	-	- 0,9 ÷ 9
AA33-0C2	- 0,9 ÷ 6	-	- 0,9 ÷ 9
AA33-0C3	- 0,9 ÷ 6	-	- 0,9 ÷ 8
AA33-CC3	- 0,9 ÷ 6	-	- 0,9 ÷ 8

2/2 and 3/2-way solenoid valves Mod. A32 and Mod. A33

Available in the 2/2-way version, NC or NO, as well as in the 3/2-way version, NC, NO or NO in line.
In the 3/2 NC version connection 1 is on the body (fi. A), whereas in the 3/2 NO version is on the M5 thread of the tube (fig. B).



Mod.	Conn. 1	Conn. 2	Conn. 3	Function	Orifice Ø mm	Qn (Nl/min)	Symbol
A321-0C2-*	M5	M5	-	2/2 NC	1,5	50	EV01
A321-1C2-*	G1/8	G1/8	-	2/2 NC	1,5	55	EV01
A321-1D2-*	G1/8	G1/8	-	2/2 NC	2	100	EV01
A321-1E2-*	G1/8	G1/8	-	2/2 NC	2,5	130	EV01
A322-0C2-*	M5	M5	-	2/2 NO	1,8	70	EV02
A322-1C2-*	G1/8	M5	-	2/2 NO	1,8	80	EV02
A331-0C2-*	M5	M5	M5	3/2 NC	1,5	50	EV03
A331-1C2-*	G1/8	G1/8	M5	3/2 NC	1,5	60	EV03
A332-0C2-*	M5	M5	M5	3/2 NO	1.5	55	EV05
A332-1C2-*	M5	G1/8	G1/8	3/2 NO	1.5	50	EV05
A333-0C2-*	M5	M5	M5	3/2NO in line	1.5	60	EV05
A333-1C2-*	G1/8	G1/8	M5	3/2NO in line	1,5	60	EV05

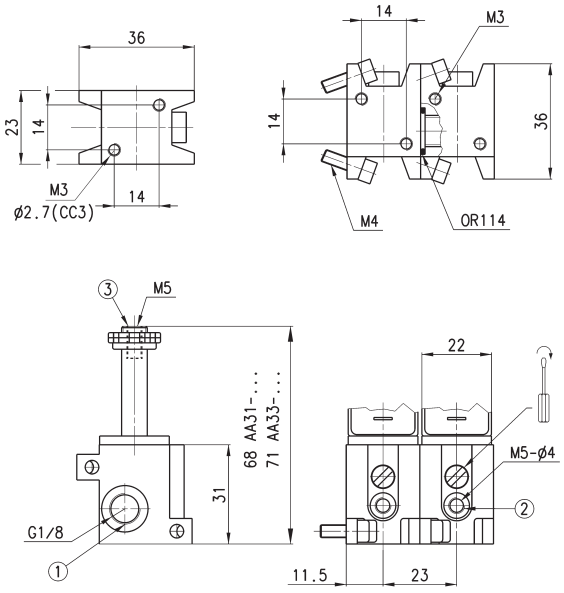


Note. For the use of NO valves in line, use the coil model U771 or U7K1 or G771 or G7K1.

* choose the most suitable solenoid.

3/2-way solenoid valve Mod. AA31... - AA33...

The 3/2-way solenoid valves for manifold assembly are available in the NC and NO in line version, with G1/8 ports at the manifold inlet.
The inlets can be with M5 threading or with a Ø 4 cartridge.
The solenoid valve is supplied complete with O-ring and screws.



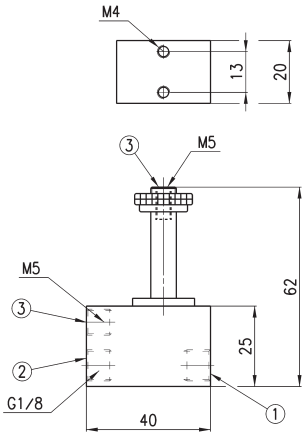
Mod.	Inlet / outlet	Function	Orifice Ø mm	Manual override bistable	Qn (Nl/min)	Symbol
AA31-0C2-*	G1/8 M5	3/2 NC	1,5	Yes	55	EV08
AA31-CC2-*	G1/8 04	3/2 NC	1,5	Yes	55	EV08
AA31-0C3-*	G1/8 M5	3/2 NC	1,5	Yes	55	EV08
AA33-0C2-*	G1/8 M5	3/2 NO in line	1,5	No	55	EV05
AA33-CC2-*	G1/8 04	3/2 NO in line	1,5	No	55	EV05
AA33-0C3-*	G1/8 M5	3/2 NO in line	1,5	No	65	EV05
AA31-CC3-*	G1/8 04	3/2 NC	1,5	Yes	55	EV08
AA33-CC3-*	G1/8 04	3/2 NO in line	1,5	No	65	EV05

Note. For the use of NO valves in line, use the coil model U771 or U7K1 or G771 or G7K1.

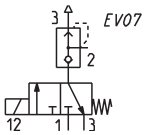
* choose the most suitable solenoid.

3/2-way solenoid valve Mod. A43

The 3/2-way NC solenoid valve, with G1/8 ports, incorporates a rapid exhaust valve.
It is particularly suitable for operating small single-acting cylinders.



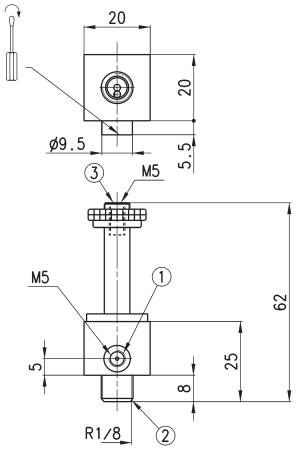
* choose the most suitable solenoid.



Mod.	Ports	Function	Orifice Ø mm	Qn (Nl/min)
A431-1C2-*	G1/8 / M5	3/2 NC	1.5	50

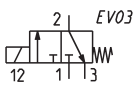
3/2-way solenoid valve Mod. A33

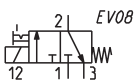
They are particularly suitable for the actuation of small single-acting cylinders and the operation of pneumatic valves with very low operating pressures.



The body has an outlet with a R1/8 male thread which can be screwed directly onto the component to be operated. The inlet port is M5 threaded.

* choose the most suitable solenoid.



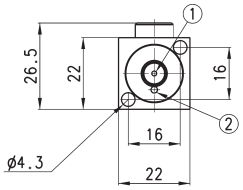


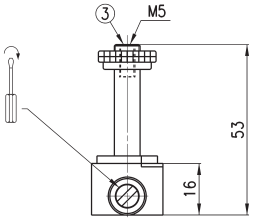
Mod.	Inlet / outlet	Function	Orifice Ø (mm)	Man. override bistable	Qn (Nl/min)	Symbol
A331-3C2-*	M5 / R1/8	3/2 NC	1,5	no	55	EV03
A331-4C2-*	M5 / R1/8	3/2 NC	1,5	yes	55	EV08

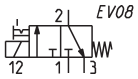
3/2-way solenoid valve Mod. A63

* choose the most suitable solenoid.

Equipped with a manual override for a steady operation, it is suitable to be mounted directly onto machine parts by two screws. The sealing is ensured by two concentric O-rings allowing the body a 360° adjustment.







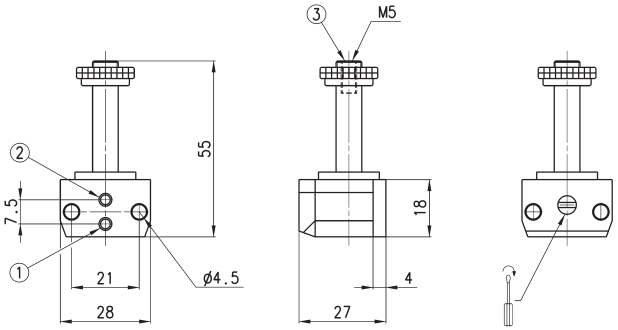
Mod.	Interface	Function	Orifice Ø (mm)	Qn (Nl/min)
A631-AC2-*	OR	3/2 NC	1,5	40

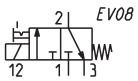
3/2-way solenoid valve Mod. A53

The body only is in technopolymer.

* choose the most suitable solenoid.

Equipped with a manual override for a steady operation, it is suitable to be mounted on Series 9 valves with an ISO interface. The interface which complies CNOMO norms is interchangeable with all ISO versions.



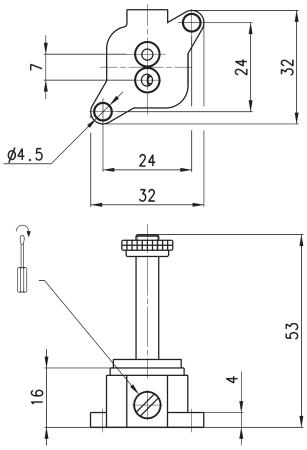


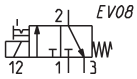
Mod.	Interface	Function	Orifice Ø (mm)	Qn (Nl/min)
A531-BC2-*	OR	3/2 NC	1,5	40

3/2-way solenoid valve Mod. A231 with fixed interface

* choose the most suitable solenoid.

Equipped with a manual override with the possibility of a bistable actuation.



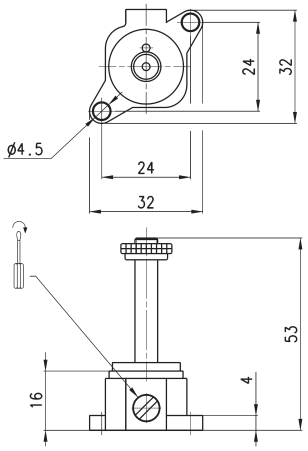


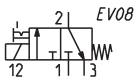
Mod.	Interface	Function	Orifice Ø (mm)	Qn (Nl/min)
A231-BC2-*	OR	3/2 NC	1,5	70

3/2-way solenoid valve Mod. A131 with swivel interface

* choose the most suitable solenoid.

Equipped with a manual override with the possibility of a bistable actuation.





Mod.	Interface	Function	Orifice Ø (mm)	Qn (Nl/min)
A131-AC2-*	OR	3/2 NC	1,5	70

Series 6
directly operated solenoid valves

2/2-way - Normally Closed (NC)
3/2-way - Normally Closed (NC), Normally Open (NO)

- Ports: G1/8, G3/8, cartridge Ø4
- Available also in version for the low temperatures up to -50°C

Series 6 solenoid valves are available as 2/2 and 3/2-way, either NC or NO.
These directly operated solenoid valves can be used either with or without lubrication.

The bodies of these valves can be used either individually or in manifolds.
The latter are provided with G1/8 threaded ports or an inbuilt diameter 4 cartridge(G3/8 for 2-way only).

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 3/2 NO
Operation	direct acting poppet type
Pneumatic connections	G1/8, G3/8 threads - ø4 fitting - CNOMO interface
Nominal diameter	2 ... 4 mm
Nominal flow	80 ... 350 Nl/min (air @ 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	1.2 ... 5.4
Operating pressure	0 ÷ 4 ... 15 bar
Operating temperature	0°C ÷ 60°C (seals in FKM) / -50°C ÷ +50°C (seals in NBR)
Media	filtered air, class 5.4.4 (5.1.4 for versions -50°C) according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time	ON <15 msec - OFF <15 msec
Manual override	see tables
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	nickel-plated brass - anodized aluminium
Seals	FKM (NBR for versions -50°C)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	12 ... 110 V DC - 24 ... 230 V AC 50/60 Hz
Voltage tolerance	±10% (DC) - +10% ÷ -15% (AC)
Power consumption	10 W (DC) - 19 VA (inrush AC), 12 VA (holding AC)
Duty cycle	ED 100%
Electrical connection	H (180°C)
Protection class	with connector DIN EN 175 301-803-A IP65 with connector
Special versions available on demand	

CODING EXAMPLE

6	3	8	M	-	105	-	A	6	B	

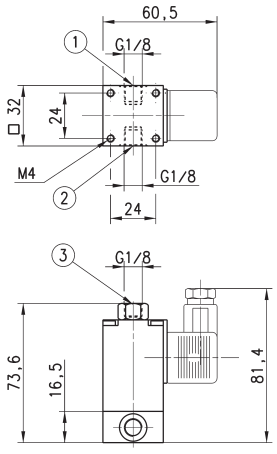
6	SERIES:
3	NUMBER OF PORTS AND FUNCTIONS: 0 = interface 2 = 2-way NC 3 = 3-way NC 4 = 3-way NO
8	CONNECTION: 0 = interface 3 = G3/8 8 = G1/8 C = cartridge Ø 4
M	M = manifold
105	TYPE OF BODY: 150 = threaded body G1/8 - orifice Ø 2 mm 15E = threaded body G3/8 - orifice Ø 2.5 mm 15F = threaded body G3/8 - orifice Ø 3 mm 15G = threaded body G3/8 - orifice Ø 4 mm 450 = base with rotatable interface 457 = base with fixed interface 101 = single manifold 102 = manifold - 2 pieces 103 = manifold - 3 pieces 104 = manifold - 4 pieces 105 = manifold - 5 pieces 106 = manifold - 6 pieces 107 = manifold - 7 pieces 108 = manifold - 8 pieces 109 = manifold - 9 pieces 110 = manifold - 10 pieces 111 = manifold - 11 pieces 112 = manifold - 12 pieces 113 = manifold - 13 pieces 114 = manifold - 14 pieces 115 = manifold - 15 pieces
A	COIL MATERIAL: A = PPS
6	SOLENOID DIMENSIONS: 6 = 32x32
B	SOLENOID VOLTAGE: B = 24V 50/60Hz C = 48V 50/60 Hz D = 110V 50/60 Hz E = 230V 50/60 Hz 2 = 12V DC 3 = 24V DC 4 = 48V DC 6 = 110V DC
	VERSIONS: = standard LT = for low temperatures

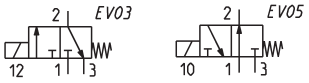
3/2-way NC and NO solenoid valve, G1/8 - Mod. 638 and Mod. 648

In the mod. 648-150-A6* (NO) connections 1 and 3 are inverted, while the max operating pressure is 6 bar in case a solenoid A6B, A6C, A6D, A6E is chosen.

* = choose the solenoid voltage according to the CODING EXAMPLE

These valves are particularly suitable for operating single-acting cylinders or for use as signal valves.



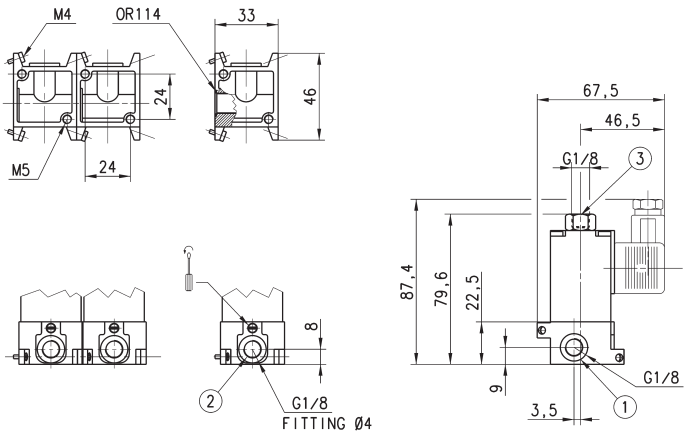


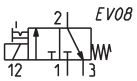
Mod.	Ports	Function	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)	Symbol
638-150-A6*	G1/8	NC	2	2.0	130	0 ÷ 10 [DC]	EV03
648-150-A6*	G1/8	NO	2	1.2	80	0 ÷ 8 [DC] - 0 ÷ 6 [AC]	EV05

3/2-way NC solenoid valve - Mod. 638M and Mod. 63CM

* = choose the solenoid voltage according to the CODING EXAMPLE

These solenoid valves are equipped with a manual override and are available with G1/8 inlet ports and with G1/8 outlets or with a diameter 4 cartridge. The body is supplied complete with screws and O-ring.

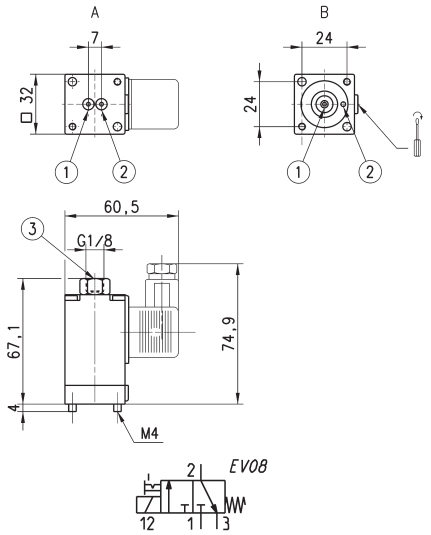




Mod.	Inlet	Outlet	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
638M-101-A6*	G1/8	G1/8	2	1.8	120	0 ÷ 10
63CM-101-A6*	G1/8	cartridge Ø 4	2	1.6	108	0 ÷ 10

3/2-way NC solenoid valve - Mod. 600

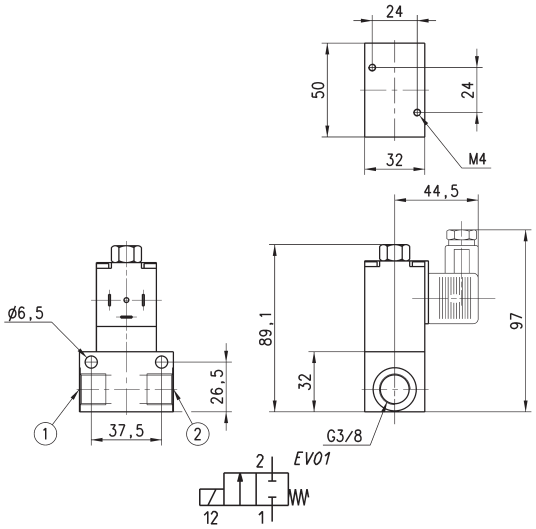
These solenoid valves are equipped with an override and are available with two types of interface:
A = fixed interface
B = swivel interface



Mod.	Interface	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Pressure min-max (bar)
600-450-A6*	Swivel	2	1.6	106	0 ÷ 10
600-457-A6*	Fixed	2	1.6	106	0 ÷ 10

* = choose the solenoid voltage according to the CODING EXAMPLE

2/2-way solenoid valves NC, G3/8 - Mod. 623

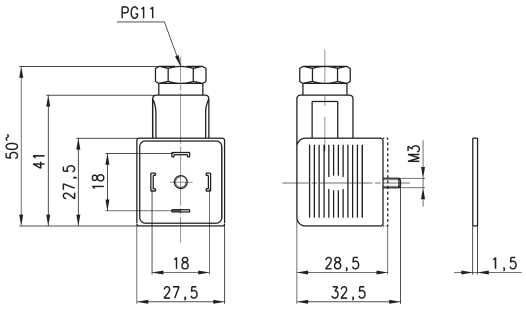


Mod.	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min-max pressure (bar)
623-15E-A6*	2.5	3.4	220	0 ÷ 12 [AC 50Hz] - 0 ÷ 15 [DC]
623-15F-A6*	3	4.5	290	0 ÷ 10 [AC 50Hz] - 0 ÷ 14 [DC]
623-15G-A6*	4	5.4	350	0 ÷ 4 [AC 50Hz] - 0 ÷ 7 [DC]

* = choose the solenoid voltage according to the CODING EXAMPLE

Connector Mod. 124-... DIN EN 175 301-803-A

Protection class IP65



Mod.	description	colour	working voltage	cable holding	tightening torque
124-800	connector, without electronics	black	-	PG9/PG11	0.5 Nm
124-702	connector, varistor + Led	black	110 V AC/DC	PG9/PG11	0.5 Nm
124-701	connector, varistor + Led	black	24 V AC/DC	PG9/PG11	0.5 Nm
124-703	connector, varistor + Led	black	230 V AC/DC	PG9/PG11	0.5 Nm

Series CFB solenoid valves

2/2-way - Normally Closed (NC) and Normally Open (NO)
3/2-way - Normally Closed (NC) and Normally Open (NO)

- Solenoid valves for air and water
- Great reliability over time, even in heavy working conditions

Series CFB solenoid valves for general purpose are available in the NC and NO version, 2/2 and 3/2-way.
Special versions are available on demand for the protection against the water hammer or with specific traitments for the interception of aggressive fluids.

The valve function is determined by a poppet or by a diaphragm with operation direct or indirect.
Different versions are available according to the nominal diameter and to the threaded ports, as shown in the following tables.
They can thus satisfy various requirements in terms of flow rates and working pressures.

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC - 3/2 NC - 2/2 NO
Operation	direct acting poppet type - servo-assisted with diaphragm
Pneumatic connections	G1/8 ... G2 threads
Nominal diameter	1.4 ... 50 mm
Nominal flow	See Kv
Flow coefficient Kv (m^3/h)	0.14 ... 45
Operating pressure	0 ÷ 0.8 ... 22 bar
Operating temperature	-10°C ÷ +90°C ... 140°C
Media	air, water, liquid and gaseous fluids with max viscosity 37 cSt (5° E)
Response time	ON <15 msec - OFF <25 msec
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	brass (alimentary or anti-limestone nickel-platings on demand)
Seals	NBR (CFB-A) - FKM (CFB-B, CFB-D) - EPDM (on demand)
Internal parts	stainless steel - stainless steel and brass (CFB-D1)
ELECTRICAL FEATURES	
Voltage	12 V DC, 24 V DC - 24 V 50 Hz, 110 V 50/60 Hz, 220/230 V 50/60 Hz
Voltage tolerance	±5% (DC) - ±10% (AC)
Power consumption	10 ... 30 W (DC) - 9 ... 29 VA (AC)
Duty cycle	ED 100%
Electrical connection	H (180°C)
Protection class	DIN 43650 connector, (A shape) IP65 with connector
Special versions available on demand	

It is recommended to use connections with internal diameters bigger than valve orifices, otherwise there may be a performance change.

CODING EXAMPLE

CFB	-	A	1	3	L	-	R	1	-	B7	E

CFB	SERIES
A	OPERATION: A = indirect B = direct with linked diaphragm D = direct
1	NUMBER OF WAYS - POSITIONS: 1 = 2/2-way NO 2 = 2/2-way NC 3 = 3/2-way NC
3	CONNECTIONS: 1 = G1/8 2 = G1/4 3 = G3/8 4 = G1/2 5 = G3/4 6 = G1 7 = G1 1/4 8 = G1 1/2 9 = G2
L	NOMINAL DIAMETER: A = 1,4 mm B = 2 mm C = 2,5 mm D = 2,8 mm F = 4 mm G = 6 mm J = 8 mm L = 11,5 mm M = 13 mm N = 13,5 mm P = 18 mm R = 26 mm T = 32 mm X = 45 mm Z = 50 mm
R	DIAPHRAGM MATERIAL: R = NBR W = FKM E = EPDM (on demand)
1	BODY MATERIAL: 1 = brass 2 = alimentary anti-limestone nickel-plated brass for high temperatures (on demand) 3 = alimentary nickel-plated brass (on demand)
B7	SOLENOID DIMENSION: B7 = 22 mm B8 = 30 mm B9 = 36 mm
E	SOLENOID VOLTAGE: B = 24V AC 50 Hz D = 110V AC 50/60 Hz E = 230V AC 50/60 Hz 2 = 12V DC 3 = 24V DC
	NOTE: for some directly operated 2/2 NO solenoid valves, the solenoid to be used is the B8*K type (see also the TABLE FOR THE COUPLING BETWEEN SOLENOIDS AND VALVES on the following page).

TABLE FOR THE COUPLING BETWEEN SOLENOIDS AND VALVES

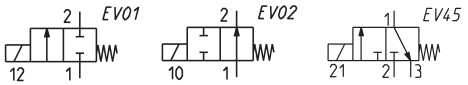
For solenoids and their connectors voir la section dédiée.
Mod. B8/B9 = mod.124-800
Mod. B7 = mod. 122-800

Mod.	24V AC 50 Hz	110V AC 50/60 Hz	220/230V AC 50/60 Hz	12V DC	24V DC
Directly operated solenoid valve, 2/2 and 3/2 NC, 2/2 NO					
CFB-D21C-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D21F-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22C-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22F-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22G-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D23J-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA) **	not available	B93 (30W)
CFB-D24J-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA) **	not available	B93 (30W)
CFB-D24M-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA) **	not available	not available
CFB-D31A-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D31D-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32A-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32D-W1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D11A-W1-	B8BK (15VA)	B8DK (15VA) **	B8EK (15VA) **	B82K (19W)	B83K (19W)
CFB-D12D-W1-	B8BK (15VA)	B8DK (15VA) **	B8EK (15VA) **	B82K (19W)	B83K (19W)
CFB-D13J-W1-	B9B (29VA)	B9D (29VA) **	B9E (29VA) **	not available	not available
Directly operated solenoid valve with constrained diaphragm, 2/2 NC					
CFB-B23L-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
CFB-B24N-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
CFB-B25P-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
CFB-B26R-W1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
Indirectly operated solenoid valve, 2/2 NC					
CFB-A23L-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B72 (10W)	B73 (10W)
CFB-A24N-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B72 (10W)	B73 (10W)
CFB-A25P-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B72 (10W)	B73 (10W)
CFB-A26R-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B72 (10W)	B73 (10W)
CFB-A27T-R1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-A28X-R1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-A29Z-R1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
Indirectly operated solenoid valve, 2/2 NO					
CFB-A13L-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B721 (14W)	B731 (14W)
CFB-A14N-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B721 (14W)	B731 (14W)
CFB-A15P-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B721 (14W)	B731 (14W)
CFB-A16R-R1-	B7B (9VA) *	B7D (9VA)	B7E (9VA)	B721 (14W)	B731 (14W)
CFB-A17T-R1-	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-A18X-R1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
CFB-A19Z-R1-	B9B (29VA)	B9D (29VA)	B9E (29VA)	not available	B93 (30W)
	* B7B solenoid with nominal bifrequency of 50/60 Hz		** only to be used with nominal frequency of 50 Hz		

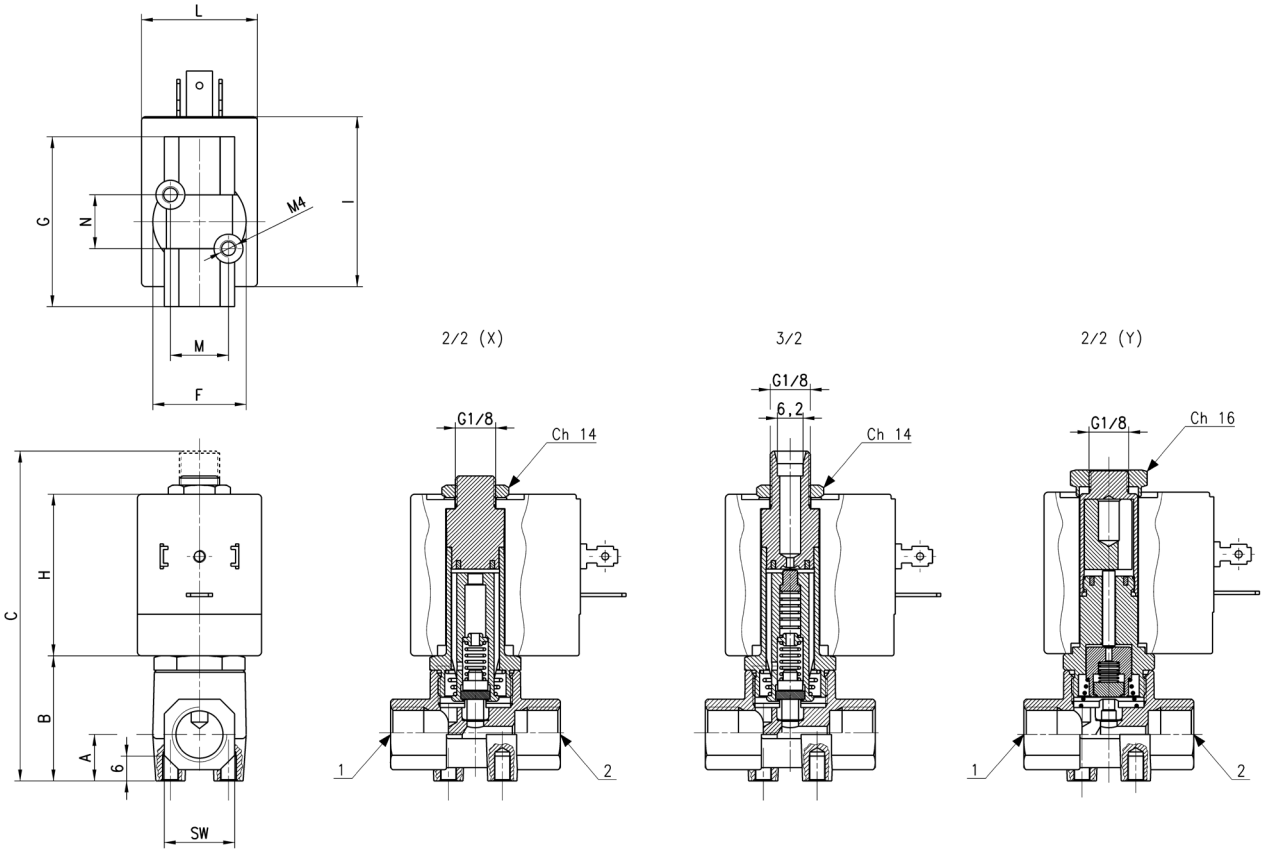
Directly operated 2/2 NC - NO and 3/2 NC solenoid valve

The direct control of these solenoid valves enables them to work with operating pressures which are equal to zero. Ports: G1/8 and G1/2.

DRAWING LEGEND:
X = NC valve
Y = NO valve



* = choose the suitable solenoid according to the TABLE FOR THE COUPLING BETWEEN SOLENOID AND VALVES
** = the performances shown in the table refer to the use with inlet from "2" and outlet from "1".
*** = 0 ÷ 4 with B9... solenoid



Mod.	Function	Ports	Ø Orifice (mm)	Kv (m³/h)	Pressure min÷max (bar)	A	B	C	F	G	SW	H	I	L	N	M	Symbol
CFB-D21C-W1-*	2/2 NC	G1/8	2.5	0.14	0 ÷ 15 [AC / DC]	11	30	73.8	23	41	17	39	41	30	13	14	EV01
CFB-D21F-W1-*	2/2 NC	G1/8	4	0.25	0 ÷ 6 [AC / DC]	11	30	73.8	23	41	17	39	41	30	13	14	EV01
CFB-D22C-W1-*	2/2 NC	G1/4	2.5	0.14	0 ÷ 15 [AC / DC]	11	30	73.8	23	41	17	39	41	30	13	14	EV01
CFB-D22F-W1-*	2/2 NC	G1/4	4	0.25	0 ÷ 6 [AC / DC]	12	31.5	75	26	41	17	39	41	30	13	14	EV01
CFB-D22G-W1-*	2/2 NC	G1/4	6	0.6	0 ÷ 2.5 [AC / DC] ***	12	31.5	75	26	41	17	39	41	30	13	14	EV01
CFB-D23J-R1-*	2/2 NC	G3/8	8	1	0 ÷ 2 [AC] - 0 ÷ 0.8 [DC]	15	45	89	37	55	27	39	47	36	22	22	EV01
CFB-D24J-R1-*	2/2 NC	G1/2	8	1	0 ÷ 2 [AC] - 0 ÷ 0.8 [DC]	15	45	89	37	55	27	39	47	36	22	22	EV01
CFB-D24M-R1-*	2/2 NC	G1/2	13	2.4	0 ÷ 1 [AC] - /	15	45	89	37	55	27	39	47	36	22	22	EV01
CFB-D31A-W1-*	3/2 NC **	G1/8	1.4	0.06	0 ÷ 14 [AC / DC]	11	30	79.6	23	41	17	39	41	30	13	14	EV45
CFB-D31D-W1-*	3/2 NC **	G1/8	2.8	0.14	0 ÷ 5 [AC / DC]	11	30	79.6	23	41	17	39	41	30	13	14	EV45
CFB-D32A-W1-*	3/2 NC **	G1/4	1.4	0.06	0 ÷ 14 [AC / DC]	11	30	79.6	23	41	17	39	41	30	13	14	EV45
CFB-D32D-W1-*	3/2 NC **	G1/4	2.8	0.14	0 ÷ 5 [AC / DC]	11	30	79.6	23	41	17	39	41	30	13	14	EV45
CFB-D11A-W1-*	2/2 NO	G1/8	1.4	0.07	0 ÷ 22 [AC 50Hz / DC]	11	30	75	23	41	17	39	41	30	13	14	EV02
CFB-D12D-W1-*	2/2 NO	G1/4	2.8	0.20	0 ÷ 7.5 [AC 50Hz / DC]	11	30	75	23	41	17	39	41	30	13	14	EV02
CFB-D13J-W1-*	2/2 NO	G3/8	8	1	0 ÷ 1.5 [AC 50Hz]	15	45	89	37	55	27	39	47	36	22	22	EV02

Directly oper. 2/2 NC solenoid valve with linked diaphragm

The diaphragm which is linked to the mobile plunger is a good arrangement between high fluid flow rates and working pressures (zero pressures as well).
Ports: from G3/8 to G1.
The standard diaphragm is supplied in FKM.

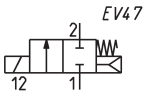
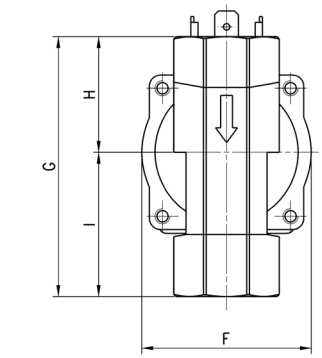
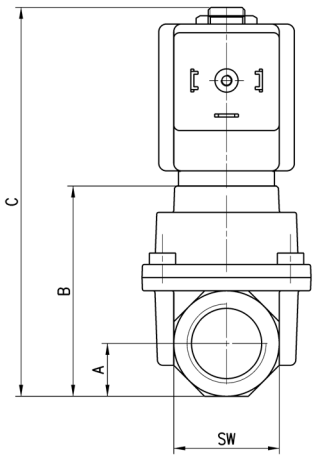
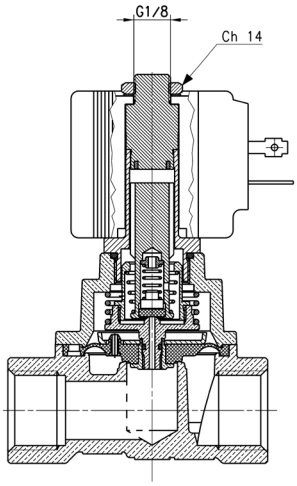


TABLE NOTE:
* = choose the suitable solenoid according to the TABLE FOR THE COUPLING BETWEEN SOLENOID AND VALVES

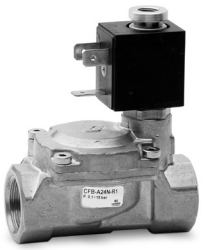






Mod.	Function	Ports	Ø Orifice (mm)	Kv (m³/h)	Pressure min÷max (bar)	A	B	C	F	G	H	I	SW
CFB-B23L-W1-*	2/2 NC	G3/8	11.5	2.1	0 ÷ 15 [AC] - 0 ÷ 8 [DC]	14	55.8	103.2	45	64	28.2	35.8	28
CFB-B24N-W1-*	2/2 NC	G1/2	13.5	2.5	0 ÷ 15 [AC] - 0 ÷ 8 [DC]	14	55.8	103.2	45	69	30.7	38.3	28
CFB-B25P-W1-*	2/2 NC	G3/4	18	5	0 ÷ 15 [AC] - 0 ÷ 5 [DC]	21	72	119.4	71	93	43.5	49.5	42
CFB-B26R-W1-*	2/2 NC	G1	26	8	0 ÷ 15 [AC] - 0 ÷ 5 [DC]	21	72	119.4	71	93	43.5	49.5	42

Indirectly operated 2/2 NC solenoid valve



The pilot of these indirectly operated solenoid valves controls the diaphragm position through a differential pressure. These valves are therefore particularly suitable for controlling high fluid flow rates and require very low working pressures.
Ports: from G3/8 to G2.
The standard diaphragm is supplied in NBR.
On demand it can be supplied in FKM or EPDM.

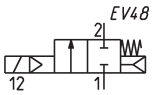
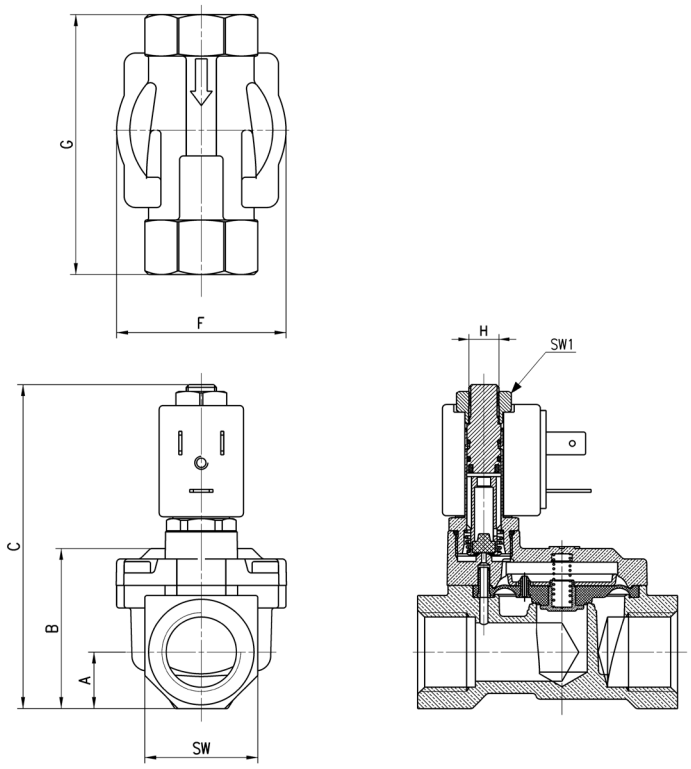
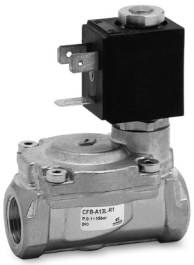


TABLE NOTE:
* = choose the suitable solenoid according to the TABLE FOR THE COUPLING BETWEEN SOLENOID AND VALVES



Mod.	Function	Ports	Ø Orifice (mm)	Kv (m³/h)	Pressure min÷max (bar)	A	B	C	F	G	H	SW	SW1
CFB-A23L-R1-*	2/2 NC	G3/8	11.5	2.6	0.1 ÷ 15 [AC / DC]	12	32.5	78.5	41.9	57	M8x0.75	24	13
CFB-A24N-R1-*	2/2 NC	G1/2	13.5	3.5	0.1 ÷ 15 [AC / DC]	15	39.7	85.7	45	69	M8x0.75	30	13
CFB-A25P-R1-*	2/2 NC	G3/4	18	5.8	0.2 ÷ 15 [AC / DC]	18	46.5	91.5	54.4	74	M8x0.75	34	13
CFB-A26R-R1-*	2/2 NC	G1	26	9.5	0.2 ÷ 12 [AC / DC]	22.5	59.8	104.5	71	93	M8x0.75	45	13
CFB-A27T-R1-*	2/2 NC	G1 1/4	32	12.5	0.4 ÷ 12 [AC 50 Hz / DC] - 0.4 ÷ 6 [AC 60 Hz]	27.5	73.5	130	86.6	111	G1/8	55	14
CFB-A28X-R1-*	2/2 NC	G1 1/2	45	31	0.4 ÷ 12 [AC 50 Hz / DC] - 0.4 ÷ 3.5 [AC 60 Hz]	31	85	138.3	110	138	G1/8	62	14
CFB-A29Z-R1-*	2/2 NC	G2	50	45	0.4 ÷ 12 [AC 50 Hz / DC] - 0.4 ÷ 3.5 [AC 60 Hz]	37.5	98.8	152	110	145	G1/8	75	14

Indirectly operated 2/2 NO solenoid valve



The pilot of these indirectly operated solenoid valves controls the diaphragm position through a differential pressure. These valves are therefore particularly suitable for controlling high fluid flow rates and require very low working pressures.
Ports: from G3/8 to G2.
The standard diaphragm is supplied in NBR.
On demand it can be supplied in FKM or EPDM.

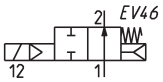
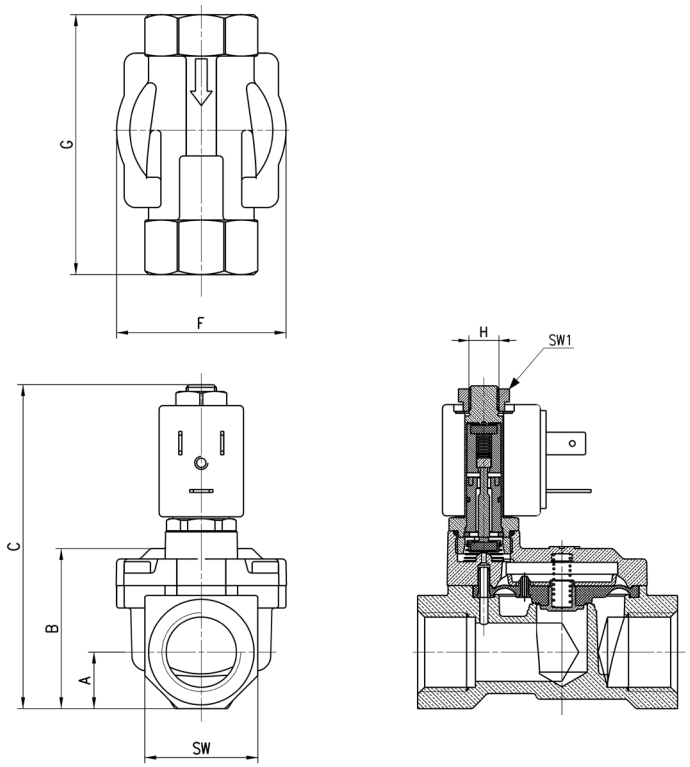


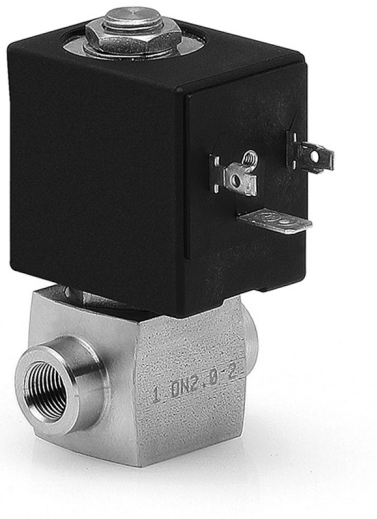
TABLE NOTE:
* = choose the suitable solenoid according to the TABLE FOR THE COUPLING BETWEEN SOLENOID AND VALVES



Mod.	Function	Ports	Ø Orifice (mm)	Kv (m³/h)	Pressure min÷max (bar)	A	B	C	F	G	H	SW	SW1
CFB-A13L-R1-*	2/2 NO	G3/8	11.5	2.6	0.1 ÷ 15 [AC / DC]	12	32.5	78.5	41.9	57	M8x0.75	24	13.5
CFB-A14N-R1-*	2/2 NO	G1/2	13.5	3.5	0.1 ÷ 15 [AC / DC]	15	39.7	85.7	45	69	M8x0.75	30	13.5
CFB-A15P-R1-*	2/2 NO	G3/4	18	5.8	0.2 ÷ 15 [AC / DC]	18	46.5	92.7	54.4	74	M8x0.75	36	13.5
CFB-A16R-R1-*	2/2 NO	G1	26	9.5	0.2 ÷ 12 [AC / DC]	22.5	59.8	104.5	71	93	M8x0.75	45	13.5
CFB-A17T-R1-*	2/2 NO	G1 1/4	32	12.5	0.4 ÷ 12 [AC / DC]	27.5	73.5	130	86.6	111	G1/8	55	14
CFB-A18X-R1-*	2/2 NO	G1 1/2	45	31	0.4 ÷ 10 [AC / DC]	31	85	138.3	110	138	G1/8	62	14
CFB-A19Z-R1-*	2/2 NO	G2	50	45	0.4 ÷ 10 [AC / DC]	37.5	98.8	152	110	145	G1/8	75	14

Series CFB stainless steel solenoid valves

2/2-way - Normally Closed (NC)
3/2-way - Normally Closed (NC)



- Stainless steel version for particularly aggressive environment and fluids
- High reliability over time, even in hard working conditions
- Compact dimensions
- Suitable to control inert and medical gases, alimentary fluids and beverages

Series CFB Stainless Steel directly operated solenoid valves for general purpose, 2/2-way and 3/2-way NC, are the ideal solution for a wide range of applications whereby the environment and fluids used can be particularly aggressive and contaminating. Special versions are available on demand.

The valve function is determined by a poppet and the operation is direct.
Different versions are available according to the nominal diameter and to the threaded ports, as shown in the following tables.
They can thus satisfy various requirements in terms of flow rates and working pressures.

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 and 3/2 NC
Operation	direct acting poppet type
Pneumatic connections	G1/8 ... G1/2 threads
Nominal diameter	1.5 ... 4 mm
Nominal flow	See Kv
Flow coefficient Kv (m^3/h)	0.08 ... 0.28
Operating pressure	0 ÷ 4 ... 25 bar
Operating temperature	-10°C ÷ +140°C
Media	air, water, liquid and gaseous fluids with max viscosity 37 cSt (5° E)
Response time	ON <15 msec - OFF <25 msec
Installation	in any position
MATERIALS IN CONTACT WITH THE MEDIUM	
Body	stainless steel 316L
Seals	FKM (EPDM on demand)
Internal parts	stainless steel
ELECTRICAL FEATURES	
Voltage	12 V DC, 24 V DC - 24V AC 50 Hz, 110 V AC 50/60 Hz, 220/230 V AC 50/60 Hz
Voltage tolerance	±5% (DC) - ±10% (AC)
Power consumption	19 W (DC) - 15 VA (AC)
Duty cycle	ED 100%
Electrical connection	H (180°C)
Protection class	DIN 43650 connector, (A Shaped) IP65 with connector
Special versions available on demand	

It is recommended to use connections with internal diameters bigger than valve orifices, otherwise there may be a performance change.

CODING EXAMPLE

CFB	-	D	2	1	A	-	W	X	-	B8	E

CFB	SERIES
D	OPERATION: D = direct
2	NUMBER OF WAYS - POSITIONS: 2 = 2/2-way NC 3 = 3/2-way NC
1	CONNECTIONS: 1 = G1/8 2 = G1/4 3 = G3/8 4 = G1/2
A	NOMINAL DIAMETER: A = 1.5 mm B = 2 mm C = 2.5 mm E = 3 mm F = 4 mm
W	SEALS MATERIAL: W = FKM E = EPDM (on demand)
X	BODY MATERIAL: X = stainless steel
B8	SOLENOID DIMENSION: B8 = 30 mm
E	SOLENOID VOLTAGE: B = 24V AC 50 Hz D = 110V AC 50/60 Hz E = 230V AC 50/60 Hz 2 = 12V DC 3 = 24V DC

TABLE FOR THE COUPLING BETWEEN SOLENOIDS AND VALVES

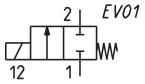
See solenoids and connectors for solenoids in the dedicated section
Mod. B8 = mod.124-800
* = complete the code according to coding example

Mod.	24V AC 50 Hz	110V AC 50/60 Hz	220/230V AC 50/60 Hz	12V DC	24V DC
CFB-D21A-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D21B-.*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D21C-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22B-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22C-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D22E-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D23E-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D23F-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D24E-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D24F-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32A-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32B-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32C-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)
CFB-D32E-*	B8B (15VA)	B8D (15VA)	B8E (15VA)	B82 (19W)	B83 (19W)

Directly operated solenoid valve, 2/2 and 3/2 NC

The direct control of these solenoid valves allows to operate with working pressures that are equal to zero.

Ports: from G1/8 to G1/2.



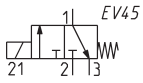
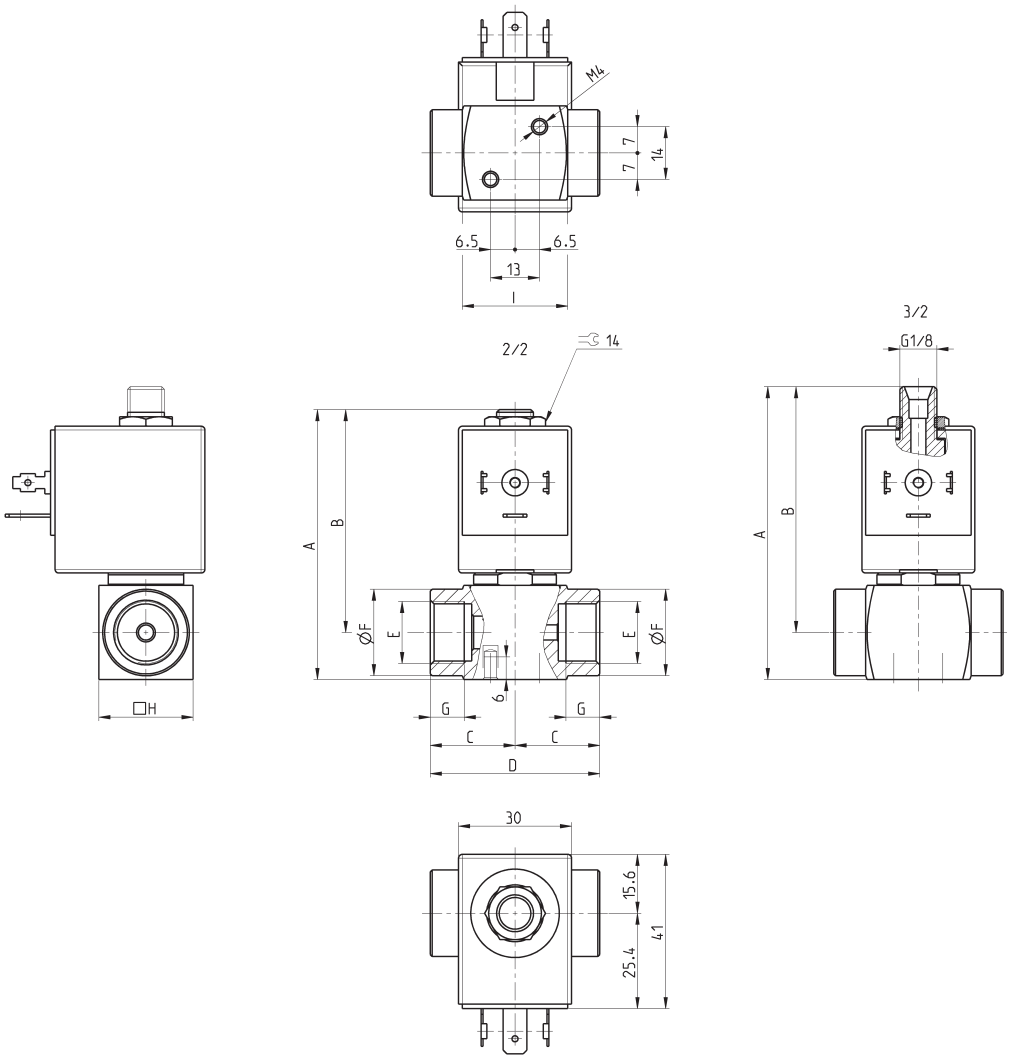


TABLE NOTE:
* = choose the suitable solenoid according to the TABLE FOR THE COUPLING BETWEEN SOLENOID AND VALVES



Mod.	Function	Orifice Ø (mm)	Kv (m³/h)	Pressure min-max (bar)	A	B	C	D	E	F	G	H	I	Pneumatic symbol
CFB-D21A-...X-*	2/2 NC	1.5	0.08	0 ÷ 25	71.7	59.2	21	42	G1/8	15	8	25	29	EV01
CFB-D21B-...X-*	2/2 NC	2	0.10	0 ÷ 22	71.7	59.2	21	42	G1/8	15	8	25	29	EV01
CFB-D21C-...X-*	2/2 NC	2.5	0.14	0 ÷ 15	71.7	59.2	21	42	G1/8	15	8	25	29	EV01
CFB-D22B-...X-*	2/2 NC	2	0.10	0 ÷ 22	71.7	59.2	21	42	G1/4	18	8	25	28	EV01
CFB-D22C-...X-*	2/2 NC	2.5	0.14	0 ÷ 15	71.7	59.2	21	42	G1/4	18	8	25	28	EV01
CFB-D22E-...X-*	2/2 NC	3	0.18	0 ÷ 10	71.7	59.2	21	42	G1/4	18	8	25	28	EV01
CFB-D23E-...X-*	2/2 NC	3	0.18	0 ÷ 10	71.7	59.2	22.5	45	G3/8	23	9.5	25	28	EV01
CFB-D23F-...X-*	2/2 NC	4	0.28	0 ÷ 6	71.7	59.2	22.5	45	G3/8	23	9.5	25	28	EV01
CFB-D24E-...X-*	2/2 NC	3	0.18	0 ÷ 10	76.7	61.7	24.5	49	G1/2	27.5	11	30	31	EV01
CFB-D24F-...X-*	2/2 NC	4	0.28	0 ÷ 6	76.7	61.7	24.5	49	G1/2	27.5	11	30	31	EV01
CFB-D32A-...X-*	3/2 NC	1.5	0.08	0÷13	77.8	65.3	21	42	G1/4	18	8	25	28	EV45
CFB-D32B-...X-*	3/2 NC	2	0.1	0÷9	77.8	65.3	21	42	G1/4	18	8	25	28	EV45
CFB-D32C-...X-*	3/2 NC	2.5	0.14	0÷5.5	77.8	65.3	21	42	G1/4	18	8	25	28	EV45
CFB-D32E-...X-*	3/2 NC	3	0.18	0÷4	77.8	65.3	21	42	G1/4	18	8	25	28	EV45

Series 8 pneumatic operated cartridge valves

2/2-way - Normally Closed (NC)

- Use with oxygen
- Suitable also for general purpose
- Compact design
- High flow
- Manifold assembly

Series 8 pneumatic operated valves are particularly suitable for applications requiring high flow combined wtih compact design.
The valve is pneumatic operated by electro-pilots which are dimensioned according to the size.
The cartridge design, which is ideal for manifold assembly, allows to reduce both dimensions and the number of pneumatic connections.

The standard function of the valve is 2/2-way NC.
It can however fulfill the 3/2-way NC function if inserted in a proper seat (see the following pages).

GENERAL DATA

TECHNICAL FEATURES	
Function	2/2 NC
Operation	pneumatic operated poppet type
Pneumatic connections	manifold cartridge
Nominal diameter	5 ... 9 mm
Nominal flow	420 ... 1480 Nl/min (air at 6 bar ΔP 1 bar)
Flow coefficient kv (l/min)	6.5 ... 23
Operating pressure	3 ÷ 6 bar (0 ÷ 6 bar with external pilot supply)
Operating temperature	0 ÷ +50°C
Media	filtered air, class 5.4.4 according to ISO 8573-1 (max oil viscosity 32 cSt), inert gas
Response time (ISO 12238)	ON <10 msec - OFF <10 msec
Installation	in any position

MATERIALS IN CONTACT WITH THE MEDIUM	
Body	brass
Internal parts	aluminium
Seals	FKM

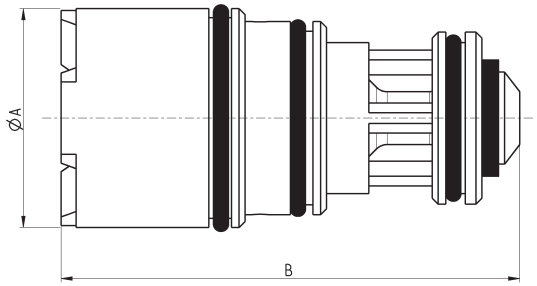
CODING EXAMPLE

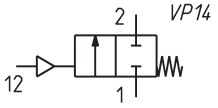
8	10	C5	1	00	-	F1	3	2	-	OX2

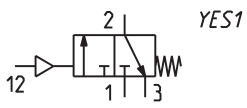
8	SERIES
10	SIZE: 10 = Size 1 20 = Size 2 30 = Size 3
C5	BODY DESIGN: C5 = cartridge
1	NUMBER OF WAYS - FUNCTIONS: 1 = 2/2-way NC or 3/2-way NC NOTE: The function depends on the seat used (for further details see the following pages)
00	PNEUMATIC CONNECTIONS: 00 = cartridge
F1	NOMINAL DIAMETER: F1 = Ø 5.0 mm (size 1 only) G7 = Ø 6.6 mm (size 2 only) K1 = Ø 9.0 mm (size 3 only)
3	SEAL MATERIAL: 3 = FKM
2	BODY MATERIAL: 2 = brass
OX2	OX2 = for use with oxygen (non volatile residual less than 33 mg/m²) NOTE: the OX2 suffix must be added also in case of use with air/gas.

Pneumatic cartridge valve 2/2-way NC

For 2/2-way (pneumatic symbol VP14) or 3/2-way (pneumatic symbol YES1) function, see the seat dimensioning in the next pages.



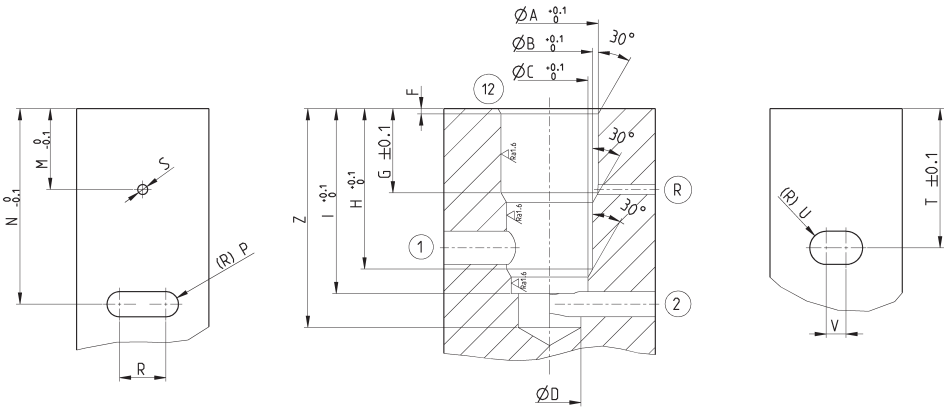




Mod.	ØA	B	Nominal diameter Ø (mm)	kv (l/min)	Qn (Nl/min)	Min/max pressure (bar)	Min/max pilot pressure (bar)
810C5100-F132-OX2	10	26.7	5.0	6.5	420	0 ÷ 6	3 ÷ 6
820C5100-G732-OX2	14.5	30.3	6.6	12.5	800	0 ÷ 6	3 ÷ 6
830C5100-K132-OX2	22	34.8	9.0	23	1480	0 ÷ 6	3 ÷ 6

Seat for Series 8 pneumatic valve with 2/2-way NC function

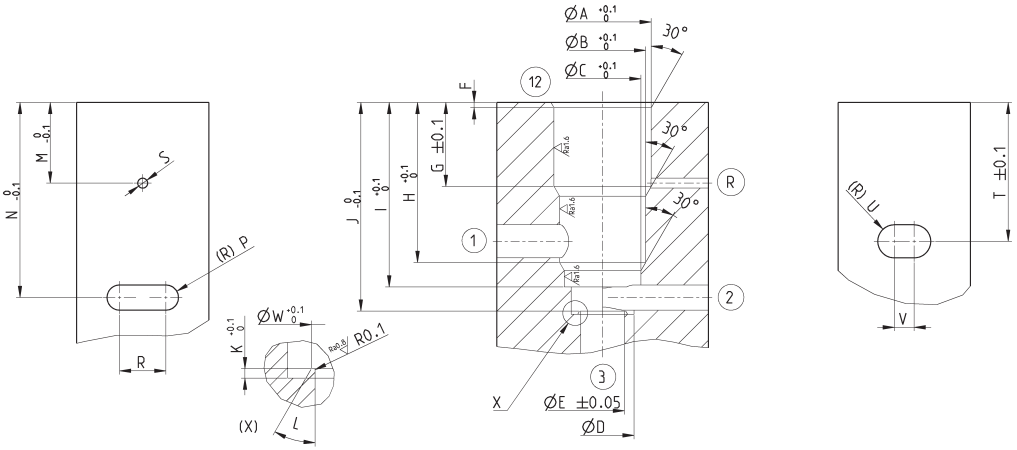
NOTE IN THE DRAWING:
1 = inlet
2 = outlet
12 = pilot supply
R = poppet chamber exhaust



SERIES 8																	
Size	A	B	C	D	F	G	H	I	M	N	P	R	S	T	U	V	Z
1	10.4	9.7	9	8.2	0.8	14.5	20.7	25	13.2	26.2	1.5	5	1.5	19.1	3	5	30
2	14.65	12.95	11.55	9.5	0.8	12.8	24.2	27.9	12.2	29.3	1.9	7	1.5	20.5	2.5	4	33
3	22.1	20.6	19.6	16.2	0.5	15	28.7	33.4	12.5	37.1	4	4.4	2.5	24.8	3.75	5	41

Seat for Series 8 pneumatic valve with 3/2-way NC function

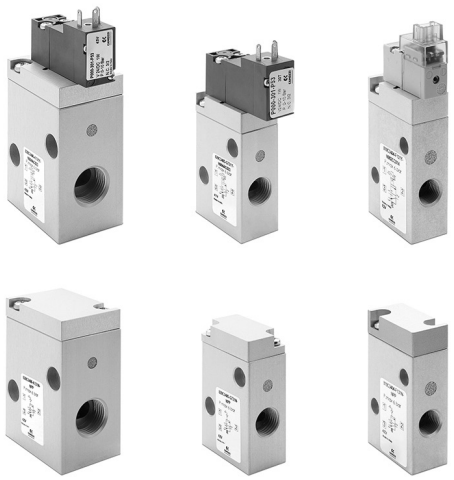
NOTE IN THE DRAWING:
1 = inlet
2 = outlet
3 = exhaust
12 = pilot supply
R = poppet chamber exhaust



SERIES 8																					
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	T	U	V	W
1	10.4	9.7	9	8.2	5	0.8	14.5	20.7	25	28	0.3	45	13.2	26.2	1.5	5	1.5	19.1	3	5	5.4
2	14.65	12.95	11.55	9.5	6.6	0.8	12.8	24.2	27.9	31.55	0.5	45	12.2	29.3	1.9	7	1.5	20.5	2.5	4	7
3	22.1	20.6	19.6	16.2	9	0.5	15	28.7	33.4	38.05	1	60	12.5	37.1	4	4.4	2.5	24.8	3.75	5	10

Series 8 pneumatically and electropneumatically operated valves

2/2-way - Normally Closed (NC), Normally Open (NO)
3/2-way - Normally Closed (NC), Normally Open (NO)



- High flow
- Available in 3 different sizes for general purpose
- Version for use with oxygen available

The Series 8 enlarges the range of versions available with the cartridge valve directly integrated in an anodized aluminium body comprising also the pilot solenoid valve. The new bodies enable to have pneumatically operated versions with external piloting or electropneumatically operated versions with both external and internal piloting.

GENERAL DATA

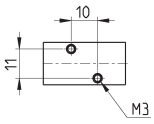
TECHNICAL SPECIFICATIONS	
Function	2/2 NC – 2/2 NO – 3/2 NC - 3/2 NO
Operation	pneumatic or electropneumatic
Pneumatic connections	G1/8 – G1/4 – G3/8
Nominal diameter	5 ... 9 mm
Flow coefficient kv (l/min)	6.5 ... 23
Nominal flow	420 ... 1480 Nl/min (air at 6 bar ΔP 1 bar)
Operating pressure	3 ÷ 6 bar (0 ÷ 6 bar with external pilot supply)
External pilot pressure	3 ÷ 6 bar
Operating temperature	0 ÷ +50°C
Fluid	filtered air class 5.4.4 according to ISO 8573-1 (oil viscosity max. 32 cSt), inert gases
Response times	ON <10 msec - OFF <10 msec
Installation	any position
MATERIALS IN CONTACT WITH FLUID	
Body	Aluminium
Seals	FKM
Internal parts	Aluminium – Brass
ELECTRICAL SPECIFICATIONS	
Voltage	24 V DC – other voltages upon request
Voltage tolerance	Size 1 = ±10% - Size 2 and 3 = -10% +15%
Power consumption	Size 1 = 1.3 W (inrush) 0.25 W (holding) – Size 2 and 3 = 2 W
Duty cycle	ED 100%
Electrical connection	connectors – wires (length = 300 mm)
Protection class	Size 1 = IP50 – Size 2 and 3 = IP65 (with connector)

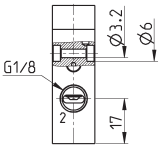
CODING EXAMPLE

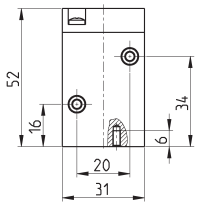
8	10	C3	4	04	-	F1	3	1	Y	-	N	00	2C	C014	

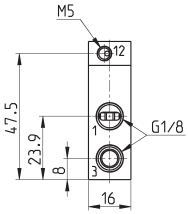
8	SERIES
10	SIZE: 10 = Size 1 20 = Size 2 30 = Size 3
C3	TYPE OF BODY: C3 = threaded body
4	NUMBER OF WAYS - FUNCTIONS: 1 = 2/2-way NC 2 = 2/2-way NO 4 = 3/2-way NC 5 = 3/2-way NO
04	PNEUMATIC CONNECTIONS: 04 = G1/8 (Size 1) 05 = G1/4 (Size 2) 06 = G3/8 (Size 3)
F1	NOMINAL DIAMETER: F1 = 5.0 mm (Size 1) G7 = 6.6 mm (Size 2) K1 = 9.0 mm (Size 3)
3	SEAL MATERIAL: 3 = FKM
1	BODY MATERIAL: 1 = aluminium
Y	MANUAL OVERRIDE: N = not provided Y = provided monostable
N	MOUNTING ACCESSORIES: N = not provided
00	OPTIONS: 00 = no option PP = pneumatic piloting PE = electropilot with external piloting
2C	ELECTRICAL CONNECTION: 2C = connection type KN 90° + protection + led (Size 1) 2F = connection type KN 90° in line + protection + led (Size 1) 3A = connection DIN EN 175 301-803-C (8 mm) 4A = industry standard connection (9.4 mm) 7A = wires - length 300 mm (Size 2 - 3)
C014	VOLTAGE - POWER CONSUMPTION: C012 = 12V DC 1.3/0.25W (Size 1) C014 = 24V DC 1.3/0.25W (Size 1) C020 = 12V DC 2W (Size 2 - 3) C023 = 24V DC 2W (Size 2 - 3) C025 = 48V DC 2W (Size 2 - 3)
	VERSION: = standard OX1 = for use with oxygen (non volatile residual less than 550 mg/m²) OX2 = for use with oxygen (non volatile residual less than 33 mg/m²)

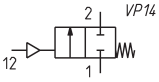
Pneumatic valve size 1 - 2/2- and 3/2-way, NC and NO

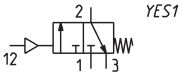






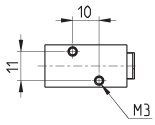




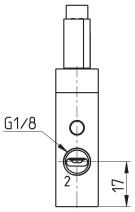


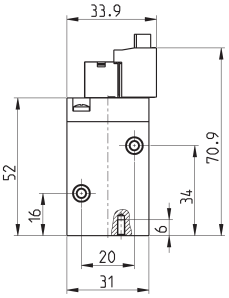
Mod.	Function		Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
810C3104-F131N-NPP	2/2 NC	(for the NO function it is required to maintain a continuos pneumatic pilot supply)	G1/8	5.0	6.5	420	0 ÷ 6	3 ÷ 6	External	VP14
810C3404-F131N-NPP	3/2 NC	(for the NO function it is required to maintain a continuos pneumatic pilot supply)	G1/8	5.0	6.5	420	0 ÷ 6	3 ÷ 6	External	YES1

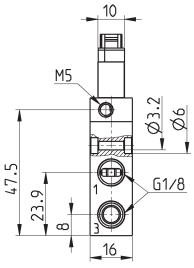
Solenoid valve size 1, 2/2- and 3/2-way, NC

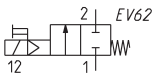


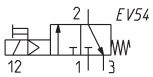
* please complete the code with ELECTRIC CONNECTION (option 2C or 2F) and VOLTAGE (see the CODING EXAMPLE).

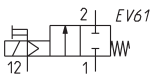


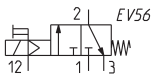






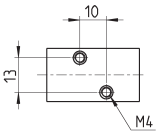


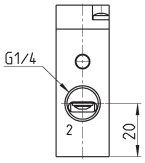


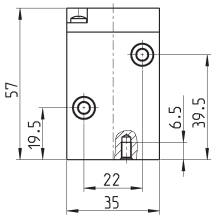


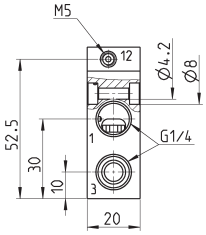
Mod.	Function	Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
810C3104-F131Y-N00*	2/2 NC	G1/8	5.0	6.5	420	3 ÷ 6	-	Internal	EV62
810C3404-F131Y-N00*	3/2 NC	G1/8	5.0	6.5	420	3 ÷ 6	-	Internal	EV54
810C3104-F131Y-NPE*	2/2 NC	G1/8	5.0	6.5	420	0 ÷ 6	3 ÷ 6	External	EV61
810C3404-F131Y-NPE*	3/2 NC	G1/8	5.0	6.5	420	0 ÷ 6	3 ÷ 6	External	EV56

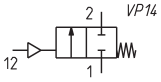
Pneumatic valve size 2 - 2/2- and 3/2-way, NC and NO

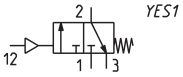








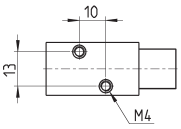


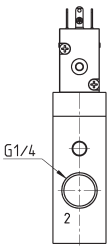


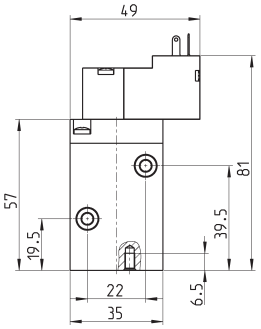
Mod.	Function		Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
820C3105-G731N-NPP	2/2 NC	(for the NO function it is required to maintain a continuous pneumatic pilot supply)	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	VP14
820C3405-G731N-NPP	3/2 NC	(for the NO function it is required to maintain a continuous pneumatic pilot supply)	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	YES1

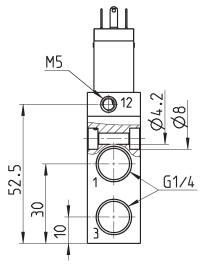
Solenoid valve size 2, 2/2- and 3/2-way, NC and NO

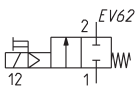
* please complete the code with ELECTRIC CONNECTION (option 3A, 4A o 7A) and VOLTAGE (see the CODING EXAMPLE).

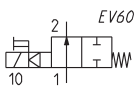


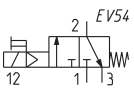


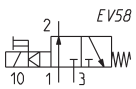


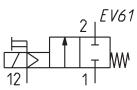


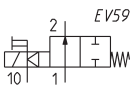


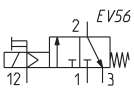


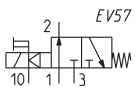






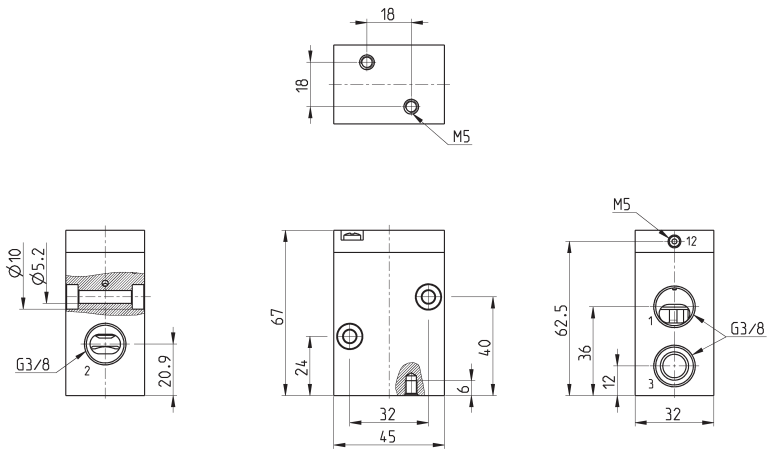


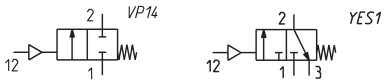




Mod.	Function	Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
820C3105-G731Y-N00*	2/2 NC	G1/4	6.6	12.5	800	3 ÷ 6	-	Internal	EV62
820C3205-G731Y-N00*	2/2 NO	G1/4	6.6	12.5	800	3 ÷ 6	-	Internal	EV60
820C3405-G731Y-N00*	3/2 NC	G1/4	6.6	12.5	800	3 ÷ 6	-	Internal	EV54
820C3505-G731Y-N00*	3/2 NO	G1/4	6.6	12.5	800	3 ÷ 6	-	Internal	EV58
820C3105-G731Y-NPE*	2/2 NC	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	EV61
820C3205-G731Y-NPE*	2/2 NO	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	EV59
820C3405-G731Y-NPE*	3/2 NC	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	EV56
820C3505-G731Y-NPE*	3/2 NO	G1/4	6.6	12.5	800	0 ÷ 6	3 ÷ 6	External	EV57

Pneumatic valve size 3 - 2/2- and 3/2-way, NC and NO

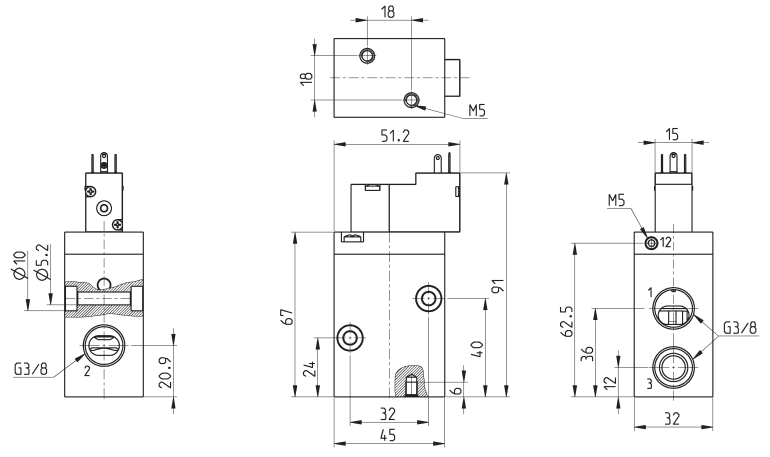


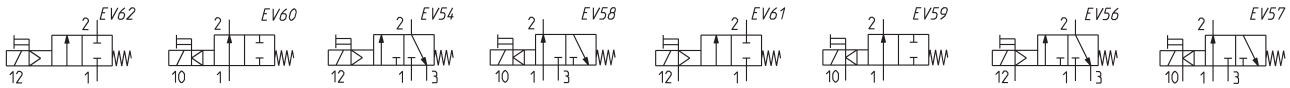


Mod.	Function		Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
830C3106-K131N-NPP	2/2 NC	(for the NO function it is required to maintain a continuous pneumatic pilot supply)	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	VP14
830C3406-K131N-NPP	3/2 NC	(for the NO function it is required to maintain a continuous pneumatic pilot supply)	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	YES1

Solenoid valve size 3, 2/2- and 3/2-way, NC and NO

* please complete the code with ELECTRIC CONNECTION (option 3A, 4A o 7A) and VOLTAGE (see the CODING EXAMPLE).





Mod.	Function	Pneumatic connection	Orifice Ø (mm)	kv (l/min)	Qn (Nl/min)	Min÷max pressure (bar)	Min÷max pilot pressure (bar)	Pilot supply	Symbol
830C3106-K131Y-N00*	2/2 NC	G3/8	9.0	23	1480	3 ÷ 6	-	Internal	EV62
830C3206-K131Y-N00*	2/2 NO	G3/8	9.0	23	1480	3 ÷ 6	-	Internal	EV60
830C3406-K131Y-N00*	3/2 NC	G3/8	9.0	23	1480	3 ÷ 6	-	Internal	EV54
830C3506-K131Y-N00*	3/2 NO	G3/8	9.0	23	1480	3 ÷ 6	-	Internal	EV58
830C3106-K131Y-NPE*	2/2 NC	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	EV61
830C3206-K131Y-NPE*	2/2 NO	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	EV59
830C3406-K131Y-NPE*	3/2 NC	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	EV56
830C3506-K131Y-NPE*	3/2 NO	G3/8	9.0	23	1480	0 ÷ 6	3 ÷ 6	External	EV57

Series TC
shut-off micro-valves

New

2/2-way - Normally Closed (NC)

- Compact design
- High performance
- Ease of installation
- Compatibility between materials used and several gaseous fluids
- Suitable for applications with oxygen

The principle of the Series TC1-V shut-off micro-valves is based on the actuation of a poppet by means of an operating pressure applied above it.

The poppet, once actuated, moves away from the tightening seal, permitting the flow of the intercepted fluid.

By removing the actuation pressure, the poppet repositions itself on the tightening seal by means of a spring positioned below that closes the flow of the fluid.

For its realization the most suitable materials for contact with fluids were selected. The body in PPS and the FKM tightening seals guarantee full compatibility with a wide range of gaseous fluids.

GENERAL DATA

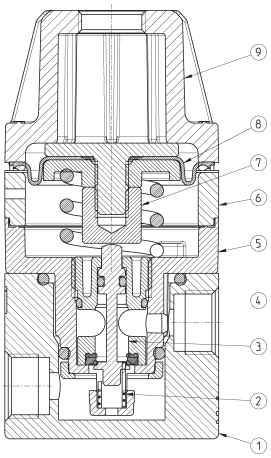
Construction	compact with pre-formed diaphragm
Materials	see the TABLE OF MATERIALS
Ports	cartridge construction in manifold - G1/8 or 1/8NPTF (only for aluminium body version)
Mounting	in-line or cartridge (any position)
Operating temperature	-5°C ÷ 50°C
Inlet pressure	0 ÷ 10 bar
Pilot pressure	0.6 ÷ 10 bar
Nominal flow	240 Nl/min (6 bar ΔP 1 bar)
Medium	air, inert/medical gases and oxygen

CODING EXAMPLE

TC	1	-	V	36	-	C	-	V	-	OX2

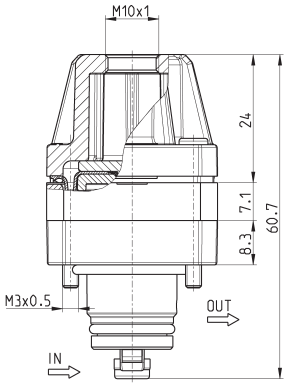
TC	SERIES
1	SIZE
V	VALVE
36	CONSTRUCTION: 36 = pneumatic command
C	PORTS: C = Cartridge 1/8 = G1/8 1/8TF = 1/8NPTF
V	SEALS MATERIAL: V = FKM
OX2	VERSIONS: OX1 = for oxygen (non-volatile residue lower than 550 mg/m^2) OX2 = for oxygen (non-volatile residue lower than 33 mg/m^2)

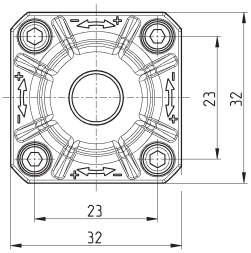
Series TC shut-off micro-valves - materials

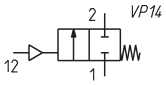


PARTS	MATERIALS
1. Base body	Anodized aluminium
2. Lower spring	Stainless steel
3. Insert	PPS
4. Poppet	Stainless steel
5. Body	PPS
6 Intermediate body	Anodized aluminium
7. Valve guide	Polyamide
8. Diaphragm	FKM
9. Bell	Polyamide
Seals	FKM

Series TC cartridge shut-off micro-valves



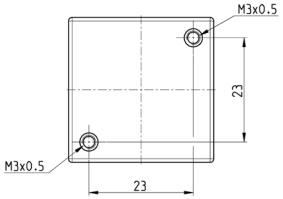


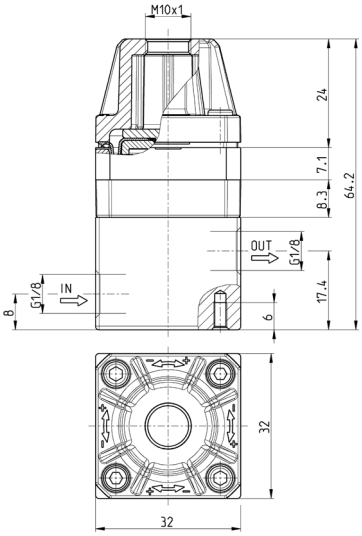


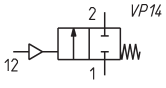
Mod.
TC1-V36-C-V-OX1
TC1-V36-C-V-OX2

Series TC shut-off micro-valves with aluminium body

* to choose the type of thread (G1/8 or 1/8 NPTF) see the Coding example

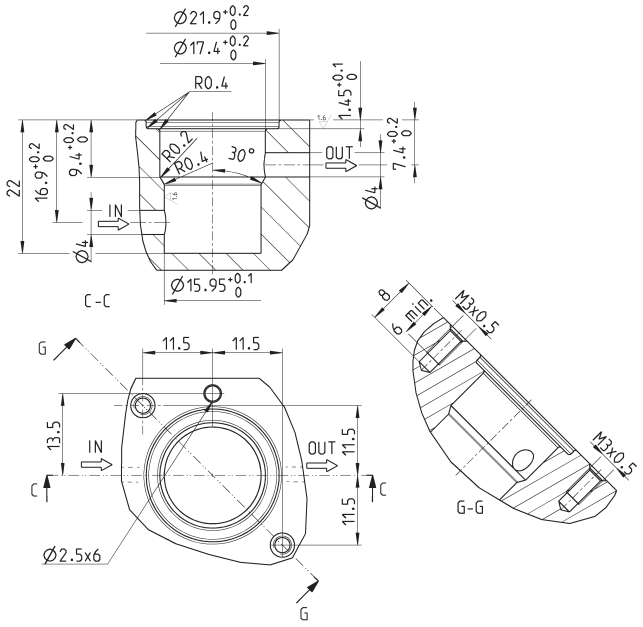






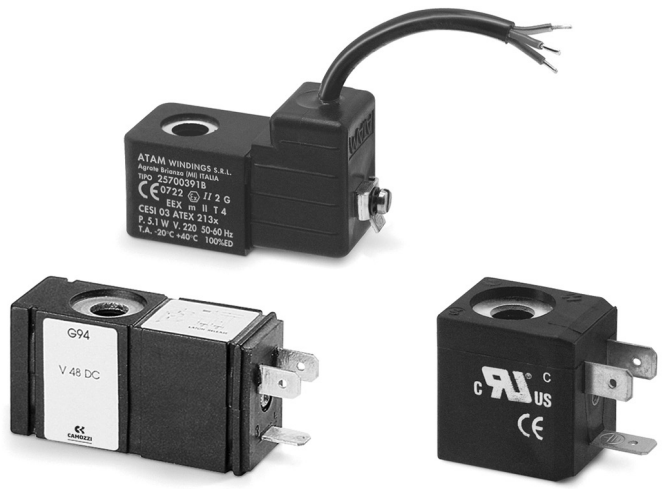
Mod.
TC1-V36-*-V-OX1
TC1-V36-*-V-OX2

Seat dimensions for Series TC cartridge valve



Solenoids
GP... - B7... - G93 - U7... - U7...EX - G7... - A8... - B8... - H8... - B9...

Version A and B
Connections according to industrial standard and to DIN EN 175 301-803 standards



The mechanical part of the tube in the solenoid valves Series A, 3, 4, 9 and NA allows the mounting of various types of solenoids.

- Mod. GP...: in compliance with industrial standard (9.4mm) and designed to be mounted only on Series AP proportional valves, size 16 mm.
- Mod. B...: to be used only with Series CFB solenoid valves (2/1.30).
- Mod. G93: special solenoids with incorporated memory for pulsed operation.
- Mod. U7...: standard solenoids are certified by UL as Recognized Component for USA and Canada. Solenoids Mod. U7 are available also with ATEX certification.
- Mod. H8...: explosion-proof solenoids suitable for potentially explosive ambients (ATEX, IECEx).

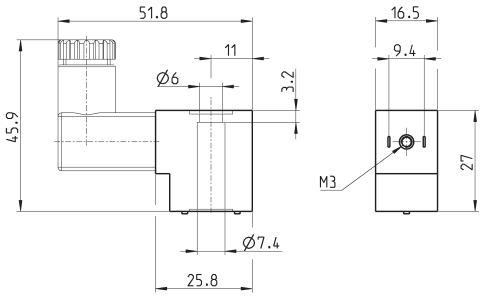
GENERAL DATA

	U7... / G7... / G93	A8...	B...	H8...
Wire insulation	class F (155° C)	class H (180° C)	class H (200° C)	class H (200° C)
Protection class	IP54 - DIN 40050 IP65 (with connector Mod. 122-800 and Mod. 122-800EX)	IP54 - DIN 40050 IP65 (with connector Mod. 124-800)	IP54 - DIN 40050 IP65 (with connector Mod. 124-800)	IP64
Operation	ED 100%	ED 100%	ED 100%	ED 100%
Tolerance V AC	-15% / +10%	-15% / +10%	±10%	-
Tolerance V DC	±10%	±10%	±5%	-

Solenoids Mod. GP...

Electrical connection: bipolar
Norm: industrial standard (9.4 mm)

Solenoid material: PA

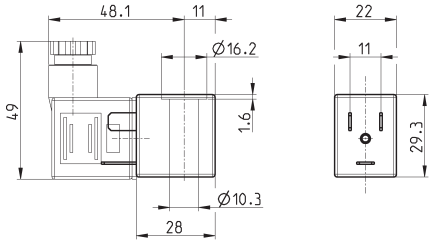


Mod.	Solenoid voltage	Power absorption
GPH	12 V DC	3 W
GP7	24 V DC	3 W

Solenoids Mod. B7...

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-B

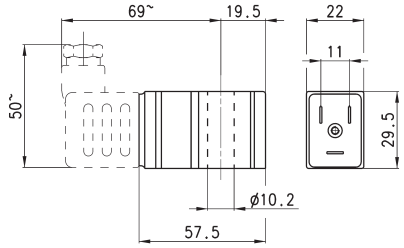
Solenoid material: PA-MXD6



Mod.	Solenoid voltage	Power absorption
B7B	24 V - 50/60 Hz	9 VA
B7D	110 V - 50/60 Hz	9 VA
B7E	230 V - 50/60 Hz	9 VA
B7H	24 V - 50/60 Hz	4 VA
B72	12 V - DC	10 W
B721	12 V - DC	14 W
B73	24 V - DC	10 W
B731	24 V - DC	14 W
B74	24 V - DC	7 W

Solenoids Mod. G93 (with memory)

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-B
Voltage tolerance: ±10%
Pulsed operation (see description)



Mod.	Voltage	Minimum inpulse latch/release	Consumption latch/release
G93	24 V DC	18 ms - 10 ms	168 mA - 80 mA

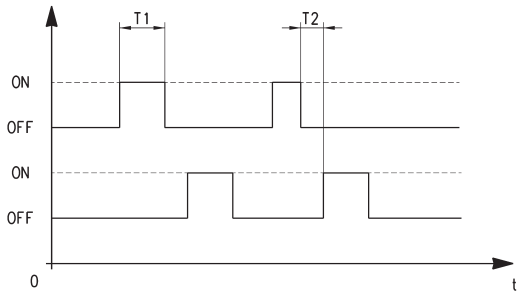
SOLENOIDS

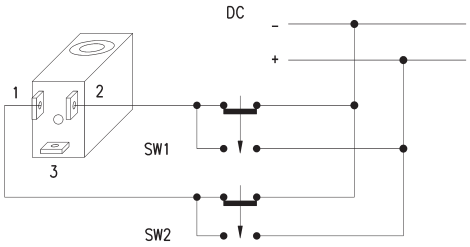
Description of solenoids Mod. G9...

Solenoids Mod. G9... can be replaced on all other Series A solenoid valves or pilots allowing to change the valve functioning from:
- unstable functioning system (spring return)
to:
- stable functioning system (memory)

The stable functioning has the following advantages:
- with an impulse of about 20 ms after which the valve always remains in the controlled position.
- the valve remains in the controlled position (opened or closed) even if there is no power.
- when normally opened valves should be used, it is not necessary to use valves with special mechanical parts as a NC valve becomes a NO valve just by changing the control impulse sequence.
- The impulse control system facilitates the utilization with electronic circuits. The minimum required impulse for the function is 20 ms; if, for circuit reasons, the impulse last for a longer period, there is no danger of heating.
- magnet attraction command = Actuation SW1
- magnet release command = Actuation SW2

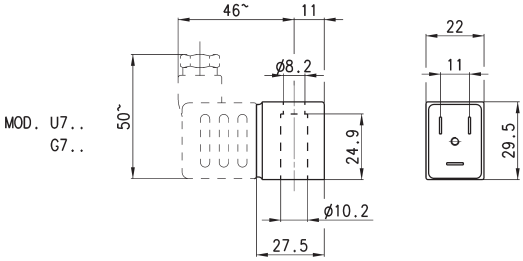
If the solenoids are mounted in batteries, a magnetic scheme type G90/L should be used.
To facilitate the cabling a special connector is available, which contains a circuit which realises the inversion of the power supply to the solenoid, indispensable for the PLC command, 122-892 P with common positive or 122-893 N with common negative.

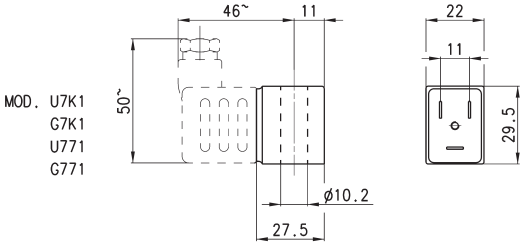




Solenoids Mod. U7... / U7*EX and Mod. G7...

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-B
Solenoid material: U7* = PET; G7* = PA
To order the ATEX version of Mod. U7 (not available for Mod. U7F, U7K1 with voltage 125V 50/60Hz) it is necessary to add EX at the end of the code.
Mod. U7*EX marked:
II 3G Ex nA IIC T4 Gc X IP65
II 3D Ex tc IIIC 130°C Dc X





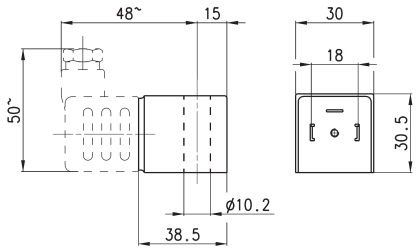
Mod.	Sol. volt. (1)	Pow. abs. (1)	Sol. volt. (2)	Pow. abs. (2)	Sol. volt. (3)	Pow. abs. (3)
U7H	12 V DC	3.1 W	24V - 50/60 Hz	3.5 VA		
G7H	12 V DC	3.1 W	24V - 50/60Hz	3.5 VA		
U7K	110V - 50/60Hz	3.8 VA	125V - 50/60Hz	5.5 VA	72 V DC	4.8 W
U7K1	110V - 50/60Hz	5.8 VA	125V - 50/60Hz	8.3 VA	72 V DC	5.6 W
G7K	110V - 50/60Hz	3.8 VA	125V - 50/60Hz	5.5 VA	72 V DC	4.8 W
G7K1	110V - 50/60Hz	5.8 VA	125V - 50/60Hz	8.3 VA	72 V DC	5.6 W
U7J	230V - 50/60Hz	3.5 VA	240V - 50/60Hz	4 VA		
G7J	230V - 50/60Hz	3.5 VA	240V - 50/60Hz	4 VA		
U79	48 V DC	3.1 W				
G79	48 V DC	3.1 W				
U710	110 V DC	3.2 W				
G710	110 V DC	3.2 W				
U77	24 V DC	3.1 W	48V - 50/60Hz	3.8 VA		
U771	24 V DC	3.1 W	48V - 50/60Hz	3.8 VA		
G77	24 V DC	3.1 W	48V - 50/60Hz	3.8 VA		
G771	24 V DC	3.1 W	48V - 50/60Hz	3.8 VA		
U7F	380V - 50/60Hz	7 VA				
U72	12 V DC	5 W				
G72	12 V DC	5 W				
U73	24 V DC	5 W				
G73	24 V DC	5 W				

Notes to the table:
Sol. volt. = Solenoid voltage
Pow. abs. = Power absorption

Mod. U7K1, G7K1, U771 and G771 are to be used only with sol. valves series A, NO in line.

Solenoids Mod. A8...

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-A

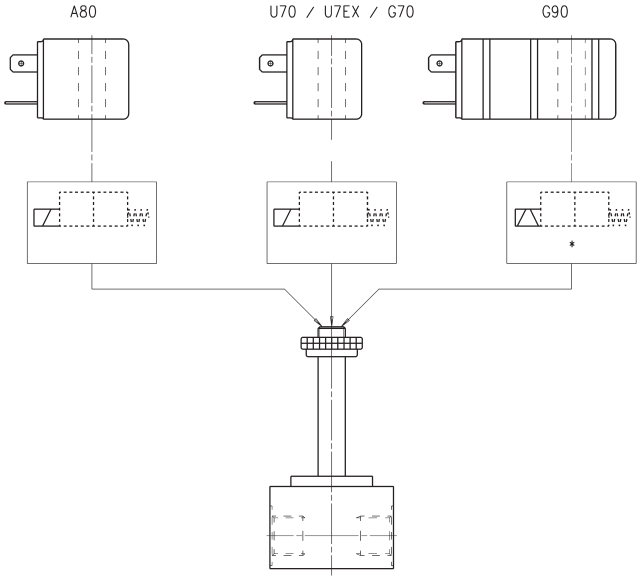


Mod.	Solenoid voltage	Power absorption
A8B	24V - 50/60Hz	5VA
A8D	110V - 50/60Hz	5VA
A8E	220V - 50/60Hz	5VA
A83	24V DC	4W

Solenoids for solenoid valves Series A, 3, 4, 9 and NA

All solenoids presented can be mounted on the following solenoid valves: Series A - 3 - 4 - 9 - NA

NB:
For the tightening of the solenoids' nut we recommend to do it manually, avoiding the use of any equipment.

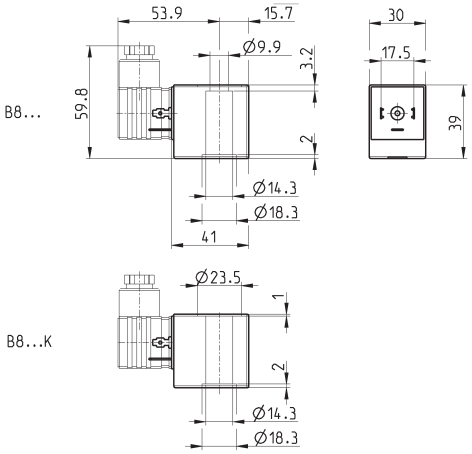


Solenoids Mod. B8...

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-A

Solenoid material: PA-MXD6

The B8*K models can be used only with some solenoid valves Series CFB
(Mod. CFB-D1..., 2/2 NO).
Further details in the dedicated section 1.30.



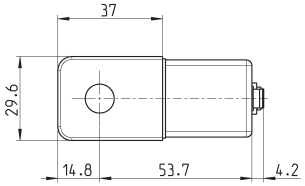
Mod.	Solenoid voltage	Power absorption
B8B	24 V - 50 Hz	15 VA
B8BK	24 V - 50 Hz	15 VA
B8D	110 V - 50/60 Hz	15 VA
B8DK	110 V - 50/60 Hz	15 VA
B8E	220/230 V - 50/60 Hz	15 VA
B8EK	230 V - 50/60 Hz	15 VA
B8F	220/230 V - 50/60 Hz	21 VA
B8FK	220/230 V - 50/60 Hz	21 VA
B82	12 V - DC	19 W
B82K	12 V - DC	19 W
B83	24 V - DC	19 W
B83K	24 V - DC	19 W

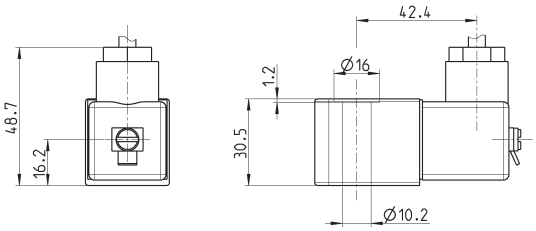
Solenoid Mod. H8.. for potentially explosive ambients

Certification in compliance with
EN 60079-0 EN 60079-18
ATEX :
II 2G Ex mb IIC T4 Gb
II 2D Ex mb IIIC T135°C Db
I M2 Ex mb I Mb
INERIS 06ATEX0002X

IECEx :
Ex mb IIC T4 Gb
Ex mb IIIC T135°C Db
Ex mb I Mb
IECEx INE 15.0053X

For Series NA use plate mod. NA54-PC.





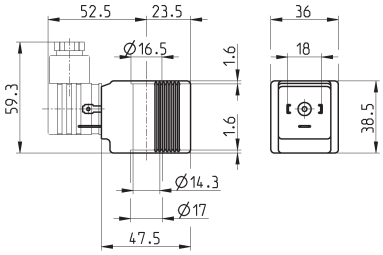
Mod.	Solenoid voltage	Power absorption
H83I	24 V - DC	5.3 W
H8BI	24 V - 50/60 Hz	5.3 W
H8CI	48 V - 50/60 Hz	5.3 W
H8DI	110 V - 50/60 Hz	5.3 W
H8EI	230 V - 50/60 Hz	5.3 W

Temperature class/Max surface temperature: T4/135°C
Environment temperature: -20°C + 40°C
Connection: tripolar cable 3 m (other lenghts on request)
Incapsulating material: self-extinguishing PA.

Solenoids Mod. B9...

Electrical connection: bipolar plus earth
Norm: DIN EN 175 301-803-A

Solenoid material: PA-MXD6

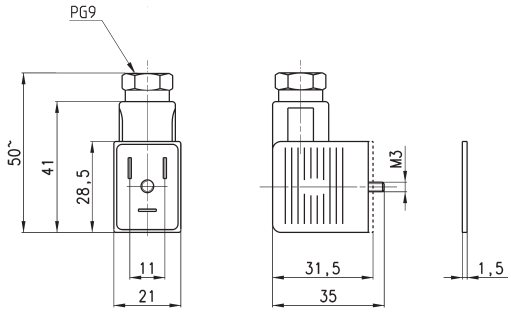


Mod.	Solenoid voltage	Power absorption
B9B	24 V - 50 Hz	29 VA
B9D	110 V - 50/60 Hz	29 VA
B9E	230 V - 50 Hz	29 VA
B92	12 V - DC	30 W
B93	24 V - DC	30 W

Connectors Mod. 122-... DIN EN 175 301-803-B

For solenoids Mod. U7/U7*EX, G7 and B7

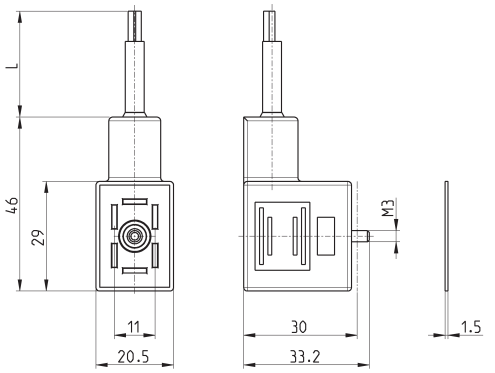
Mod. 122-800EX:
for ATEX certified solenoids mod. U7*EX, with anti-screwing off screw mod. TORX.



Mod.	description	colour	working voltage	cable holding	tightening torque
122-601	connector, diode + Led	transparent	10/50 V DC	PG9	0.5 Nm
122-701	connector, varistor + Led	transparent	24 V AC/DC	PG9	0.5 Nm
122-702	connector, varistor + Led	transparent	110 V AC/DC	PG9	0.5 Nm
122-703	connector, varistor + Led	transparent	230 V AC/DC	PG9	0.5 Nm
122-800	connector, without electronics	black	-	PG9	0.5 Nm
122-800EX	connector, without electronics	black	-	PG9	0.5 Nm

Connectors Mod. 122-571 DIN EN 175 301-803-B with cable

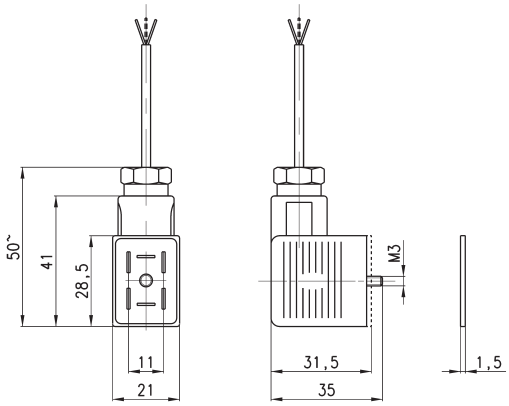
For solenoids Mod. U7/U7*EX, G7 and B7



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
122-571-1	moulded cable, varistor + Led	black	24 V AC/DC	1000 mm	-	0.5 Nm
122-571-2	moulded cable, varistor + Led	black	24 V AC/DC	2000 mm	-	0.5 Nm
122-571-3	moulded cable, varistor + Led	black	24 V AC/DC	3000 mm	-	0.5 Nm
122-571-5	moulded cable, varistor + Led	black	24 V AC/DC	5000 mm	-	0.5 Nm
122-571-10	moulded cable, varistor + Led	black	24 V AC/DC	10000 mm	-	0.5 Nm

Connectors Mod. 122-89*C DIN EN 175 301-803-B

For solenoids Mod. G9

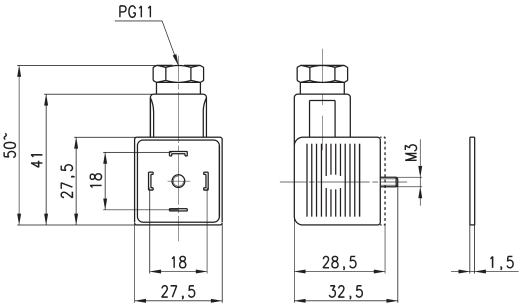


Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
122-892C	pre-wired connector, positive common	transparent	12/24V DC	2000 mm	PG9	0.5 Nm
122-893C	pre-wired connector, negative common	transparent	12/24V DC	2000 mm	PG9	0.5 Nm

Connector Mod. 124-... DIN EN 175 301-803-A

For solenoids Mod. A8 and Mod. B8/B9

Protection class IP65



Mod.	description	colour	working voltage	cable holding	tightening torque
124-800	connector, without electronics	black	-	PG9/PG11	0.5 Nm
124-702	connector, varistor + Led	black	110 V AC/DC	PG9/PG11	0.5 Nm
124-701	connector, varistor + Led	black	24 V AC/DC	PG9/PG11	0.5 Nm
124-703	connector, varistor + Led	black	230 V AC/DC	PG9/PG11	0.5 Nm

Series VNR
Unidirectional valves

New model

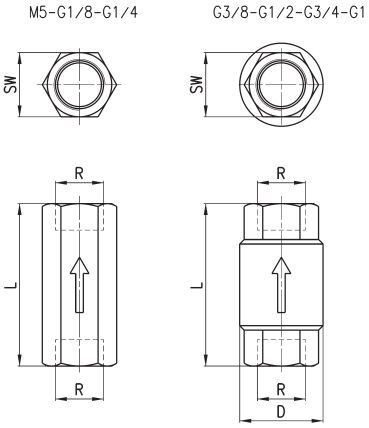
Ports of Thread version: M5, G1/8, G1/4, G3/8, G1/2, G3/4, G1
Dimensions of Tube/Tube version: Ø4; Ø6; Ø8

- In-line mounting thanks to integrated fittings
- Low operating pressures
- Robust design, brass body
- Version 6580 in FKM with a wide range of chemical compatibility and operating temperatures extended

Series VNR unidirectional valves are available in the Thread or Integrated Fitting version. Thanks to their construction they operate at low pressures.

Valve group	automatic valves
Construction	poppet-type
Materials	brass body stainless steel spring NBR/FKM seals (for version 6580)
Mounting	in any position
Ports	M5, G1/8, G1/4, G3/8, G1/2, G3/4, G1
Operating temperature	0°C ÷ 80°C; NBR (with dry air -20 / +80°C) FKM (with dry air - 20 / +200 °C)
Medium	filtered air without lubrication. If lubricated air is used, it is recommended to use ISO VG32 oil. Once applied the lubrication should never be interrupted.
Tube dimensions	Ø4; Ø6 and Ø8

Series VNR unidirectional valves

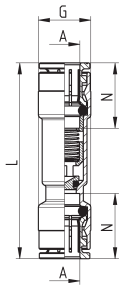


VNR1

DIMENSIONS							
Mod.	R	L	SW	D	Flow (Nl/min)	Min. operating pressure (bar)	Max working pressure (bar)
VNR-205-M5	M5	25	8	9	50	1	10
VNR-210-1/8	G1/8	34	13	15	600	0.2	10
VNR-843-07	G1/4	43	17	20	1400	0.2	10
VNR-238-3/8	G3/8	55	23	34.5	3000	0.02	25
VNR-212-1/2	G1/2	58.5	27	34.5	5800	0.02	25
VNR-234-3/4	G3/4	65	33	41.5	8000	0.06	25
VNR-201-01	G1	74.5	40	48	13000	0.06	25

Series VNR unidirectional valves

New



VNR1

Mod.	A	G	L	N	Flow 6 bar ΔP1(Nl/min)	Min. operating pressure (bar)	Max operating pressure (bar)	Weight (g)
6580 4-VNR	4	9	40	14	85	0,5	10	13
6580 6-VNR	6	12	48	16	450	0,2	10	20
6580 8-VNR	8	14	52.5	17.5	900	0,2	10	30

Series VSO, VSC quick exhaust valves

Series VSO ports: M5, G1/8, cartridge ø4
Series VSC ports: G1/8, G1/4, G1/2

- Suitable to rapidly discharge air contained in tanks, systems or cylinder chambers.
- Threaded versions and with fitting

Series VSC and VSO quick exhaust valves are commonly used to increase the speed of cylinders or for rapid depressurisation of tanks containing compressed air.

Mod. VSO 425-M5, VSO 426-04: they are particularly suitable to be mounted on solenoid valves and valves incorporating a ø 4 cartridge.

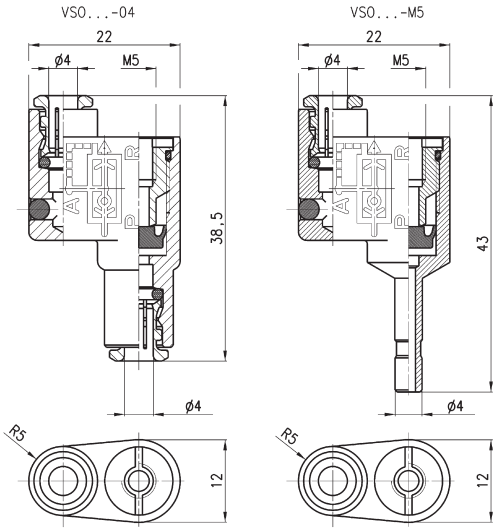
Mod. VSO 4-1/8: it is particularly suitable for direct mounting on the actuator connection. The air coming in from the jointed part (1) is used by the threaded side (2), whilst the exhaust (3) passes through the holes sideways to the valve body.

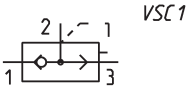
Mod. VSC: they are particularly suitable to be mounted directly on the cylinder mouth through the use of a nipple. It is recommended to mount a silencer on the outlet.

GENERAL DATA

Valve group	automatic valves
Construction	poppet-type
Materials	Series VSO: brass body - NBR seals Series VSC: brass body - Desmopan seal
Mounting	in any position
Ports	Series VSO: M5, G1/8, cartridge ø4 Serie VSC: G1/8, G1/4, G1/2
Operating temperature	0°C ÷ 80°C (with dry air -20°C)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use ISO VG32 oil. Once applied the lubrication should never be interrupted.

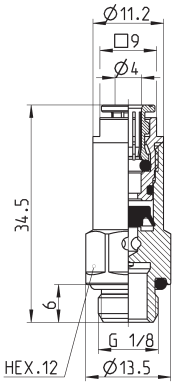
Quick exhaust valves Mod. VSO 425-M5, VSO 426-04

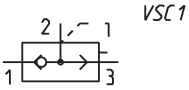




Mod.	Ports	Flow rate at 6 bar 1 > 2 (Nl/min)	Flow rate at 6 bar 2 > 3 (Nl/min)	Min. operating pressure (bar)	Max working pressure (bar)
VSO 425-M5	M5	50 (ΔP = 1 bar)	100 (ΔP = 1 bar)	1	16
VSO 426-04	cartridge ø4	50 (ΔP = 1 bar)	100 (ΔP = 1 bar)	1	16

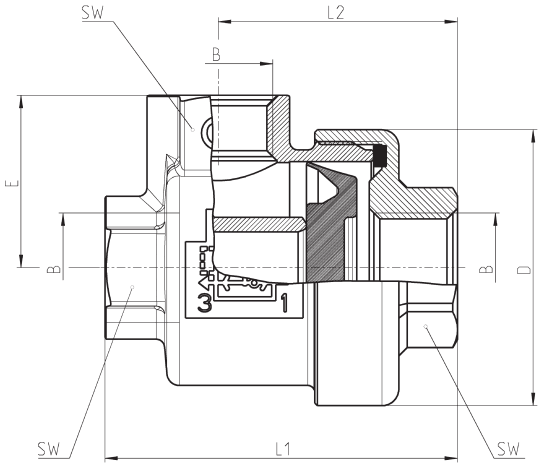
Quick exhaust valve Mod. VSO 4-1/8

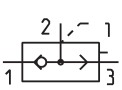




Mod.	Ports	Flow rate at 6 bar 1 > 2 (Nl/min)	Flow rate at 6 bar 2 > 3 (Nl/min)	Min. operating pressure (bar)	Max working pressure (bar)
VSO 4-1/8	G1/8	50 (ΔP = 1 bar)	330 (free flow)	0.5	16

Series VSC quick exhaust valves





VSC 1

Mod.	B	D	E	L1	L2	SW	Ports	Medium inlet flow rate 1 > 2 [flow at 6 bar, ΔP 1 bar] (Nl/min)	Medium exhaust flow rate 2 > 3 [flow at 6 bar, ΔP 1 bar] (Nl/min)	Min. operating pressure (bar)	Max working pressure (bar)
VSC 588-1/8	1/8	28	17.5	36.5	25	14	G1/8	630	940	0.5	12
VSC 544-1/4	1/4	33	20.5	42	28.5	17	G1/4	860	1600	0.3	12
VSC 522-1/2	1/2	43	27	57.5	39.5	24	G1/2	4700	6250	0.2	12

Adjustable overpressure exhaust valve Mod. VMR 1/8-B10

Ports: G1/8

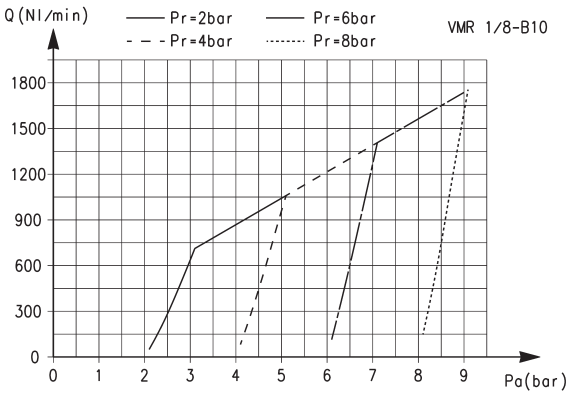
» Able to maintain pressure constant at a set value which allows the overpressure to exhaust

The adjustable valve Mod. VMR 1/8-B10 allows to discharge the overpressure that can be generated in a volume.

GENERAL DATA

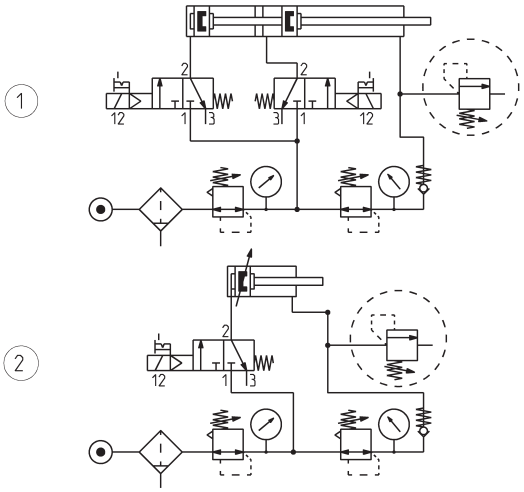
Valve group	automatic valves
Construction	diaphragm type
Materials	brass body zinc-plated steel spring NBR seals
Mounting	in any position
Ports	G1/8
Operating temperature	-5°C ÷ 50°C (with the dew point of the fluid lower than 2°C at the min. working temperature)
Medium	filtered air, without lubrication. If lubricated air is used, it is recommended to use ISO VG32 oil. Once applied the lubrication should never be interrupted.

FLOW DIAGRAM and FUNCTIONING SCHEMES



FLOW DIAGRAM

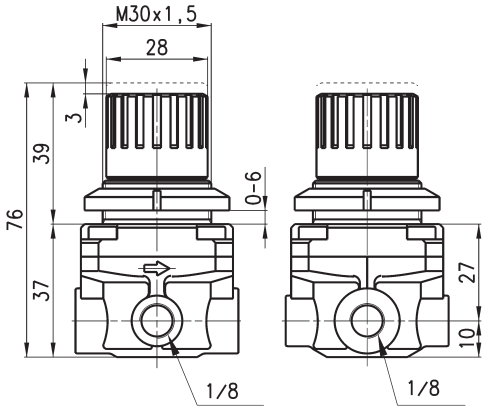
Pa = Inlet pressure
Pr = Regulated pressure
Q = Flow

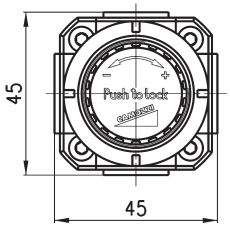


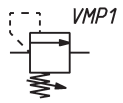
FUNCTIONING SCHEME 1: overpressure exhaust in a cylinder chamber or in a tank when the set value has been exceeded.

FUNCTIONING SCHEME 2: VMR valve with maximum adjustable pressure allows pressure in a cylinder chamber or in tank to exhaust in the atmosphere every time the set regulation value is exceeded.

Valve with maximum adjustable pressure Mod. VMR 1/8-B10







Mod.	Working pressure (bar)
VMR 1/8-B10	1 ÷ 8

Series VBO - VBU blocking valves

Unidirectional valves (VBU) and bidirectional valves (VBO) Ports G1/8, G1/4, G3/8 and G1/2

- Series VBU: unidirectional valves with operating pressure from 0.3 to 10 bar
- Series VBO: bidirectional valves with operating pressure from 0 to 10 bar
- Direct mounting on cylinders or on distribution and fluid control blocks

These unidirectional and bidirectional blocking valves have been realised in order to enable mounting directly on cylinders.
They can be used as high flow valves for blows, cleaning of pieces, filling of volumes.
For these applications it is suggested to connect the supply to port 2 (having the mail thread).

These valves can be mounted directly also on distribution and fluid control blocks.

GENERAL DATA

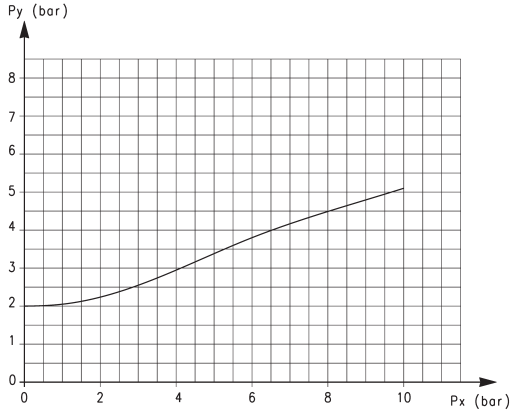
Construction	poppet type
Valve group	unidirectional and bidirectional blocking valve
Materials	Brass - NBR seals - stainless steel springs - PTFE
Mounting	by male thread
Ports	G1/8 - G1/4 - G3/8 - G1/2
Position	in any position
Operating temperature	0°C ÷ 80°C (with dry air -20°C)
Operating pressure	VBU: 0,3 ÷ 10 bar, VBO: 0 ÷ 10 bar
Nominal pressure	6 bar
Nominal flow	see graph
Nominal diam.	G1/8 ø 5,5 mm - G1/4 ø 8 mm - G3/8 ø 11 mm - G1/2 ø 15 mm
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied, the lubrication should never be interrupted.

CODING EXAMPLE

VB	U		1/8

VB	SERIES: VB
U	VERSIONS: U = unidirectional O = bidirectional
1/8	PORTS: G1/8 G1/4 G3/8 G1/2

DIAGRAM OF THE PILOT PRESSURE



This diagram shows the relation between working pressure (Px) and pilot pressure required in order to operate the valve (Py).
The opening pressure of the unidirectional valve is 0,3 bar.

FLOW DIAGRAMS OF UNIDIRECTIONAL AND BIDIRECTIONAL VALVES

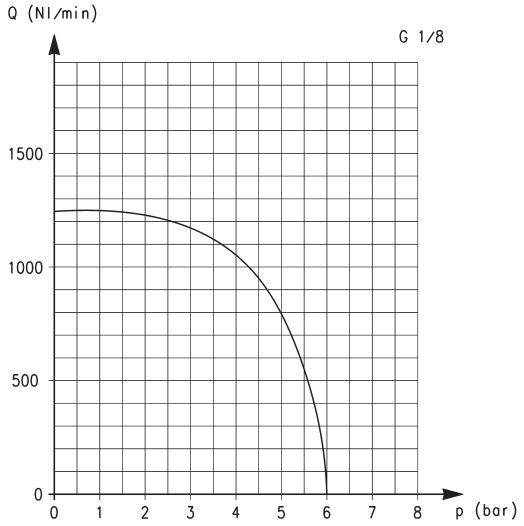


Diagram for valves VBU and VBO with G1/8 ports.

Q is the flow measured in Nl/min and determined with an inlet pressure of 6 bar.

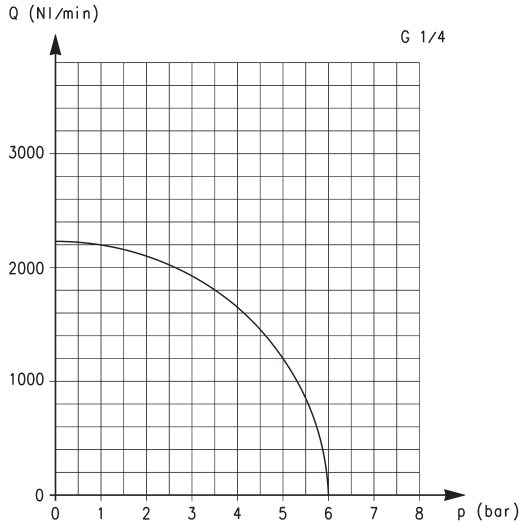


Diagram for valves VBU and VBO with G1/4 ports.

Q is the flow measured in Nl/min and determined with an inlet pressure of 6 bar.

FLOW DIAGRAMS OF UNIDIRECTIONAL AND BIDIRECTIONAL VALVES

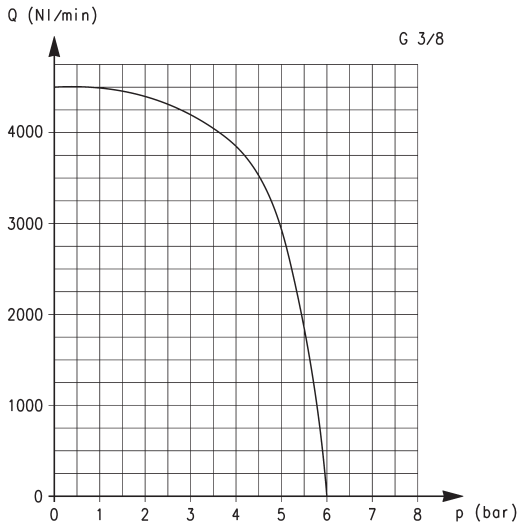


Diagram for valves VBU and VBO with G3/8 ports.

Q is the flow measured in Nl/min and determined with an inlet pressure of 6 bar.

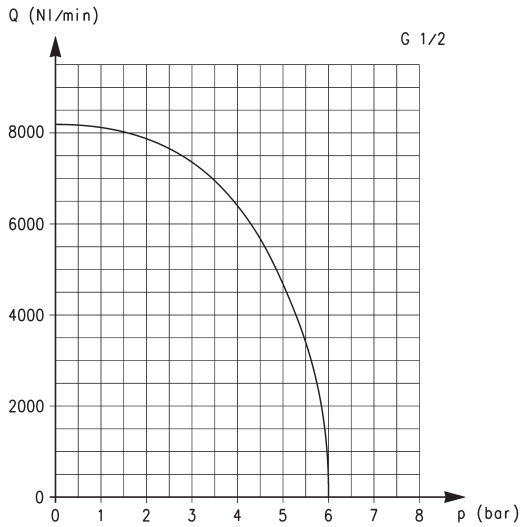
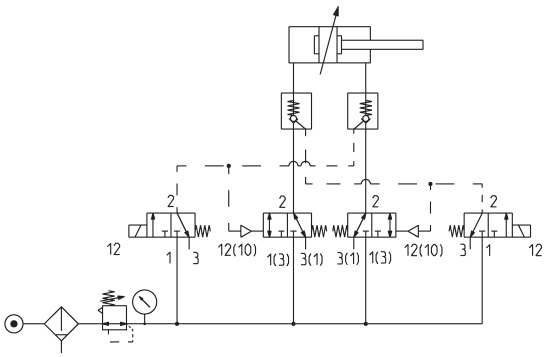


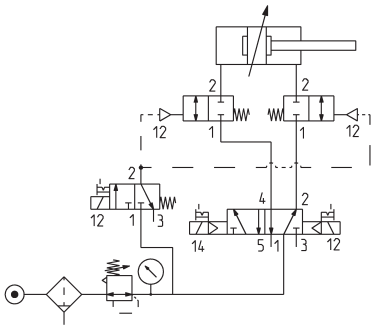
Diagram for valves VBU and VBO with G1/2 ports.

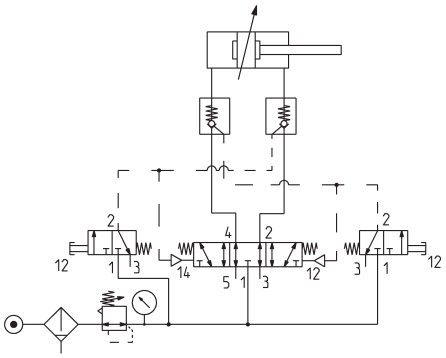
Q is the flow measured in Nl/min and determined with an inlet pressure of 6 bar.

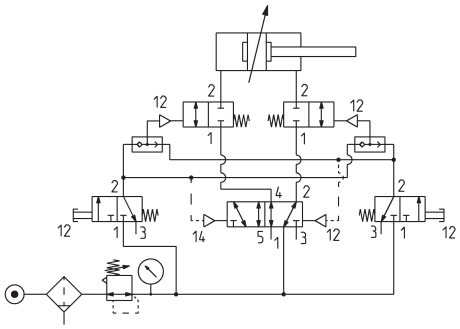
APPLICATION SCHEMES

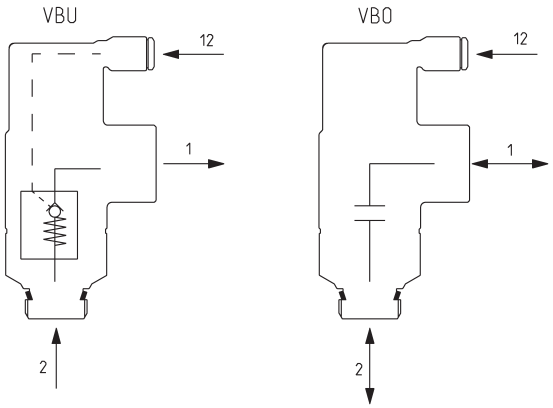
VBU = UNIDIRECTIONAL blocking valve
VBO = BIDIRECTIONAL blocking valve



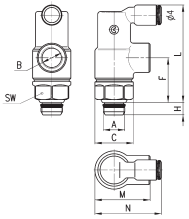






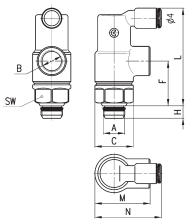


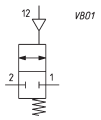
Unidirectional blocking valve



DIMENSIONS									
Mod.	A	B	C	F	H	L	M	N	SW
VBU 1/8	1/8	1/8	16,9	20	5,5	43	24,5	30	15
VBU 1/4	1/4	1/4	20,5	25	7	50	32,2	33,5	19
VBU 3/8	3/8	3/8	26,8	33	8	67	40	39,5	24
VBU 1/2	1/2	1/2	30	45,5	9	85,7	52	48	27

Bidirectional blocking valve





DIMENSIONS									
Mod.	A	B	C	F	H	L	M	N	SW
VBO 1/8	1/8	1/8	16,9	20	5,5	43	24,5	30	15
VBO 1/4	1/4	1/4	20,5	25	7	50	32,2	33,5	19
VBO 3/8	3/8	3/8	26,8	33	8	67	40	39,5	24
VBO 1/2	1/2	1/2	30	45,5	9	85,7	52	48	27

Series SCU, MCU, SVU, MVU, SCO, MCO flow control valves

Unidirectional and bidirectional banjo flow control regulators
Ports: M5, G1/8, G1/4, G3/8, G1/2

These unidirectional and bidirectional flow controllers have been designed as small as possible so as to be mounted directly on valves or cylinders.
The great variety of adjustable fittings makes it possible to complete the regulator with the most suitable system in relation to the available tube.

Only the G1/2 model is supplied complete with banjo flow controllers.
For the other models the banjo flow controller is to be requested separately.

GENERAL DATA

Construction	needle type
Valve group	unidirectional and bidirectional controller
Materials	body and regulation screw: M5 = stainless steel; 1/8 - 1/4 - 3/8 - 1/2 = OT; seals = NBR
Mounting	by male thread
Ports	M5 - G1/8 - G1/4 - G3/8 - G1/2
Installation	in any position
Operating temperature	0°C ÷ 80°C (with dry air - 20°C)
Operating pressure	1 ÷ 10 bar
Nominal pressure	6 bar
Nominal flow	see graph
Nominal diameter	M5 = 1,5 mm - G1/8 = 2 mm - G1/4 = 4 mm - G3/8 = 7 mm - G1/2 = 12 mm
Fluid	filtered air

Series PSCU, PMCU, PSVU, PMVU, PSCO, PMCO flow control valves

Unidirectional and bidirectional flow regulators with banjo in brass (M5) or in technopolymer (G1/8, G1/4, G3/8)
Ports: M5, G1/8, G1/4, G3/8

These unidirectional and bidirectional flow controllers have been designed as small as possible so as to be mounted directly on valves or cylinders.
The great variety of adjustable fittings makes it possible to complete the regulator with the most suitable system in relation to the available tube.

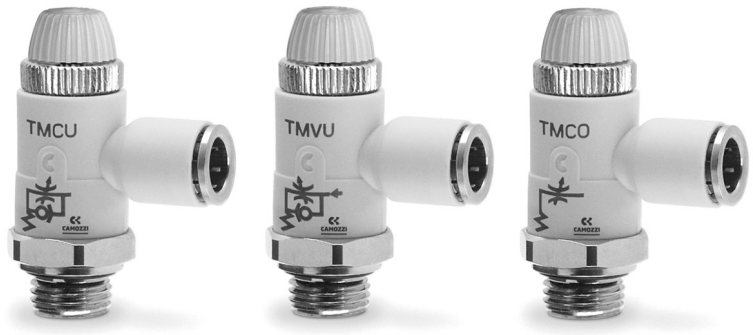
All models are supplied complete with banjo flow controllers.

GENERAL DATA

Construction	needle type
Valve group	unidirectional and bidirectional controller
Materials	body, regulation screw: stainless steel (M5), brass (G1/8 - G1/4 - G3/8) collet and insert = brass banjo: brass (M5), technopolymer (G1/8 - G1/4 - G3/8) controller = technopolymer - seals = NBR
Mounting	by male thread
Ports	M5 - G1/8 - G1/4 - G3/8
Installation	in any position
Operating temperature	0°C ÷ 60°C (with dry air -20°C)
Operating pressure	1 ÷ 10 bar
Nominal pressure	6 bar
Nominal flow	see graph
Nominal diameter	M5 = 1.5 mm - G1/8 = 2 mm - G1/4 = 4 mm - G3/8 = 7 mm
Fluid	filtered air

Series TMCU, TMVU, TMCO flow control valves

Unidirectional and bidirectional banjo flow controllers with nominal diameter 2 - 3,8 - 5,8 - 8 mm
Ports: G1/8, G1/4, G3/8, G1/2



Series TMCU, TMVU, TMCO unidirectional and bidirectional flow controllers have been revised in order to decrease their dimensions and improve their flow rate characteristics. Their construction allows for easy assembly to cylinders and valves and allows the regulation adjustment to be precise and gradual.

GENERAL DATA

Construction	needle - type
Valve group	unidirectional and bidirectional controller
Materials	brass - technopolymer - NBR
Mounting	by male threaded
Threaded ports	G1/8 - G1/4 - G3/8 - G1/2
Installation	in any position
Operating temperature	0°C ÷ 60°C (with dry air -20°C)
Operating pressure	0,5 ÷ 10 bar
Nominal pressure	6 bar
Nominal flow	see graph
Nominal dia.	Tube 4 Ø2 - Tube 6 Ø3,8 - Tube 8 Ø5,8 - Tube 10 and 12 Ø8
Fluid	filtered air If lubricated air is used, it is recommended to use ISOVG 32 oil. Once applied the lubrication should never be interrupted.

Series GSCU, GMCU, GSVU, GMVU, GSCO, GMCO flow control valves

Unidirectional and bidirectional banjo flow controllers with nominal diameter 1,5 - 3,5 - 5 mm
Ports: M5, G1/8 and G1/4

These unidirectional and bidirectional flow controllers have been designed as small as possible to enable mounting directly on valves or cylinders.
The flow regulation range is wide and gradual, allowing the regulation to be very accurate either at minimum or maximum flow.

GENERAL DATA

Construction	needle - type
Valve group	unidirectional and bidirectional controller
Materials	body and screws M5 inox; 1/8 - 1/4 - 3/8 - 1/2 OT58 seals NBR
Mounting	by male threaded
Installation	in any position
Operating temperature	0°C ÷ 80°C (with dry air -20°C)
Operating pressure	1 ÷ 10 bar
Nominal pressure	6 bar
Nominal flow	see graph
Nominal diameter	M5 = 1.5 mm - G1/8 = 2 mm - G1/4 = 4 mm G3/8 = 7 mm - G1/2 = 12 mm
Fluid	filtered air

Series AP directly operated proportional valves

2/2-way proportional valves, NC
Sizes: 16 - 22 mm

- PWM or current operation
- Open loop flow control
- Also suitable for use with vacuum

Several versions available:

- with body in PVDF (size 16mm only),
- with rear flanged bodies
- with lower flanged bodies,
- suitable for use with oxygen
- Seals in FKM, NBR and EPDM

Series AP directly operated 2/2-way proportional solenoid valves, NC, with nominal diameters range from 0.8 to 2.4 mm, can be used where an open loop flow control is required, with gas mixtures, to control free flows or blows, or emptying chambers using vacuum.

Series AP proportional valves have been manufactured to optimize and reduce friction and stick-slip effects. The output flow is proportional to the control signal. As they can work also in vacuum, a minimum working pressure is not required.

GENERAL DATA

Function	2/2 NC			
Operation	proportional directly operated			
Ports	M5 - G1/8 - with rear flanges - with lower flanges			
Hysteresis	Size 16mm: 12% FS - Size 22mm: 10% FS			
Repeatibility	Size 16mm: 7% FS - Size 22mm: 7% FS			
Operating temperature	0 ÷ 60°C			
Medium	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas. All the valves are suitable for use with oxygen.			
Installation	any position			
Materials	body = brass / PVDF (size 16mm only) seals = NBR, FKM, EPDM			
	GP7	GPH	U711	U712
Nominal resistance	193 ohm	48 ohm	85 ohm	22 ohm
Rated current	125 mA	250 mA	271 mA	542 mA

NOTE: Having a counterpressure on the outlet connection of at least 25% of the inlet pressure ensures the good functioning of the valve and improves its performance. Example: with inlet Pressure = 1 bar on the outlet connection, a min. counterpressure of 250 mbar is recommended.

CODING EXAMPLE

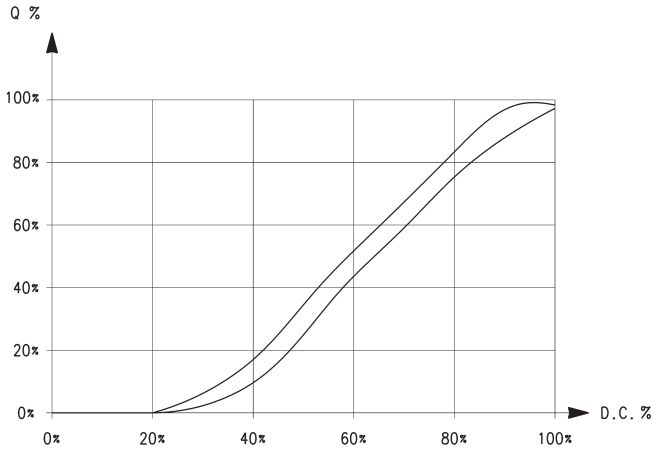
AP	-	7	2	1	1	-	L	R	2	-	U	7	11		OX2

AP	SERIES		
7	BODY: 6 = size 16mm	7 = size 22mm	
2	NUMBER OF WAYS: 2 = 2-way		
1	VALVE FUNCTION: 1 = NC		
1	PORTS: 0 = M5 (size 16mm only) 1 = G1/8 (size 22mm only)	4 = with rear flanges (size 16mm only) 5 = with lower flanges	L = male hose adaptor (for body in PVDF only, size 16mm)
L	ORIFICE: D = ø 0.8 mm (size 16mm only) F = ø 1 mm	H = ø 1.2 mm L = ø 1.6 mm	N = ø 2 mm (size 22mm only) Q = ø 2.4 mm (size 22mm only)
R	SEAL MATERIAL: R = NBR	W = FKM	E = EPDM
2	BODY MATERIAL: 2 = brass	3 = PVDF (size 16mm only)	
U	ENCAPSULATING MATERIAL: G = PA (size 16mm only)	U = PET (size 22mm only)	
7	SOLENOID DIMENSIONS: P = 16x26 DIN EN 175301-803-C (size 16mm only)	7 = 22x22 DIN 43650 B (size 22mm only)	
11	SOLENOID VOLTAGE: H = 12 V DC 3 W (size 16mm only) 7 = 24 V DC 3 W (size 16mm only)	11 = 24 V DC 6.5 W (size 22mm only) 12 = 12 V DC 6.5 W (size 22mm only)	
	COIL ORIENTATION: = fastons opposite to pneumatic ports/same side of the outlet 5 = fastons towards pneumatic ports/same side of the inlet		
OX2	VERSION: OX2 = version with ASTM G93-03 Certification Level B (FKM seals only) = non-certified version		

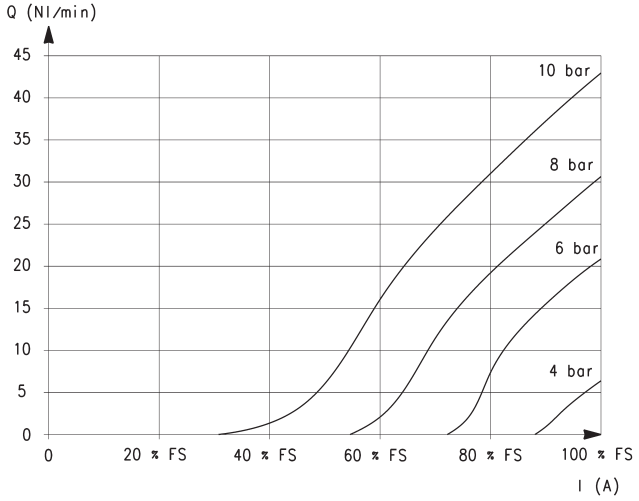
FLOW GRAPH

Flow characteristic curve of a proportional valve

Q = flow
D.C. = duty cycle

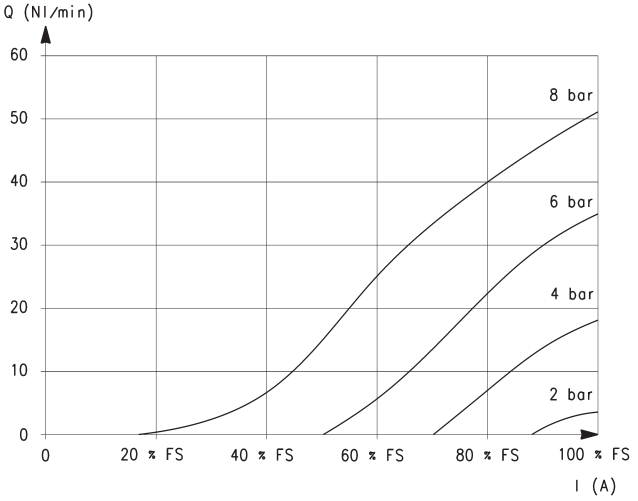


FLOW DIAGRAMS - size 16mm



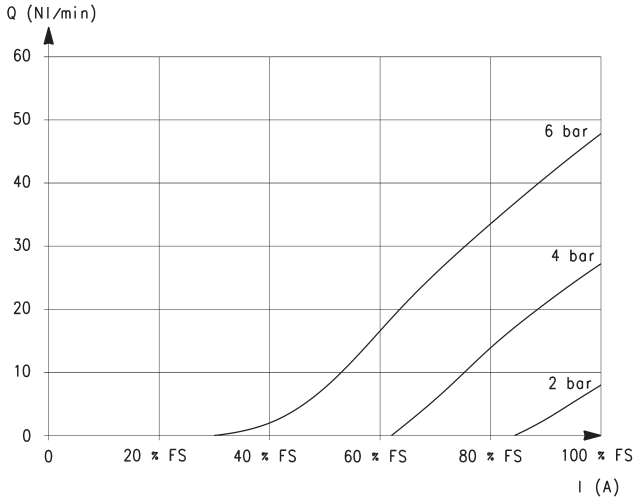
Nozzle 0.8mm

Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



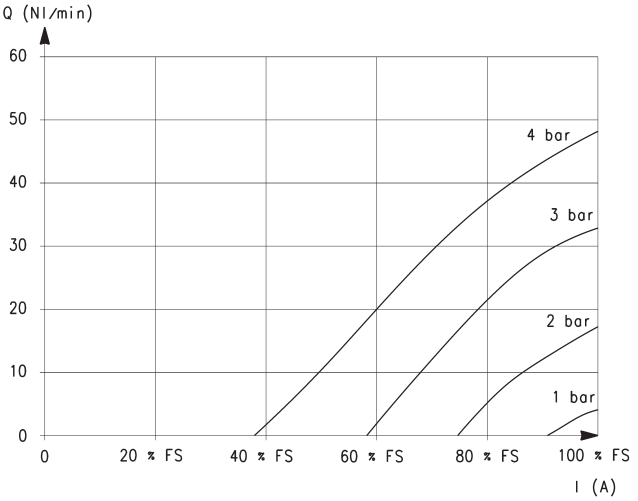
Nozzle 1mm

Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



Nozzle 1.2mm

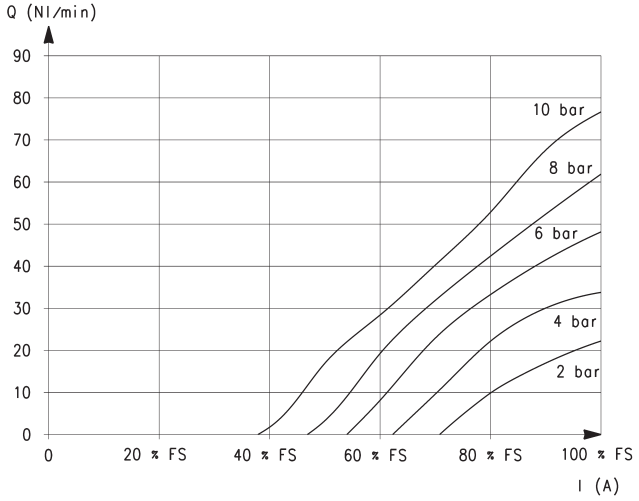
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



Nozzle 1.6mm

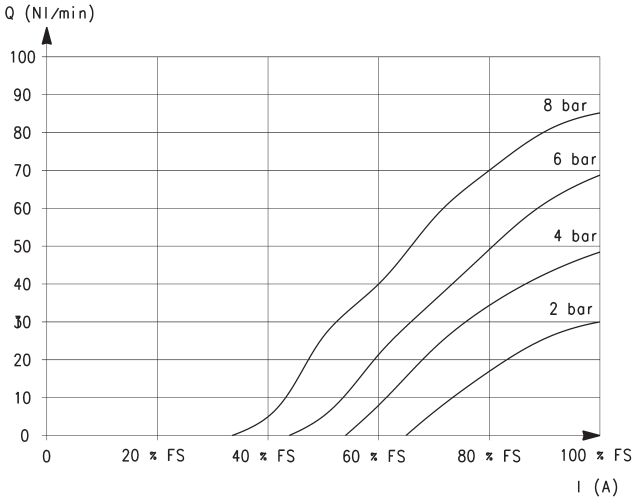
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

FLOW DIAGRAMS - size 22mm



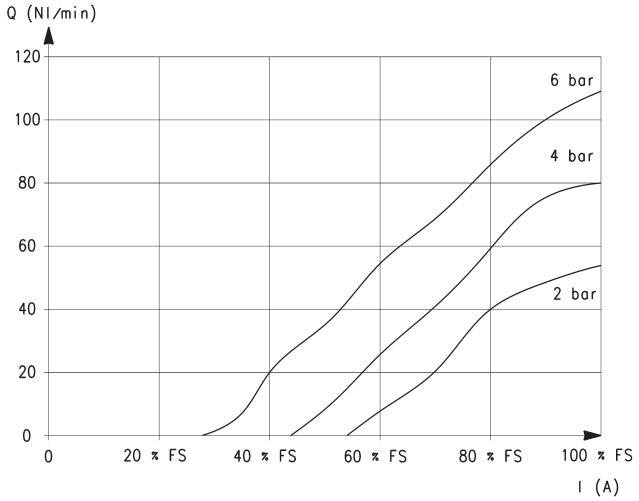
Nozzle 1mm

Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



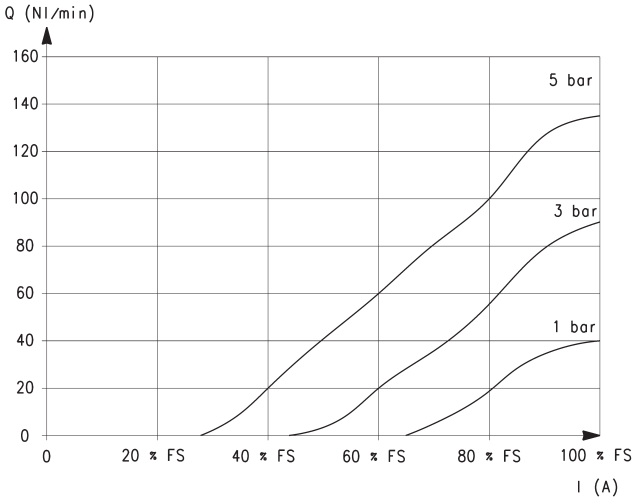
Nozzle 1.2mm

Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



Nozzle 1.6mm

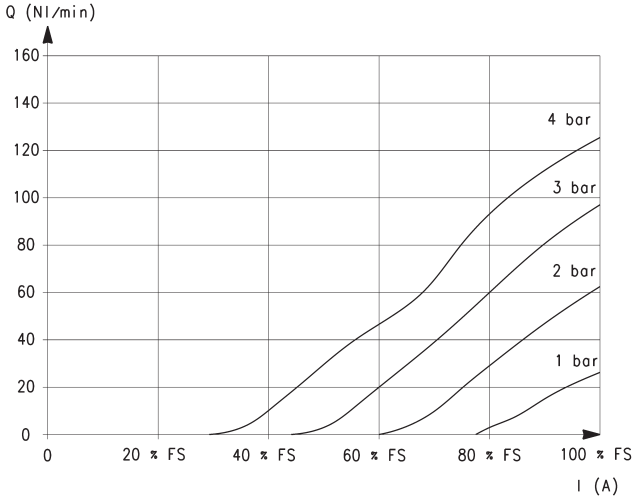
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



Nozzle 2mm

Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

FLOW DIAGRAM - size 22mm



Nozzle 2.4mm

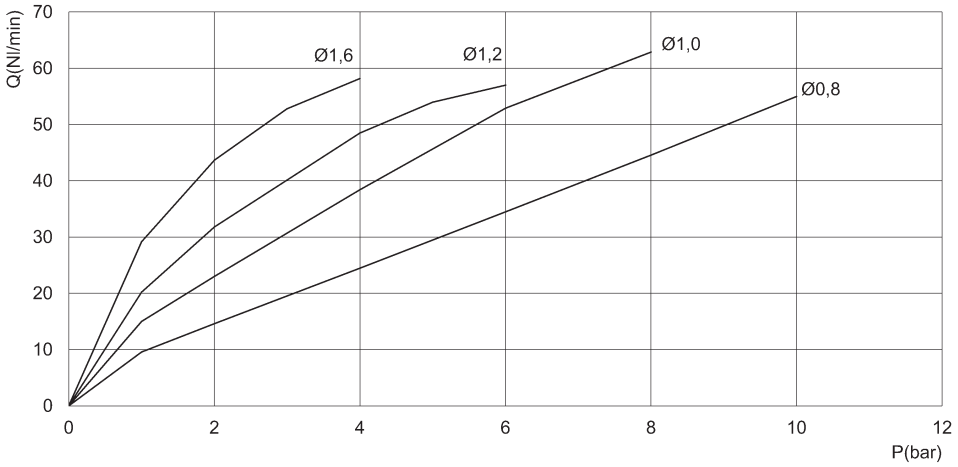
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

MAXIMUM FLOW AND RESPONSE TIMES - size 16mm

Maximum flow according to the set pressure, for each orifice.

DIAGRAM LEGEND:

Q = flow (Nl/min)
P = set pressure (bar)



RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]

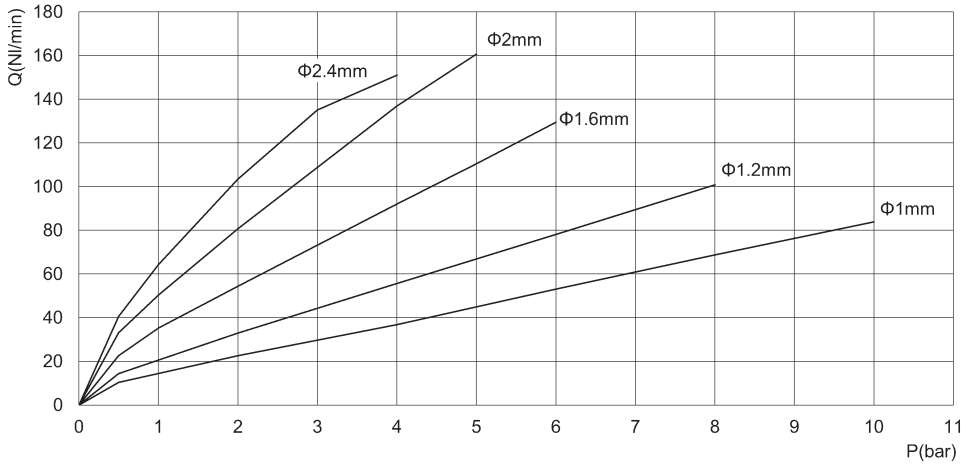
ø	Pin [bar]	Load response time [ms]			Exhaust response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
0.8 mm	10	12	43	31	11	39	28
1 mm	8	12	42	30	11	38	27
1.2 mm	6	10	41	31	11	41	30
1.6 mm	4	10	40	30	11	40	29

MAXIMUM FLOW AND RESPONSE TIMES - size 22mm

Maximum flow according to the set pressure, for each orifice.

DIAGRAM LEGEND:

Q = flow (Nl/min)
P = set pressure (bar)

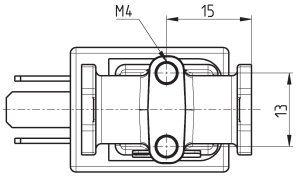


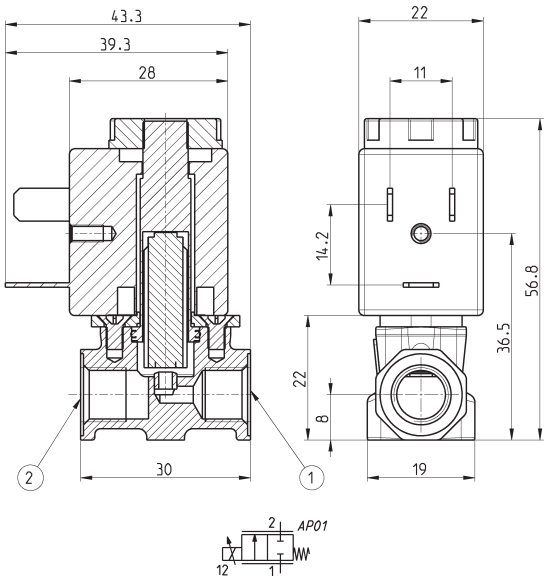
RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]

ø	Pin [bar]	Load response time [ms]			Exhaust response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
1 mm	10	10	36	26	10	36	26
1.2 mm	8	10	45	35	12	38	26
1.6 mm	6	12	45	33	12	40	28
2 mm	5	12	42	30	11	34	26
2.4 mm	4	11	45	34	12	44	32

Series AP proportional valves - 22mm, body with threaded ports

For the use with vacuum connect the line to port 2.



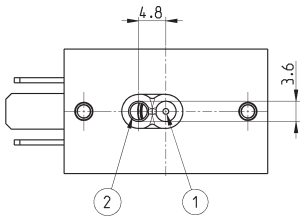


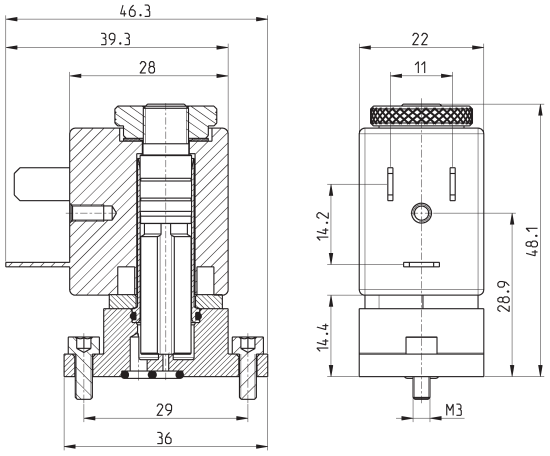
Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7211-FR2-U7*	G1/8	G1/8	2/2 NC	1	0.5	10	75
AP-7211-HR2-U7*	G1/8	G1/8	2/2 NC	1.2	0.7	8	85
AP-7211-LR2-U7*	G1/8	G1/8	2/2 NC	1.6	1.2	6	110
AP-7211-NR2-U7*	G1/8	G1/8	2/2 NC	2	1.7	5	135
AP-7211-QR2-U7*	G1/8	G1/8	2/2 NC	2.4	1.7	4	113
AP-7211-FW2-U7*OX2	G1/8	G1/8	2/2 NC	1	0.5	10	75
AP-7211-HW2-U7*OX2	G1/8	G1/8	2/2 NC	1.2	0.7	8	85
AP-7211-LW2-U7*OX2	G1/8	G1/8	2/2 NC	1.6	1.2	6	110
AP-7211-NW2-U7*OX2	G1/8	G1/8	2/2 NC	2	1.7	5	135
AP-7211-QW2-U7*OX2	G1/8	G1/8	2/2 NC	2.4	1.7	4	113

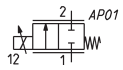
* choose the desired voltage

Series AP proportional valves - size 22mm, low flanged body

For the use with vacuum connect the line to port 2.





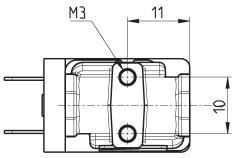


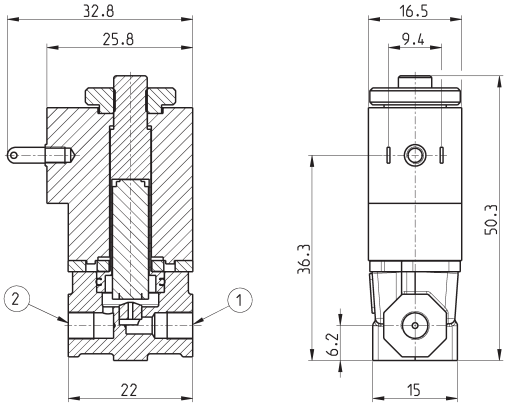
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7215-FR2-U7*	2/2 NC	1	0.5	10	75
AP-7215-HR2-U7*	2/2 NC	1.2	0.7	8	85
AP-7215-LR2-U7*	2/2 NC	1.6	1.2	6	110
AP-7215-NR2-U7*	2/2 NC	2	1.7	5	135
AP-7215-QR2-U7*	2/2 NC	2.4	1.7	4	113
AP-7215-FW2-U7*OX2	2/2 NC	1	0.5	10	75
AP-7215-HW2-U7*OX2	2/2 NC	1.2	0.7	8	85
AP-7215-LW2-U7*OX2	2/2 NC	1.6	1.2	6	110
AP-7215-NW2-U7*OX2	2/2 NC	2	1.7	5	135
AP-7215-QW2-U7*OX2	2/2 NC	2.4	1.7	4	113

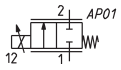
* choose the desired voltage

Series AP proportional valves - 16mm, body with threaded ports

For the use with vacuum connect the line to port 2.





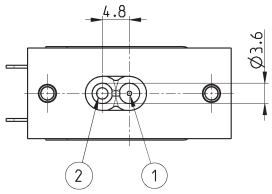


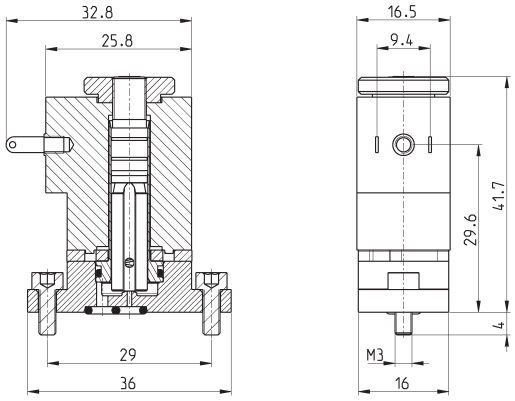
Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6210-DR2-GP*	M5	M5	2/2 NC	0.8	0.3	10	43
AP-6210-FR2-GP*	M5	M5	2/2 NC	1	0.45	8	53
AP-6210-HR2-GP*	M5	M5	2/2 NC	1.2	0.57	6	53
AP-6210-LR2-GP*	M5	M5	2/2 NC	1.6	0.78	4	52
AP-6210-DW2-GP*OX2	M5	M5	2/2 NC	0.8	0.3	10	43
AP-6210-FW2-GP*OX2	M5	M5	2/2 NC	1	0.45	8	53
AP-6210-HW2-GP*OX2	M5	M5	2/2 NC	1.2	0.57	6	53
AP-6210-LW2-GP*OX2	M5	M5	2/2 NC	1.6	0.78	4	52

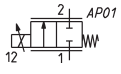
* choose the desired voltage

Series AP proportional valves - 16mm, low flanged body

For the use with vacuum connect the line to port 2.





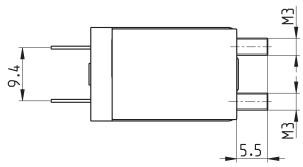


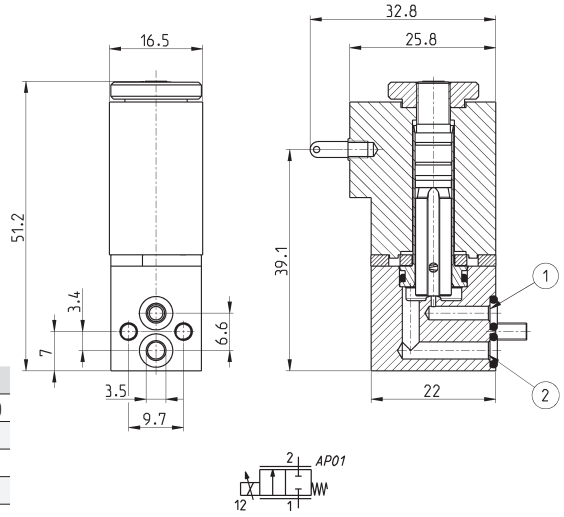
Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6215-DR2-GP*	2/2 NC	0.8	0.3	10	43
AP-6215-FR2-GP*	2/2 NC	1	0.45	8	53
AP-6215-HR2-GP*	2/2 NC	1.2	0.57	6	53
AP-6215-LR2-GP*	2/2 NC	1.6	0.78	4	52
AP-6215-DW2-GP*OX2	2/2 NC	0.8	0.3	10	43
AP-6215-FW2-GP*OX2	2/2 NC	1	0.45	8	53
AP-6215-HW2-GP*OX2	2/2 NC	1.2	0.57	6	53
AP-6215-LW2-GP*OX2	2/2 NC	1.6	0.78	4	52

* choose the desired voltage

Series AP proportional valves - 16mm, rear flanged body

For the use with vacuum connect the line to port 2.



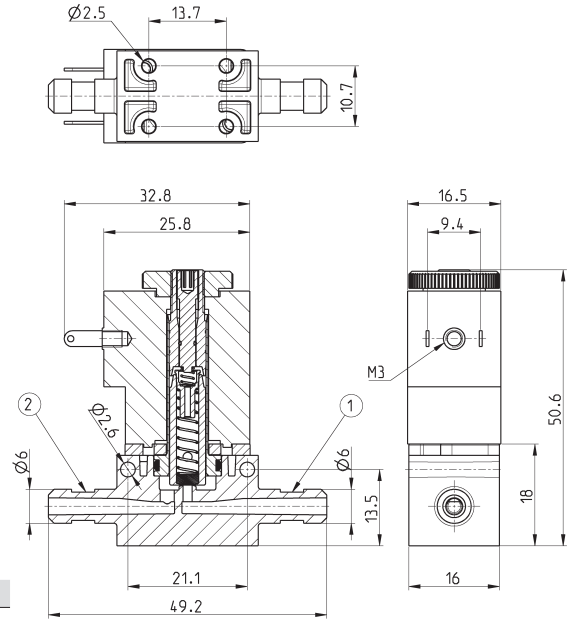


Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6214-DR2-GP*	2/2 NC	0.8	0.3	10	43
AP-6214-FR2-GP*	2/2 NC	1	0.45	8	53
AP-6214-HR2-GP*	2/2 NC	1.2	0.57	6	53
AP-6214-LR2-GP*	2/2 NC	1.6	0.78	4	52
AP-6214-DW2-GP*OX2	2/2 NC	0.8	0.3	10	43
AP-6214-FW2-GP*OX2	2/2 NC	1	0.45	8	53
AP-6214-HW2-GP*OX2	2/2 NC	1.2	0.57	6	53
AP-6214-LW2-GP*OX2	2/2 NC	1.6	0.78	4	52

* choose the desired voltage

Series AP proportional valves, size 16mm - body in PVDF

For the use with vacuum connect the line to port 2.

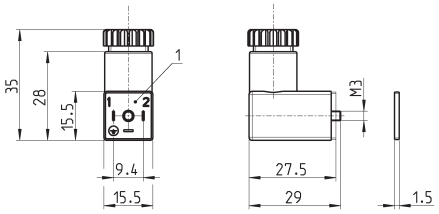


Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-621L-DR3-GP*	Ø6 **	Ø6 **	2/2 NC	0.8	0.3	10	43
AP-621L-FR3-GP*	Ø6 **	Ø6 **	2/2 NC	1	0.45	8	53
AP-621L-HR3-GP*	Ø6 **	Ø6 **	2/2 NC	1.2	0.57	6	53
AP-621L-LR3-GP*	Ø6 **	Ø6 **	2/2 NC	1.6	0.78	4	52
AP-621L-DW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	0.8	0.3	10	43
AP-621L-FW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1	0.45	8	53
AP-621L-HW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1.2	0.57	6	53
AP-621L-LW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1.6	0.78	4	52

* choose the desired voltage
** pneumatic connection with tube and clamps

Connector Mod. 125-800 DIN 43650 pitch 9.4 mm

For size 16 mm only

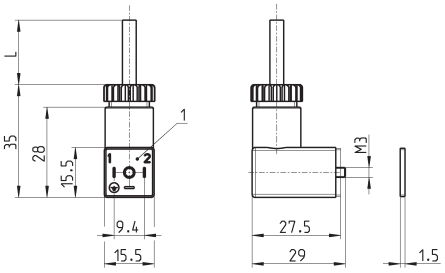


Mod.	description	colour	working voltage	cable holding	tightening torque
125-800	connector, without electronics	black	-	PG7	0.3 Nm

1 = 90° adjustable connector

Connector Mod. 125-550- DIN 43650 pitch 9.4 mm with cable

For size 16 mm only

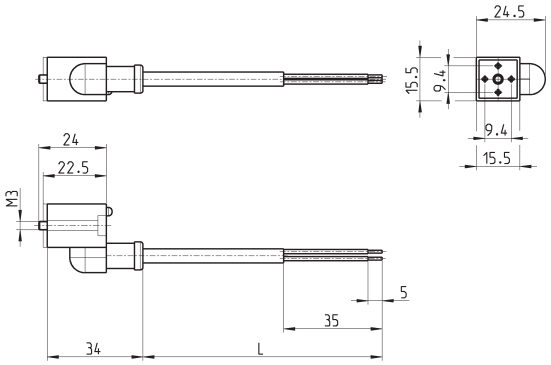


Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.3 Nm

1 = 90° adjustable connector

In-line connectors with cable Mod. 125-553

For size 16 mm only

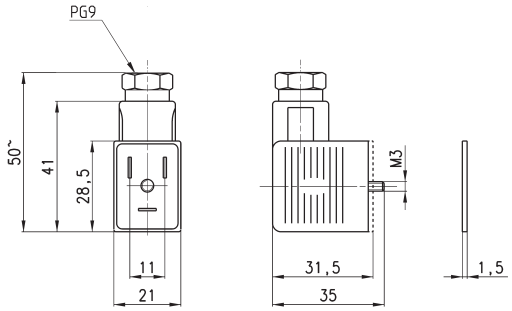


Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0.3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0.3 Nm

Connectors Mod. 122-800 DIN 43650

For size 22 mm only

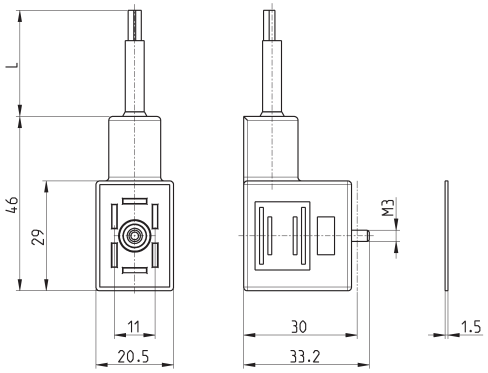
Mod. 122-800EX:
for ATEX certified solenoids Mod. U7*EX,
with anti-screwing off screw Mod. TORX.



Mod.	description	colour	working voltage	cable holding	tightening torque
122-800	connector, without electronics	black	-	PG9	0.5 Nm
122-800EX	connector, without electronics	black	-	PG9	0.5 Nm

Connectors Mod. 122-550 DIN 43650 with cable

For size 22 mm only



Mod.	description	colour	working voltage	cable length [L]	cable holding	tightening torque
122-550-1	moulded cable, without electronics	black	-	1000 mm	-	0.5 Nm
122-550-5	moulded cable, without electronics	black	-	5000 mm	-	0.5 Nm

Series CP directly operated and pressure compensated proportional solenoid valves

New models

Function: 2/2-way NC
Sizes: 16 and 20 mm

- High flow and great precision
- Low hysteresis
- Cartridge body
- Pressure compensated version (size 20mm only) available
- Suitable to work also with oxygen

Series CP directly operated proportional solenoid valves can be used where an open loop flow control is required, with gas mixtures or to control flows.
Their cartridge design makes them particularly compact, thus they can be mounted directly near the workstation.

Series CP valves have been designed to optimize dimensions and reduce friction and stick-slip effects. The output flow is proportional to the control signal.
Apart from the pressure compensated version, these valves can work also in vacuum. A minimum working pressure is thus not required.

GENERAL DATA

TECHNICAL FEATURES	Size 16mm, 2/2 NC	Size 20mm, 2/2 NC	Size 20mm, 2/2 NC pressure compensated
Operation	proportional directly operated cartridge	proportional directly operated cartridge	proportional pressure compensated cartridge
Pneumatic connections	1 mm - 1.5 mm - 2 mm	3 mm - 3.5 mm	4.4 mm
Nominal diameters	70 Nl/min - 80 Nl/min - 90 Nl/min	145 Nl/min - 165 Nl/min	200 l/min
Free flow capacity	3 bar - 5 bar - 8 bar	2.8 bar - 2 bar	2.8 bar (max pressure 6 bar)
Operating pressure	16 bar	16 bar	16 bar
Max overpressure	3% FS	5% FS	2% FS
Linearity (5-95%)	10% FS	15% FS	15% FS
Hysteresis	5% FS	5% FS	5% FS
Repeatability	10°C ÷ 50°C	10°C ÷ 50°C	10°C ÷ 50°C
Operating temperature	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas.	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas.	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas.
Media	in any position	in any position	in any position
Installation			
MATERIALS IN CONTACT WITH THE MEDIUM			
Body	brass, stainless steel, PPS	brass, stainless steel, PPS	brass, stainless steel, PPS
Seals	FKM	FKM	FKM
ELECTRICAL FEATURES			
Operation	PWM > 1000 Hz or current control	PWM > 500 Hz or current control	PWM > 1000 Hz or current control
Operation voltage	6 V DC, 12 V DC, 24 V DC	6 V DC, 12 V DC, 24 V DC	6 V DC, 12 V DC, 24 V DC
Max power consumption	3.1 W	5 W, 3.7 W	4.2 W
Nominal resistance	11.8 Ohm - 37.6 Ohm - 184.7 Ohm	5.4 Ohm, 21.6 Ohm, 86.4 Ohm, 6.4 Ohm, 25.1 Ohm, 102.1 Ohm	6.4 Ohm, 25.1 Ohm, 102.1 Ohm
Rated current	410 mA, 238 mA, 103 mA	820 mA, 410 mA, 205 mA	700 mA, 350 mA, 175 mA
Duty cycle	100% with air flow	100% with air flow	100% with air flow
Electrical connection	cable 300mm AWG24	cable 300mm AWG24	cable 300mm AWG24
Protection class	IP00 / IP40	IP00 / IP40	IP00 / IP40
Average lifecycles	50000000	50000000	50000000
Command signal	recommended PWM: 1000 Hz	recommended PWM: 500 Hz	recommended PWM: 1000 Hz

Versions available on demand base with 1/8, 1/4 ports

CODING EXAMPLE

CP	-	C	6	2	1	-	G	W	2	-	0	P	3

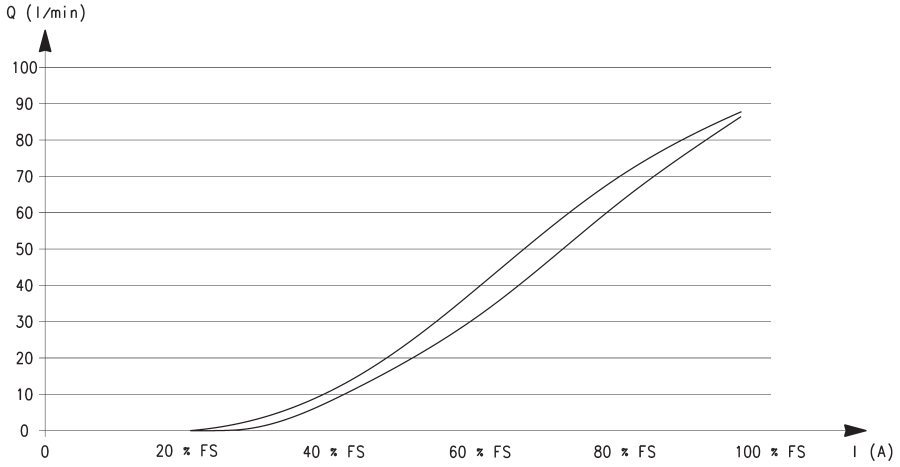
CP	SERIES		
C	PORTS: C = cartridge S = subbase		
6	BODY SIZE: 6 = size 16mm	7 = size 20mm	9 = size 20mm pressure compensated
2	NUMBER OF PORTS: 2 = 2-way		
1	FUNCTION: 1 = NC		
G	ORIFICE DIAMETRES: F = 1mm (size 16mm only) G = 1.5mm (size 16mm only) N = 2mm (size 16mm only)	M = 3mm (size 20mm only) P = 3.5mm (size 20mm only)	T = ø 4.4 mm (size 20mm only, pressure compensated)
W	SEAL MATERIAL: W = FKM		
2	BODY MATERIAL: 2 = BRASS		
0	OVERMOULDING MATERIAL OF COIL: 0 = cartridge		
P	COIL DIMENSIONS: P = ø 16 7 = ø 20		
3	VOLTAGE: 1 = 6 V DC 3.1 W (size 16mm only) 3 = 24 V DC 3.1 W (size 16mm only) 5 = 12 V DC 3.1 W (size 16mm only)	2 = 12 V DC 4.3 W (size 20mm only) 4 = 24 V DC 4.3 W (size 20mm only) 6 = 6 V DC 4.3 W (size 20mm only) 7 = 6 V 4.8 W (only Ø 3.5, size 20mm) 8 = 12 V 4.8 W (only Ø 3.5, size 20mm) 9 = 24 V 4.8 W (only Ø 3.5, size 20mm)	10 = 6 V DC 4.2 W (size 20mm only, pressure compensated) 11 = 24 V DC 4.2 W (size 20mm only, pressure compensated) 12 = 12 V DC 4.2 W (size 20mm only, pressure compensated)

HYSTERESIS AND RESPONSE TIMES

DIAGRAM LEGEND:

Q = flow (l/min)
I = current (A)
FS = full scale

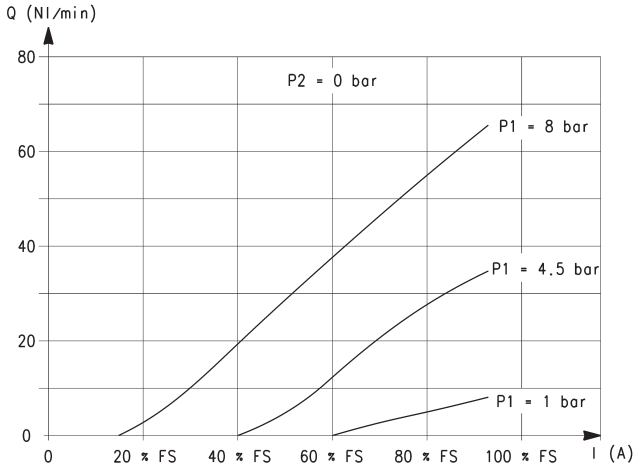
NOTE TO THE TABLE:
* in the pressure compensated version the counter pressure at the valve outlet must be always lower than 15-20% of the inlet pressure.



RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]

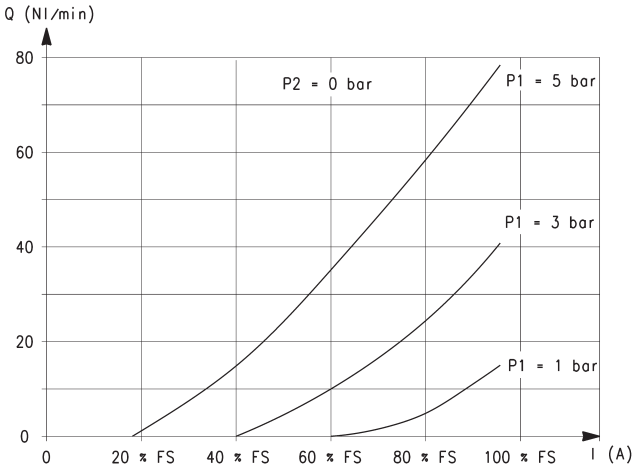
ø	Inlet pressure (bar)	Load response time (ms)			Exhaust response time (ms)		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
1 mm	8	12	42	30	9	33	24
1.5 mm	5	12	39	27	9	33	24
2 mm	3	11	39	28	9	33	26
3 mm	2.8	13	29	16	14	28.5	14.5
3.5 mm	2	15	31	16	12.5	27.5	15
4.4 mm *	2.8	13	52	49	10	37	27

FLOW DIAGRAMS - Size 16mm



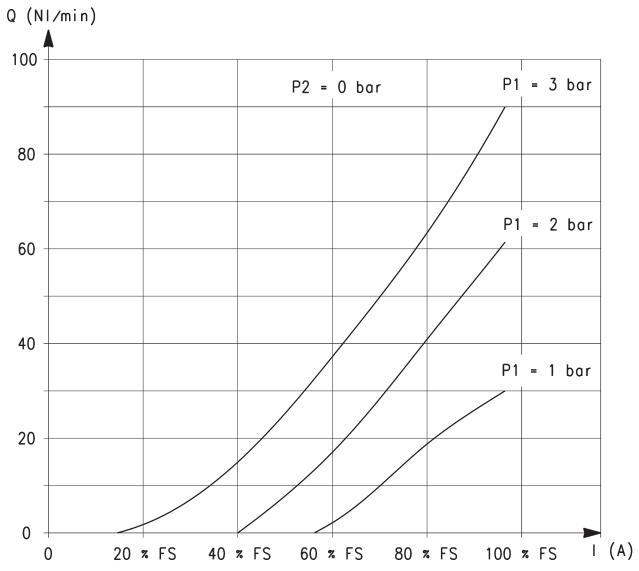
Nominal diameter 1mm

Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)



Nominal diameter 1.5mm

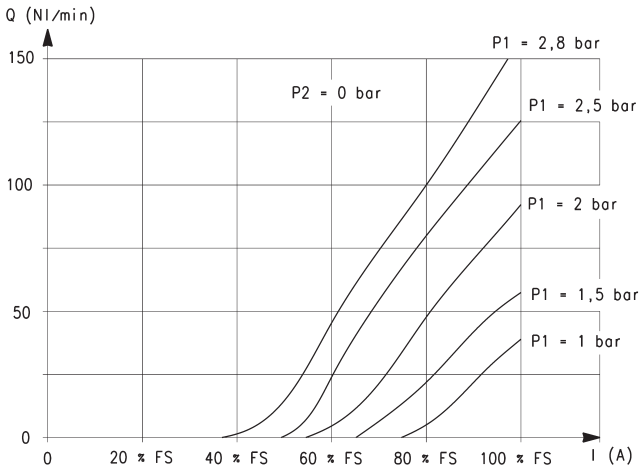
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)



Nominal diameter 2mm

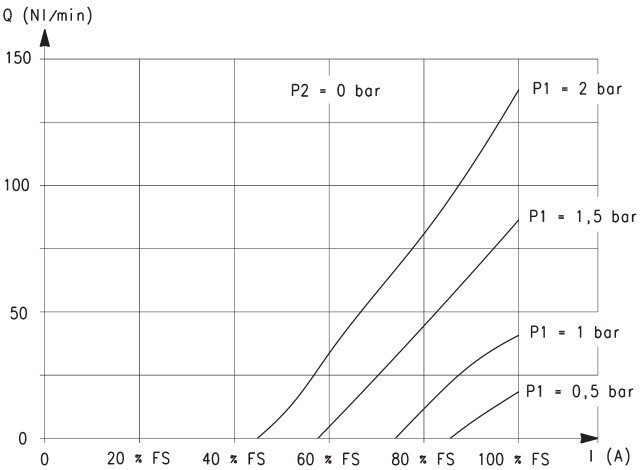
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)

FLOW DIAGRAMS - Size 20mm



Nominal diameter 3mm

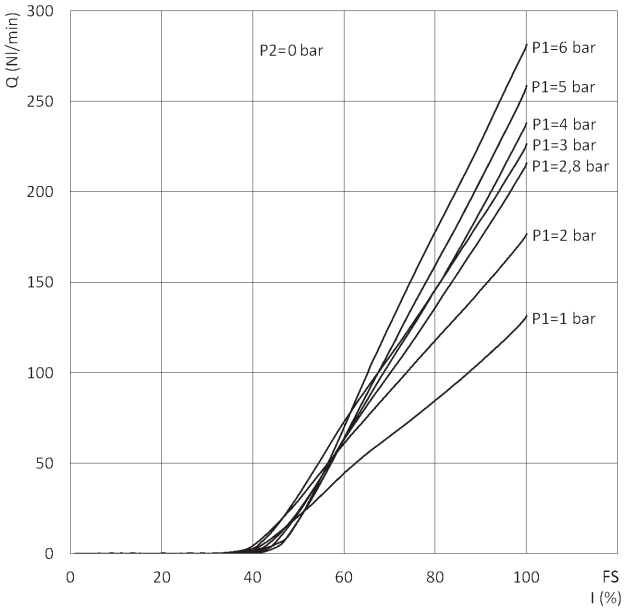
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)



Nominal diameter 3.5mm

Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)

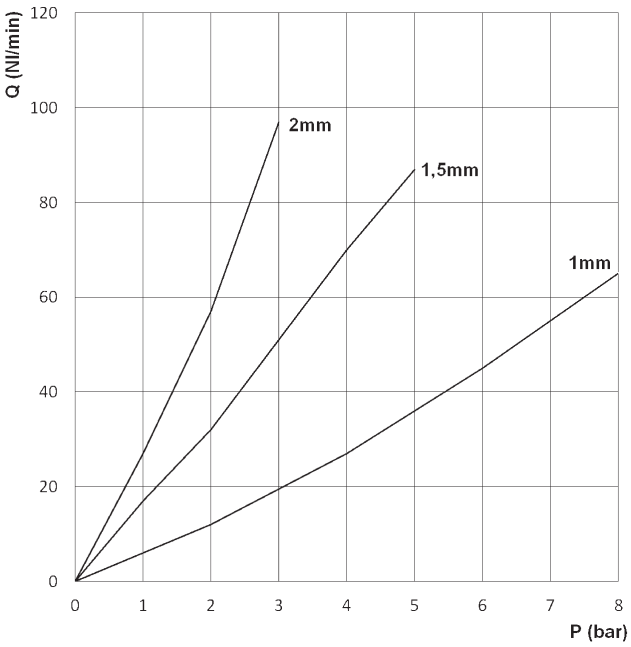
FLOW DIAGRAMS - Size 20mm pressure compensated



Nominal diameter 4.4mm

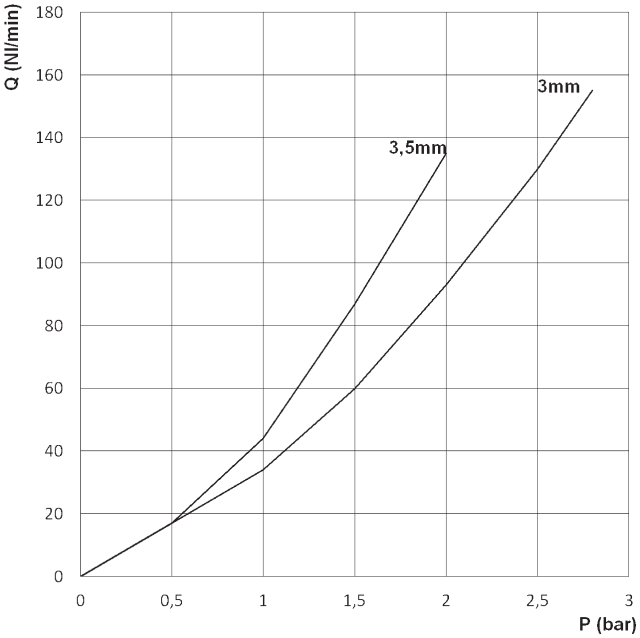
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale

MAXIMUM FLOW ACCORDING TO THE INLET PRESSURE



Size 16 mm

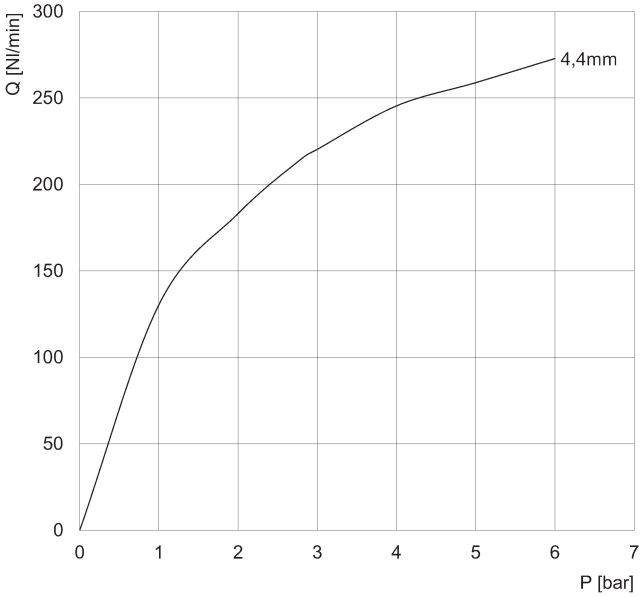
Q = Flow (Nl/min)
P = Inlet pressure (bar)



Size 20 mm

Q = Flow (Nl/min)
P = Inlet pressure (bar)

MAXIMUM FLOW ACCORDING TO THE INLET PRESSURE

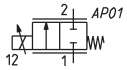


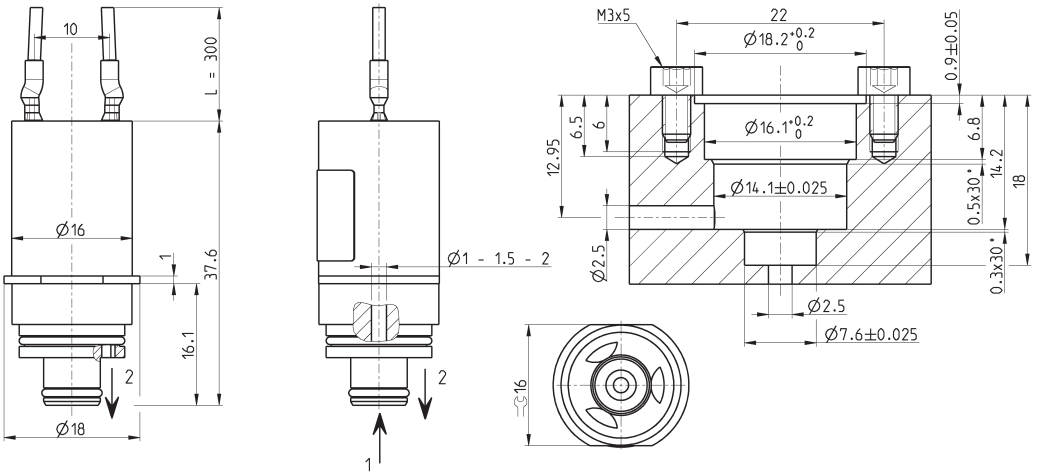
Size 20mm pressure compensated

Q = Flow (Nl/min)
P = Inlet pressure (bar)

Solenoid valves, size 16mm

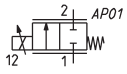
Out of stock version

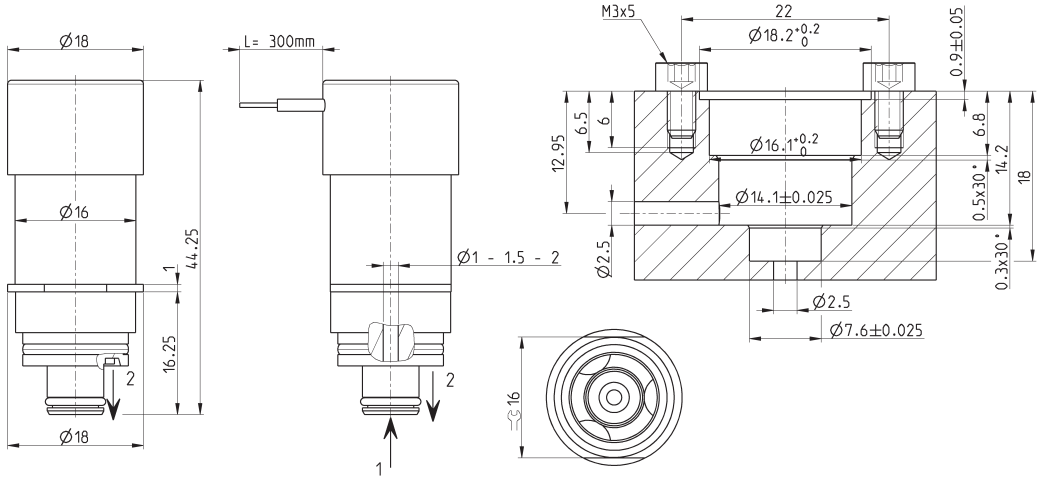




Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C621-FW2-0P1	1	8	70	0.55	6	410
CP-C621-GW2-0P1	1.5	5	80	0.88	6	410
CP-C621-NW2-0P1	2	3	90	1.42	6	410
CP-C621-FW2-0P3	1	8	70	0.55	24	103
CP-C621-GW2-0P3	1.5	5	80	0.88	24	103
CP-C621-NW2-0P3	2	3	90	1.42	24	103
CP-C621-FW2-0P5	1	8	70	0.55	12	238
CP-C621-GW2-0P5	1.5	5	80	0.88	12	238
CP-C621-NW2-0P5	2	3	90	1.42	12	238

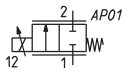
Solenoid valves, size 16m

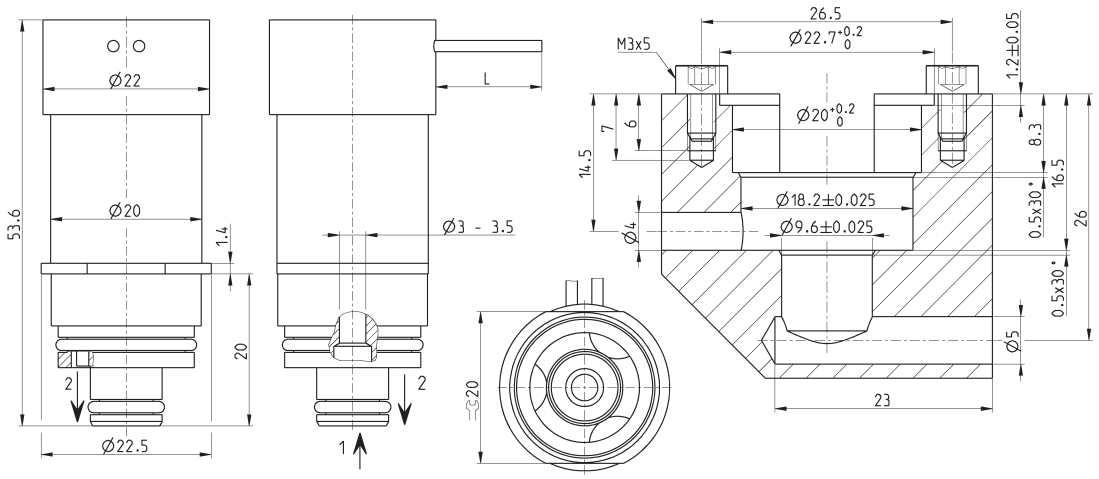




Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CPN-C621-FW2-0P1	1	8	70	0.55	6	410
CPN-C621-GW2-0P1	1.5	5	80	0.88	6	410
CPN-C621-NW2-0P1	2	3	90	1.42	6	410
CPN-C621-FW2-0P3	1	8	70	0.55	24	103
CPN-C621-GW2-0P3	1.5	5	80	0.88	24	103
CPN-C621-NW2-0P3	2	3	90	1.42	24	103
CPN-C621-FW2-0P5	1	8	70	0.55	12	238
CPN-C621-GW2-0P5	1.5	5	80	0.88	12	238
CPN-C621-NW2-0P5	2	3	90	1.42	12	238

Solenoid valves, size 20mm



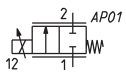


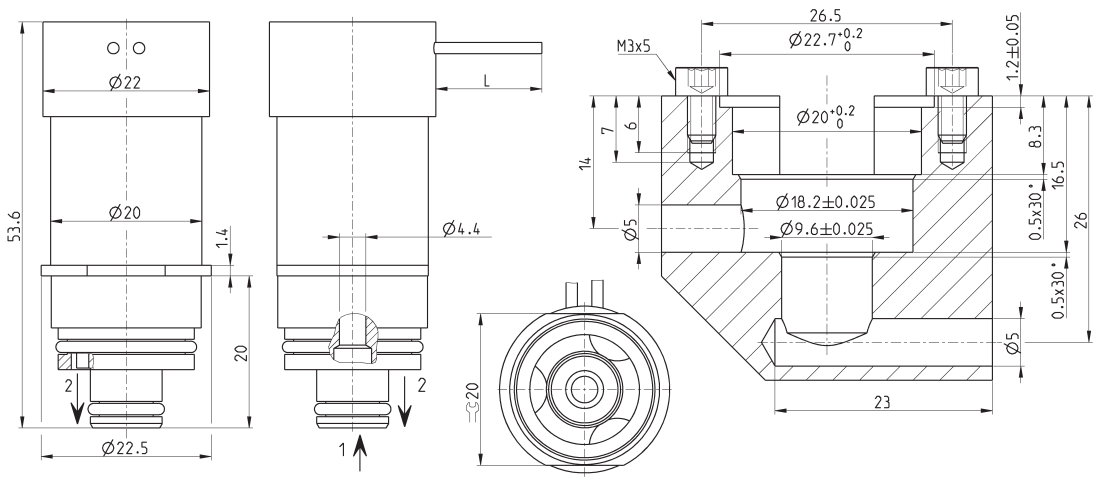
Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C721-MW2-072	3	2.8	150	2.8	12	313
CP-C721-MW2-074	3	2.8	150	2.8	24	154
CP-C721-MW2-076	3	2.8	150	2.8	6	615
CP-C721-PW2-072	3.5	2	130	3	12	313
CP-C721-PW2-074	3.5	2	130	3	24	154
CP-C721-PW2-076	3.5	2	130	3	6	615
CP-C721-PW2-077	3.5	2	180	4.5	6	820
CP-C721-PW2-078	3.5	2	180	4.5	12	410
CP-C721-PW2-079	3.5	2	180	4.5	24	205

Solenoid valves, size 20mm pressure compensated

New

Working nominal pressure: 2.8 bar

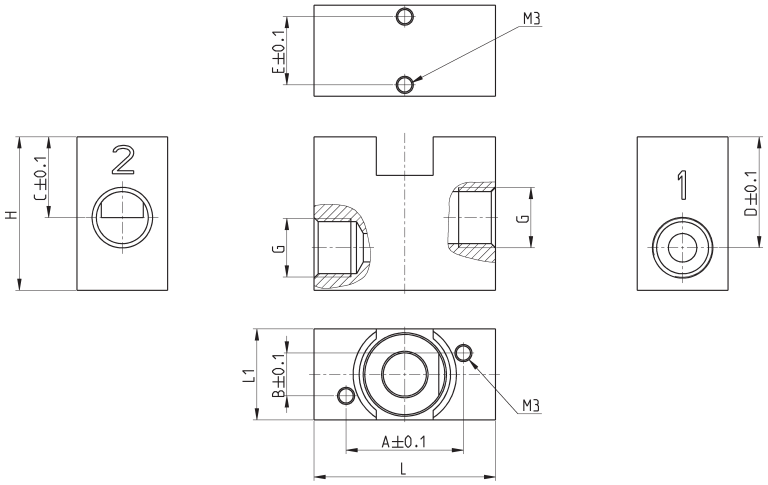




Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C921-TW2-0710	4.4	6	200	4	6	700
CP-C921-TW2-0711	4.4	6	200	4	24	175
CP-C921-TW2-0712	4.4	6	200	4	12	350

Sub-base

New



Mod.	Ø	A	B	C	D	E	G	H	L	L1
CP-S6	16	20.7	7.5	14.2	19.5	12	G1/8	27	32	16
CP-S7	20	25.2	8	14	22.5	15	G1/4	31.5	45	22

Series 130 electronic control device for proportional valves

PWM control device, with current control system for directly operated proportional valves

- Closed loop current control (max current that can be provided = 1A)
- Management of up and down ramp
- Command signal 0-10V and 4-20mA
- Regulation of min and max current (Span and Offset)

Series 130 electronic control device allows to pilot any proportional valve with a maximun current of 1 A.
It turns a standard inlet signal (0-10V or 4-20 mA) into a PWM signal to obtain at the solenoid outlet a current which is proportional to the inlet signal.

A control system of the provided current allows to compensate variations due to heating of the solenoid or to the variation of the supply voltage. It is possible to adjust the maximum and minimum current provided to the solenoid. The outlet signal can have a ramp progress that is adjustable between 0 and 5 s. The device has a firmware dedicated to the proportional valve to pilot in order to guarantee the best performance.

GENERAL DATA

Material of container	Polycarbonate
Electrical connections	screw
Environmental temperature	0 ÷ 50°C
Mounting	in any position
Power supply	6 V ÷ 24 V DC (± 10%)
Consumption	0.4 W (without valve)
Analogical input	0 ÷ 10 V 4 ÷ 20 mA
Input impedence	>30 Kohm with inlet under voltage <200 ohm with inlet under current
Output PWM	120 Hz ÷ 11.7 KHz (fixed, according to the valve chosen)
Maximum current (valve)	1 A
Protection	Polarity inversion, short circuit of the outlet
External diameter of cable jacket	5 ÷ 7.5 mm with seal only 4 ÷ 6 mm with reducer and seal
Conductor section	26 ÷ 16 AWG / 0,13 ÷ 1,5 mm2
Maximum length supply/signal cable	10 m
Maximum length valve cable	5 m
IP protection class according to EN 60529	IP 54
Ramp function	Adjustable time from 0 to 5 s
Regulation min. current (Offset)	0% ÷ 40% F.S.
Regulation maximum current	50% ÷ 100% F.S.

CODING EXAMPLE

130	-	2	2	2

130	SERIES
2	VOLTAGE: 2 = 24 V DC (max power 24 W) 3 = 12 V DC (max power 12 W) 4 = 6 V DC (max power 6 W) 5 = 11 V DC (max power 11 W)
2	POWER: 1 = 3 W 2 = 6.5 W 3 = 3.2 W 4 = 4.3 W 5 = 10 W 6 = 4.2 W
2	PWM FREQUENCY: 2 = 500 Hz 3 = 1 KHz

NOTE: it is possible to realize configurations with voltage, power and PWM frequency values that are not yet foreseen in the coding example.
For further information we suggest you to contact our technical department.

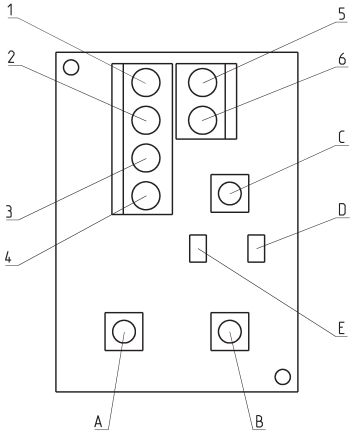
ELECTRICAL CONNECTIONS AND SETTINGS

DRAWING LEGEND:

1 = 6 ÷ 24 V DC (supply)
2 = 0 V (Ground) common also for the reference signal
3 = analogical reference signal 0 ÷ 10V DC
4 = analogical reference signal 4 ÷ 20 mA
A = regulation of min. current (OFFSET)
B = regulation of max. current (SPAN)
C = regulation of the PWM outlet up and down ramp
D = red LED
E = yellow LED

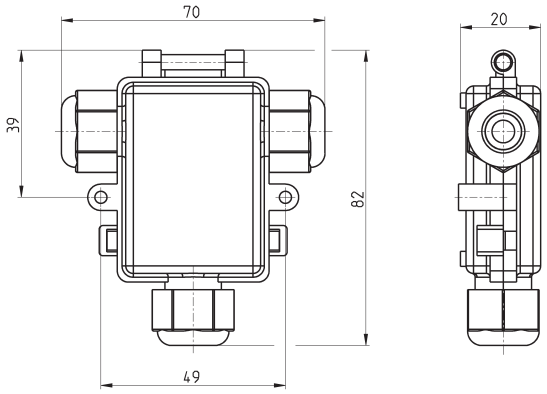
Note 1: the GND of the reference signal and the GND of supply have to be linked together.

Note 2: For the valve connection use a connector without protection - diodes, varistors, etc... - as these might alter the regulation of the device.



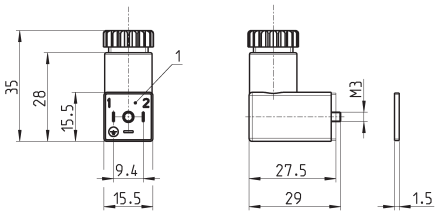
Series 130 electronic control device

NOTE: it is possible to realize configurations with voltage, power and PWM frequency values that are not shown in the table below. For further information we suggest you to contact our technical department.



Mod.	Matching valve family	Valve voltage (Output)	Adjusted power	Adjusted frequency
130-222	Series AP - size 22 mm	24 V DC	6.5 W	500 Hz
130-322	Series AP - size 22 mm	12 V DC	6.5 W	500 Hz
130-252	Series AP - size 22 mm	24 V DC	10 W	500 Hz
130-352	Series AP - size 22 mm	12 V DC	10 W	500 Hz
130-213	Series AP - size 16 mm	24 V DC	3 W	1000 Hz
130-313	Series AP - size 16 mm	12 V DC	3 W	1000 Hz
130-433	Series CP - size 16 mm	6 V DC	3.2 W	1000 Hz
130-533	Series CP - size 16 mm	11 V DC	3.2 W	1000 Hz
130-233	Series CP - size 16 mm	24 V DC	3.2 W	1000 Hz
130-442	Series CP - size 20 mm	6 V DC	4.3 W	500 Hz
130-342	Series CP - size 20 mm	12 V DC	4.3 W	500 Hz
130-242	Series CP - size 20 mm	24 V DC	4.3 W	500 Hz
130-463	Series CP pressure compensated - size 20 mm	6 V	4.2 W	1000 Hz
130-363	Series CP pressure compensated - size 20 mm	12 V	4.2 W	1000 Hz
130-263	Series CP pressure compensated - size 20 mm	24 V	4.2 W	1000 Hz

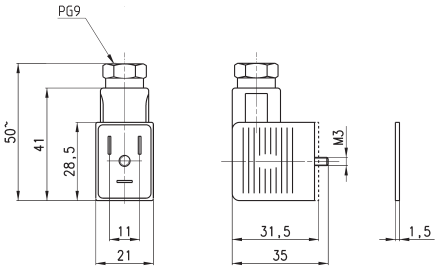
Connector Mod. 125-800 DIN 43650 pin spacing 9,4mm



Mod.
125-800

1 = 90° adjustable connector

Connector Mod. 122-800 DIN 43650 (PG)



Mod.	Torque (Nm)
122-800	0.5

Series LR
digital proportional servo valves

3/3-way directly operated servo valves for the flow (LRWD2), pressure (LRPD2) and position (LRXD2) control

- Digital version which is completely configurable through micro USB
- Rotating spool system with a metal to metal seal
- High flow rate
- Electronic control to ensure high precision in the flow control
- 3-way-function with 4 - 6 mm nominal diameters
- Compact version for cabinet mounting on DIN-rail
- Position control version

Series LR digital proportional servo valves are direct driven 3/3-way valves with a patented rotating spool system with closed loop control circuit. The electronic board is integrated into the valve's body ready to connect.

Series LR*D2 digital proportional servo valve has been designed to be as compact as possible in order to save space and to be mounted on a DIN-rail.
Thanks to this new digital version, the valve can be configurated through a USB connection according to different requirements.

GENERAL DATA

Power supply	24 V DC +/- 10%, max absorption 1.5 A
Command signal	+/- 10 V 0-10 V 4-20 mA
Hysteresis	1% FS LRWD2 - 0,2% FS LRPD2
Linearity	1% FS LRWD2 - 0.3% FS LRPD2
Switching time	see the following pages
Working temperature	from 0 to 50° C
Relative humidity of air	max. 90%
Direction of assembly	any
Maximum flow	see the diagrams on the following pages
Medium	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas
Supply pressure	-0.9 to 10 bar
Leakage	< 1% of maximum flow rate
Electrical connection	male connector M12 8 poles
Hardware configuration port	micro USB

CODING EXAMPLE

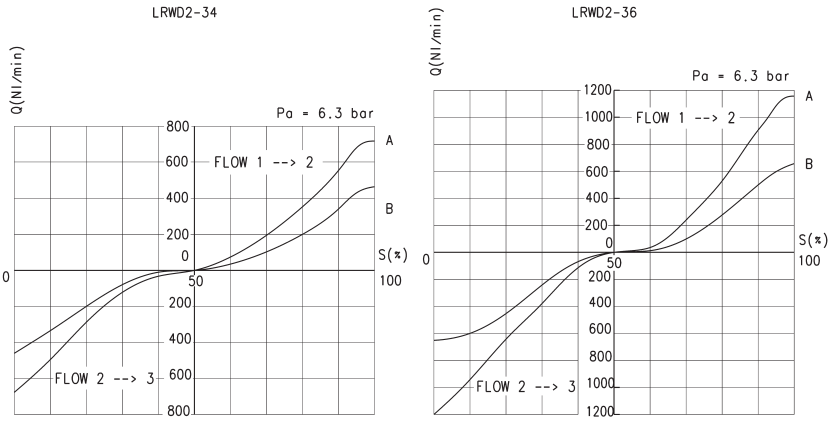
L	R	W	D	2	-	3	4	-	1	-	A	-	00

L	SERIES: L = proportional servo valves	
R	TECHNOLOGY: R = rotating spool	
W	VERSION: W = flow control P = pressure control X = position control	
D	ELECTRONICS: D = digital	
2	MODEL: 2 = compact DIN-RAIL	
3	FUNCTION: 3 = 3/3-way	
4	NOMINAL DIAMETER: 4 = 4 mm 6 = 6 mm	
1	COMMAND SIGNAL (Setpoint): 1 = +/- 10 V 2 = 0 - 10 V 5 = 4 - 20 mA	
A	INPUT SIGNAL: 2 = 0 - 10 V (LRPD2 and LRXD2 only) 4 = 0 - 5V (LRPD2 and LRXD2 only) 5 = 4 - 20mA (LRPD2 and LRXD2 only)	A = internal encoder (LRWD2 only) B = 1 bar (internal sensor - LRPD2 only) D = 10 bar (internal sensor - LRPD2 only) E = 250 mbar (internal sensor - LRPD2 only) F = +1/-1 bar (internal sensor - LRPD2 only)
00	CABLE: 00 = no cable	2F = straight cable of 2 m 2R = 90° cable of 2 m 5F = straight cable of 5 m 5R = 90° cable of 5 m

FLOW DIAGRAMS FOR VALVES LRWD2-34 AND LRWD2-36

LEGEND:

A = free flow
B = ΔP1
Q = flow (Nl/min)
S = set point (%)
Pa = inlet pressure (bar)

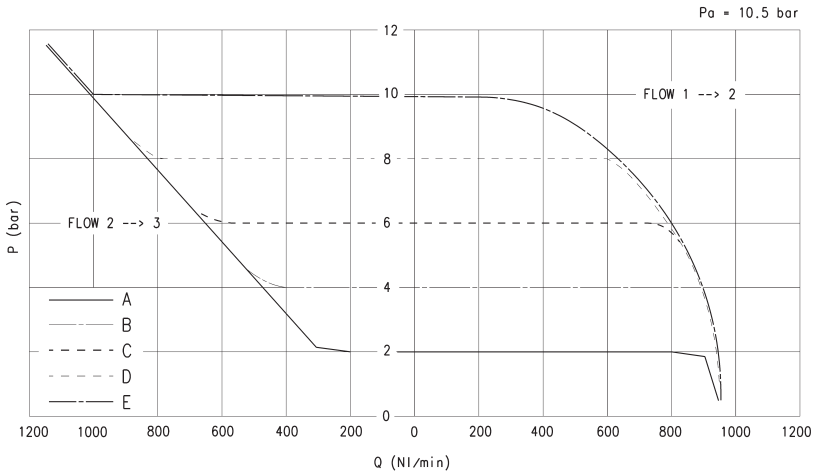


RESPONSE TIMES ACCORDING TO THE COMMAND SIGNAL IN COMPLIANCE WITH THE ISO 10094-2 STANDARD						
COMMAND SIGNAL	-5% ÷ +5%	+5% ÷ -5%	-25% ÷ +25%	+25% ÷ -25%	-90% ÷ +90%	+90% ÷ -90%
Time [ms] LRWD2-34	4	5	6	9	10	10
Time [ms] LRWD2-36	5	5	6	6	10	10

*** closed valve with SET POINT = 0**
loaded valve with SET POINT = +
exhaust valve with SET POINT = -

FLOW DIAGRAMS FOR VALVE LRPD2-34

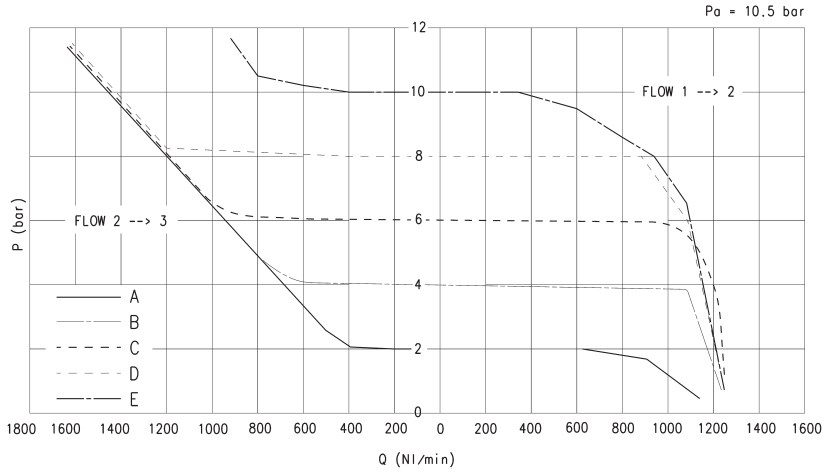
LEGEND:
P = regulated pressure (bar)
F = flow (Nl/min)
Pa = inlet pressure (bar)



RESPONSE TIMES WITH COMMAND SIGNAL BETWEEN 0% AND 100% IN COMPLIANCE WITH ISO 10094-2 STANDARD				
		Without volume	Volume 0,5 l	Volume 2 l
	Filling [ms]	24	313	1841
	Exhaust [ms]	35	663	3640
valve with SET POINT = 0% and regulated pressure = 0 bar				
valve with SET POINT = 100% and regulated pressure = maximum pressure (example: 10 - 1 bar or 250 mbar)				

FLOW DIAGRAMS FOR VALVE LRPD2-36

LEGEND:
P = regulated pressure (bar)
F = flow (Nl/min)
Pa = inlet pressure (bar)



RESPONSE TIMES WITH COMMAND SIGNAL BETWEEN 0% AND 100% IN COMPLIANCE WITH ISO 10094-2 STANDARD				
		Without volume	Volume 0,5 l	Volume 2 l
	Filling [ms]	20	263	1560
	Exhaust [ms]	32	357	1905
valve with SET POINT = 0% and regulated pressure = 0 bar				
valve with SET POINT = 100% and regulated pressure = maximum pressure (example: 10 - 1 bar or 250 mbar)				

Series LRXD2 - pneumatic and electrical schemes for the installation

The LRXD2 servo valves are proportional valves with a high-precision integrated control for the positioning of pneumatic cylinders. The valves include a patented 3-way system based on the rotating spool principle with electronic control of the spool position. The servo pneumatic closed loop system allows the control of the position through the feedback of the external positioning sensor or of the Camozzi 6PF cylinder with the integrated linear transducer.
The electronic board which is integrated in the valve body manages speed and acceleration directly.
The Master valve Mod. LRXD2 is equipped with a proper signal to command a LRWD2 valve that will work as a slave-valve.

Configuration for the position control with two valves (Fig. 1)
A = Slave LRWD2-3*-2-A-00 - B = Master LRXD2-3*-*-4-00 - C = 6PF cylinder...

Configuration for the position control with a LRXD2 valve (Fig. 2)
A = Master LRXD2-3*-*-4-00 - B = PR104-... - C = 6PF cylinder...

Fig.1

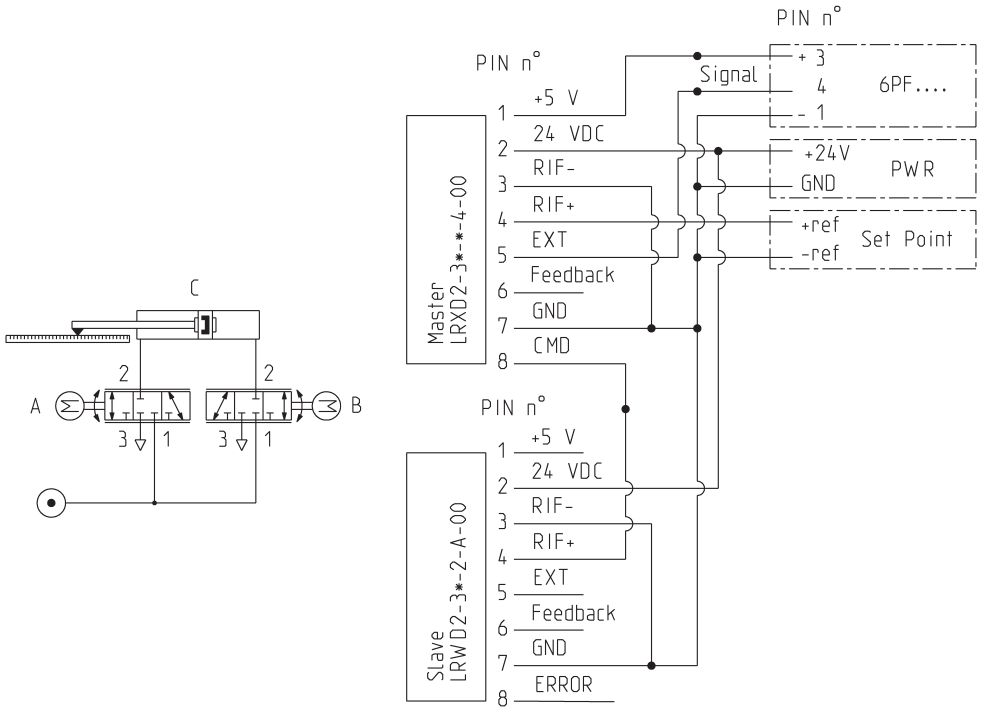
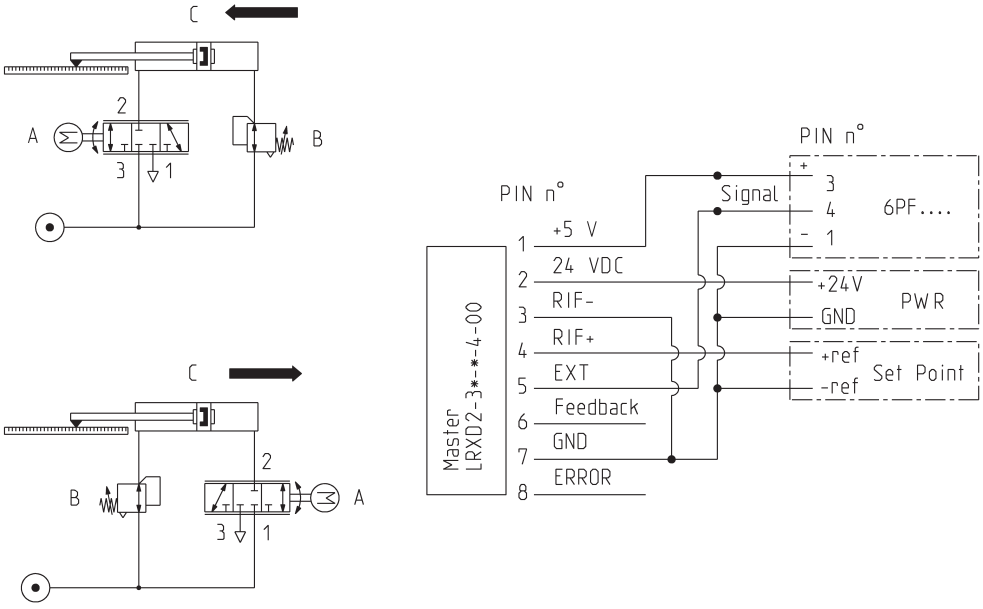
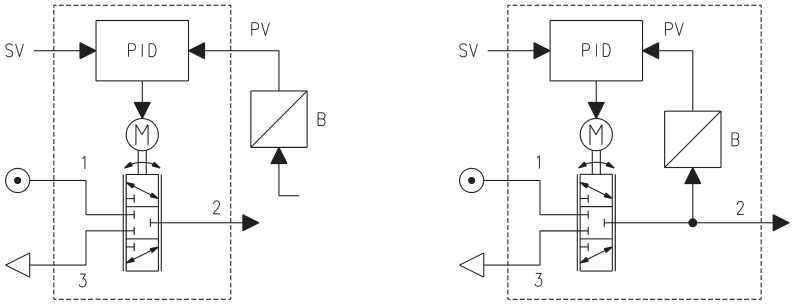


Fig.2

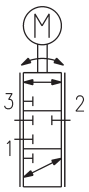


Series LRPD2 - pneumatic scheme for the installation

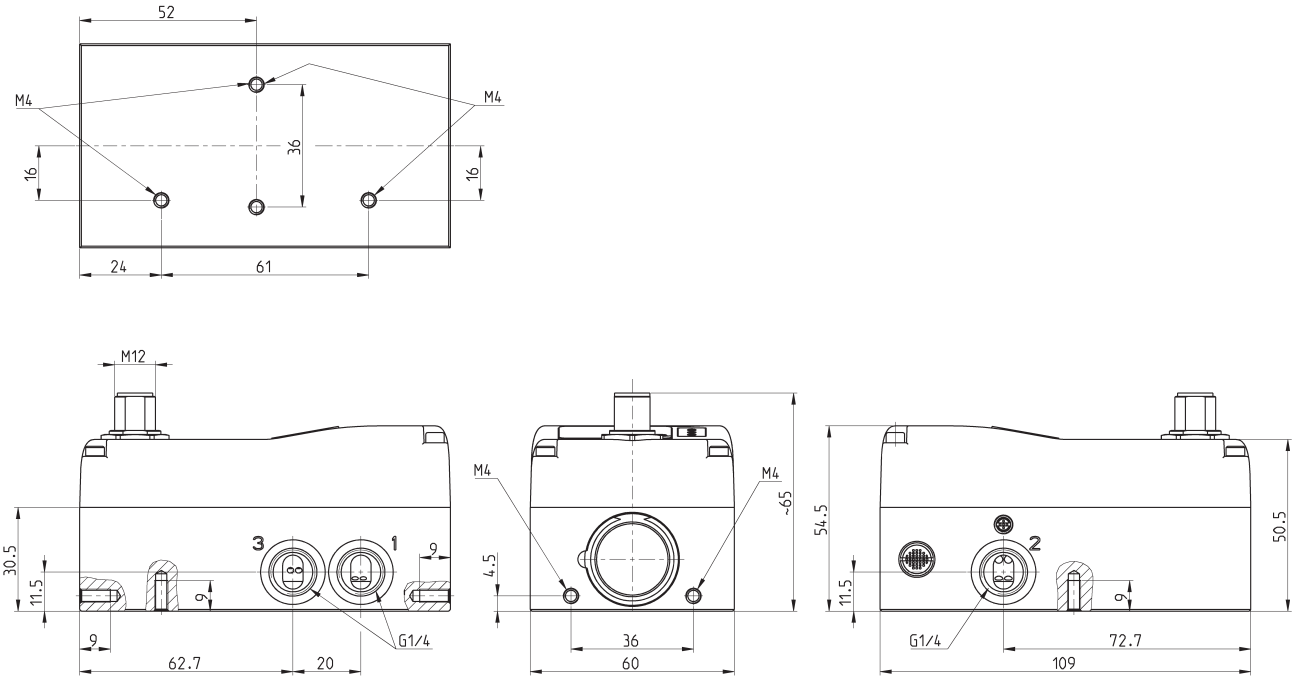
SV = setpoint value
PV = process value
B = sensor
PID = proportional control, integrative, derivative

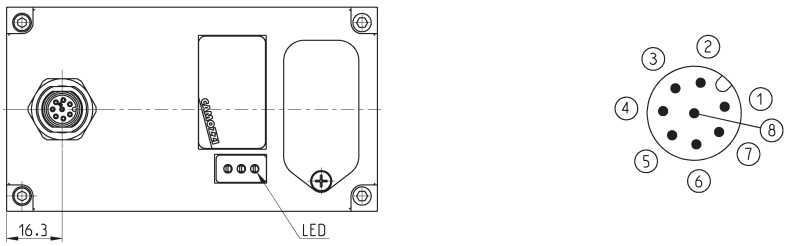


Series LR digital proportional servo valves - dimensions



The detailed user and maintenance manual and the Hardware configuration Software of the valve is available online at http://catalogue.camozzi.com.





PIN	SIGNAL		DESCRIPTION
1	+5V		+5V power supply for external potentiometer transducer (ref. GND). If used, it is necessary to connect RIF- with GND.
2	24 V DC		24V DC power supply (logic and motor): connect to the positive pole of the 24V DC power supply (ref. GND)
3	RIF-		GND reference or NEGATIVE pole of the command signal (0-10V / 4-20mA / ±10V)
4	RIF+		POSITIVE reference of the command signal (0-10V / 4-20mA / ±10V)
5	EXT	for LRWD valve:	not used
		for LRXD valve:	feedback signal of the external transducer 0-5V / 0-10V / 4-20mA (ref. RIF-)
		for LRPD valve:	feedback signal of the external transducer 0-5V / 0-10V / 4-20mA (ref. RIF-). To be used only with LRPD2 valve versions with external sensor.
6	FBK		feedback signal 0-10V / 4-20mA (ref. GND)
7	GND		common (reference pin 1 and 2): connect to the negative pole of the 24V DC power supply (compulsory)
8	ERR	for LRWD and LRPD valve:	error signal (output) 0-24V (ref. GND)
		for LRXD valve:	command signal 0-10V for slave valve (ref. GND)

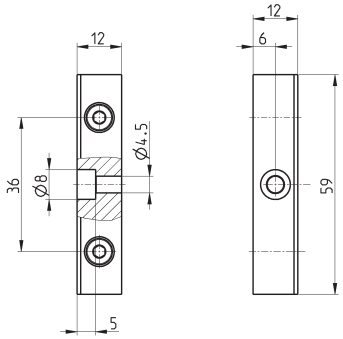
Series LR digital proportional servo valves - technical characteristics

* To order the complete code, please replace the asterisk with 4 or 6 according to the desired nominal diameter.

Mod.	Control	Command/Input signal	Sensor/External signal	
LRWD2-3*-1-A-00	flow	+/- 10 V	-	
LRWD2-3*-2-A-00	flow	0-10 V	-	
LRWD2-3*-5-A-00	flow	4..20 mA	-	
LRPD2-3*-1-2-00	pressure	+/- 10 V	0..10 V	
LRPD2-3*-2-2-00	pressure	0-10 V	0..10 V	
LRPD2-3*-5-2-00	pressure	4..20 mA	0..10 V	
LRPD2-3*-1-4-00	pressure	+/- 10 V	0 - 5 V	
LRPD2-3*-2-4-00	pressure	0-10 V	0 - 5 V	
LRPD2-3*-5-4-00	pressure	4..20 mA	0 - 5 V	
LRPD2-3*-1-5-00	pressure	+/- 10 V	4..20 mA	
LRPD2-3*-2-5-00	pressure	0-10 V	4..20 mA	
LRPD2-3*-5-5-00	pressure	4..20 mA	4..20 mA	
LRPD2-3*-1-B-00	pressure	+/- 10 V	1 bar internal	
LRPD2-3*-2-B-00	pressure	0-10 V	1 bar internal	
LRPD2-3*-5-B-00	pressure	4..20 mA	1 bar internal	
LRPD2-3*-1-D-00	pressure	+/- 10 V	10 bar internal	
LRPD2-3*-2-D-00	pressure	0-10 V	10 bar internal	
LRPD2-3*-5-D-00	pressure	4..20 mA	10 bar internal	
LRPD2-3*-1-E-00	pressure	+/- 10 V	250 mbar internal	
LRPD2-3*-2-E-00	pressure	0-10 V	250 mbar internal	
LRPD2-3*-5-E-00	pressure	4..20 mA	250 mbar internal	
LRPD2-3*-1-F-00	pressure	+/- 10 V	+1/-1 bar internal	
LRPD2-3*-2-F-00	pressure	0-10 V	+1/-1 bar internal	
LRPD2-3*-5-F-00	pressure	4..20 mA	+1/-1 bar internal	
LRXD2-3*-1-4-00	position	+/- 10 V	0-5 V	suitable to work with the 6PF cylinder (see the PNEUMATIC ACTUATION catalogue)
LRXD2-3*-2-4-00	position	0-10 V	0-5 V	suitable to work with the 6PF cylinder (see the PNEUMATIC ACTUATION catalogue)
LRXD2-3*-5-4-00	position	4..20 mA	0-5 V	suitable to work with the 6PF cylinder (see the PNEUMATIC ACTUATION catalogue)
LRXD2-3*-1-2-00	position	+/- 10 V	0-10 V	
LRXD2-3*-2-2-00	position	0-10 V	0-10 V	
LRXD2-3*-5-2-00	position	4..20 mA	0-10 V	
LRXD2-3*-1-5-00	position	+/- 10 V	4..20mA	
LRXD2-3*-2-5-00	position	0-10 V	4..20mA	
LRXD2-3*-5-5-00	position	4..20mA	4..20mA	

Fixing foot Mod. LRADB

Supplied with:
2x feet
4x screws

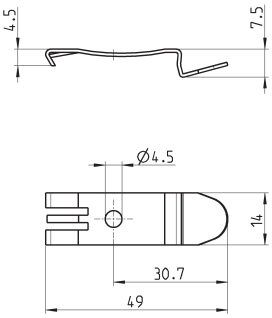


Mod.
LRADB

Mounting brackets for DIN-rail Mod. PCF-EN531

DIN EN 50022 (7,5mm x 35mm - width 1)

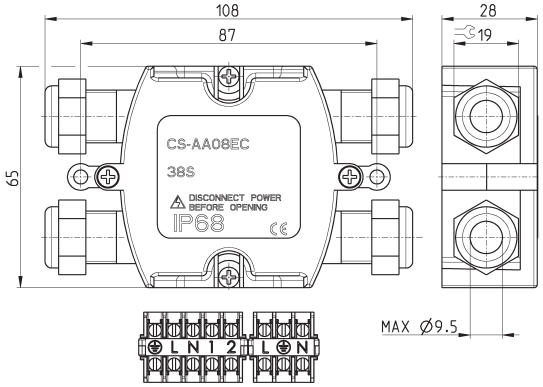
Supplied with:
2x mounting brackets
2x screws M4x6 UNI 5931
2x nuts



Mod.
PCF-EN531

Electrical tee box Mod. CS-AA08EC

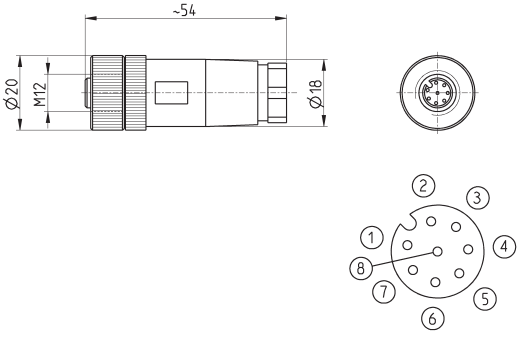
Connection valve-PLC-external transducer



CS-AA08EC

Straight female connector M12 8 poles

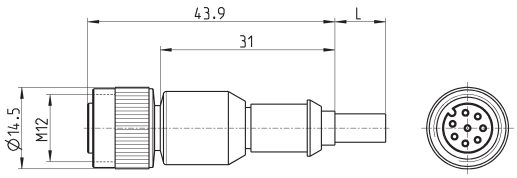
For electric supply and commands

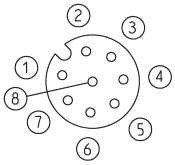


CS-LF08HC

Cable with straight female connector M12 8 poles

For electrical supply and commands

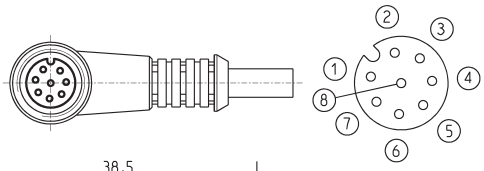


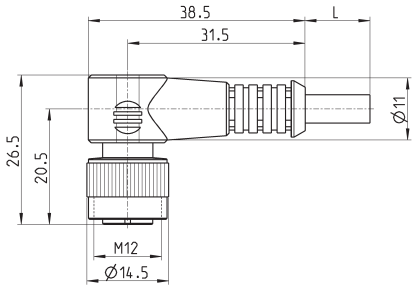


Mod.	Cable length (m)
CS-LF08HB-C200	2
CS-LF08HB-C500	5

Cable with angular (90°) female connector M12 8 poles

For electric supply and commands

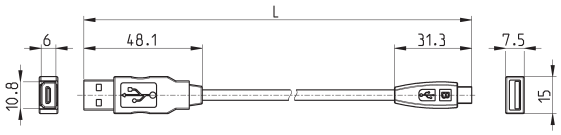




Mod.	Cable length (m)
CS-LR08HB-C200	2
CS-LR08HB-C500	5

USB to Micro USB cable Mod. G11W-G12W-2

For the hardware configuration
of the Camozzi products



Mod.	description	connections	material for outer sheath	cable length "L" (m)
G11W-G12W-2	black shielded cable 28 AWG	standard USB to Micro USB	PVC	2

Series K8P electronic proportional micro regulator

News: use with oxygen

Proportional regulator for the pressure control

- High precision
- Reduced response times
- Minimum consumption
- Self-regulation function
- Flexibility of use
- Compact design
- Suitable for use with oxygen

Series K8P electronic proportional micro regulators have evolved from our Series K8 mini-solenoid valves. Series K8P regulators guarantee excellent pressure regulation, fast response times, self-regulation and low energy consumption.
Series K8P is a high performance proportional pressure regulator which is suitable for use in all applications where high precision, quick response times and low consumption are required.

The K8P regulator adjusts the outlet pressure through the operation of two K8 monostable valves according to the inlet signal and to the retroactivity of the internal pressure sensor. A self-adjusting function has been integrated into the regulator control algorithm to guarantee the highest levels of performance apart from the volume connected.

GENERAL DATA

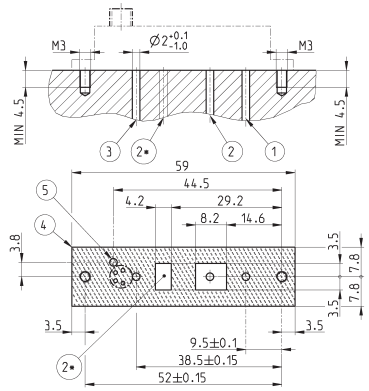
Fluids	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, oxygen, inert gases (argon, molecular nitrogen)	
Pressures	Regulated pressure 0.5 ÷ 10 bar 0.15 ÷ 3 bar 0.35 ÷ 7 bar 0.05 ÷ 1 bar	Max inlet pressure 11 bar 4 bar 8 bar 1.5 bar
Working temperature	0 ÷ 50°C	
Analogical input	0-10 V DC 4-20 mA Ripple ≤ 0,2%	
Analogical output	0.5 - 9.5 V [Feedback]	
Analog input impedance	20.000 Ω for versions 0-10 V 250 Ω for versions 4-20 mA	
Maximum flow	12 l/min with regulated pressure = 6 bar (IN Pres. 10 bar) 6 l/min with regulated pressure = 3 bar (IN Pres. 4 bar) 8 l/min with regulated pressure = 7 bar (IN Pres. 8 bar) 2 l/min with regulated pressure = 1 bar (IN Pres. 1.5 bar)	
Supply / Use	24 V - ~ 1 W	
Function	3/2 NC	
Linearity	≤ ±1% FS	
Hysteresis	±0.5% FS	
Resolution	±0.5% FS (referred to the command signal)	
Repeatability	±0.5% FS	
Minimal set point change	50 mV => 50 mB (10 bar) 100 mV => 30 mB (3 bar)	
Electrical connection	M8 4 Pin (Male)	
Protection class	IP65 (with standard sub-base or with single use) IP51 (with Light sub-base and Light Sub-base for the pressure remote reading)	
In compliance with the European Directive 2004/108/EC		

CODING EXAMPLE

K8P	-	0	-	D	5	2	2	-	0	

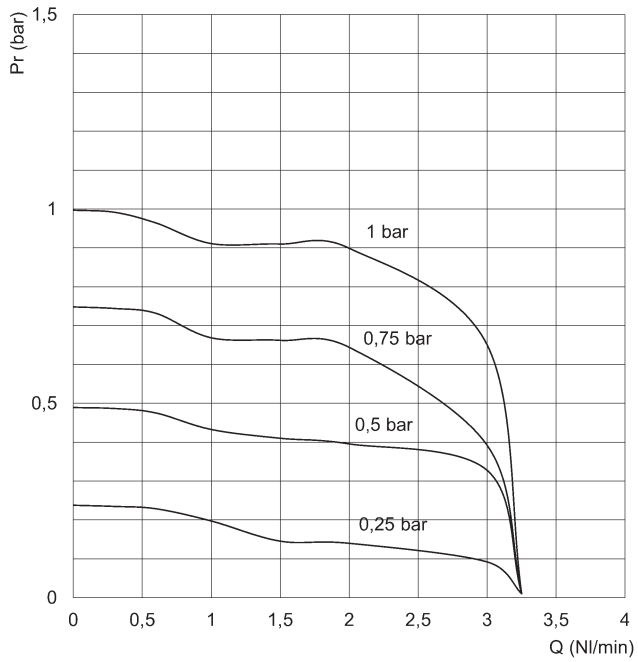
K8P	SERIES
0	BODY DESIGN: 0 = Stand alone S = Standard Sub-base L = Light Sub-base T = Light Sub-base for the pressure remote reading
D	WORKING PRESSURE: D = 0 - 10 bar E = 0 - 3 bar F = 0 - 7 bar B = 0 - 1 bar
5	VALVE FUNCTIONS: 5 = 3/2-way NC
2	COMMAND: 2 = 0-10 V DC 3 = 4-20 mA
2	OUTPUT SIGNAL: 2 = 0-10 V
0	CABLE LENGTH: 0 = without cable 2F = straight cable, 2 m 2R = right angle cable (90 degrees), 2 m 5F = straight cable, 5 m 5R = right angle cable (90 degrees), 5 m
OX1	VERSIONS: = standard OX1 = for use with oxygen (in compliance with ASTM G93-03 Level E)
	APPLICATIONS The K8P proportional regulator can be used as a pilot valve to control the opening of high flow valves or to check the high flow pressure regulators proportionally (version with sub-base for the pressure remote reading). It enables proportional control of power in lifting systems and can be used with inert gas to maintain a constant pressure in pneumatic cylinders or expansion valve chambers. It has also been designed to maintain a constant pressure during the pulling power applied to the wires in winding machines, to modulate pressure during the smoothing process in woodworking machines or to adjust the opening of diaphragm valves.

Interface for single use without sub-base



DRAWING LEGEND	
	Notes
1 = Inlet pressure	Pneumatic connection
2 = Outlet pressure	Pneumatic connection
2* = area for possible positioning of outlet port 2	Do not exceed the indicated outline
3 = Exhaust	Pneumatic connection
4 = OUTLET DIMENSION	
5 = VENT PORT FOR IP65	Optional when a OR seal is mounted

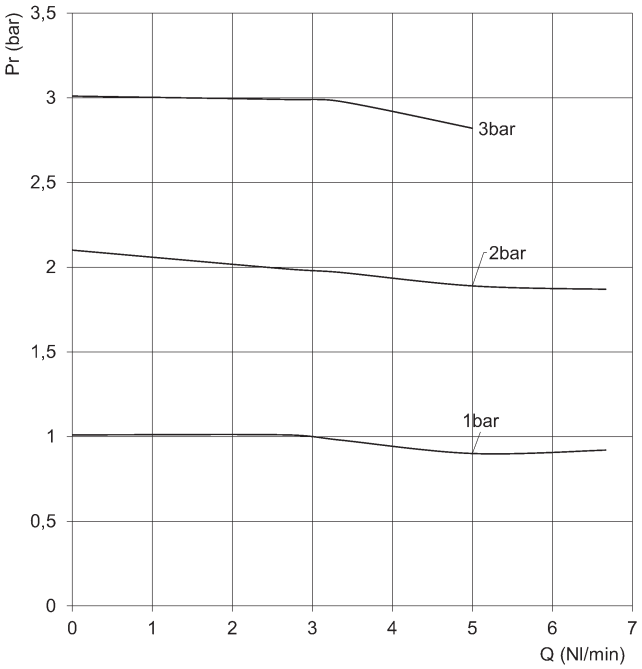
FLOW DIAGRAMS



0-1 bar version

Pr = Outlet pressure (bar)*
Q = Flow (Nl/min)*

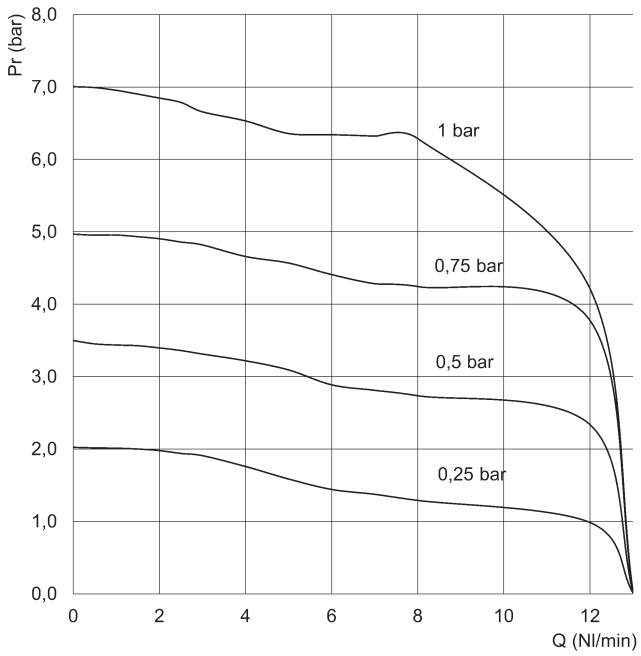
* = Inlet pressure 2 bar



0-3 bar version

Pr = Outlet pressure (bar)*
Q = Flow (Nl/min)*

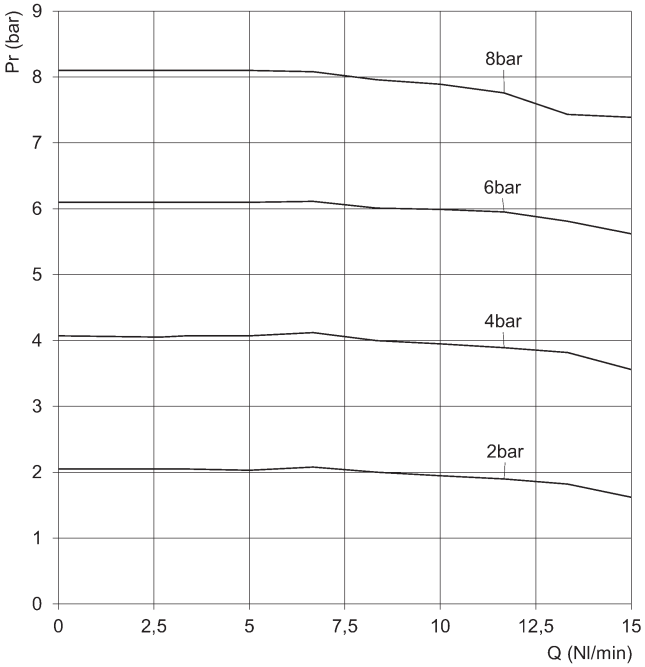
* = Inlet pressure 4 bar



0-7 bar version

Pr = Outlet pressure (bar)*
Q = Flow (Nl/min)*

* = Inlet pressure 8 bar



0-10 bar version

Pr = Outlet pressure (bar)*
Q = Flow (Nl/min)*

* = Inlet pressure 10 bar

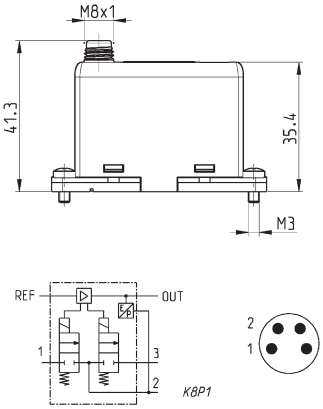
Series K8P electronic proportional micro regulator

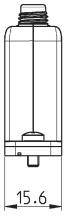
* = sub-bases and single use can be supplied for all versions.
** = all the cables can be supplied for all versions.

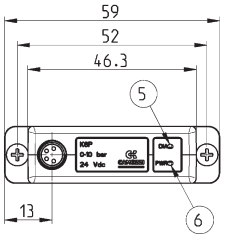
M8 4-pole male connector

Pin 1: +24 V DC (Power supply)
Pin 2: Command analogical signal 0-10 V DC or 4-20 mA
Pin 3: 0 V (Ground) common also for the command signal
Pin 4: Output analogical signal (according to the regulated pressure)

5 red LED
6 green LED



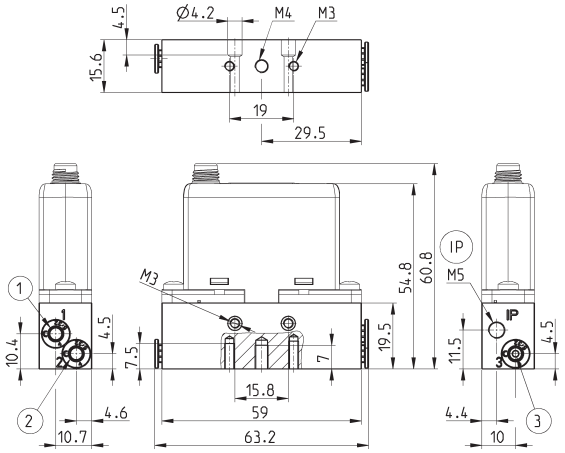




Mod.	Working pressure	Use with oyxgen	Command
K8P-*-D522-**	0-10 bar	no	0-10 V DC
K8P-*-E522-**	0-3 bar	no	0-10 V DC
K8P-*-D532-**	0-10 bar	no	4-20 mA
K8P-*-E532-**	0-3 bar	no	4-20 mA
K8P-*-B522-**	0-1 bar	no	0-10 V DC
K8P-*-F522-**	0-7 bar	no	0-10 V DC
K8P-*-B532-**	0-1 bar	no	4-20 mA
K8P-*-F532-**	0-7 bar	no	4-20 mA
K8P-*-B522-OX1**	0-1 bar	yes	0-10 V DC
K8P-*-F522-OX1**	0-7 bar	yes	0-10 V DC
K8P-*-E522-OX1**	0-3 bar	yes	0-10 V DC
K8P-*-B532-OX1**	0-1 bar	yes	4-20 mA
K8P-*-F532-OX1**	0-7 bar	yes	4-20 mA
K8P-*-E532-OX1**	0-3 bar	yes	4-20 mA

Standard Sub-base

The use of a silencer (Mod. 2939 4) on the exhaust is recommended.



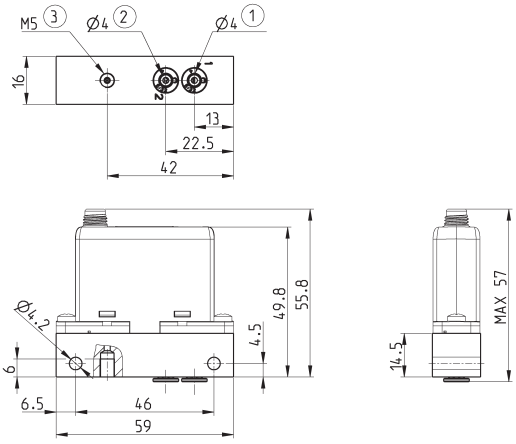
Mod.
K8P-AS

1 = Inlet pressure
2 = Outlet pressure
3 = Exhaust

IP = IP65 connection

Light Sub-base

The use of a silencer (Mod. 2931 M5, 2938 M5, 2901 M5) on the exhaust is recommended.

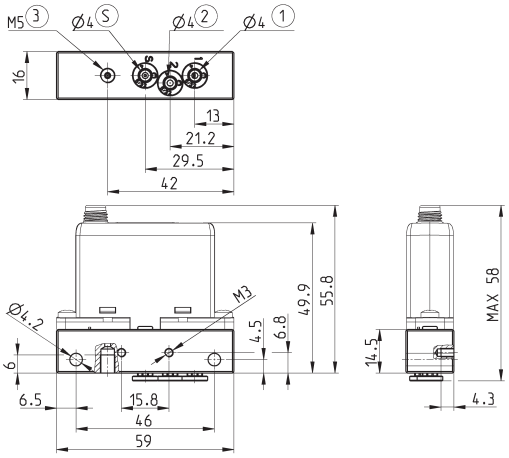


Mod.
K8P-AL

1 = Inlet pressure
2 = Outlet pressure
3 = Exhaust

Light Sub-base for the pressure remote reading

The use of a silencer (Mod. 2931 M5, 2938 M5, 2901 M5) on the exhaust is recommended.



Mod.
K8P-AT

1 = Inlet pressure
2 = Outlet pressure
3 = Exhaust

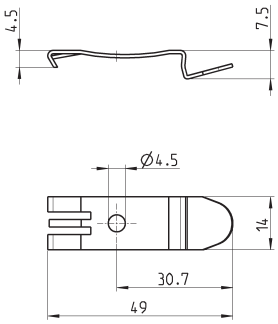
S = remote-mounted sensor

Mounting bracket for DIN rail

DIN EN 50022 (7,5mm x 35mm - width 1)

Supplied with:
1x mounting bracket
1x screw M4x6 UNI 5931

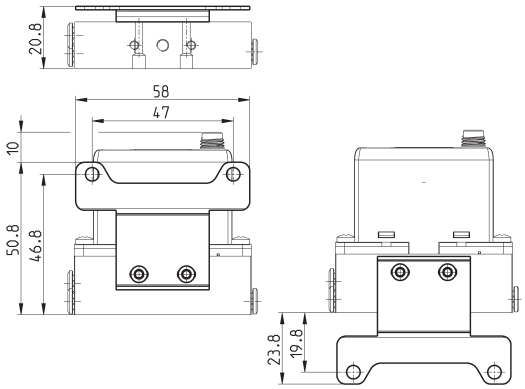
This accessory cannot be used with the Light sub-base.



Mod.
PCF-K8P

Bracket for horizontal mounting, for standard sub-base

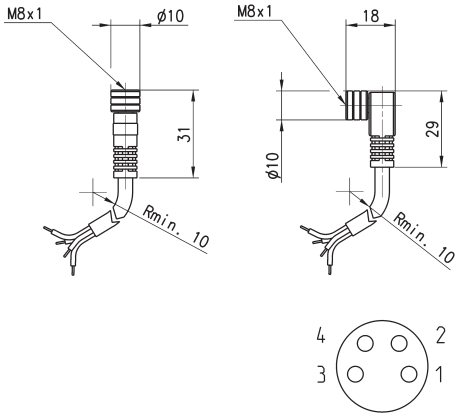
Supplied with:
1x mounting bracket
2x screws M3x8 UNI 5931



Mod.
K8P-B1

Circular M8 4-pole connectors, Female

With PU sheathing, non shielded cable.
Protection class: IP65



Mod.	Type of connector	Cable length (m)
CS-DF04EG-E200	straight	2
CS-DF04EG-E500	straight	5
CS-DR04EG-E200	right angle (90 degrees)	2
CS-DR04EG-E500	right angle (90 degrees)	5

Series MX-PRO proportional pressure regulator and proportional flow valve

New versions

Regulator and valve ports (standard and Manifold): G1/2
Regulator: with built-in pressure gauge or G1/8 threaded ports
Valve: without pressure gauge

Series MX-PRO electronic proportional pressure regulator is the result of combining advanced technology of Series K8P electronic proportional micro regulator, with reliability and high performance of Series MX2 modular regulators.
This new regulator ensures high precision in pressure regulation, high flow rate and low consumption. Moreover, it can take the most of Series MX ease of assembly to provide particularly compact Manifolds.

- High precision
- Low electric consumption
- High exhaust flow
- Modular with Series MX
- MANIFOLD and external servo pilot supply versions available
- Suitable for use with oxygen

GENERAL DATA

	PROPORTIONAL PRESSURE REGULATOR	PROPORTIONAL FLOW VALVE
Construction	modular, compact, diaphragm type	modular, piston type
Materials	see material tables on the following pages	see material tables on the following pages
Ports	G1/2	G1/2
Mounting	vertical in-line, wall-mounting (by means of clamps)	vertical in-line, wall-mounting (by means of clamps)
Working pressure	0°C ÷ 50°C	0°C ÷ 50°C
Max inlet pressure	11 bar (10 bar), 4 bar (3 bar), 1.5 bar (1 bar), 8 bar (7 bar)	6 bar
Regulated pressure	0.5 ÷ 10 bar, 0.15 ÷ 3 bar, 0.05 ÷ 1 bar, 0.35 ÷ 7	-
Max servo-pilot pressure	4 bar (3 bar), 11 bar (10 bar), 1.5 bar (1 bar), 8 bar (7 bar)	4 bar (essential for the proper functioning)
Overpressure exhaust	with Relieving (standard) or without Relieving	NO
Nominal flow	see flow diagrams on the following pages	see flow diagrams on the following pages
Air specifications	filtered compressed air, non lubricated, class 7.4.4 according to ISO 8573.1 standard. If lubrication is necessary, please use only oils with maximum viscosity of 32 Cst and the version with external servo-pilot supply. The servo-pilot supply air quality class must be 7.4.4 according to ISO 8573.1 standard.	filtered compressed air, non lubricated, class 7.4.4 according to ISO 8573.1 standard. If lubrication is necessary, please use only oils with maximum viscosity of 32 Cst and the version with external servo-pilot supply. The servo-pilot supply air quality class must be 7.4.4 according to ISO 8573.1 standard.
Pressure gauge	with built-in pressure gauge (standard) with G1/8 port	without pressure gauge
Analogical input	0-10 V DC Ripple ≤ 0.2%; 4 – 20 mA	0-10 V DC Ripple ≤ 0.2%; 4 – 20 mA
Analogical output	0.5 - 9.5 V DC [Feedback]	not relevant
Electrical supply	24 V DC ±10%	24 V DC ±10%
Electrical connection	M8 4 Pin (Male)	M8 4 Pin (Male)
Linearity	≤ ± 1% FS	±4% FS
Hysteresis	±0.5% FS	±8% FS
Repeatability	±0.5% FS	±0.35% FS
Sensibility	0.3% FS	5% FS
Protection class	IP51	IP51

CODING EXAMPLE

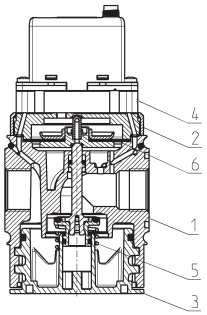
MX	2	-	1/2	-	R	CV	2	0	4	-	LH

MX	SERIES	
2	SIZE: 2 = G1/2	
1/2	PORTS: 1/2 = G1/2	
R	FUNCTIONING: R = pressure regulator M = Manifold pressure regulator	V = flow valve W = Manifold flow valve
CV	COMMAND: CV = electrical command 0-10 V DC (regulator only) CA = electrical command 4-20 mA (regulator only)	EV = electrical command 0-10 V DC with external servo pilot supply EA = electrical command 4-20 mA with external servo pilot supply
2	REGULATOR SETTING RANGE: 1 = working pressure 0 ÷ 3 bar 2 = working pressure 0 ÷ 10 bar 3 = working pressure 0 ÷ 1 bar 4 = working pressure 0 ÷ 7 bar	VALVE SETTING RANGE: 8 = low flow 9 = high flow
0	DESIGN TYPE: 0 = relieving (regulator only) 1 = without relieving	
4	PRESSURE GAUGE: 0 = without pressure gauge, with threaded port for gauges 2 = with built-in pressure gauge 0-6 bar (regulator only) 4 = with built-in pressure gauge 0-12 bar (regulator only)	
LH	FLOW DIRECTION: = from left to right (standard) LH = from right to left	
OX1	VERSIONS: = standard OX1 = for use with oxygen (in compliance with ASTM G93-03 Level E), FKM seals	

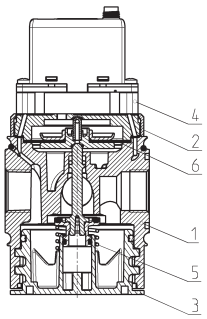
Further details about the assembly of a single component with fixing flanges or wall-mounting can be found in the AIR TREATMENT catalogue, section SERIES MX ASSEMBLED FRL.

Series MX-PRO proportional pressure regulator - materials

R = proportional pressure regulator
M = Manifold proportional pressure regulator



R

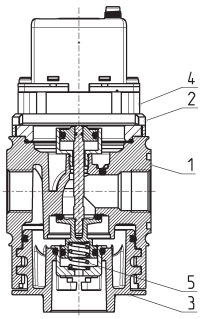


M

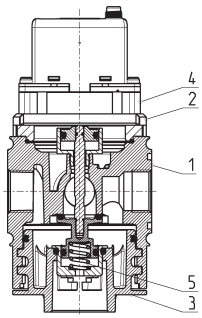
PARTS	MATERIALS, standard version	MATERIALS, oxygen version
1 = Body	Aluminium	Aluminium
2 = Covering	Polyacetal	PBT
3 = Valve holder plug	Polyacetal	PBT
4 = Upper base	Aluminium	Aluminium
5 = Lower spring	Stainless steel	Stainless steel
6 = Diaphragm	NBR	FKM
Seals	NBR	FKM

Series MX-PRO proportional flow valve - materials

V = proportional flow valve
W = Manifold proportional flow valve



V



W

PARTS	MATERIALS, standard version	MATERIALS, oxygen version
1 = Body	Aluminium	Aluminium
2 = Covering	Polyacetal	PBT
3 = Valve holder plug	Polyacetal	PBT
4 = Upper base	Aluminium	Aluminium
5 = Lower spring	Stainless steel	Stainless steel
Seals	NBR	FKM

Series MX-PRO proportional pressure regulator

Male connector M8 4 poles
Pin 1: +24 V DC (Power supply)
Pin 2: Command analogical signal 0-10 V DC or 4-20 mA
Pin 3: 0 V (Ground) common also for the command signal
Pin 4: Output analogical signal (according to the regulated pressure)

5 red LED
6 green LED

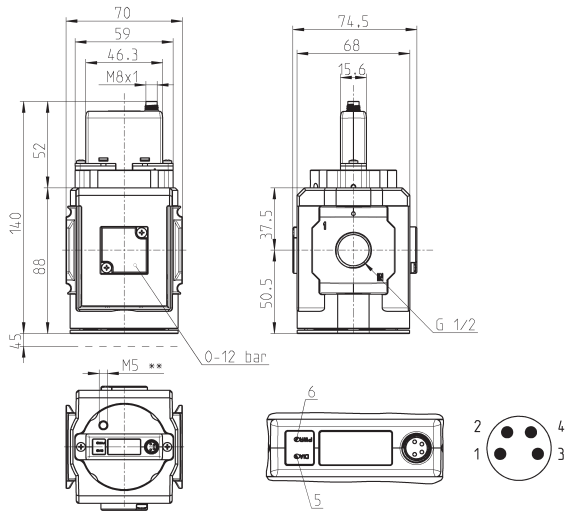
TABLE NOTES:

* = versions with or without external pilot supply

** = versions with our without relieving

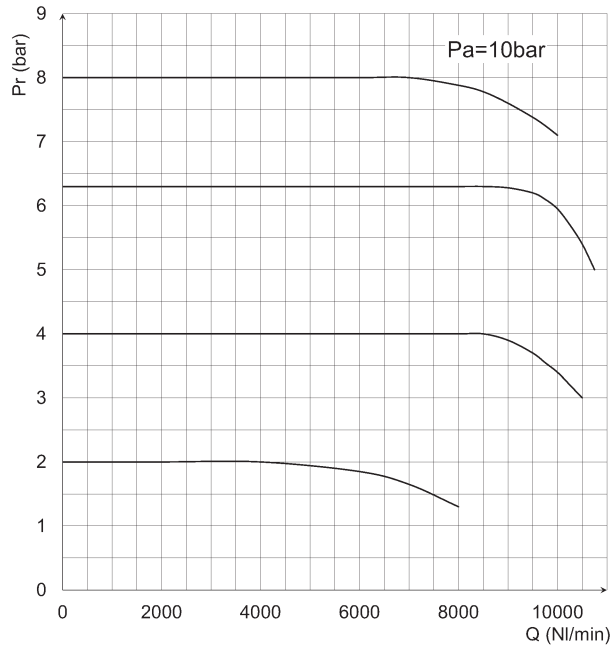
LH = add LH at the end of the code for air inlet from the right to the left

DRAWING NOTE:
** = in the versions with external servo pilot supply only (MX2-1/2-REV... and MX2-1/2-REA...)



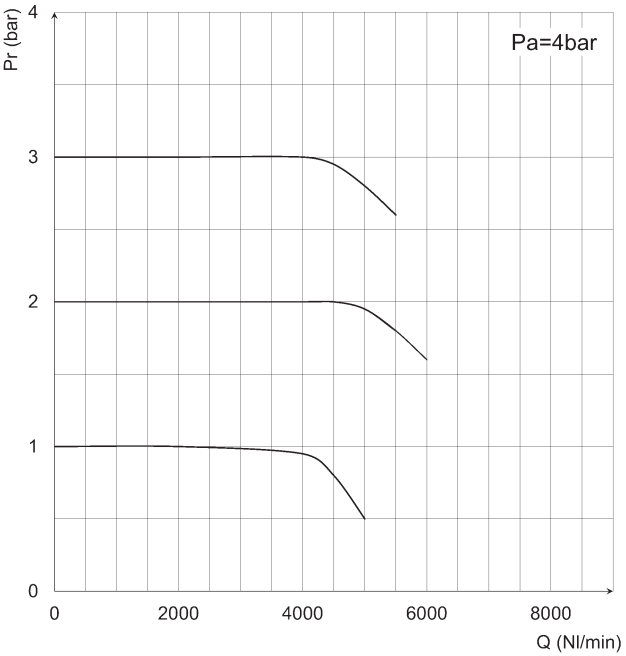
Mod.	Electrical command	Setting range	Pressure gauge
MX2-1/2-R*V10**	0-10 V DC	0 ÷ 3 bar	without pressure gauge
MX2-1/2-R*V12**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V14**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V20**	0-10 V DC	0 ÷ 10 bar	without pressure gauge
MX2-1/2-R*V22**	0-10 V DC	0 ÷ 10 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V24**	0-10 V DC	0 ÷ 10 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V30**	0-10 V DC	0 ÷ 1 bar	without pressure gauge
MX2-1/2-R*V32**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V34**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V40**	0-10 V DC	0 ÷ 7 bar	without pressure gauge
MX2-1/2-R*V42**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V44**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A10**	4-20 mA	0 ÷ 3 bar	without pressure gauge
MX2-1/2-R*A12**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A14**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A20**	4-20 mA	0 ÷ 10 bar	without pressure gauge
MX2-1/2-R*A22**	4-20 mA	0 ÷ 10 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A24**	4-20 mA	0 ÷ 10 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A30**	4-20 mA	0 ÷ 1 bar	without pressure gauge
MX2-1/2-R*A32**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A34**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A40**	4-20 mA	0 ÷ 7 bar	without pressure gauge
MX2-1/2-R*A42**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A44**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V10-OX1**	0-10 V DC	0 ÷ 3 bar	without pressure gauge
MX2-1/2-R*V12-OX1**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V14-OX1**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V30-OX1**	0-10 V DC	0 ÷ 1 bar	without pressure gauge
MX2-1/2-R*V32-OX1**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V34-OX1**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-R*V40-OX1**	0-10 V DC	0 ÷ 7 bar	without pressure gauge
MX2-1/2-R*V42-OX1**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-R*V44-OX1**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A10-OX1**	4-20 mA	0 ÷ 3 bar	without pressure gauge
MX2-1/2-R*A12-OX1**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A14-OX1**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A30-OX1**	4-20 mA	0 ÷ 1 bar	without pressure gauge
MX2-1/2-R*A32-OX1**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A34-OX1**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-R*A40-OX1**	4-20 mA	0 ÷ 7 bar	without pressure gauge
MX2-1/2-R*A42-OX1**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-R*A44-OX1**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-12

PRESSURE REGULATOR FLOW DIAGRAMS - STANDARD VERSION



Pr = Regulated pressure
Q = Flow

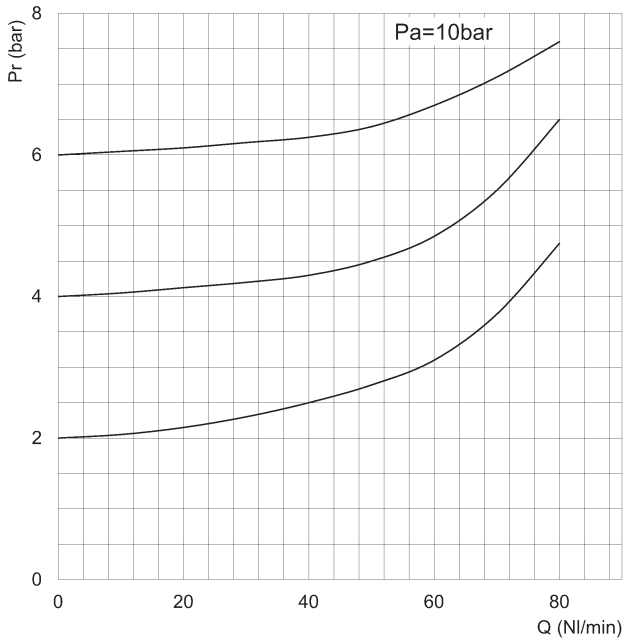
Pa = Inlet pressure



Pr = Regulated pressure
Q = Flow

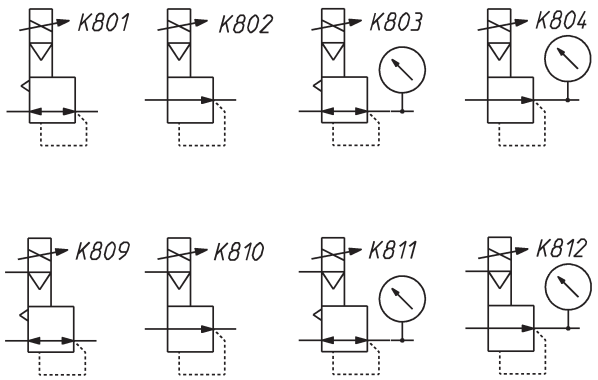
Pa = Inlet pressure

EXHAUST FLOW DIAGRAM AND PNEUMATIC SYMBOLS



Pr = Regulated pressure
Q = Flow

Pa = Inlet pressure



K801 = relieving, electrical command
K802 = NO relieving, electrical command
K803 = relieving, electrical command, built-in pressure gauge
K804 = NO relieving, electrical command, built-in pressure gauge
K809 = relieving, electrical command, ext. servo pilot supply
K810 = NO reliev., electrical command, ext. servo pilot supply
K811 = reliev., el. com., built-in pr. gauge, ext. servo pilot supply
K812 = NO reliev., el. com., built-in pr. gauge, ext. servo pilot sup.

Series MX-PRO proportional pressure regulator

Male connector M8 4 poles
Pin 1: +24 V DC (Power supply)
Pin 2: Command analogical signal 0-10 V DC or 4-20 mA
Pin 3: 0 V (Ground) common also for the command signal
Pin 4: Output analogical signal (according to the regulated pressure)

5 red LED
6 green LED

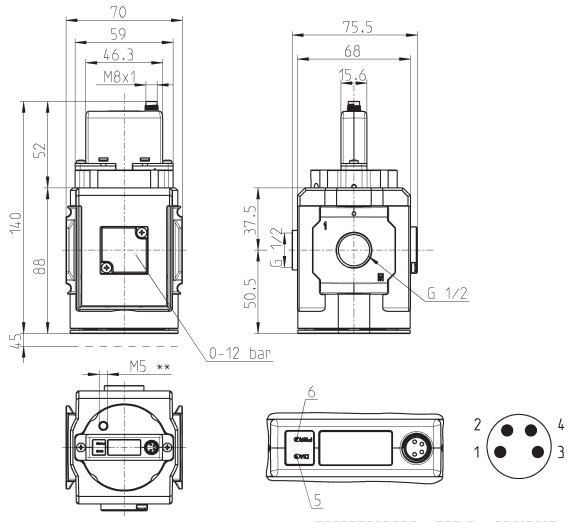
TABLE NOTES:

* = versions with or without external pilot supply

** = versions with our without relieving

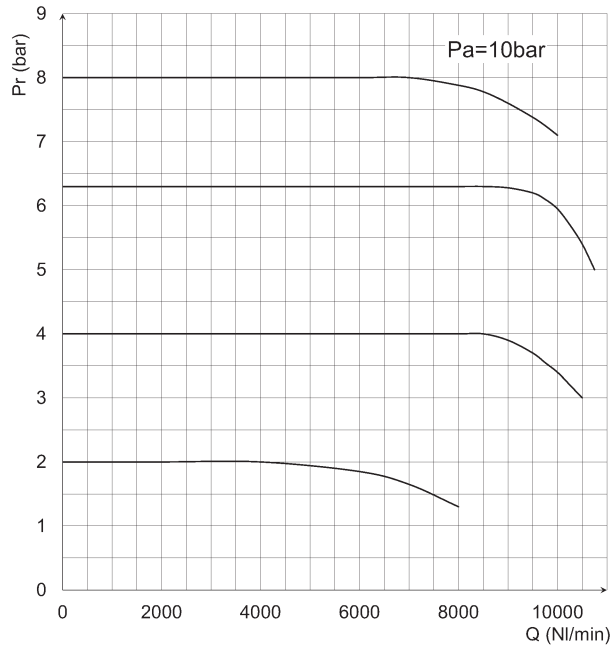
LH = add LH at the end of the code for air inlet from the right to the left

DRAWING NOTE:
** = in the versions with external servo pilot supply only (MX2-1/2-REV... and MX2-1/2-REA...)



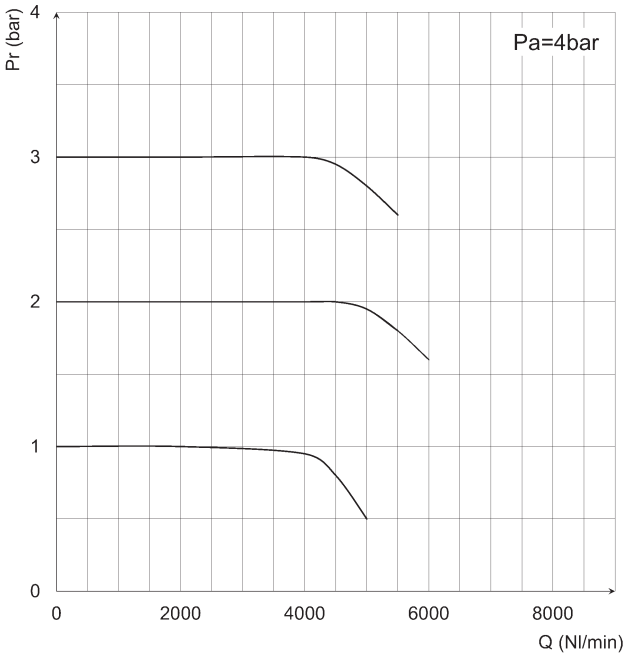
Mod.	Electrical command	Setting range	Pressure gauge
MX2-1/2-M*V10**	0-10 V DC	0 ÷ 3 bar	without pressure gauge
MX2-1/2-M*V12**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V14**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V20**	0-10 V DC	0 ÷ 10 bar	without pressure gauge
MX2-1/2-M*V22**	0-10 V DC	0 ÷ 10 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V24**	0-10 V DC	0 ÷ 10 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V30**	0-10 V DC	0 ÷ 1 bar	without pressure gauge
MX2-1/2-M*V32**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V34**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V40**	0-10 V DC	0 ÷ 7 bar	without pressure gauge
MX2-1/2-M*V42**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V44**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A10**	4-20 mA	0 ÷ 3 bar	without pressure gauge
MX2-1/2-M*A12**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A14**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A20**	4-20 mA	0 ÷ 10 bar	without pressure gauge
MX2-1/2-M*A22**	4-20 mA	0 ÷ 10 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A24**	4-20 mA	0 ÷ 10 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A30**	4-20 mA	0 ÷ 1 bar	without pressure gauge
MX2-1/2-M*A32**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A34**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A40**	4-20 mA	0 ÷ 7 bar	without pressure gauge
MX2-1/2-M*A42**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A44**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V10-OX1**	0-10 V DC	0 ÷ 3 bar	without pressure gauge
MX2-1/2-M*V12-OX1**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V14-OX1**	0-10 V DC	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V30-OX1**	0-10 V DC	0 ÷ 1 bar	without pressure gauge
MX2-1/2-M*V32-OX1**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V34-OX1**	0-10 V DC	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-M*V40-OX1**	0-10 V DC	0 ÷ 7 bar	without pressure gauge
MX2-1/2-M*V42-OX1**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-M*V44-OX1**	0-10 V DC	0 ÷ 7 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A10-OX1**	4-20 mA	0 ÷ 3 bar	without pressure gauge
MX2-1/2-M*A12-OX1**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A14-OX1**	4-20 mA	0 ÷ 3 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A30-OX1**	4-20 mA	0 ÷ 1 bar	without pressure gauge
MX2-1/2-M*A32-OX1**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A34-OX1**	4-20 mA	0 ÷ 1 bar	with built-in pressure gauge 0-12
MX2-1/2-M*A40-OX1**	4-20 mA	0 ÷ 7 bar	without pressure gauge
MX2-1/2-M*A42-OX1**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-6
MX2-1/2-M*A44-OX1**	4-20 mA	0 ÷ 7 bar	with built-in pressure gauge 0-12

PRESSURE REGULATOR FLOW DIAGRAMS - MANIFOLD VERSION



Pr = Regulated pressure
Q = Flow

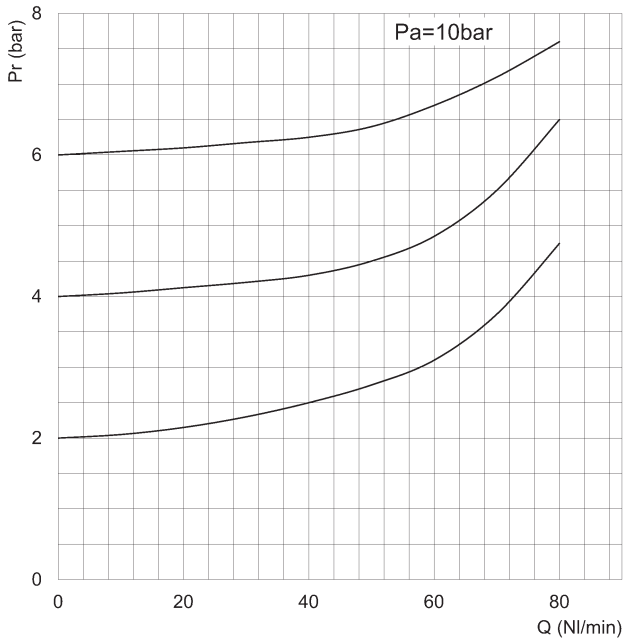
Pa = Inlet pressure



Pr = Regulated pressure
Q = Flow

Pa = Inlet pressure

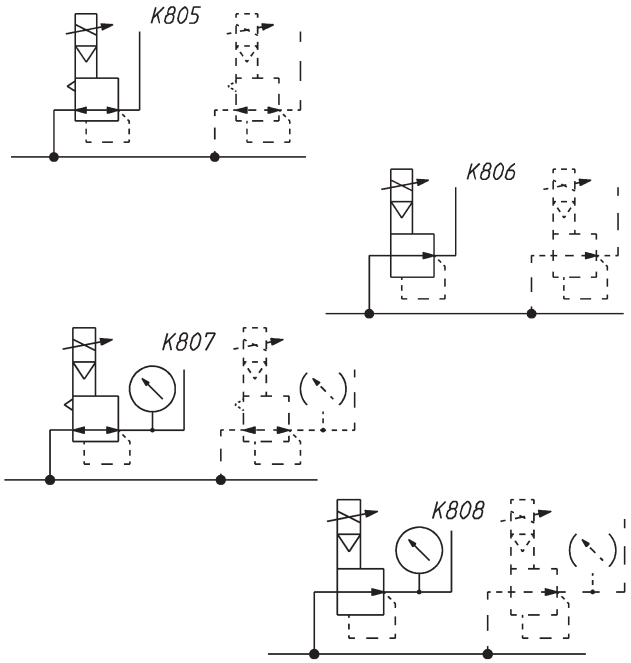
EXHAUST FLOW DIAGRAM - MANIFOLD VERSION



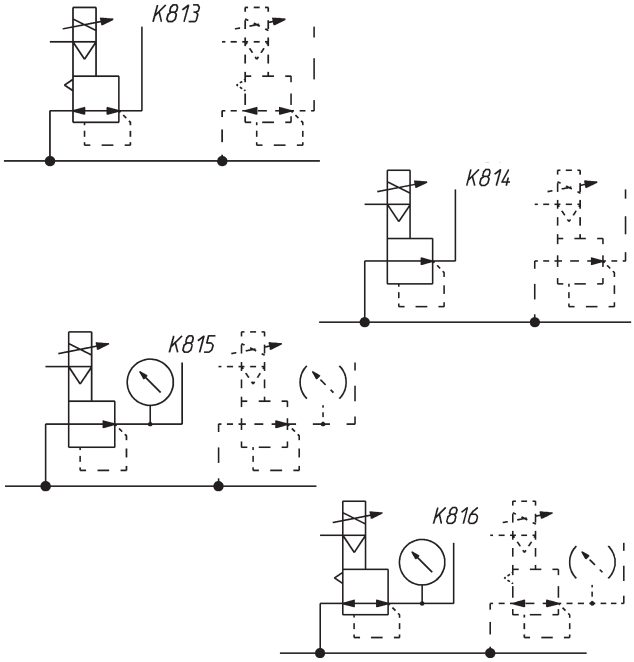
Pr = Regulated pressure
Q = Flow

Pa = Inlet pressure

PNEUMATIC SYMBOLS - MANIFOLD VERSION



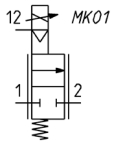
K805 = MANIFOLD reg., relieving, electrical command
K806 = MANIFOLD reg., NO relieving, electrical command
K807 = MANIFOLD reg., relieving, electrical command and built-in pressure gauge
K808 = MANIFOLD reg., NO relieving, electrical command and built-in pressure gauge

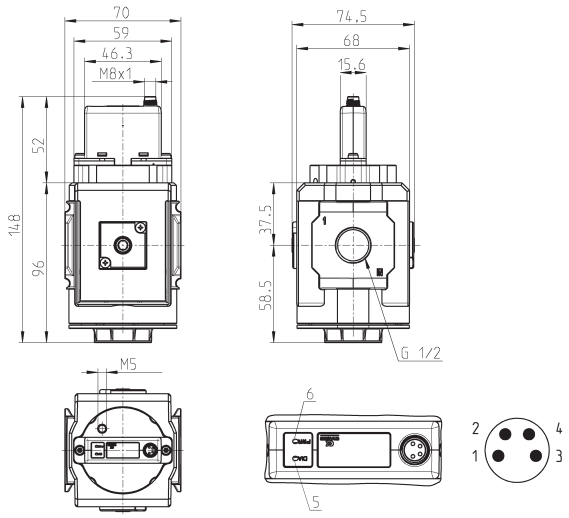


K813 = MANIFOLD reg., relieving, electrical command, and external servo pilot supply
K814 = MANIFOLD reg., NO relieving, electrical command, and external servo pilot supply
K815 = MANIFOLD reg., relieving, electrical command, built-in pressure gauge and external servo pilot supply
K816 = MANIFOLD reg., NO relieving, electrical command, built-in pressure gauge and external servo pilot supply

Series MX-PRO proportional flow valve

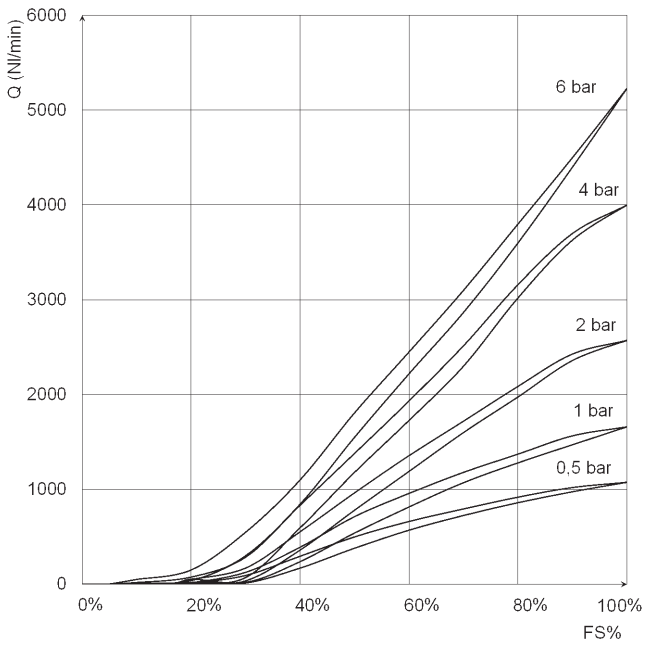
Male connector M8 4 poles
Pin 1: +24 V DC (Power supply)
Pin 2: Command analogical signal
0-10 V DC or 4-20 mA
Pin 3: 0 V (Ground) common also
for the command signal
Pin 4: Output analogical signal
(according to the
regulated pressure)
5 red LED
6 green LED





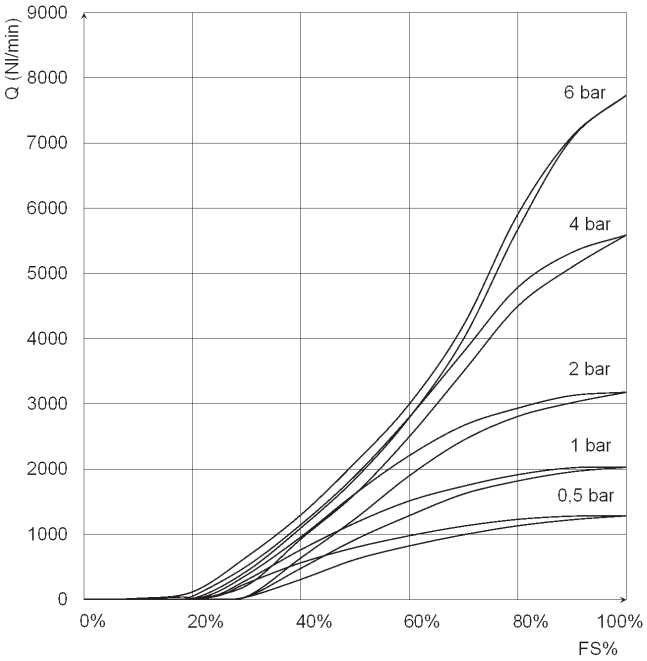
Mod.	Electrical command	Setting range
MX2-1/2-VEV810	0-10 V DC	low flow
MX2-1/2-VEA810	4-20 mA	low flow
MX2-1/2-VEV910	0-10 V DC	high flow
MX2-1/2-VEA910	4-20 mA	high flow
MX2-1/2-VEV810-LH	0-10 V DC	low flow
MX2-1/2-VEA810-LH	4-20 mA	low flow
MX2-1/2-VEV910-LH	0-10 V DC	high flow
MX2-1/2-VEA910-LH	4-20 mA	high flow
MX2-1/2-VEV810OX1	0-10 V DC	low flow
MX2-1/2-VEA810OX1	4-20 mA	low flow
MX2-1/2-VEV910OX1	0-10 V DC	high flow
MX2-1/2-VEA910OX1	4-20 mA	high flow
MX2-1/2-VEV810-LHOX1	0-10 V DC	low flow
MX2-1/2-VEA810-LHOX1	4-20 mA	low flow
MX2-1/2-VEV910-LHOX1	0-10 V DC	high flow
MX2-1/2-VEA910-LHOX1	4-20 mA	high flow

VALVE FLOW DIAGRAMS



Low flow version

Q (Nl/min) = flow
FS% = full scale command signal

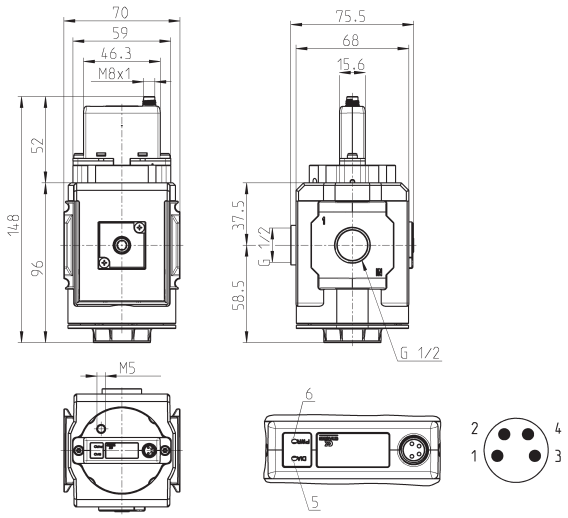


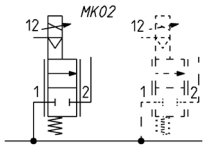
High flow

Q (Nl/min) = flow
FS% = full scale command signal

Series MX-PRO Manifold proportional flow valve

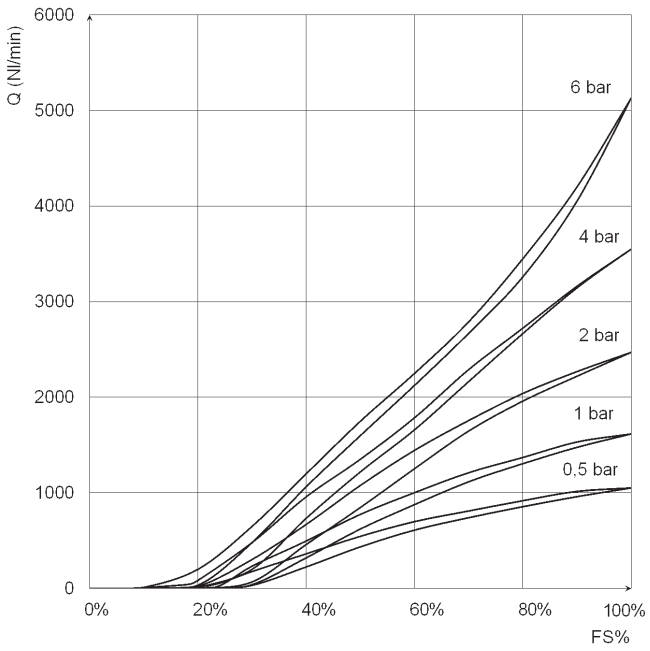
Male connector M8 4 poles
Pin 1: +24 V DC (Power supply)
Pin 2: Command analogical signal
0-10 V DC or 4-20 mA
Pin 3: 0 V (Ground) common also
for the command signal
Pin 4: Output analogical signal
(according to the
regulated pressure)
5 red LED
6 green LED





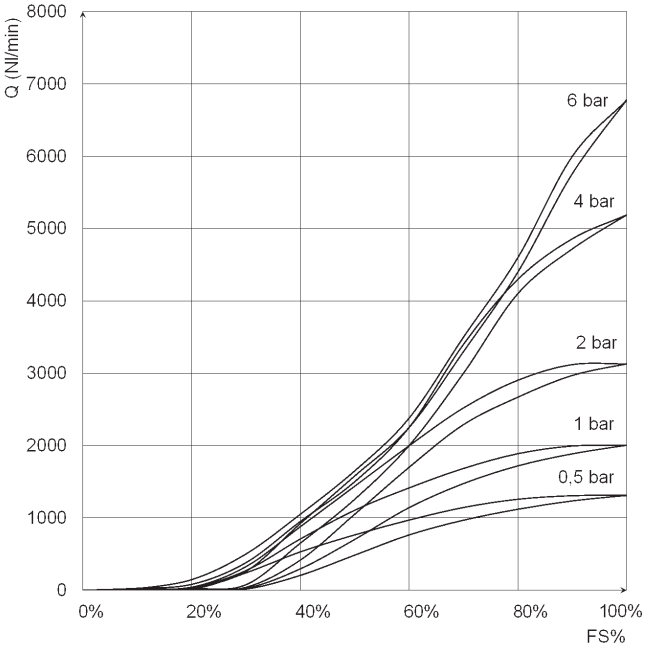
Mod.	Electrical command	Setting range
MX2-1/2-WEV810	0-10 V DC	low flow
MX2-1/2-WEA810	4-20 mA	low flow
MX2-1/2-WEV910	0-10 V DC	high flow
MX2-1/2-WEA910	4-20 mA	high flow
MX2-1/2-WEV810-LH	0-10 V DC	low flow
MX2-1/2-WEA810-LH	4-20 mA	low flow
MX2-1/2-WEV910-LH	0-10 V DC	high flow
MX2-1/2-WEA910-LH	4-20 mA	high flow
MX2-1/2-WEV810OX1	0-10 V DC	low flow
MX2-1/2-WEA810OX1	4-20 mA	low flow
MX2-1/2-WEV910OX1	0-10 V DC	high flow
MX2-1/2-WEA910OX1	4-20 mA	high flow
MX2-1/2-WEV810-LHOX1	0-10 V DC	low flow
MX2-1/2-WEA810-LHOX1	4-20 mA	low flow
MX2-1/2-WEV910-LHOX1	0-10 V DC	high flow
MX2-1/2-WEA910-LHOX1	4-20 mA	high flow

VALVE FLOW DIAGRAMS - MANIFOLD VERSION



Low flow version

Q (Nl/min) = flow
FS% = full scale command signal

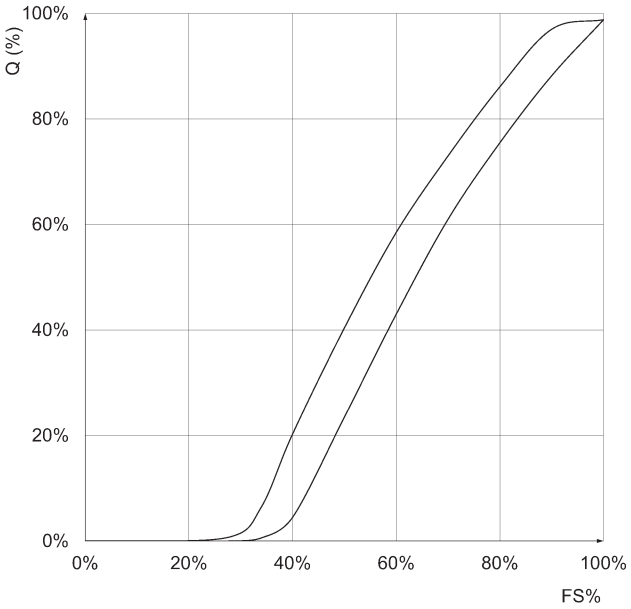


High flow version

Q (Nl/min) = flow
FS% = full scale command signal

Flow characteristic curve of a proportional valve

Q% = flow
FS% = full scale command signal

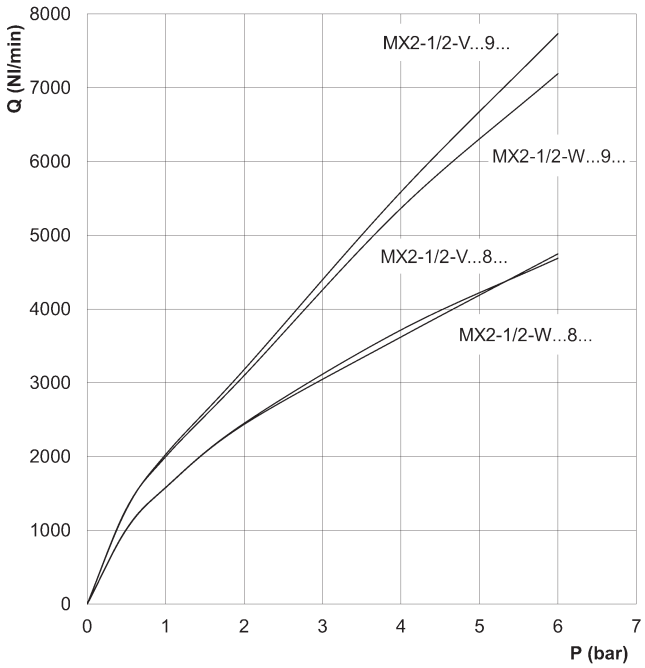


Valve maximum flow and response times

Maximum flow according to the inlet pressure

DIAGRAM LEGEND:

Q = flow (Nl/min)
P = inlet pressure (bar)



Pin	Type		Flow at steady speed [Nl/min]	Command [V]	Load response time (ms)				Exhaust réponse time (ms)			
					0-10%	0-50%	0-90%	0-99%	0-10%	0-50%	0-90%	0-99%
2 bar	Low flow	Standard	915	6	351	452.4	967.2	6240	171.6	284.7	487.5	624
		Manifold	1000	6.3	327.6	421.2	951.6	6162	249.6	366.6	577.2	780
	High flow	Standard	960	4.7	331.5	444.6	1279.2	6942	245.7	329.16	526.5	702
		Manifold	960	4.2	313	420	1156	9700	200	340	540	800
4 bar	Low flow	Standard	952	5.4	319.8	436.8	1029.6	7410	187.2	304.2	491.4	624
		Manifold	925	5.3	284.7	408.72	1474.2	6240	237.9	370.5	557.7	897
	High flow	Standard	970	4.4	279.24	429	1177.8	7878	225	351	526.5	741
		Manifold	940	3.8	230	400	1680	8500	175	360	580	900

Set flow: about 1000 Nl/min

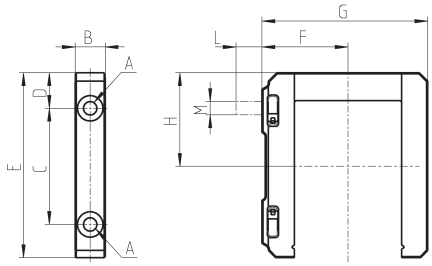
Rapid clamp kit

The kit MX2-X is supplied with:
1 rapid clamp, 1 O-ring OR 3125 *,
2 exagonal nuts M5, 2 screws M5x69.

The kit MX2-Z is supplied with:
1 rapid clamp, 1 O-ring OR 3125 *,
1 exagonal nut M5, 1 screw M5x69,
1 screw M5x85 for wall fixing.

* it can be ordered separately (cod. 160-39-11/19)

Materials: technopolymer clamp, NBR O-ring,
zinc-plated steel nuts and screws.



DIMENSIONS

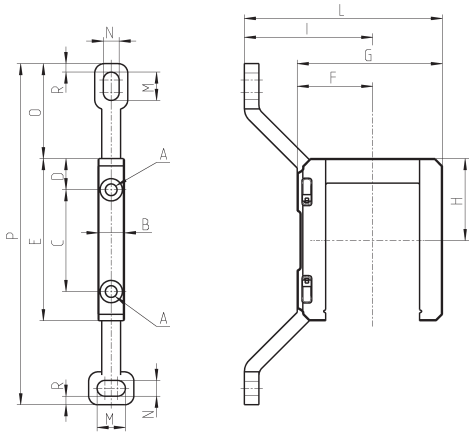
Mod.	A	B	C	D	E	F	G	H	L	M	Notes
MX2-X	5.2	12	46	14	73.5	37.5	70.5	37	-	-	
MX2-Z	5.2	12	46	14	73.5	37.5	70.5	37	14	M5	kit with wall fixing screw

Rapid clamp kit with wall fixing brackets

The kit MX2-Y is supplied with:
1 wall rapid clamp, 1 O-ring OR 3125 **, 2 exagonal nuts, 2 screws M5x69.

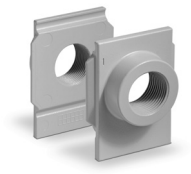
** it can be separately ordered (cod. 160-39-11/19)

Materials: technopolymer clamp, NBR O-ring,
zinc-plated steel nuts and screws.



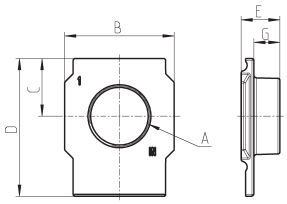
Mod.	A	B	C	D	E	F	G	H	I	L	M	N	O	P	R
MX2-Y	5,2	12	46	14	73,5	32,5	70,5	37	70,5	103	12	6,5	42	152	4

Terminal flanges (IN/OUT)



The kit is supplied with:
- 1 flange INLET side
- 1 flange OUTLET side

Materials: painted aluminium flanges.



Mod.	A	B	C	D	E	G
MX2-1/2-FL	G1/2	50	26,5	63,5	17	11

Rapid clamps kit + flanges

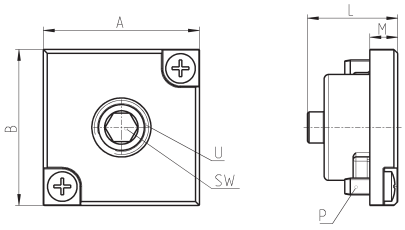
Mod.	The kit is supplied with:
MX2-1/2-HH	1x MX2-1/2-FL + 2x MX2-X
MX2-1/2-JJ	1x MX2-1/2-FL + 2x MX2-Z

Rapid clamps kit with wall fixing brackets + flanges

Mod.	The kit is supplied with:
MX2-1/2-KK	1x MX2-1/2-FL + 2x MX2-Y

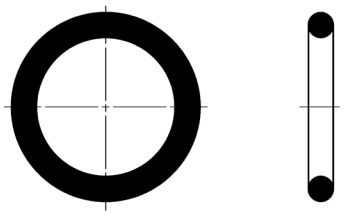
Block for pressure gauge fixing

The kit is supplied with:
1 block
1 grain
2 screws
1 seal



DIMENSIONS							
Mod.	A	B	L	M	P	U	SW
MX2-R26/1-P	28	28	16.5	5	M3X7	1/8	5

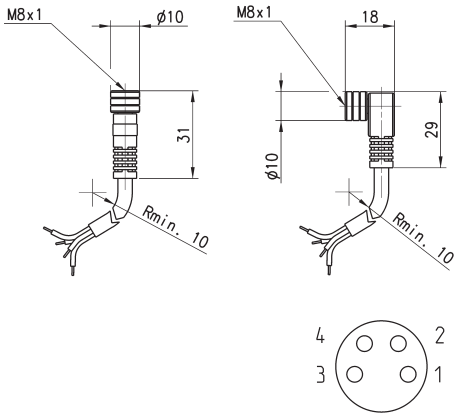
O-ring for assembling



Mod.	O-ring	For assembly
160-39-11/19	OR 3125	MX2

Circular M8 4-pole connectors, Female

With PU sheathing, non shielded cable.
Protection class: IP65



Mod.	Type of connector	Cable length (m)
CS-DF04EG-E200	straight	2
CS-DF04EG-E500	straight	5
CS-DR04EG-E200	right angle (90 degrees)	2
CS-DR04EG-E500	right angle (90 degrees)	5

NOTES

Series N filter-regulators

New version

Ports G1/8, G1/4

» Available with: transparent PA12 bowl or nickel-plated brass bowl for the small version (N1)

The version with metal bowl is particularly suitable for applications subject to impacts or in the presence of aggressive agents that could damage the PA12 bowl.

**Series N filter-regulator is available with G1/4 and G1/8 ports.
Its design incorporates a self relieving diaphragm. The transparent filter bowl allows an easy monitoring of the condensate level. The semi-automatic manual drain makes both the manual and automatic condensate exhaust easier when there is no pressure.**

GENERAL DATA

Construction	HDPE and coalescing filtering element
Materials	brass body and poppet stainless steel spring NBR O-ring HDPE filtering element transparent PA12 or nickel-plated bowl others: PA
Ports	G1/8 - G1/4
Max. condensate capacity	11 cm^3 (bowl size = 1) 28 cm^3 (bowl size = 2)
Weight	0.370 Kg
Pressure gauge ports	G1/8
Mounting	vertical, in-line
Operating temperature	-5°C ÷ 50°C a 10 bar (with the dew point of the fluid lower than 2°C at the min. working temperature)
Quality of delivered air according to ISO 8573-1 2010	Class 7.8.4 with 25 µm filtering element Class 6.8.4 with 5 µm filtering element
Draining of condensate	see the coding example
Inlet pressure	with standard drain and protected depressurisation 0.3 ÷ 16 bar
Outlet pressure	with depressurisation drain 0.3 ÷ 10 bar
Nominal flow	see FLOW DIAGRAMS on the following pages
Secondary pressure relieving	with relieving (standard) without relieving
Fluid	compressed air

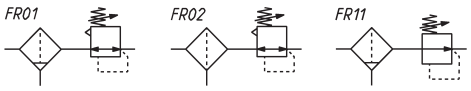
CODING EXAMPLE

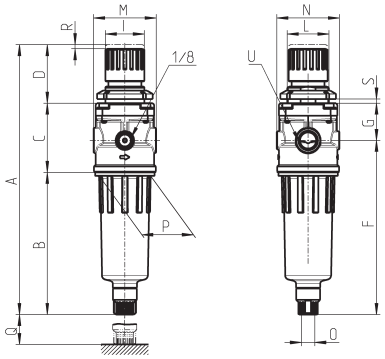
N	2	04	-	D	0	0	-	4	-	

N	SERIES
2	SIZE: 1 = small bowl (11 cm³) 2 = normal bowl (28 cm³)
04	PORTS: 08 = G1/8 04= G1/4
D	D = FILTER-REGULATOR
0	FILTERING ELEMENT: 0 = 25µm (standard) 1 = 5µm
0	DRAINING OF CONDENSATE (further details in the dedicated section) AND DESIGN TYPE: 0 = semi-automatic manual drain with self-relieving 1 = semi-automatic manual drain without relieving 4 = depressurisation with self-relieving (with normal bowl only) 5 = protected depressurisation with self-relieving (with normal bowl only) 8 = no drain (direct port 1/8), with self-relieving
4	OPERATING PRESSURE: = 0.5 ÷ 10 bar (standard) 2 = 0 ÷ 2 bar 4 = 0 ÷ 4 bar 7 = 0.5 ÷ 7 bar
	BOWL MATERIAL: = transparent PA12 (standard) TM = nickel-plated brass (only in the small size with semi-automatic manual drain or without drain)

Series N filter-regulators

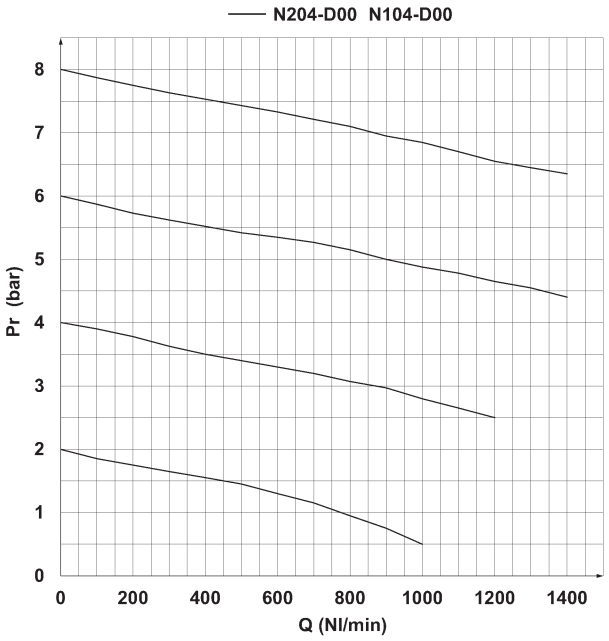
FR01 = filter-regulator with relieving and manual drain
FR02 = FR with relieving and without drain
FR11 = FR with manual drain and wiithout relieving





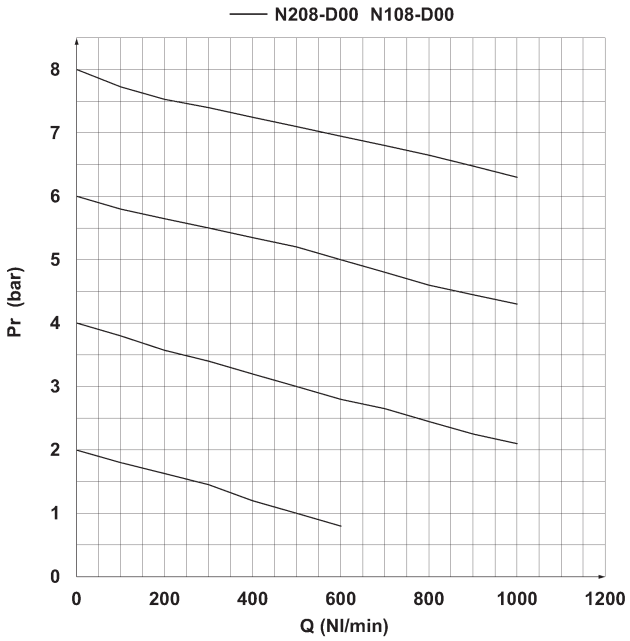
Mod.	A	B	C	D	F	G	I	L	M	N	O	P	Q	R	S	U
N108-D00	167	78	50	39	101	27	28	M30x1,5	45	45	G1/8	38	40	3	0 ÷ 6	G1/8
N104-D00	167	78	50	39	101	27	28	M30x1,5	45	45	G1/8	38	40	3	0 ÷ 6	G1/4
N208-D00	191	102	50	39	125	27	28	M30x1,5	45	45	G1/8	38	40	3	0 ÷ 6	G1/8
N204-D00	191	102	50	39	125	27	28	M30x1,5	45	45	G1/8	38	40	3	0 ÷ 6	G1/4

FLOW DIAGRAMS



Flow diagrams for models: N204-D00 - N104-D00

Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Qn = Flow (Nl/min)



Flow diagrams for models: N208-D00 - N108-D00

Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Qn = Flow (Nl/min)

Series CLR micro pressure regulators

New models

Ports G1/4, G1/8
With banjo stem with or without relieving
Available with or without banjo

Series CLR micro pressure regulators are available with G1/8 and G1/4 connections. A piston with or without relieving and VS function (by-pass valve) has been incorporated into its design. The body is in brass, while the connection fitting is in technopolymer which guarantees maximum lightness. They can be supplied with or without banjo and can be console mounted.

With a threaded top part of the body both direct mounting to a valve outlet (1/8 and 1/4 threads) and console mounting are easily facilitated.
The pressure is precisely regulated simply by turning the polymer knob with a locking nut available to set the desired output.

- Extremely lightweight
- Compact
- In-line or console mounting

GENERAL DATA

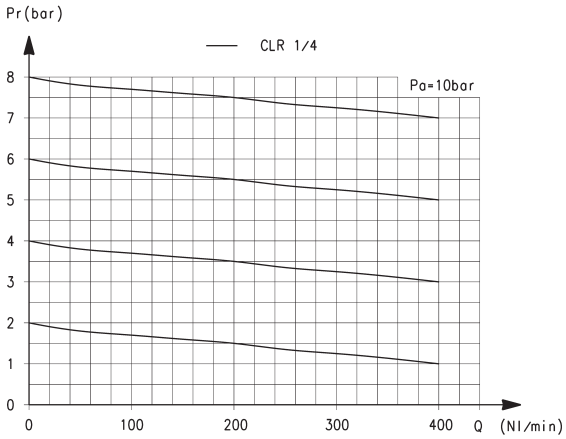
Construction	piston
Materials	brass body, technopolymer banjo, stainless steel spring; NBR O-ring
Ports	G1/8 - G1/4
Weight	Kg 0,035
Mounting	in-line or panel mounting (in any position)
Operating temperature	-5°C ÷ 50°C (with the dew point of the fluid lower than 2°C at the min. working temperature)
Inlet pressure	2 ÷ 10 bar
Outlet pressure	0,5 ÷ 10 bar
Nominal flow	see FLOW DIAGRAMS on the following pages
Secondary pressure (relieving)	with relieving (standard) without relieving (all regulators are provided with high relief flow VS function)
Fluid	compressed air

CODING EXAMPLE

CL	R		1/8	-	01	-	4

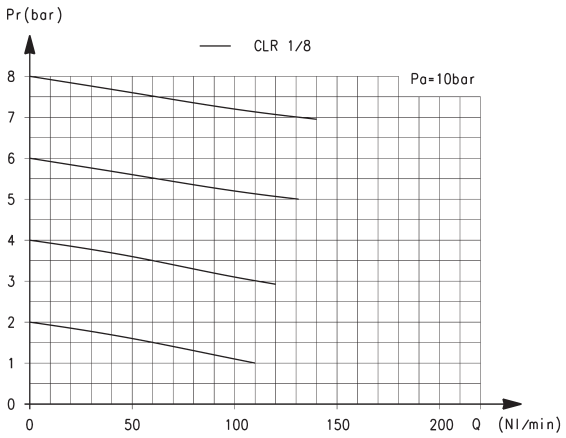
CL	SERIES:
R	R = REGULATOR
1/8	PORTS: 1/8 = G1/8 1/4 = G1/4
01	DESIGN TYPE: = with relieving 01 = without relieving
4	TUBE: = without banjo 4 = single technopolymer banjo with tube diameter Ø4 mm (only CLR 1/8) 6 = single technopolymer banjo with tube diameter Ø6 mm 8 = single technopolymer banjo with tube diameter Ø8 mm 1/8L = single metal banjo with thread G1/8 (only CLR 1/8) 1/8D = double metal banjo with double thread G1/8 (only CLR 1/8)

FLOW DIAGRAMS at 6 bar with ΔP1



Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

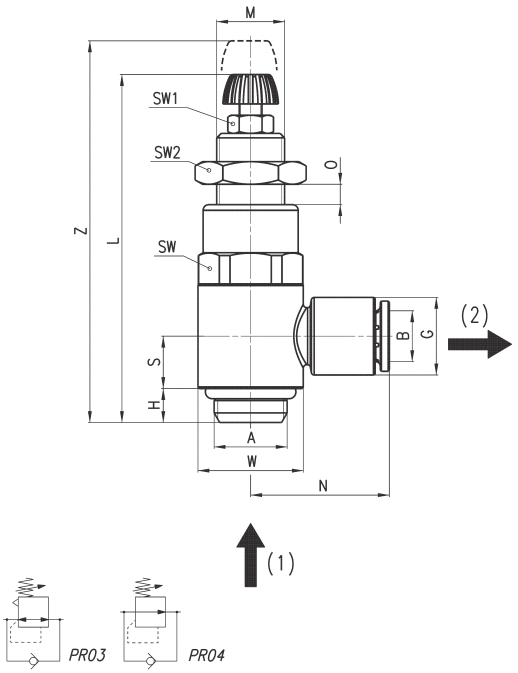
CLR 1/4-6 = 209 Nl/min
CLR 1/4-8 = 310 Nl/min



Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

CLR 1/8-4 = 90 Nl/min
CLR 1/8-6 = 120 Nl/min
CLR 1/8-8 = 120 Nl/min

Series CLR Micro pressure regulators with banjo

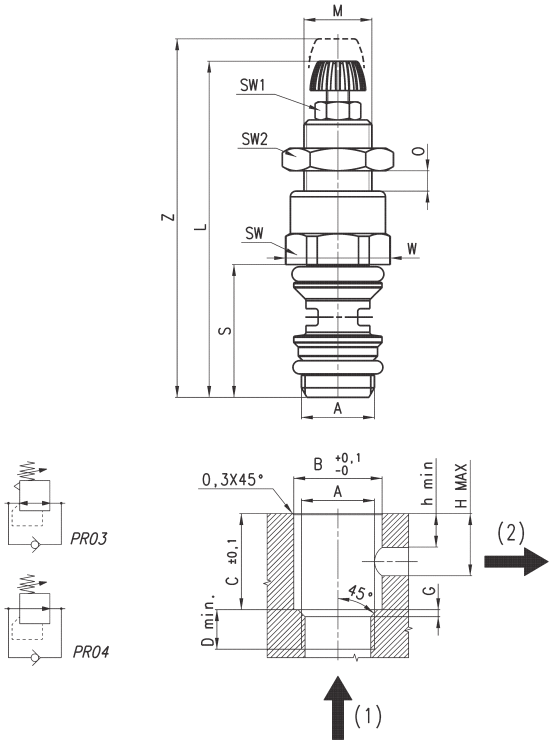


Mod.	A	B	G	H	L	M	N	O	S	W	SW	SW1	SW2	Z
CLR 1/8-4	G1/8	4	11.6	5	52	M11x1	21	0 ÷ 6.5	7.75	14	14	7	14	59
CLR 1/8-6	G1/8	6	11.6	5	52	M11x1	21	0 ÷ 6.5	7.75	14	14	7	14	59
CLR 1/8-8	G1/8	8	13.9	5	52	M11x1	22.5	0 ÷ 6.5	7.75	14	14	7	14	59
CLR 1/4-6	G1/4	6	13.9	6	59.5	M12x1	24.5	0 ÷ 8	9.25	18.6	17	7	17	68
CLR 1/4-8	G1/4	8	13.9	6	59.5	M12x1	24.5	0 ÷ 8	9.25	18.6	17	7	17	68

DRAWING NOTE
(1) = inlet pressure
(2) = regulated pressure

PR03 = Regulator with relieving and by-pass valve
PR04 = Regulator without relieving and with by-pass valve

Series CLR Micro pressure regulators without banjo



DIMENSIONS

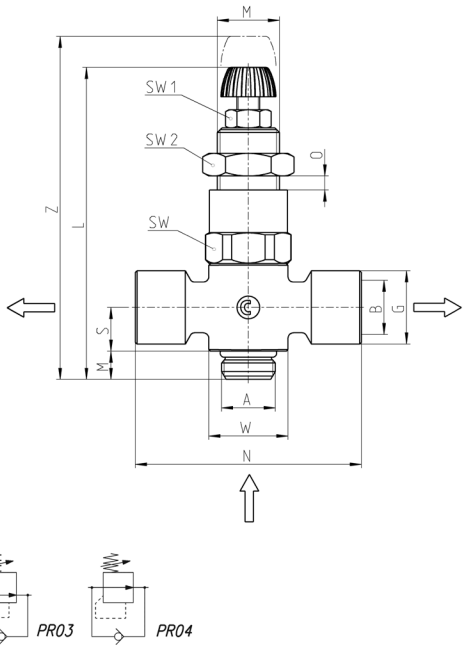
Mod.	A	B	C	D min	G	h min	H MAX	L	M	O	S	W	SW	SW1	SW2	Z
CLR 1/8	G1/8	11	15.5	6	1	5.5	10	52	M11x1	0÷6.5	20.5	15.2	14	7	14	59
CLR 1/4	G1/4	15.65	18.5	7	1.25	7	12	59.5	M12x1	0÷8	24.5	18.5	17	7	17	68

DRAWING NOTE
(1) = inlet pressure
(2) = regulated pressure

PR03 = Regulator with relieving and by-pass valve
PR04 = Regulator without relieving and with by-pass valve

Series CLR Micro pressure regulators with double banjo

New model



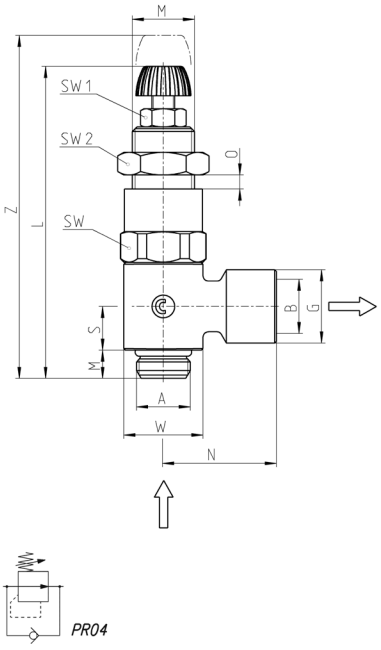
Mod.	A	B	G	H	L	M	N	O	S	W	SW	SW1	SW2	Z
CLR 1/8-1/8D	G1/8	G1/8	13	5	52	M11x1	40	0 ÷ 6.5	7.75	14	14	7	14	59

DRAWING NOTE
(1) = inlet pressure
(2) = regulated pressure

PR03 = Regulator with relieving and by-pass valve
PR04 = Regulator without relieving and with by-pass valve

Series CLR Micro pressure regulators with banjo

New model



Mod.	A	B	G	H	L	M	N	O	S	W	SW	SW1	SW2	Z
CLR 1/8-1/8L	G1/8	G1/8	13	5	52	M11x1	20	0 ÷ 6.5	7.75	14	14	7	14	59

DRAWING NOTE
(1) = inlet pressure
(2) = regulated pressure

PR03 = Regulator with relieving and by-pass valve
PR04 = Regulator without relieving and with by-pass valve

Series TC
pressure microregulators

For applications with oxygen, without relieving
Ports: cartridge construction, G1/8 and 1/8 NPTF

- Compact design
- High performance
- Easy to install
- Materials suitable with several gases

The Series TC pressure regulator has been designed to be used for all the applications and equipment where it is needed to insert the single component in customized integrated pneumatic circuits (manifolds) or collectors.

The cartridge design and the compact size allow the regulator to be plugged in a proper seat, making the installation easier and reducing the assembly time. To produce the new TC regulator, materials have been analized and chosen on the basis of their suitability with the contact medium. The body in PPS and the seals in FKM ensure thus full compatibility with a wide range of gaseous fluids.

GENERAL DATA

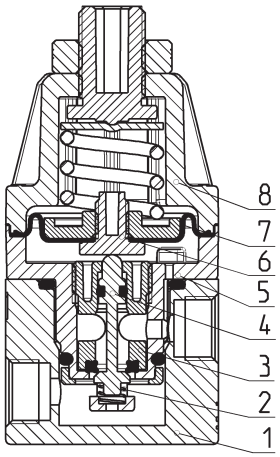
Construction	compact with pre-formed diaphragm
Materials	see the TABLE OF MATERIALS on the following page
Ports	cartridge construction in manifold - G1/8 or 1/8NPTF (aluminium body version only)
Mounting	in-line or cartridge (any position)
Operating temperature	-5°C ÷ 50°C
Inlet pressure	0 ÷ 10 bar
Outlet pressure	0 ÷ 0.5 bar; 0 ÷ 2 bar; 0 ÷ 3 bar; 0 ÷ 4 bar
Overpressure exhaust	without relieving
Nominal flow	see FLOW DIAGRAMS on the following pages
Medium	air, inert and medical gases, OXYGEN
Repeatability	±0.2% FS

CODING EXAMPLE

TC	1	-	R	3	1	-	C	-	V	-	OX2

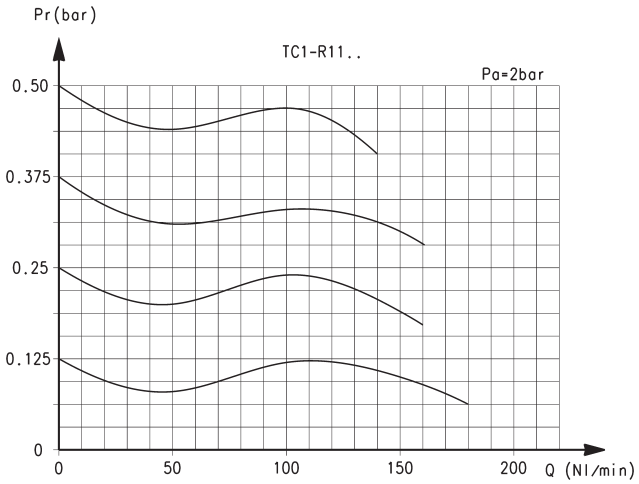
TC	SERIES
1	SIZE
R	REGULATOR
3	WORKING PRESSURE: 1 = 0 ÷ 0.5 bar 2 = 0 ÷ 2 bar 3 = 0 ÷ 3 bar 4 = 0 ÷ 4 bar
1	TYPE OF CONSTRUCTION: 1 = without relieving
C	PORTS: C = Cartridge 1/8 = G1/8 1/8TF = 1/8NPTF
V	SEALS MATERIAL: V = FKM
OX2	VERSIONS: OX1 = for oxygen (non-volatile residue lower than 550 mg/m^2) OX2 = for oxygen (non-volatile residue lower than 33 mg/m^2)

Series TC pressure microregulators - materials



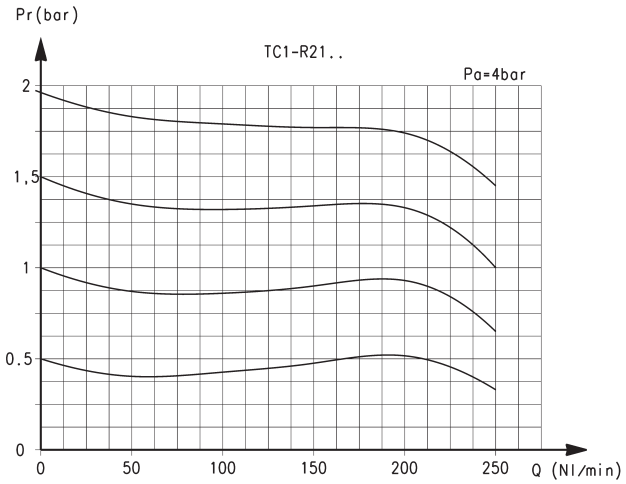
PARTS	MATERIALS
1. Base body	Anodized aluminium
2. Lower spring	Stainless steel
3. Insert	PPS
4. Poppet	Stainless steel
5. Body	PPS
6. Valve guide	PPS
7. Diaphragm	FKM
8. Bell	Polyamide
Seals	FKM

FLOW DIAGRAMS - 0.5 and 2 bar working pressure



Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

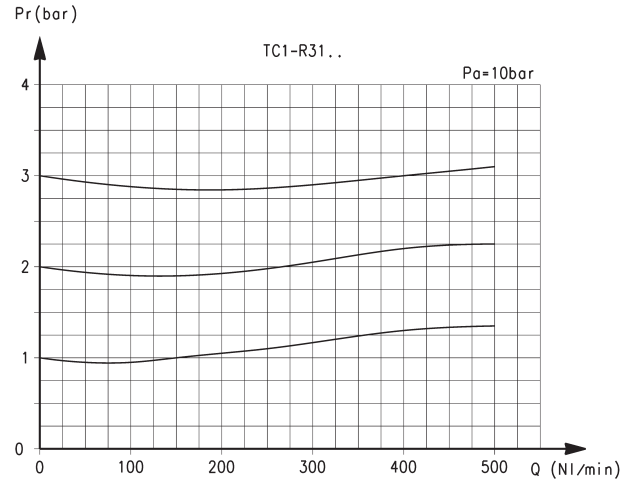
Pa = Inlet pressure (bar)



Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

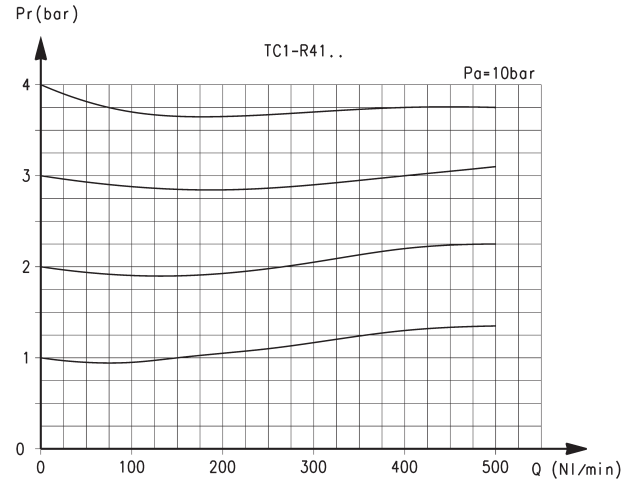
Pa = Inlet pressure (bar)

FLOW DIAGRAMS - 3 and 4 bar working pressure



Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

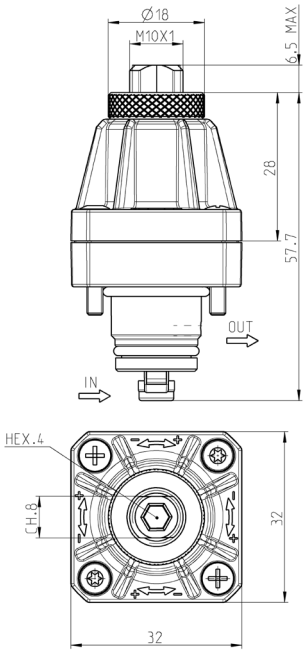
Pa = Inlet pressure (bar)



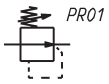
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

Pa = Inlet pressure (bar)

Series TC cartridge pressure microregulators



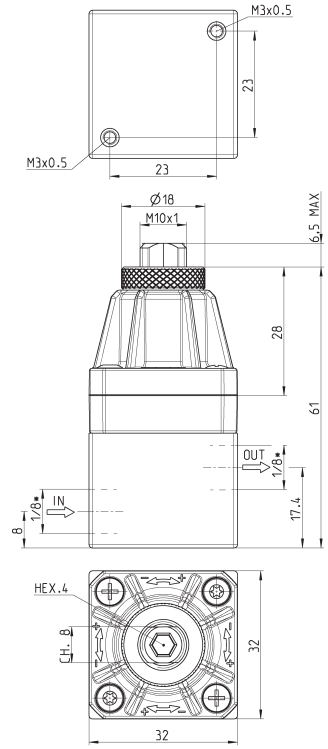
Mod.
TC1-R11-C-V-OX1
TC1-R11-C-V-OX2
TC1-R21-C-V-OX1
TC1-R21-C-V-OX2
TC1-R31-C-V-OX1
TC1-R31-C-V-OX2
TC1-R41-C-V-OX1
TC1-R41-C-V-OX2



PR01 = regulator without relieving

Series TC pressure microregulators with aluminium body

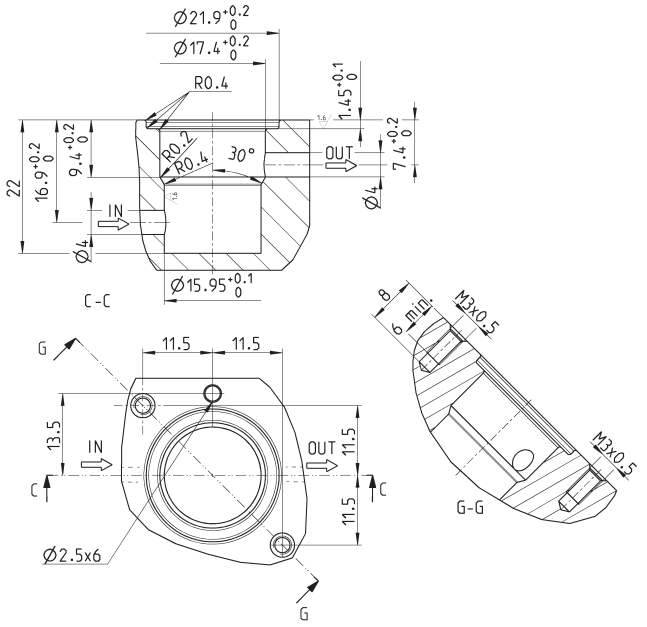
* to choose the type of thread (G1/8 or 1/8 NPTF) see the Coding example



Mod.
TC1-R11-*-V-OX1
TC1-R11-*-V-OX2
TC1-R21-*-V-OX1
TC1-R21-*-V-OX2
TC1-R31-*-V-OX1
TC1-R31-*-V-OX2
TC1-R41-*-V-OX1
TC1-R41-*-V-OX2

PR01 = regulator without relieving

Seat dimensions for cartridge version



Series M pressure microregulators for use with water and fluids

Ports G1/8, G1/4

- Versions with certified diaphragms and seals materials available
- Version with non nickel-plated body for applications with water or fluids (gaseous or liquid) available

Series M pressure regulator is available with G1/8 and G1/4 ports.

The versions with non nickel-plated body are equipped with KTW certified seals and can be thus used with water or non aggressive fluids.

GENERAL DATA

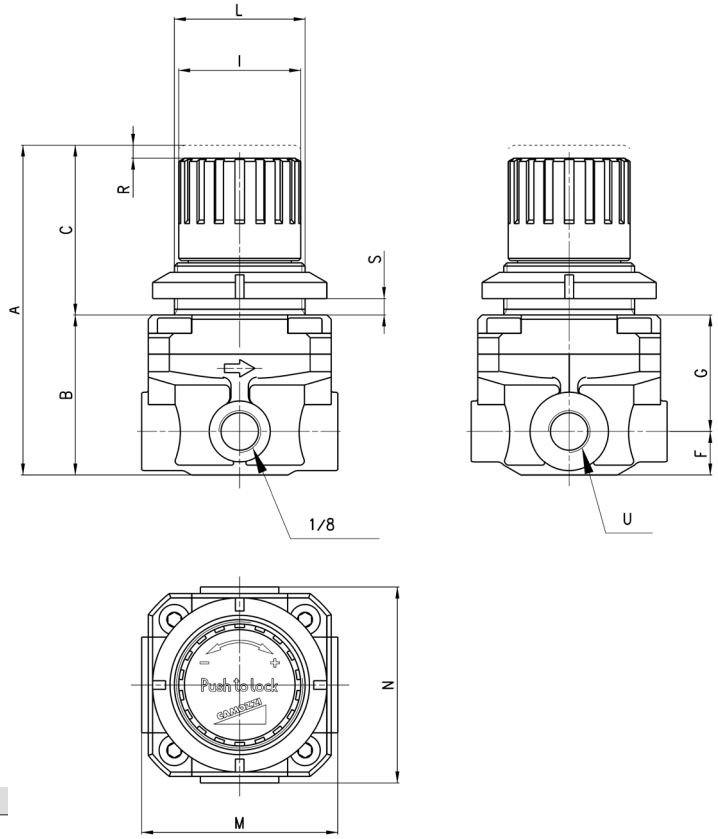
Construction	diaphragm type
Materials	body: non nickel-plated brass spring: stainless steel seals: diaphragm in EPDM (H versions only)
Ports	G1/8 - G1/4
Weight	Kg 0.235
Pressure gauge ports	G1/8
Mounting	in-line or panel mounting (in any position)
Operating temperature	10°C ÷ 50°C with water
Inlet pressure	0 ÷ 16 bar
Outlet pressure	0.5 ÷ 10 bar
Nominal flow	air: Qn 480 (Nl/min) water: Kv 0.42 (N3h)

CODING EXAMPLE

M	0	04	-	R	0	1	-	H

M	SERIES
0	SIZE
04	PORTS: 08 = G1/8 04 = G1/4
R	REGULATOR
0	OPERATING PRESSURE: 0 = 0.5 ÷ 10 bar
1	DESIGN TYPE: 1 = non relieving
H	VERSION: H = for use with water F = for use with various fluids

Series M pressure microregulator



DIMENSIONS												
Mod.	A	B	C	F	G	I	L	M	N	R	S	U
M008-R01-H	76	37	39	10	27	28	M30x1,5	45	45	3	0 ÷ 6	G1/8
M008-R01-F	76	37	39	10	27	28	M30x1,5	45	45	3	0 ÷ 6	G1/8
M004-R01-H	76	37	39	10	27	28	M30x1,5	45	45	3	0 ÷ 6	G1/4
M004-R01-F	76	37	39	10	27	28	M30x1,5	45	45	3	0 ÷ 6	G1/4

Series T pressure microregulators

Ports G1/8 and G1/4

- Extremely lightweight
- Compact
- In-line or console mounting

Series T pressure regulators are available with G1/8 and G1/4 brass connections. A self-relieving piston has been incorporated into the design to allow decreasing adjustments. Non-relieving versions are also available.

All models are equipped with a by-pass valve which is useful when a regulator should be inserted between the valve and cylinder (or capacity) without any negative influence on the exhaust.

GENERAL DATA

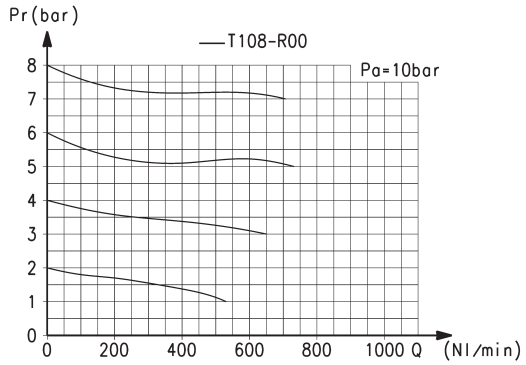
Construction	piston
Materials	technopolymer body and piston, stainless steel spring, brass inserts, NBR O-ring and poppet
Ports	G1/8 - G1/4
Weight	g 95
Pressure gauge ports	G1/8
Mounting	in-line or panel mounting (in any position)
Operating temperature	-5°C ÷ 50°C (with the dew point of the fluid lower than 2°C at the min. working temperature)
Inlet pressure	0 ÷ 12 bar
Outlet pressure	0.5 ÷ 10 bar (standard) 0 ÷ 2 bar 0 ÷ 4 bar 0.5 ÷ 7 bar
Nominal flow	see FLOW DIAGRAMS on the following pages
Secondary pressure relieving	with relieving (standard) without relieving (all regulators are provided with high relief flow VS function)
fluid	compressed air

CODING EXAMPLE

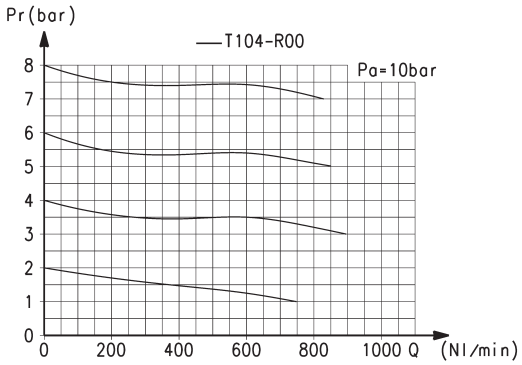
T	1	08	-	R	0	0	2

T	SERIES		
1	SIZE		
08	PORTS: 08 = G1/8	04 = G1/4	
R	REGULATOR		
0	OPERATING PRESSURE: 0 = 0,5 ÷ 10 1 = 0 ÷ 4	2 = 0 ÷ 2 7 = 0 ÷ 7 (standard)	
0	DESIGN TYPE: 0 = self-relieving; 1 = non relieving		
2	MANOMÈTRES: ** = sans manomètre (standard) 1 = avec manomètre 0-2,5, avec pression de travail 0÷2 bar 2 = with pressure gauge 0-6, with working pressure 0÷4 bar	3 = with pressure gauge 0-10, with working pressure 0,5÷7 bar 4 = with pressure gauge 0-12, with working pressure 0,5÷10 bar	** les manomètres sont fournis démontage manomètres mod. M043-P ..

FLOW DIAGRAMS

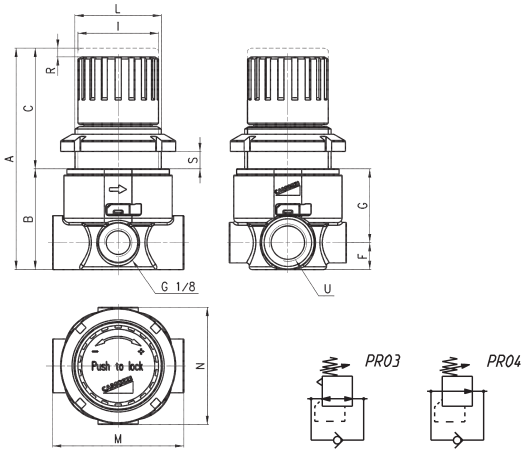


Flow diagram for model: T108-R00
Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)



Flow diagram for model: T104-R00
Pa = Inlet pressure (bar)
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)

Series T pressure microregulator



DIMENSIONS												
Mod.	A	B	C	F	G	I	L	M	N	R	S	U
T108-R00	77	35	42	9.5	25.5	28	M30X1.5	46	41	3	7	G1/8
T104-R00	77	35	42	9.5	25.5	28	M30X1.5	46	41	3	7	G1/4

PR03 = regulator with relieving and by-pass valve

PR04 = regulator without relieving and with by-pass valve

Series PR precision regulators with manual override

Size 1 ports: G1/4
Size 2 ports: G1/4, G3/8

- High precision adjustment
- Multi-diaphragm construction to reach the highest stability
- Adjustment lock
- Compact dimensions
- Removable adjustment knob

The Series PR precision pressure regulators are ideal for applications that require a precise and stable air pressure control. The operating principle using multiple diaphragms allows the Series PR to react to even the smallest pressure variations that may occur during use.

GENERAL DATA

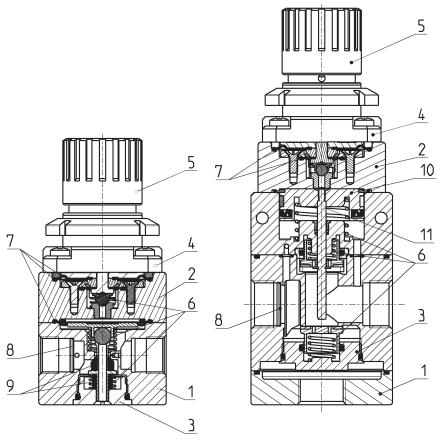
Construction	compact, multi-diaphragm type
Materials	see the following page
Ports	Size 1: G1/4 Size 2: G1/4, G3/8
Mounting	vertical in-line, wall or panel mounting (in any position)
Working temperature	0°C ÷ 50°C
Inlet pressure	0.1 ÷ 12 bar
Outlet pressure	0.05 ÷ 2 bar 0.05 ÷ 4 bar 0.05 ÷ 7 bar 0.05 ÷ 10 bar
Overpressure exhaust	with relieving (standard)
Nominal flow	see FLOW DIAGRAMS on the following pages
Media	filtered and not lubricated compressed air according to DIN ISO 8573-1 Classes 1-3-2
Hysteresis	20mbar
Repeatability	±0.2% FS
Bleed air consumption	≤ 5 l/min

CODING EXAMPLE

PR	1	04	-	M	07

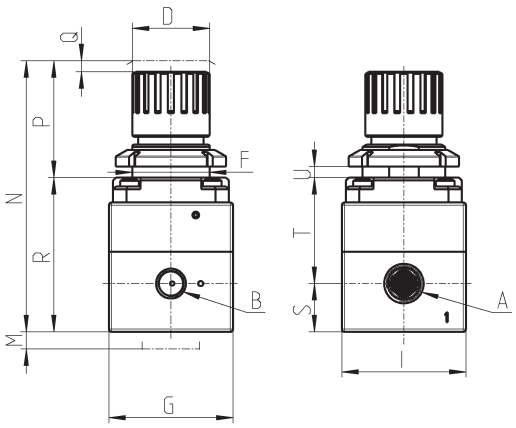
PR	SERIES
1	SIZE: 1 = size 1 2 = size 2
04	PORTS: 04 = G1/4 38 = G3/8 (size 2 only)
M	TYPE OF ADJUSTMENT: M = manual
07	OPERATING PRESSURE (1 bar = 14,5 psi): 02 = 0.05 ÷ 2 bar 04 = 0.05 ÷ 4 bar 07 = 0.05 ÷ 7 bar 00 = 0.05 ÷ 10 bar

Series PR precision regulators - materials



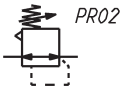
PARTS	MATERIALS
1 = Body	Anodized aluminium
2 = Intermediate body	Aluminium
3 = Valve holder plug	Brass
4 = Bell	Polyamide
5 = Regulator knob	Polyamide
6 = Springs	Stainless steel
7 = Diaphragms	NBR
8= Filters	Stainless steel
9 = Seals	NBR
10 = Piston	Aluminium
11 = Rod	Stainless steel
O-ring	NBR

Series PR precision regulators - size 1



* to complete the code, add the OPERATING PRESSURE (see the CODING EXAMPLE)

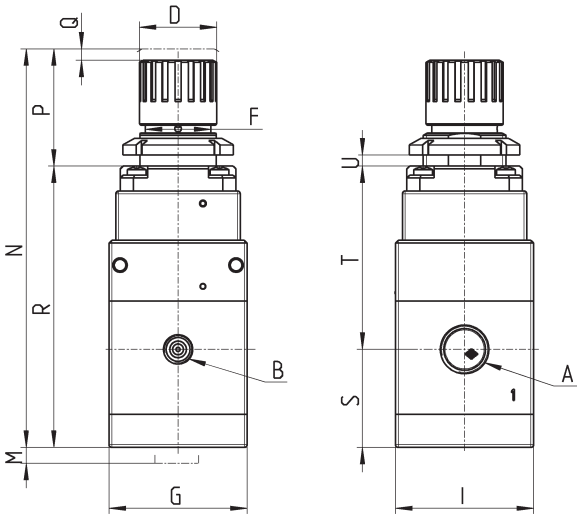
PR02 = Regulator with relieving



DIMENSIONS

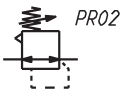
Mod.	A	B	D	F	G	I	M	N	P	Q	R	S	T	U	Weight (Kg)
PR104-M*	G1/4	G1/8	28	30	45	45	25	96	40	2	56	17.5	38.5	0-6	0.35

Series PR precision regulators - size 2



* to complete the code, add the OPERATING PRESSURE (see the CODING EXAMPLE)

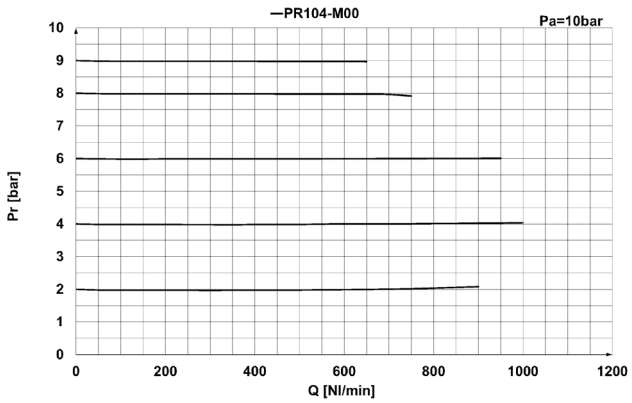
PR02 = Regulator with relieving



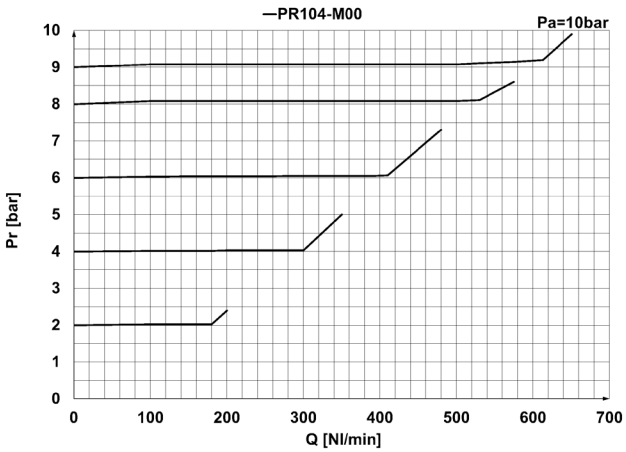
DIMENSIONS

Mod.	A	B	D	F	G	I	M	N	P	Q	R	S	T	U	Weight (Kg)
PR204-M*	G1/4	G1/8	28	30	50	50	25	140	40	2	101.8	35.5	66.3	0-6	0.645
PR238-M*	G3/8	G1/8	28	30	50	50	25	140	40	2	101.8	35.5	66.3	0-6	0.645

FLOW DIAGRAMS Mod. PR104-M00

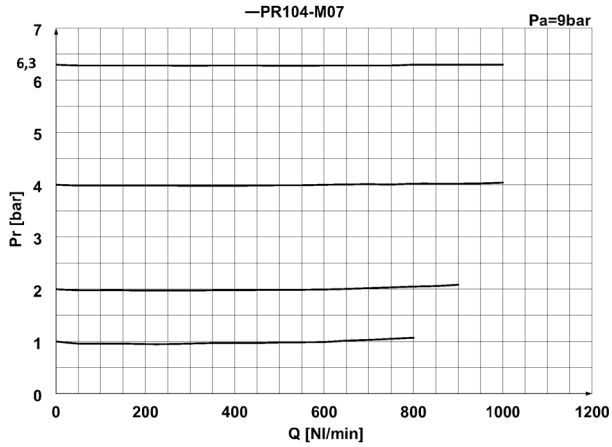


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

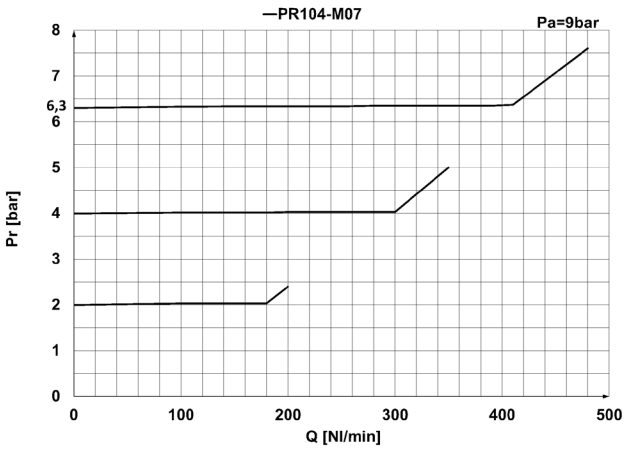


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR104-M07

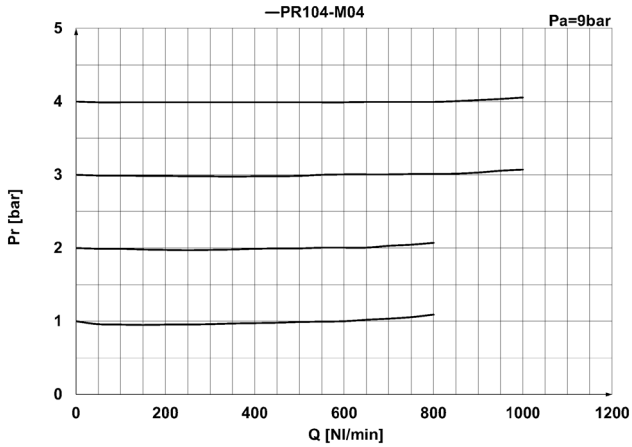


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

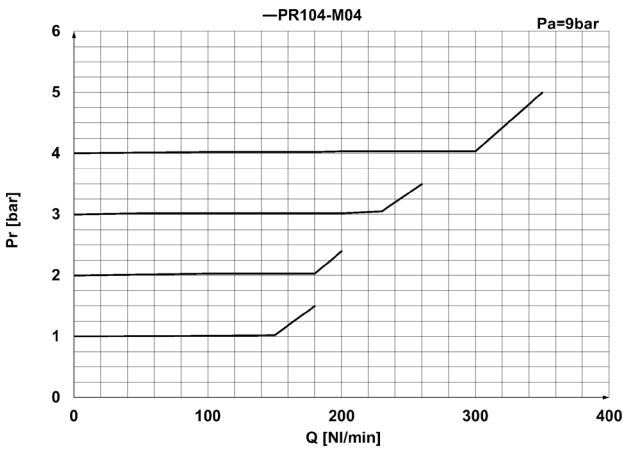


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR104-M04

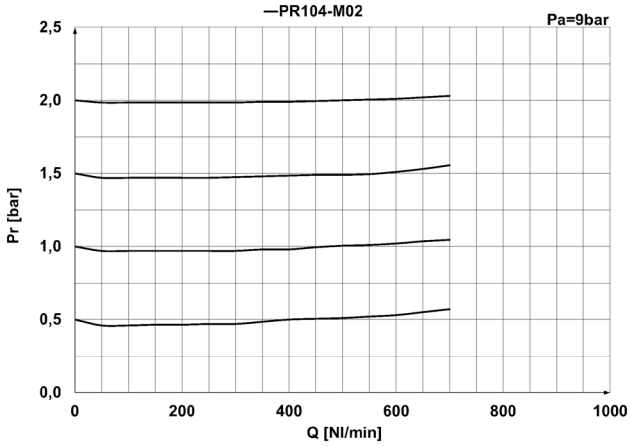


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

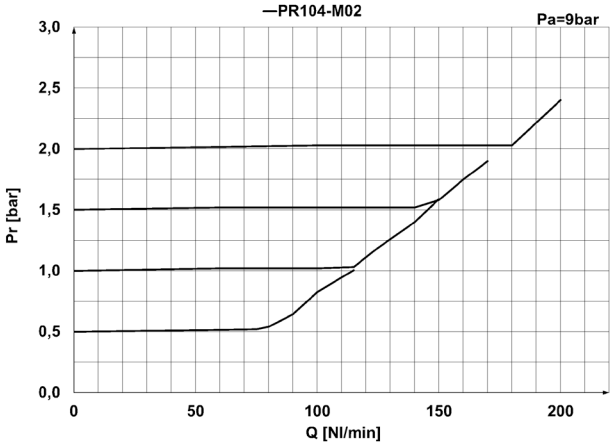


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR104-M02

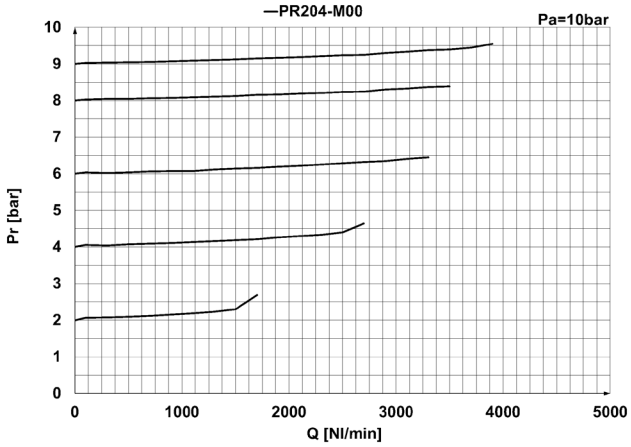


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

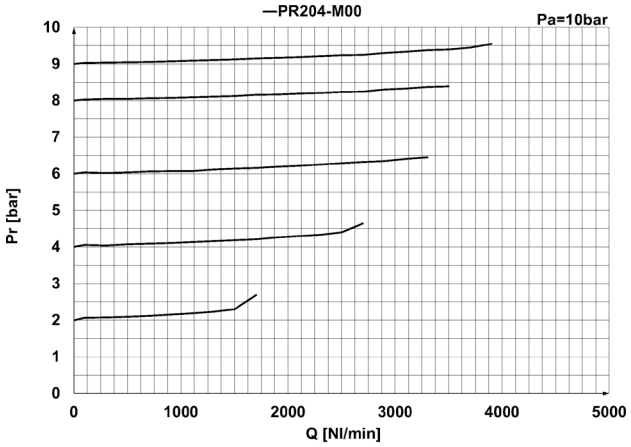


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR204-M00

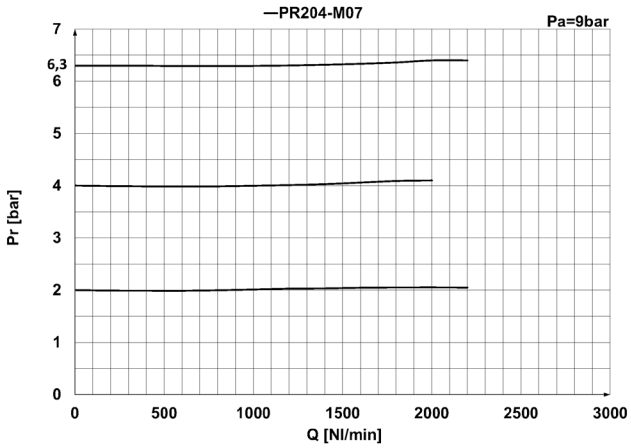


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

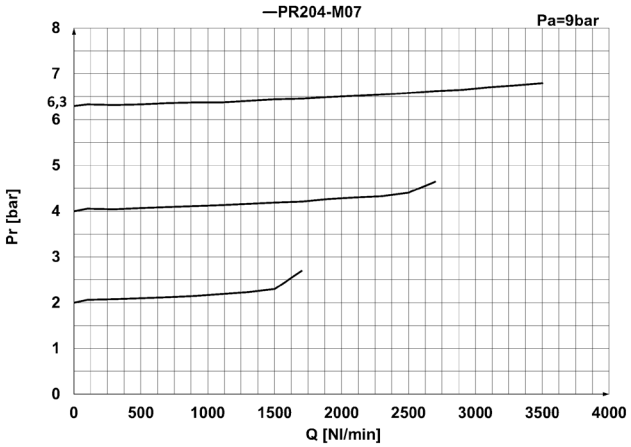


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR204-M07

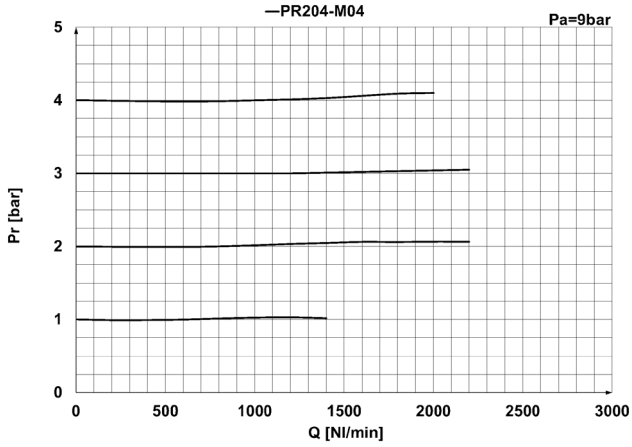


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

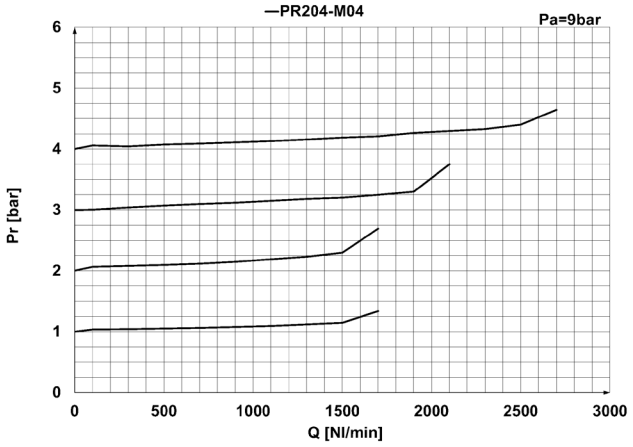


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR204-M04

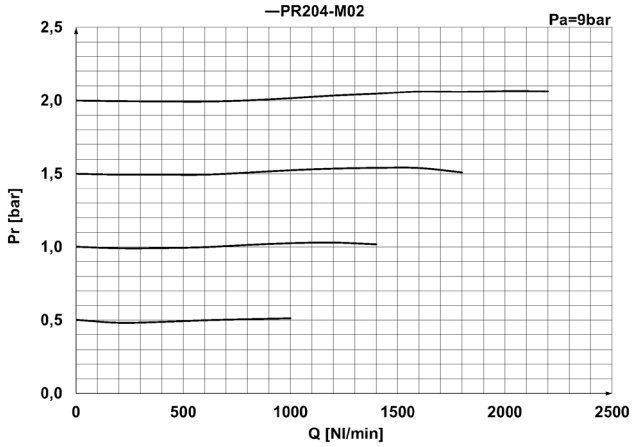


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

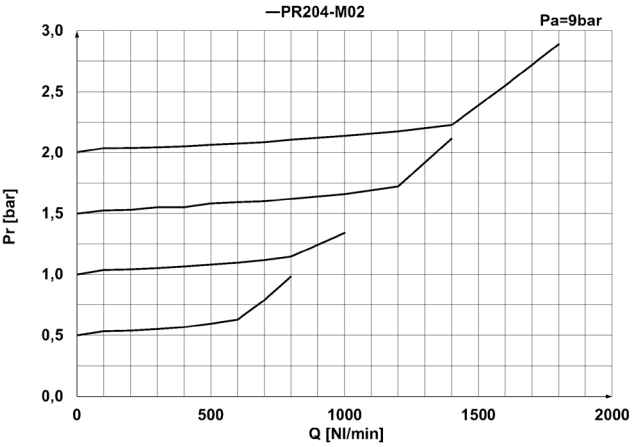


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR204-M02

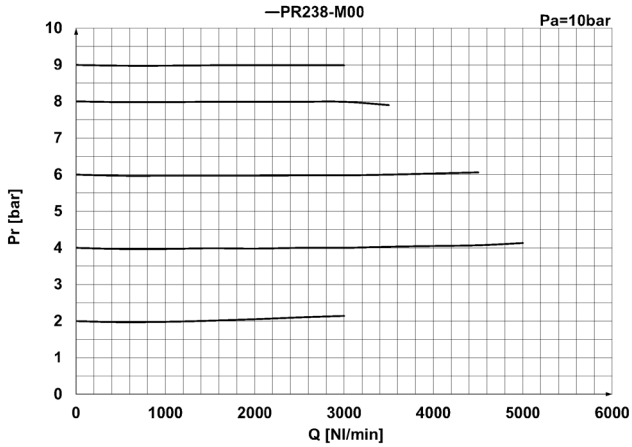


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

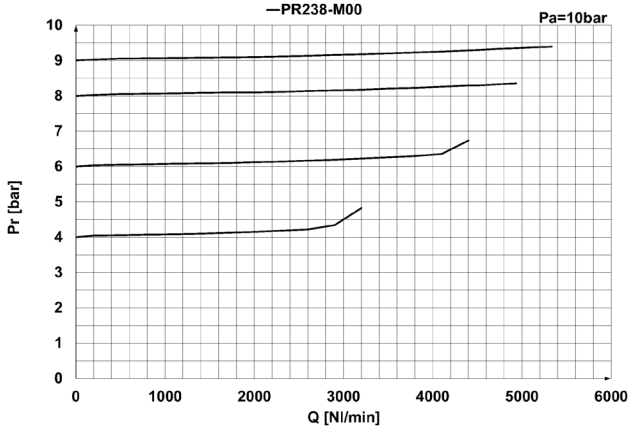


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR238-M00

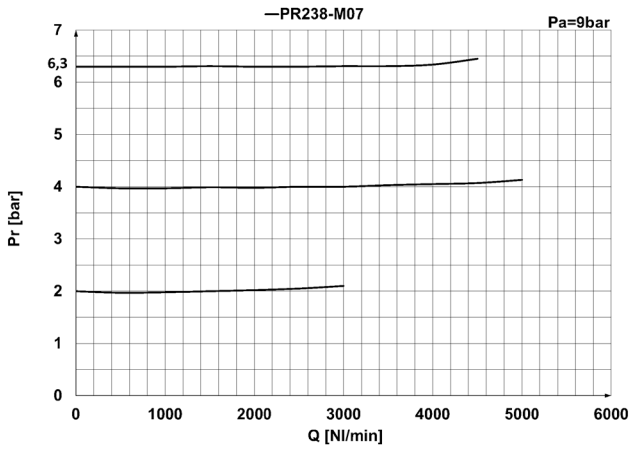


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

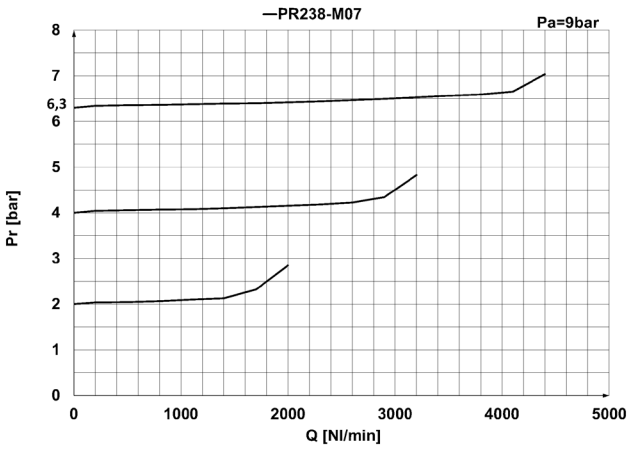


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR238-M07

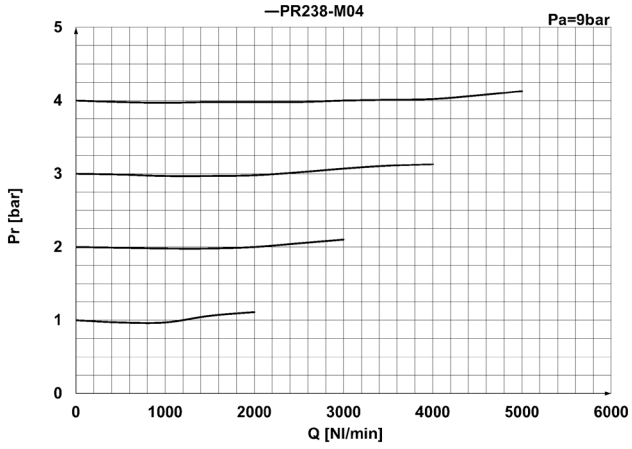


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

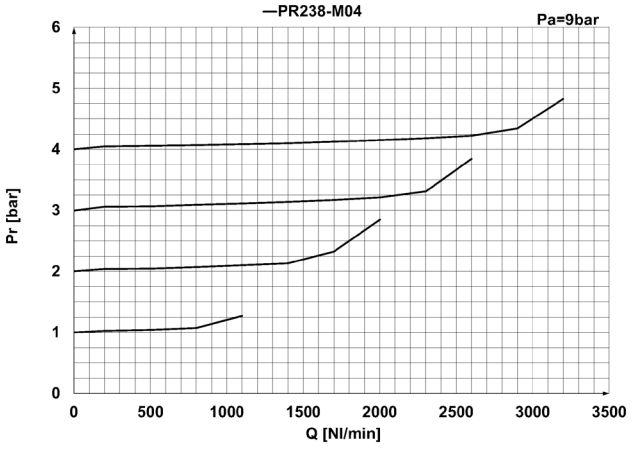


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR238-M04

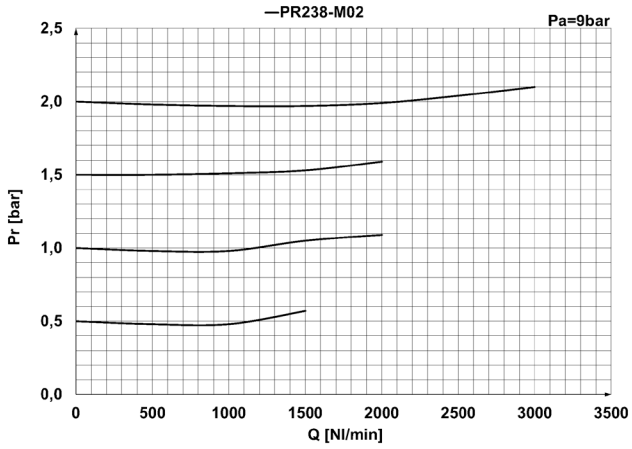


Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

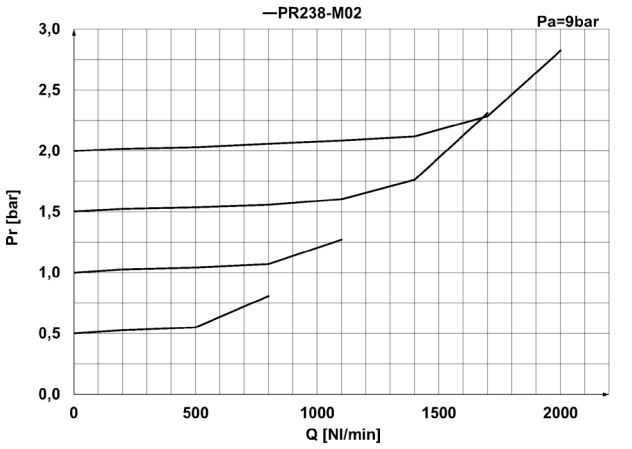


EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

FLOW DIAGRAMS Mod. PR238-M02



Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)



EXHAUST FLOW
Pr = Regulated pressure (bar)
Q = Flow (Nl/min)
Pa = Inlet pressure (bar)

Series PG digital pressure gauges

Possibility of a direct mounting with rear or panel connection

- Pressure unit on display
- Battery-powered / with cable
- Easy and fast read out with digital display
- 4 user programmable pressure units available
- Power saving mode
- Back light
- Dust-proof and splash-proof (IP65 protection class)

The new Series PG digital pressure gauges meet the need of an even more precise pressure adjustment, above all in proportional control.
Thanks to the IP65 protection class these pressure gauges are particularly suitable for applications where the highest environmental protection is required.

TECHNICAL DATA

CHARACTERISTICS

	Vacuum PG...-VB...	Pressure PG...-PB...
Pressure units	psi, bar, mmHg, kPa programmable by the user	psi, bar, kgf/cm², MPa programmable by the user
Rated pressure range	0 ÷ -1 bar	0 ÷ 10 bar
Display pressure range	0.1 ÷ -1 bar	-0.1 ÷ 10 bar
Withstand pressure	3 bar	15 bar
Repeatability	≤ ± 1% F.S. ± 1 digit	≤ ± 0,2% F.S. ± 1 digit
Resolution: kPa	1	-
MPa	-	0.001
kgf/cm²	0.01	0.01
bar	0.01	0.01
psi	0.1	0.1
Indicator accuracy	≤ ± 2% F.S. ± 1 digit (ambient temperature: 25 ± 3°C)	
Medium	Filtered air, incombustible and non-corrosive gases	
Back light	Yes	
Sample rate	2 Hz (2 times/second)	
LCD display	3 ½ digit, 7 segment	
Environment: Protection class	IP65 (an air tube must be installed to maintain this grade)	
Temperature	Operation: 0 ÷ 50°C Storage: -10 ÷ 60°C (no condensation or freezing)	
Relative humidity	Operation/storage: 35 ÷ 85% RH (no condensation)	
Vibrations	Total amplitude 1.5mm or 10G 10Hz-55Hz-10Hz scan for 1 minute 2 hours for each direction of X, Y and Z	
Shock	100 m/s² (10G) 3 times for each direction of X, Y and Z	
Changes due to temperature	≤ ± 2% F.S. of detected pressure (25°C) within the operating temperature range	
Pneumatic connections ports	G1/4 - M5 or G1/8 - M5	

FOR BATTERY-POWERED PRESSURE GAUGES ONLY

Battery: Type	CR 2032 lithium
Life	1 year (5 times/day)
Low-power indicator	Yes
Replacement	Yes
Turn-on interval	Display turns off after 60 seconds

FOR PRESSURE GAUGES WITH POWER SUPPLY CABLE ONLY

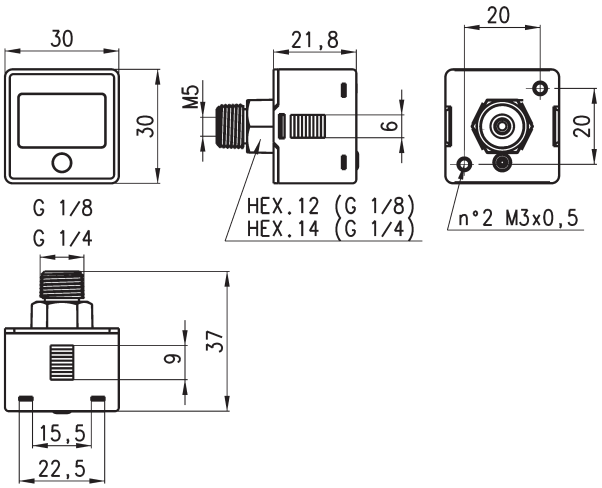
Supply voltage	from 12 to 28 V DC±10% Ripple
Power consumption	10 mA
Maximum voltage	1000V AC in 1-min (between the casing and the cables)
Isolation resistance	50 Mohm min (at 500 V DC, between the casing and the cables)
Electrical connection: for pressure gauges PG...-2	Unshielded 2-pole cable, length 2 m
for pressure gauges PG...-M	Connection with M8 4-pole connector

CODING EXAMPLE

PG	010	-	P	B	-	1/8	-	2

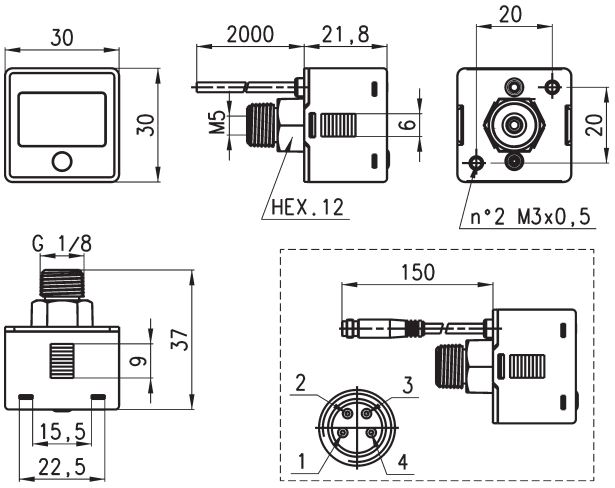
PG	SERIES
010	BOTTOM SCALE: 010 = 10 bar 001 = -1 bar
P	PRESSURE RANGE: P = pressure V = vacuum
B	LIGHTING: B = back light
1/8	PNEUMATIC CONNECTIONS: 1/8 = G 1/8 BSPP; M5 1/4 = G 1/4 BSPP; M5 (for battery-powered version only)
2	ELECTRICAL CONNECTION (for version with cable only): 2 = with unshielded 2-pole cable of 2 m M = with cable of 150 mm and M8 4-pole connector

Series PG digital pressure gauges - battery-powered



Mod.
PG010-PB-1/8
PG001-VB-1/8
PG010-PB-1/4
PG001-VB-1/4

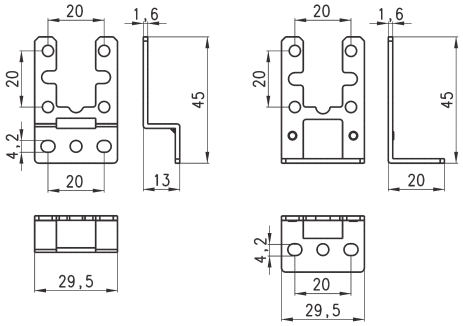
Series PG digital pressure gauges - with cable



Mod.
PG010-PB-1/8-2
PG001-VB-1/8-2
PG010-PB-1/8-M
PG001-VB-1/8-M

Mounting brackets Mod. PG-B

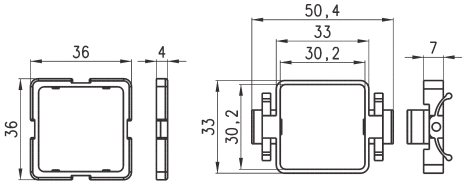
Supplied with:
1x bracket type A
1x bracket type B
2x screws M3x6



Mod.
PG-B

Panel mounting adapter Mod. PG-F

Supplied with:
1x adapter type A
1x adapter type B



Mod.
PG-F

a > Appendix

CAMOZZI

Automation

Valve islands

The control of actuation is one of the aspects that mostly affect the performance of a pneumatic circuit in industrial applications. Guaranteeing flexible and reliable components and solutions is the target that Camozzi pursues in the constant development of valve islands, conceived to satisfy all needs in terms of flow, dimensions and performance, both in the multipole and serial versions.

Series F valve islands, Multipole and Fieldbus

» Multipole integrated electrical connection (PNP)
» Valve functions: 2x2/2; 2x3/2; 5/2; 5/3 CC
» Valve size: 12 and 14mm
» Modularity: single
» Valve positions: from 2 to 24
» Manual override: Push or Push & Turn
» It can interface with all major serial communication protocols: PROFIBUS-DP, CANopen, DeviceNet, EtherNet/IP, PROFINET, EtherCAT

Series HN valve islands, Multipole and Fieldbus

» Multipole connection with 25 or 37 pins
» Valve functions: 2x2/2; 2x3/2; 5/2; 5/3 CC
» Valve size: 12 and 14mm
» Valve flow: 400 and 700 Nl/min
» Modular subbases: 2 positions for valve size 10.5mm, single position for valve size 21mm
» Subbases for monostable and bistable valves (size 10.5mm)
» Serial connection with the most common communication protocols: PROFIBUS-DP, CANopen, DeviceNet, EtherNet/IP, PROFINET, EtherCAT

Series Y valve islands, Individual, Multipole and Fieldbus

» Integrated Pneumatics and Electronics
» Valve functions: 2x2/2; 2x3/2; 5/2; 5/3 CC
» Pneumatic modularity: 2, 4, 6 and 8 valve positions
» Valve size: 12.5mm
» Flow rate: 800 Nl/min
» Serial connection with the following communication protocols: Individual, Multipole, Fieldbus (Profibus-DP, DeviceNet, CANopen)

The complete catalogue of our valve islands is available on the site http://catalogue.camozzi.com.

Vacuum and pressure switches

Our range of vacuum and pressure switches includes compact and light solutions, able to satisfy the most different conditions of application and use. The electronic pressure switches with digital display are ideal for safety monitoring and enable the optimization of cycle times or energy saving devices. Thanks to the programmable switching point and hysteresis, they perfectly suit the customer's needs.
The two separate outputs (digital and analog) are programmable and enable the setting of upper and lower limit vacuum values and continuous vacuum control.

Series SWDN electronic vacuum/pressure switches

» With digital display
» High precision, easy to use
» Digital indicator: precision electronic insertion with two separated switch outputs
» Switching point and hysteresis can be programmed with a membrane keypad
» Port: with external thread G1/8 and internal thread M5
» Electric connection: with M8 4-pole connector or pre-wired cable of 2 meters

Series SWCN electronic vacuum/pressure switches

» With digital display
» High precision, easy to use
» Digital indicator: precision electronic insertion with two separated switch outputs
» Switching point and hysteresis can be programmed with a membrane keypad
» Upper and lower limit values can be programmed through two PNP switch outputs
» Port: with external thread G1/8 and internal thread M5
» Electric connection: with M8 4-pole connector or pre-wired cable of 2 meters

The complete catalogue of our vacuum and pressure switches is available on the site http://catalogue.camozzi.com.

*Section of reference inside the Camozzi catalogue

Series MD modular FRL units

The Series MD air preparation product line is characterized by a modern and linear design as well as high performance.
The technopolymer structure has allowed to create a simplified, product, lightweight and robust at the same time.

Filters, coalescing filters, activated carbon filters, regulators and take-off blocks

Filters:
» Removal of impurities and condensate
» Visual blockage indicator
» Condensate drain options: semi-automatic manual, automatic protected depressurisation, direct G1/8 exhaust
» Bowl locking system reducing the risk of accidents
» Additional air intakes with the same characteristics of the outlet air (line)

Coalescing filters:
» High performance and high purity compressed air
» Air quality according to ISO 8573-1:2010 standard, Class 1.8.1 and Class 2.8.2

Activated carbon filters:
» Removal of oil, liquid and gaseous components from compressed air through the active carbons
» Air quality in compliance with ISO 8573-1 standard, Class 1.7.1

Regulators:
» Minimal pressure decreases
» Knob with position lock
» Tamper-proof system (lockable regulator)
» With or without overpressure exhaust (relieving)

Take-off blocks:
» Compact design
» Utilities orientation

The complete catalogue of our Series MD Modular FRL Units is available on the site http://catalogue.camozzi.com.

Fittings

Our range of fittings and accessories is composed of numerous series in brass and technopolymer studied in order to respond to the needs of different types of systems. Super-rapid, rapid, universal fittings, accessories and couplings are available in different sizes with threads ranging from M3 to G1. The patented Sprint® system guarantees tightening even under the worst conditions, with the possibility to repeat the connection and disconnection of the fitting several times.

Series 6000 super-rapid fittings for plastic tubes

» In nickel-plated brass
» Tube external diameters: 3, 4, 5, 6, 8, 10, 12, 14, 16mm
» Fittings threads: M3, M5, M6, M7, G1/8, G1/4, G3/8, G1/2, G3/4, R1/8, R1/4, R3/8, R1/2

Series 7000 super-rapid Compact fittings

» In technopolymer
» Tube external diameters: 4, 6, 8, 10, 12, 16mm
» Fittings threads: M5, M7, G1/8, G1/4, G3/8, G1/2, G3/4

Series 8000 dual seal super-rapid fittings

» In nickel-plated brass
» Tube external diameters: 4, 6, 8, 10, 12mm
» Fittings threads: G1/8, G1/4, G3/8, G1/2

Series H8000 fittings with double tightening for harsh environments

» In nickel-plated brass
» Diameters: 4, 6, 8, 10, 12, 14, 16mm
» Fittings threads: Gas cylindrical ISO-228 (BSP)

Series X6000 super-rapid fittings

» In stainless steel 316L
» Tube external diameters: 4, 6, 8, 10, 12mm
» Fittings threads: G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2

Series 1000 rapid push-in fittings for plastic tubes

» In nickel-plated brass
» Tube external diameters: 5/3, 6/4, 8/6, 10/8, 12/10, 15/12.5mm
» Fittings threads: M5, M6, M12 x1, M12 x1.25, G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2

Series 2000 pipe fittings

» In nickel-plated brass
» Fittings threads: M5, G1/8, G1/4, G3/8, G1/2, G3/4, G1, R1/8, R1/4, R3/8, R1/2, R3/4, R1

Series 5000 quick-release couplings

» In nickel-plated brass
» Nominal diameters: 5.7mm
» Threads: G1/8, G1/4, G3/8, G1/2

The complete catalogue of our fittings is available on the site http://catalogue.camozzi.com.

INDUSTRIAL

MICRO_CONTROLS

The technology used on miniaturised components for fluid control with on-off operation and proportional or total isolation function, is suitable for the manufacturing industry because of its low power consumption, light weight, small dimensions and ergonomic design, these being the main characteristics of the instruments, devices and machines used in a multitude of industrial and medical application sectors.
With the devices integrated in control and command systems for the industrial automation or for the handling of fluids in general, the trend is towards even smaller dimensions.
With the use of portable instruments that require low power consumption there is the opportunity and in many cases the need to study fluid dynamic solutions with more and more miniaturised and performing components.
The proportional technology with low power consumption along with fluid isolation functions applied on miniaturised solenoid valves handling and controlling gases and liquids allow the construction of for example portable and pocket devices for analysis or taking measurements.
The progress in the field of biotechnology and electronics has enabled the miniaturisation of previously very bulky and expensive equipment and we are now able to perform complex chemical and mechanical operations on the surface of a single, specifically functionalized chip.
The Micro-dosing or dispensing applications involve the use of micro-components, but with high precision in implementing its function.
Of particular importance is the possibility to apply a defined quantity of fluid of low and medium viscosity exactly where required, in a quick, constant and repeatable way.

GENERAL PURPOSE

The integration of the use of fluid-dynamic components with equipments for pneumatic automation is essential for the realization of machines and instruments. Many specific sectors need advanced applications that require innovative components and technologies.
It is the single component inserted in a control and actuation system that determines the effective technical and quality level of the machines, instruments or devices inserted in a technologically new and winning context.
The fluid-dynamic components, called in this way as they were built to control and handle all types of liquid and gaseous fluids, but also identified as valves and solenoid valves, are often inserted in an automated pneumatic or electro-pneumatic system.
The integrated use of valves and solenoid valves, that in most of the cases are with 2 or 3 ways, complete an automated machine, a system or an instrument that for their intrinsic functions need, besides the movement by means of actuators and solenoid valves for the relative control and handling of liquid fluids different than compressed air.
Today, in many sectors we can find examples of integrated components for fluids and pneumatic components, one serving the other or vice versa.
Typical examples can be frequently found in the Packaging and Textile sector, in Sterilization or Pasteurization machines, in Machine Tools, in commercial vehicles, in plastic injection machinery, in food processing systems, in conditioning machines, etc.

PROCESS: CONTROL & REGULATION

The control and regulation of fluids, either liquid or gaseous, demand increasingly more sophisticated and technologically advanced components as their application needs are ever more sophisticated and modern.
The sectors that require a greater use of solenoid valves, for example, are in continuous evolution and expansion.
The use of solenoid valves is often determined by factors such as safety, ecology or the durability of machines, instruments and equipment operating in the most diverse sectors, as the fluids to be controlled can be toxic or aggressive or require high speed interventions. Fluid dynamics is the field of mechanics that studies the laws of the dynamics of liquids and gases.
The solenoid valves are the elements that intercept, control or regulate within a circuit or a system - the flow of fluids automatically to transmit power, but above all to supply equipments with a low power consumption. An industrial process is made up of a series of units integrated among themselves in a rational way with the global aim to convert and/or manipulate, in the most economic way, certain raw materials or items in a finished product.
The automation, the control and the regulation of the process are essential for the safe and profitable functioning of petrochemical equipment, equipment in the food and pharmaceutical industry, and equipment for water treatment and purification.
The solenoid valves operating in an integrated and retroactive system with flow sensors, pressure sensors and measuring instruments have an essential role in order to:
- Stabilize the process
- Assure the regularity of the process
- Minimize the environmental impact
- Obtain the requested quality of the finished product
- Obtain the desired production rate
- Optimize the functioning of the process

LIFE SCIENCE

BIOTECHNOLOGY

Biotech or Biotechnology include a wide range of procedures for modifying living organisms according to human purposes.
The use of biotechnology also includes genetic engineering as well as cell and tissue culture technologies.
Biotech Diagnostic & Analytical instrumentation provides laboratory test demonstrating the presence or identification, the quality and the quantity of the substances in organisms or drugs.
These procedures are useful and indispensable to determinate the therapy of disease and to discover new drugs.
Camozzi designs, develops and assembles components and equipment to supply specialized fluidic and electronic solutions to manufacturers of diagnostic and analytical instruments.
The expertise and experience of our technicians allow us to offer fully customized solutions based on a large range of solenoid valves for the construction of fluid control systems which apply advanced and innovative technologies.

MEDICAL DEVICE

A medical device is an instrument, apparatus, implant or other similar which is intended for use in the diagnostics of disease or other conditions, or treatment, mitigation and prevention of disease or pain.
Medical device include a wide range of products varying in complexity and application.
FLUID CONTROL is classified as one of the basic technologies in medical technology and related sectors, due to the fact that the substances are primarily present in liquid and gaseous form.
The logical requirement for the components and solenoid valves for this sector is:
- Media isolation
- Small internal volume and overall dimensions
- Use of inert and compatible materials
- Low power consumption
- Proportional control

Medical equipment employs many different technologies to customize solutions in terms of functionality, dimensions, and the overall configuration of the components which must comply with material compatibility and specific legislation relating to the Life Science sector.
Our internal laboratories are fully equipped with the most modern instruments to conduct application and customer specific tests.

TABLE OF CHEMICAL COMPATIBILITY BETWEEN FLUIDS AND PRODUCTS

	BODY MATERIALS													SEALS MATERIALS							
	Aluminium	Brass	PA Polyamide	Stainless steel	PVDF Teflon	Bronze	POM Delrin	PVC	PBTP - PETP	PEEK	Polypropylene	PPS Ryton	PCTFE Kel-F	NBR-HNBR Buna	FKM-FPM Viton	PTFE Teflon	EPDM	Kalrez FFKM-FFPM	MQ Silicone	CR Neoprene	PUR Polyurethane
Acetic acid	●	×	×	●	●	×	×	×	●	●	×	●	●	●	×	●	●	●	×	×	×
Acetone	●	●	●	●	×	●	●	×	×	●	●	●	●	×	×	●	●	●	×	×	×
Acetylene	●	●	●	●		×	●	●		●	●	●	●	●	●	●	●	●	●	●	●
Air	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alcohol - ethanol	●	●	●	●	●	●	●	●	×	●	●		●	●	×	●	●	●	●	●	×
Alcohol - methanol	●	●	●	●	●	●	●	×	●	●	●		●	●	×	●	●	●	●	●	×
Alcohol - propane	●	●	●	●	●	●	●	×	●	●	●		●	●	●	●	●	●	●	●	×
Ammonia (solution)	●	×	●	●	●	×	●	●	●	●	●	●	●	●	●	●	●	●	×	●	×
Animal fat			●				●	●	●	●	×		●	●	●	●	●	●	●	●	●
Animal oil	●		●				●	●		●	×			●	●	●	●	●	●	●	●
ASTM oil from 1 to 3	●	●	●	●			●		×	●	●		●	●	●	●	×	●	×	●	●
Benzene	●	●	●	●		●	●	×	●	●	×	●	●	×	●	●	×	●	×	×	×
Boric acid	●	●	●	●		●	×	●	●	●	●		●	●	●	●	●	●	●	●	×
Butyl alcohol	●	●	●	●	●	●	●	×	×	●	●	●	●	●	●	●	●	●	×	●	×
Carbon dioxide (dry)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbon dioxide (wet)		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Carbon monoxide	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Carbonic acid	●		●				●	●		●	●		●	●	●		●	●	×	●	●
Chlorinated water	×		×				×	×		●	●			×	●	●	×	●	×	×	×
Chloroform	●	●	●	●	●	●	●	×	×	●	×	×	×	×	●	●	×	●	×	×	×
Chromic acid	●	×	×	●	●	×	×	×	●	●	●	●		×	●	●	●	●	×	×	×
Citric acid	●	×	●	●	●	×	×	●	●	●	●		●	●	●	●	●	●	●	●	●
Concentrated hydrochloric acid	×	×	×	×	●	×	×	×		●	●	×	●	×	×	●	●	●	×	×	×
Concentrated nitric acid	●	×	×	●	●	×	×	×	●	●	×	×	●	×	●	●	×	●	×	×	×
Concentrated sulphuric acid	×	×	×	●	●	●	×	×		●	×	×	●	×	●	●	×	●	×	×	×
Diesel oil	●	●	●	●		●	●	×	●	●	●	●	●	●	●	●	×	●	×	×	×
Distilled-demineralized water	●	×	●	●		●	●	●	●	●	●	●		●	×	●	●		●	●	●
Dry gaseous chlorine	●	×	●	●	●	●	×	●		●	×	●	●	×	●	●	×	●	×	×	×
Ethane	●	●	●	●		●				●	●		●	●	●	●	×	●	×	●	×
Ether	●	●	×	●		●	●	×	●	●	●	●	×	×	×	●	×	●	×	×	●
Ethylene		●	●	●		×			●	●	●		●	●	●	●		●	×	×	●
Ethylene glycol	●	×	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fat - silicone			●				●	×	●	●	●		●	●	●	●	●	●	×	●	●
Formic acid	×	●	×	●	●	×	×	×	●	●	●	×	●	×	×	●	●	●	●	●	×
Freon 12		●	●	●		●	●	●	●	●	×		●	●	●	●	●	×	×	●	●
Freon 21	●	●		●	×	×	×					×	×	●	×	●	×	●	×		
Freon 22			●	●	●				●	●	×		●	×	●	●	×	×	×	●	×
Gaseous ammonia (dry)	●	×	●	●	●	×	●	×	×	●	●	●	●	●	×	●	●	●	×	●	×
Gaseous butane	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	×	●	×	●	×
Gasoline/Petrol		●	●	●	●	●	●	●	●	●	×		●	●	●	●	×	●	×	●	●
Glycol		●	×	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	×
Grease			●				●	×	●	●	×		●	●	●	●	●	●	●	●	×
Heavy oil - fuel	●	●	●	●		●	×	×		●	×	●	●	●	●	●	×	●	×	×	×
Hydraulic oil			●				●	●		●	●		●	●	●	●	×	●	×	●	●
Hydrochloric acid 15-20%	×	×	×	×	●	×	×	●	●	●	●	×	●	×	●	●	●	●	×	×	×
Hydrogen	●	●	●	●		●	●	●	●	●	●	●	×	●	●	●	●	●	×	●	●
Hydrogen peroxide	●	×	×	●	●	×	×	●	●	●	●			×	×	●	●	●	×	×	×
Hydrogen sulphide	●	×	●	●	●	×	×	●	×	●	●	●	●	×	×	●	●	●	×	×	●
Kerosene	●	●	●	●	●	●	●	●	●	●	×	●	●	●	●	●	×	●	×	●	●
Liquid butane			●				●	●	●	●	●		●	●	●	●	×		×	●	●
Mash gas	●		●				●	●	●	●	●		●	●	●	●	×		×	×	×
Methane (gaseous)	●	●	●	●	●	●	●	●	●	●	●		●	●	×	●	●	●	×	●	×
Methylethylketone (MEK)	●	●	●	●	×	●	●	×	●	●	●	●	●	×	×	●	●	●	×	×	×
Mineral oil	●	●	●	●	●	●	●	×	●	●	×	●	●	●	●	●	×	●	●	●	●
Naphtha	●	●	●	●	●	●	●	×	●	●	×	●		●	●	●	×	●	●	●	●
Natural gas	●	●	●	●		●	●	●	●	●	●		●	●	●	●	×	●	●	●	×
Nitric acid 3 molar	×	×	×	●	●	×	×	×	×	×	×	×		×	●	●	●	●	×	×	×
Nitrogen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Nitrous oxide		×	●	●		×	●	●	●	●	●		●	●	×	●	●	●	●	●	●
Oil - silicone			●				●	×	●	●	×		●	●	●	●	●	●	●	●	●
Oxygen (gaseous)	×	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Ozone		×	×	●	●	●	×	●	●	●	×		●	×	●	●	●	●	●	×	●
Phosphoric acid 3 molar	×	●	×	●	●	●	×	●	●	●	●	×	●	×	●	●	●	●	●	×	×
Phosphoric acid (concentrated)	×	×	×	×	●	×	×	×		●	●	×		×	●	●	●	●	×	×	×
Perchlorethylene	●	×	●	●	●	×	×	×	●	●	×	●	●	●	●	●	×	●	×	×	×
Propane (gaseous)	●	●	●	●		●	●	●	×	●	×		●	●	●	●	×	●	×	×	×
Sea water	×	×	●	●	●	●	●	●	●	●	●	●	●	●	×	●	●	●	●	●	×
Sodium hydroxide	×		●	×		×	×	●	×	●	●	●	●	●	×	●	●	●	×	●	×
Sodium hypochlorite	×	×	×	●	●	×	×	●	●	●	×	×		×	●	●	×	●	×	×	×
Steam > 150°C	●	●	×	●		●	×	×	×	●	×	●	●	×	×	●	●	●	×	×	×
Sulphuric acid 3 molar	×	×	×	×	●	×	×	●	×	●	●	×	●	×	●	●	●	●	×	×	×
Toluene	●	●	●	●	●	●	●	×	●	●	×	●		×	●	●	×	●	×	×	×
Trichlorethylene	●	●	●	●	●	●	×	×		×	×	×	×	×	●	●	×	×	×	×	×
Turpentine	●	●	●	●		●	●	×	×	●	×	●		●	●	●	×	●	×	×	×
Vegetable fat			●				●	●	●	●	×		●	●	●	●	×		×	●	●
Vegetable oil	●	●	●	●		●	●	×		●	●		●	●	●	●	×	●	●	×	×
Vinegar	×		●	●			●	×	●	●	●	●	●	×	×	●	●	●	●	●	×
Water	×	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	×
Wet gaseous chlorine	×	×	×	×	●	×		●			×			×	●	●	×	●	×	×	×
Xenon	●	●		●						●		●	●	●	●	●	●	●	●	●	×

● compatible × not compatible

TECHNICAL INFORMATION ABOUT THE SEAL MATERIALS WHICH ARE SHOWN IN THE PREVIOUS PAGE

BUNA "N" (NBR-HNBR)
Nitrile rubber. This is a mix of polymers based on butadiene which is being used with aliphatic hydrocarbons (propane, butane, oils and mineral fats, oils and petroleum gas, kerosene), with air, water, soft acids, alcohols and with turpentine. The use of this rubber is not recommended with aromatic essences, polar solvents and with strong acids. NBR shows good mechanical properties and has very high abrasion resistance.
On the contrary, it is not resistant to oxygen, ozone and light. Operating temperature: from -20°C to +100°C.

VITON (FPM)
Fluorocarbon rubber. It has excellent resistance to high temperatures, ozone, oxygen and light. It is resistant to mineral oils, fuels, hydraulic fluids, organic solvents and to forced vacuum. On the contrary it is not resistant to halogen hydrocarbons and to freon. It is not recommended to be used at low operating temperature. Operating temperature: from -10°C to +200°C.

NEOPRENE (CR)
Chloroprene rubber. It is suitable for use with alcohols, soft acids, air, water, acetone and neutral gases. It has moderate resistance to oils. It is used in refrigeration systems using oils with high aniline points. Chloroprene shows in general good ozone and aging resistance. It has good mechanical resistance at every working temperature. Operating temperature: from -30°C to +100°C.

E.P.D.M.
Ethylene-propylene-diene rubber derives from the ethylene and propylene copolymerization. It is recommended to be used with hydraulic fluids based on phosphates esters and with brake fluids based on glycols, with hot water and steam with temperatures up 150°C, as well as with polar solvents. It is oxygen, ozone and light resistant. Operating temperature: from -40°C to +130°C.

KALREZ (FFKM - FFPM)
Perfluoro rubber having the same chimical properties as PTFE (TEFLON) and the same elastic properties as FPM (VITON) rubber. It is chemically compatible with almost every chemicals, in particular it is recommended to be used with corrosive fluids. It is oxygen, ozone and aging resistant. It is also suitable for use at high temperatures with forced vacuum. It is not recommended for use with fluorinated combined fluids like freon. Operating temperature: from -20°C to +250°C.

TEFLON (PTFE)
Polytetrafluoroethylene. PTFE has almost absolute chemical resistance. It is not suitable for use with melted alkaline metals, nor with fluorinated combinations at high pressure and high temperature, nor with some halogen units. It doesn't show any particular problem of absorption in the presence of fluids like water. Operating temperature: from -150°C to +180°C.

KEL-F (PCTFE)
Polychlorotrifluoroethylene polymer (CTFE). It is suitable for use with most of corrosive chemicals, organic solvents, hot water and steam, chlorate gases, cryogenic liquids. PCTFE is not recommended for use with some halogen products. It is light and radiation resistant.
Operating temperature: from -50°C to +180°C.

SILICONE (Q, MQ, MVQ)
"Silicone rubber" includes various rubber-like materials composed of methyl-vinyl silicone. It is suitable for use with motor or transmission oils and with animal and vegetables fats and oils. It is not recommended to be used with steam, silicone fats and oils, fuels and aromatic hydrocarbons. It is weatherproof, ozone and aging resistant and shows physiologically neutral properties. It has good resistance to low and high temperature.
Operating temperature: from -50°C to +190°C.

RUBY
Synthetic ruby corundum is inert to all the chemical agents and is resistant to high temperatures.
Synthetic ruby is generally used as siphon nozzle, batching plant nozzles, burner nozzles and valves.

POLYURETHANE (PUR)
Polyurethane rubber can be, according to its poli oil components, both in polyester-urethane (AU) and in polyeter-urethane (EU). The last one shows better resistance to hydrolysis and it is used with pure aliphatic hydrocarbons, oils and mineral fats or with silicone, as well as with water temperatures of up to 50°C. It is not recommended to be used with hot water and with steam, esters and eters, alcohols and glycols. Polyurethane shows excellent abrasion resistance compared with other elastomers and has great elasticity. It has also excellent ozone and aging resistance. Operating temperature: from -30°C to +80°C.

This information doesn't imply on the part of our company any responsibility. This data is provided for information only.
We thus suggest that you contact our technical support staff.

CONVERSION TABLES

SYSTEMS OF MEASUREMENT

LENGTH

	meter	inch	foot	yard
1 m	1	39,37	3,2808	1,0936
1 in	0,0254	1	0,0833	0,0278
1 ft	0,3048	12	1	0,033
1 yd	0,9144	36	3	1

1 m = 10^{-3} km = 10 dm = 10^{2} cm = 10^{3}mm = 10^{6} µm = 10^{12} nm

MASS

	kilogram	pound	tons	
			short (US)	long (Imp)
1 kg	1	2,205	1,102.10^{-3}	0,9843.10^{-3}
1 lb	0,4536	1	0,500.10^{-3}	0,4464.10^{-3}
1 short ton (US)	907,2	2000	1	0,8929
1 long ton (Imp)	1016	2240	1,12	1

1 kg = 10^{3} g = 10^{2} dkg

AREA

	cm²	m²	sq.inch	sq.foot	sq.yard
1 cm²	1	1.10^{-4}	0,155	1,0764.10^{-3}	1,196.10^{-4}
1 m²	1.10^{4}	1	1550	10,764	1,196
1 sq in	6,4516	0,64516.10^{-3}	1	0,00694	0,772.10^{-3}
1 sq ft	929,0	0,0929	144	1	0,1111
1 sq yd	8360	0,8360	1296	9	1

1 m² = 10^{-6} km = 10^{-4} ha = 10^{2} dm² = 10^{6}mm

DENSITY

	kg/ltr	kg/m³	pound/cubic foot	pound/gallon	
				Imperial	US
1 kg/ltr	1	1000	62,43	10,022	8,345
1 kg/m³	0,001	1	0,06243	0,010022	0,008345
1 lb/cu ft	0,01602	16,02	1	0,16054	0,1337
1 lb/gal (Imp)	0,0998	99,78	6,229	1	0,8327
1 lb/gal (US)	0,1198	119,8	7,481	1,201	1

VOLUME

	liter (dm³)	m³	cubic inch	cubic foot	gallons US	gallons Imperial
1 l	1	1.10^{-3}	61,024	0,03531	0,2642	0,220
1 m³	1000	1	61024	35,31	264,2	220
1 cu in	16,387.10^{-3}	16,387.10^{-6}	1	0,5787.10^{-3}	4,329.10^{-3}	3,606.10^{-3}
1 cu ft	28,320	28,320.10^{-3}	1728	1	7,481	6,229
1 US gal	3,785	3,785.10^{-3}	231	0,1337	1	0,8327
1 Imp gal	4,546	4,546.10^{-3}	277,3	0,1605	1,210	1

Imperial = British

SPECIFIC VOLUME

	ltr/kg	m³/kg	cubic foot/pound
1 ltr/kg	1	0,001	0,01602
1 m³/kg	1000	1	16,02
1 cu ft/lb	62,43	0,06243	1

FORCE

	Newton	kilopound	poundal
1 N	1	0,1020	7,24
1 kp	9,807	1	70,90
1 pdl	0,1383	0,0141	1

1 N = 10^{5} dyn; 1 dyn = 1 g x 1cm/s² ; 1 kg = 1 kg x g
1 Poundal = 1 Pound x g

CONVERSION TABLES

PRESSURE

	1 bar = 10^5 N/m²	1 at = 1 Kp/cm²	poundal sq ft	poundal sq in = Psi	1 atm = 760 Torr = 760mm Hg (0°C)	Hg column (0°C) mm Hg = Torr	Hg column (0°C) in Hg	H_2O column (WC) (4°C) m H_2O	H_2O column (WC) (4°C) ft H_2O
1 Pa = 1 N/m²	1.10^{-5}	$1,02.10^{-5}$	0,0209	$1,45.10^{-4}$	$9,87.10^{-6}$	0,0075	$2,95.10^{-4}$	$1,02.10^{-4}$	$3,35.10^{-4}$
1 bar	1	1,0197	2089	14,504	0,9869	750	29,5	10,20	33,5
1 at	0,980665	1	2048	14,22	0,96784	735,56	29,0	10,00	32,8
1 pdl/sq ft	$0,4790.10^{-3}$	$0,4882.10^{-3}$	1	$6,944.10^{-3}$	$0,4725.10^{-3}$	0,359	0,141	$4,88.10^{-3}$	0,0160
1 pdl/sq in = Psi	0,06895	0,07031	144	1	0,06806	51,7	2,04	0,703	2,31
1 atm	1,013	1,033	2120	14,70	1	760	29,09	10,33	33,9
1mm Hg	$1,330.10^{-3}$	$1,360.10^{-3}$	2,78	0,0193	$1,316.10^{-3}$	1	0,0394	0,0136	0,0446
1 in Hg	0,0339	0,0345	70,7	0,4910	0,0334	25,4	1	0,3450	1,133
1 mH_2O	0,0981	0,1000	205	1,4220	0,0968	73,6	2,90	1	3,28
1 ft H_2O	0,0299	0,0305	62,4	0,4340	0,0295	22,4	0,883	0,3050	1

1 N/m² = Pa (Pascal) = 10 dyn/cm² ; 1 kp/m² = 10^{-4} kp/cm² = 1mm WC (at 4°C)

WORK, ENERGY, HEAT CONTENT

	1 kcal	1 kp m	Btu (British thermal unit)	ft poundal	1 kWh	Horsepower/hour (hph) metrical 75 kp m/s h	Horsepower/hour (hph) imperial 550 lb.ft/s h	on-day of refrigeration	1 Joule = 1 Nm = Ws
1 kcal	1	427,0	3,968	3088	$1,163.10^{-3}$	$1,581.10^{-3}$	$1,560.10^{-3}$	$13,779.10^{-6}$	4190
1 kpm	$2,342.10^{-3}$	1	$9,294.10^{-3}$	7,233	$2,723.10^{-6}$	$3,704.10^{-6}$	$3,653.10^{-6}$	$32,270.10^{-6}$	9,807
1 Btu	0,252	107,59	1	778,0	$0,293.10^{-3}$	$0,398.10^{-3}$	$0,3931.10^{-3}$	$3,472.10^{-6}$	1055
1 ft pdl	$0,3238.10^{3}$	0,13826	$1,285.10^{-3}$	1	$0,377.10^{-6}$	$0,512.10^{-6}$	$0,505.10^{-6}$	$4,462.10^{-9}$	1,356
1 kWh	860	$367,1.10^{-3}$	3412,8	$2,655.10^{6}$	1	1,360	1,341	$11,850.10^{-3}$	$2,6.10^{6}$
1 PSh	632,3	270.10^{-3}	2509	$1,953.10^{6}$	0,7353	1	0,9863	$8,713.10^{-3}$	$2,65.10^{6}$
1 hph	641,1	$273,7.10^{-3}$	2545	$1,980.10^{6}$	0,7457	1,014	1	$8,834.10^{-3}$	$2,68.10^{6}$
1 ton-day	$72,57.10^{-3}$	$30,99.10^{-3}$	288.10^{3}	$244,1.10^{6}$	84,39	144,78	113,2	1	304.10^{6}
1 J	$0,239.10^{-3}$	0,102	$0,948.10^{-3}$	0,738	$0,278.10^{-6}$	$0,378.10^{-6}$	$0,372.10^{-6}$	$3,280.10^{-9}$	1

1 erg = 1 dyn cm = 10^{-7} Nm ; 1 kJ = 10^{3}J

CAPACITY, ENERGY FLOW, HEAT FLOW

	1 kcal/h	1 kp m/s	British thermal unit per hour	1 kcal/s = British theor. unit of refrigeration	1 kWh = 1 kJ/s	Horsepower hour (HP) metrical 75 kp m/s	Horsepower hour (HP) imperial 550 lb.ft/s	US Standard commercial ton of refrigeration	British commercial ton of refrigeration
1 kcal/h	1	0,1186	3,968	$0,278.10^{-3}$	$1,163.10^{-3}$	$1,581.10^{-3}$	$1,560.10^{-3}$	$0,331.10^{-3}$	$0,299.10^{-3}$
1 kp m/s	8,4312	1	33,455	$2,342.10^{-3}$	$9,804.10^{-3}$	$13,333.10^{-3}$	$13,150.10^{-3}$	$2,792.10^{-3}$	$2,520.10^{-3}$
1 Btu/h	0,252	$29,89.10^{-3}$	1	$0,07.10^{-3}$	$0,293.10^{-3}$	$0,398.10^{-3}$	$0,393.10^{-3}$	$0,083.10^{-3}$	$75,310.10^{-3}$
1 kcal/s	3600	427,0	$14,285.10^{-3}$	1	4,186	5,693	5,615	1,190	1,078
1 kW	860,0	102,0	3414	0,2389	1	1,360	1,341	0,2846	0,2572
1 HP	632,3	75	2509,3	0,1756	0,736	1	0,9863	0,2094	0,1891
1 hp	641,2	76,04	2545	0,1781	0,7455	1,014	1	0,2123	0,21227
1 ton	3024	358,2	$12,0.10^{3}$	0,831	3,513	4,776	4,711	1	0,9037
1 Br ton	3340	396,9	$13,26.10^{3}$	0,9277	3,888	5,287	5,214	1,1045	1

ENTHALPY DIFFERENCE, SPECIFIC HEAT

Δh	kJ/kg	kcal/kg	Btu/pound
1 kJ/kg	1	0,239	0,43
1 kcal/kg	4,19	1	1,80
1 Btu/lb	2,33	0,556	1

1 cal/g = kcal/kg

ENTROPY DIFFERENCE, SPECIFIC HEAT

Δs	kJ/kg K	kcal/kg °C	Btu/pound °F
1 kJ/kg K	1	0,239	0,239
1 kcal/kg °C	4,19	1	1
1 Btu/lb °F	4,19	1	1

TEMPERATURE

°F = [1,8 · °C] + 32

°C = [°F - 32] · 0,55

°K = °C + 273

°C = degrees Celsius

°K = degrees Kelvin

°F = degrees Fahrenheit

MULTIPLES AND SUB-MULTIPLES

Name	Symbol	Value
tera	T	10^{12}
giga	G	10^{9}
mega	M	10^{6}
kilo	k	10^{3}
etto	h	10^{2}
deca	da	10
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	µ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}

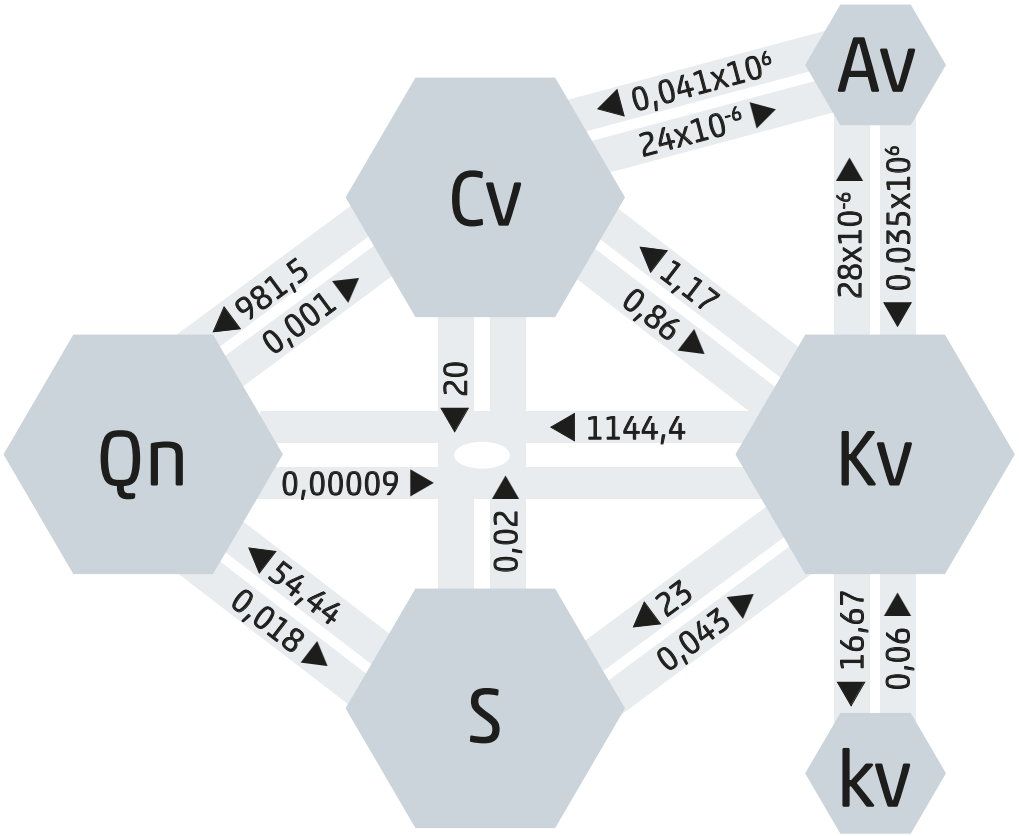
FLOW MEASURING

The flow of gases is indicated in Nl/min, of liquids in m^3/h.
In fluid valves, the flow is obtained by using a Flow Coefficient Kv.
The Flow Coefficient Kv defines the quantity of water at a temperature between 5°C and 40°C that passes through a valve when there is a Δp of 1 bar between inlet and use.

To find the flow with different liquids, you need to divide the flow calculated with water by the value of kinematic viscosity of the liquid to intercept.

CONVERSION COEFFICIENTS

Kv = quantity of water m^3/h
kv = quantity of water l/min
Cv = quantity of water Gal/min
Av = flow coefficient m^2
Qn = flow rate l/min
S = orifice cross-section mm^2



S (mm^2)	ORIFICE (mm)
0,02	0,16
0,2	0,50
0,5	0,80
0,52	0,81
0,54	0,83
0,56	0,84
0,58	0,86
0,6	0,87
0,65	0,91
0,7	0,94
0,75	0,98
0,8	1,01
0,85	1,04
0,9	1,07
0,95	1,10
1	1,13
1,5	1,38
2	1,60
2,5	1,78
3	1,95
3,5	2,11
4	2,26
4,5	2,39
5	2,52
5,5	2,65
6	2,76
6,5	2,88
7	2,99
10	3,57
15	4,37
25	5,64
35	6,68
45	7,57
55	8,37
65	9,10
75	9,77

FLUID VISCOSITY

Not all liquids have the same viscosity, i.e. that characteristic that can be considered a sort of friction inside the liquid that opposes to its flowing. It is the opposite of fluidity. Water runs quicker through a tube than a gel, because it is less viscose than gel.
Viscosity affects the flow and the response times.
Do not confuse Viscosity with Density that is the relation between the Mass of the liquid and the occupied Volume. The Camozzi solenoid valves can be used with fluids with a max. viscosity of 37 cSt.

Viscosity can be of two types: Dynamic and Kinematic.

Dynamic viscosity is proportional to the value of the resisting force that opposes to the flowing of a liquid.
Kinematic viscosity is the relation between Dynamic Viscosity and the Density of the liquid.
In other words, when a liquid passes through a conduct, its speed is minor where it is in contact with the conduct (where there is more friction) and major inside the flow.

Dynamic viscosity is the result of a mathematic calculation that considers the trend of the speed curve inside the tube.
The flowing speed varies according to the Density of liquids, the relation between Dynamic Viscosity and Density gives the value of Kinematic Viscosity.
Dynamic Viscosity can be indicated in

Pa s (Pascal * second)
N s/m^2
kg/m s

1 Pa s = 1 N s/m^2 = 1 kg/m s

Kinematic Viscosity is indicated in St or cSt (Stoke or CentiStokes)

St = 100 cSt = 10^{-4} m^2/s

SOLENOID VALVES DIMENSIONING

a) Solenoid valves for fluids:

Flow:

$$Q = Kv \bullet \sqrt{\frac{\Delta P}{\gamma}}$$

Flow factor:

$$Kv = Q \bullet \sqrt{\frac{\gamma}{\Delta P}}$$

where:

Q = m^3/h

ΔP = bar

γ = Kg/dm^3

In case of liquids with viscosity higher than 3°E (22 c Stokes), Kv changes according to the following formula:

$$Kv_1 = Kv + C$$

where C is the viscosity correction factor that is calculated through the formula:

$$C = \frac{\delta \bullet \sqrt{Kv}}{200 \bullet Q} + 1$$

where:

δ = kinematic viscosity of the fluid in Centistokes

Kv = flow factor of the solenoid valve

Q = flow l/m

Load loss:

$$\Delta P = \gamma \bullet \left(\frac{Q}{Kv}\right)$$

b) Solenoid valves for gases:

If $\Delta P \leq 1/2\ P_1$ use the following formula

Flow:

$$Qn = 514 \bullet Kv \bullet \sqrt{\frac{\Delta P \bullet P_2}{\gamma n \bullet (273 + t)}}$$

Flow factor:

$$Kv = \frac{Qn}{514} \bullet \sqrt{\frac{(273 + t) \bullet \gamma n}{\Delta P \bullet P_2}}$$

where:

Qn = Nm^3/h

P_1 = bar

P_2 = bar

t = °C

γ n = Kg/m^3

Load loss:

$$\Delta P = \frac{(273 + t) \bullet \gamma n}{P_2} \bullet \frac{Qn^2}{(514 \bullet Kv)^2}$$

If $\Delta P > 1/2\ P_1$ use the following formula

$$Qn = 757 \bullet Kv \bullet \sqrt{\frac{\Delta P \bullet P_2}{(273 + t) \bullet \gamma n}}$$

SPECIFICATIONS OF CAMOZZI CLEAN ROOM

Class	maximum number of particles/m^3			FED STD 209E
	≥ 0.5 µm	≥ 1 µm	≥ 5 µm	
ISO 7	352,000	83,200	2,930	Class 10,000

OX1:
non-volatile residue equal to or less than 550 mg/m^2
Level OX1: ultrasonic cleaning of components, inspection with UV black light, lubrication (only if necessary for the product's operation) with a specific grease suitable to be used with oxygen.
Assembly, testing and packaging outside the clean room.

OX2:
non-volatile residue equal to or less than 33 mg/m^2
Level OX2: ultrasonic cleaning of components, inspection with UV black light, lubrication (only if necessary for the product's operation) with a specific grease suitable to be used with oxygen.
Assembly, testing and packaging inside a clean room with ISO 7 classification according to ISO 14644-1.

ATEX DIRECTIVE 2014/34/EU

As from 19 April 2016 all products which are commercialised in the European Union and destined to be used in **potentially explosive atmospheres** have to be approved according to the directive 2014/34/EU, also known as ATEX. This new directive also refers to non-electric items, like pneumatic drives, which need to be approved.

ATEX 2014/34/EU

These are the main changes introduced by the new directive 2014/34/EU:
- Also non-electric apparatus

and devices, as pneumatic cylinders, are part of the Directive
- The apparatus are assigned to different categories which are assigned to certain potentially explosive zones.
- The products are identified with the CE mark Ex.
- The instructions for use and the declarations of conformity should in order to be supplied with each sold product used in potentially explosive zones.
- Products destined to be used in potentially explosive zones, because of the presence of dust, are included in the directive like the products destined to be used in zones with the presence of dangerous gases.

A potentially explosive atmosphere could be composed of gas, mist, steam or dust which can be created in manufacturing processes or in all those areas in which there is a constant or random presence of inflammable substances.
An explosion can occur when there is an existing presence of inflammable substances and an ignition source in a potentially explosive atmosphere.

An ignition source could be:
- Electrical (electric arcs, induced current, heat generated by the Joule effect)
- Mechanical (heat between surfaces caused by friction, sparks generated by the collision of metallic bodies, electrostatic discharges, adiabatic compression)
- Chemical (exothermic reactions between materials)
- Naked flames.

The products which are subject to the approval are those which, during their normal use or because of a malfunction, present one or more ignition sources for the potentially explosive atmospheres.

The producer has to guarantee that the product conforms with the declarations and to the marking of the product.
Moreover the product should always be accompanied by the relative instructions.
The builder of the equipment and/or user should identify the risk zone in which the products, to which directive 99/92/CE refers, are used and purchase the product according to the use in the pre-determined zone paying attention to the specifications in the relative instructions.

In case a product is composed by two components with different markings, the component which is classified in the lowest category defines the class to which the complete product belongs.

Example:
solenoid suitable for Category 3 marked ...
Ex - II 3 EEx...

and valve suitable for Category 2 ...
Ex - II 2 EEx...
The valve unit with solenoid can be used only in category 3 or zone 2/22

ZONES, GROUPS AND CATEGORIES

In the places and for the types of equipment subject to Directive 99/92/CE, the employer should execute the classification of the zones regarding the danger of the creation of explosive atmospheres because of the presence of gas or dust. The apparatus for the use in potentially explosive zones are divided in GROUPS:
GROUP I > apparatus used in mines
GROUP II > apparatus used in installations above the ground

GROUP I: APPARATUS FOR MINES
CATEGORY M1 Functioning in explosive atmosphere
CATEGORY M2 Non-supplied equipment in explosive atmospheres

GROUP II: APPARATUS FOR INDUSTRIES ABOVE THE GROUND		
PRODUCT CATEGORY	GAS	DUST
1	Zone 0	Zone 20
2	Zone 1	Zone 21
3	Zone 2	Zone 22

CLASSIFICATION IN ZONES ACCORDING TO DIRECTIVE 99/92/CE

Category 1	Zone 0 -	Area in which (permanently, for long periods or often) an explosive atmosphere is present, consisting of a mixture of air and inflammables in the form of gas, vapour or mist.
	Zone 20 -	Area in which (permanently, for long periods or often) an explosive atmosphere is present in the form of a dust/powder cloud which is combustible in the air.
Category 2	Zone 1 -	Area in which, during normal activities, the formation of an explosive atmosphere is probable, consisting of a mixture of air and inflammables in the form of gas, vapours or mist.
	Zone 21 -	Area in which occasionally during normal activities the formation of an explosive atmosphere is probable, in the form of a dust/powder cloud which is combustible in the air.
Category 3	Zone 2 -	Area in which, during normal activities, the formation of an explosive atmosphere, consisting of a mixture of air and inflammables in the form of gas, vapour or mist is not probable and, whenever this should occur, it is only of a short duration.
	Zone 22 -	Area in which, during normal activities, the formation of an explosive atmosphere in the form of a combustible dust/powder cloud is not probable and, whenever this should occur, it is only of a short duration.

EXAMPLE OF MARKING: Ex II 2 GD c T100°C (T5) -20°C≤TA≤60°C

II	Group: Devices which are to be used in spaces exposed to risks of an explosive atmosphere, different from underground spaces, mines, tunnels, etc., individuated according to the criteria in enclosure I of the Directive 94/9/CE (ATEX)
2	Category: Devices designed to function in compliance with the operational parameters determined by the manufacturer and guarantee a high protection level
GD	Protected against gas (G) and explosive powders (D)
c	Non-electrical constructions for potentially explosive atmospheres. Protection through constructive security
T 100°C	Max. superf. temp. of 100 °C reg. potential hazards resulting from striking within the vicinity of hazardous powders
T5	Max. superf. temp. of 100 °C regarding potential hazards which may result from striking within gassy environments
Ta	Environmental temperature: -20°C≤Ta≤60°C. Environmental temperature range (with dry air)

GROUP I: TEMPERATURE CLASSES

Temperature =150 °C
or = 450 °C according to the level
of dust on the apparatus.

GROUP II: TEMPERATURE CLASSES

Temp. classes for gas (G)	Admissible surface temperatures
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

ATEX CERTIFIED CAMOZZI PRODUCTS

APPARATUS REGARDING ATEX - GROUP II

Solenoids

Series	Category	Zone	Gas/Dust
U70	3	2/22	G/D
U80	2	1/21	G/D
U80I**	2	1/21	G/D

Pressure switches

Series	Category	Zone	Gas/Dust
PM 11**	1	0/20	G/D

FRL

Series	Category	Zone	Gas/Dust
MC#	2	1/21	G/D
N	2	1/21	G/D
MX#	2	1/21	G/D
T	2	1/21	G/D
CLR	2	1/21	G/D
M	2	1/21	G/D

Valvole

Series	Category	Zone	Gas/Dust
9#*	2	1/21	G/D
K	3	2/22	G/D
P	3	2/22	G/D
W	3	2/22	G/D
A#	2	1/21	G/D
3#	2	1/21	G/D
4#	2	1/21	G/D
NAMUR#	2	1/21	G/D
E (pneumatic)	2	1/21	G/D
E (electropneumatic)	3	2/22	G/D
Y	3	2/22	G/D
2	2	1/21	G/D

* According ISO
** Products with ATEX and IECEX certification
# Without solenoid

COMPONENTS regarding ATEX - Group II

Products	Category	Zone	Gas/Dust
Silencers	2	1/21	G/D
Quick release couplings	2	1/21	G/D
Manifolds	2	1/21	G/D
Subbases	2	1/21	G/D
Feet	2	1/21	G/D
Caps	2	1/21	G/D
Plates	2	1/21	G/D

» The order code number of the certified products is obtained by adding "EX" to the standard article number
Es. 358-015 standard solenoid valve
Es. 358-015EX ATEX certified solenoid valve

Accessories available in category 2 zone 1/21: couplings, junctions, brackets, piston rod nuts, nuts, counter brackets, bushings, pins, clevis pins, caps, gaskets, diaphragm, sub-bases, plates, feet, hand operated valves, flow valves, flanges, screw, tie rods, automatic and blocking valves, silencers and pressure gauge, connector kits, clamps, rapid and super rapid push-in fittings, hoses, sealing rings, locking nuts. Accessories available in category 3, zone 2/22: adaptors, slot covers, extensions, connectors. For more informations on this kind of products see the website: http://catalogue.camozzi.com within the section: Downloads > Certifications > ATEX Directive 2014/34/EU > List of products excluded from the directive 2014/34/EU ATEX.

IP PROTECTION CLASS

IP 6 5

DEGREE OF PROTECTION AGAINST THE PENETRATION OF LIQUIDS

DEGREE OF PROTECTION AGAINST THE PENETRATION OF FOREIGN BODIES COMING INTO CONTACT WITH LIVE PARTS

DEGREE OF PROTECTION AGAINST THE PENETRATION OF FOREIGN BODIES COMING INTO CONTACT WITH LIVE PARTS	DEGREE OF PROTECTION AGAINST THE PENETRATION OF LIQUIDS	IP 0X Not protected	IP 1X Protected against solid bodies greater than Ø 50mm	IP 2X Protected against solid bodies greater than Ø 12mm	IP 3X Protected against solid bodies greater than Ø 2.5mm	IP 4X Protected against solid bodies greater than Ø 1mm	IP 5X Protected against dust	IP 6X Totally protected against dust
IP X0	Not protected	IP 00	IP 10	IP 20	IP 30	IP 40	IP 50	IP 60
IP X1	Protected against water falling vertically (condensate)		IP 11	IP 21	IP 31	IP 41		
IP X2	Protected against drops of water falling up to 15° off the vertical		IP 12	IP 22	IP 32	IP 42		
IP X3	Protected against rain water up to 60° off the vertical			IP 23	IP 33	IP 43		
IP X4	Protected against sprays of water from any direction				IP 34	IP 44	IP 54	
IP X5	Protected against jets of water fired from any direction						IP 55	IP 65
IP X6	Protected against sea waves or the like							IP 66
IP X7	Protected against the effects of immersion							IP 67

FLUID CONTROL RANGE OF PRODUCTS

When choosing a valve, it is essential to consider parameters linked to the mechanics of the product and to the environmental conditions of use. The Camozzi range includes many solutions suitable to control different types of fluids with good performances and a high reliability, optimizing consumption and dimensions. The table on the next page shows the main parameters to evaluate in order to find the most suitable type of valve.
Furthermore it is possible to develop customized solutions in order to satisfy the needs of every single client.

	K8	K8B	K8DV	K 2/2	K 3/2	KN	KN High Flow	W
VALVE WIDTH	8mm	8mm	8mm	10mm	10mm	10mm	10mm	15mm
FUNCTION	2/2 - 3/2 NC - NO	2/2 -3/2 NC - NO	2/2 NC	2/2 NC	3/2 NC - NO	3/2 NC	3/2 NC	3/2 NC - NO
OPERATION	poppet	spool	membrane	poppet	poppet	poppet	poppet	poppet
PNEUMATIC CONNECTIONS	cartridge	cartridge	cartridge flange	flange	flange	flange	flange	flange
NOMINAL DIAMETER	0.5mm	3.6mm	0.7mm	0.6 - 1 - 1.4mm	0.65mm	0.65mm	1.1mm	0.8 ... 1.5mm
FLOW	5 l/min	180 Nl/min	0.1 Kv (l/min)	0.18 ... 45 Kv	10 l/min	10 l/min	25 l/min	14 ... 35 l/min
OPERATING PRESSURE	1 ÷ 7 bar	1 ÷ 7 bar	0 ÷ 2 bar (low vacuum)	0 ÷ 2; 0 ÷ 3; 0 ÷ 6 bar	0 ÷ 5 ... 7 bar	0 ÷ 7 bar	0 ÷ 3 ... 7 bar	0 ÷ 5 ... 10 bar
OPERATING TEMPERATURE	0° ÷ +50°C	0° ÷ 50°C	0° ÷ 50°C	0° ÷ 50°C	0° ÷ +50°C	0° ÷ +50°C	0° ÷ +50°C	0° ÷ +50°C
MEDIA	inert gases	inert gases	aggressive gases and liquids	inert gases, oxygen	inert gases	inert gases and liquids	inert gases	inert gases
SEALS	FKM	FKM	EPDM FKM FFKM	FKM	NBR	HNBR NBR	NBR FKM	PU NBR
VOLTAGE	6 - 12- 24 V DC	6 - 12- 24 V DC	3 - 5 - 6 - 12 - 24 V DC	6 - 12- 24 V DC	6 - 12 - 24 V DC	24 V DC	24 V DC	24 - 48 V DC
POWER CONSUMPTION	0.6 W	0.6 W	0.6 W	1 W	0.9 W	1.3/0.25 W	4/1 W	1 ... 2 W
DUTY CYCLE	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%
ELECTRICAL CONNECTION	2 Pin 0.5 x 0.5 spacing 4mm	2 Pin 0.5 x 0.5 spacing 4mm	2 Pin 0.5 x 0.5 spacing 4mm	connector cabels	connector - thin cabels L = 300mm	Connector	Connector	DIN 43650 (C Shape), 8mm connector

FLUID CONTROL RANGE OF PRODUCTS

	P	PD	PDV	PL	PN	A	6	8	8
VALVE WIDTH	15mm	15mm	15mm	15mm	15mm	22mm	30mm	10 ... 22mm	16 ... 32mm
FUNCTION	3/2 NC - NO	2/2 NC	2/2 NC	3/2 NC	3/2 NC	2/2 - 3/2 NC - NO	2/2 - 3/2 NC - NO	2/2 - 3/2 NC - NO	2/2 - 3/2 NC - NO
OPERATION	poppet	poppet	membrane	poppet	poppet	poppet	poppet	spool	spool
PNEUMATIC CONNECTIONS	flange	flange - M5	flange	flange	flange	M5 - 1/8	flange - 1/4	cartridge	1/8 - 3/8
NOMINAL DIAMETER	0.8 ... 1.5mm	0.8 ... 2.5mm	0.8 ... 2mm	1.5mm	0.8mm	1.5 ... 2.5mm	2 ... 4mm	5 ... 9mm	5 ... 9mm
FLOW	14 ... 35 l/min	25 ... 125 l/min	0,3 ... 0,9 Kv	24 ... 35 l/min	12 l/min	40 ... 130 l/min	80 ... 520 l/min	420 ... 1480 Nl/min	420 ... 1480 Nl/min
OPERATING PRESSURE	0 ÷ 3 ... 10 bar	-0.9 ÷ 4 ... 12 bar	-0.9 ÷ 0 ... 0 ÷ 10 bar	-0.9 ÷ 3 ... 8 bar	0 ÷ 10 bar	-0.9 ... 15 bar	0 ÷ 6 ... 15 bar	-0.9 ... 7 bar	3 ÷ 6 bar; 0 ÷ 6 bar (ext, pilot)
OPERATING TEMPERATURE	0° ÷ +50°C	0° ÷ +50°C	0° ÷ 50°C	0° ÷ +50°C	0° ÷ +50°C	0° ÷ +60°C	0° ÷ +80°C	0° ÷ 50°C	0° ÷ 50°C
MEDIA	inert gases	inert gases and liquids	aggressive gases and liquids	inert gases	inert gases	inert gases and liquids	inert gases and liquids	inert gases	inert gases
SEALS	FKM NBR	NBR	EPDM FKM FFKM	FKM NBR	PU NBR	HNBR NBR	NBR	FKM	FKM
VOLTAGE	24 ... 110 V DC 24 ... 110 V AC	24 ... 110 V DC	6 - 12 - 24 V DC	24 V DC	24 ... 205 V DC	12 ... 110 V DC 24 ... 380 V AC	12 ... 110 V DC 24 ... 230 V AC		6 - 12 - 24 V DC
POWER CONSUMPTION	1 ... 2 W	1 ... 4 W	2 W	2.7 W	1 ... 2 W	3 ... 5 W 3.5 ... 7 VA	10 W 19/12 VA		1,3 ... 2 W
DUTY CYCLE	ED 100%	ED 50% ... 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%		ED 100%
ELECTRICAL CONNECTION	DIN 43650, (C Shape), 9.4mm connector	DIN 43650 (C Shape), 9.4mm connector	DIN 43680 (C Shape), 9.4mm (C Shape), 8mm connectors	DIN 43650, (C Shape), 9.4mm connector	DIN 43650 (C Shape), 9.4mm connector	DIN 43650 (A, B Shape) connector	DIN 43650 (A Shape) connector		DIN 43680 (C Shape), 9.4mm (C Shape), 8mm connectors

FLUID CONTROL RANGE OF PRODUCTS

	CFB	CFB INOX	AP	AP	CP16	CP20	K8P	MX-PRO
VALVE WIDTH	22 ÷ 40mm	22 ÷ 40mm	16mm	22mm	16mm	20mm	16mm	70mm
FUNCTION	2/2 - 3/2 NC - NO	2/2 NC	2/2 PROPO NC	2/2 PROPO NC	2/2 NC	2/2 NC	PROPO NC	3/2 NC
OPERATION	poppet diaphgram	poppet	poppet	poppet	poppet	poppet	poppet	membrane
PNEUMATIC CONNECTIONS	1/8 - 2	1/8 - 1/2	flange - M5	flange 1/8 - 1/4	cartridge	cartridge	flange	G1/2
NOMINAL DIAMETER	1.4 ... 50mm	1.5 ... 4mm	0.8 ... 1.6mm	1 ... 2.4mm	1 ... 2mm	3; 3.5mm	0.5mm	
FLOW	0.14 ... 36 m³/h	0.08 ... 0.26 m³/h	26 ... 80 l/min	33 ... 132 l/min	70 ... 90 l/min	145 ... 165 l/min	6 l/min (3 bar) 12 l/min (10 bar)	0 ... 10 000 l/min
OPERATING PRESSURE	0 ÷ 0.8 ... 22 bar	0 ÷ 6 ... 25 bar	0 ÷ 4 ... 10 bar	0 ÷ 4 ... 10 bar	3; 5; 8 bar	2; 2,8 bar	0.15 ÷ 3 bar 0.5 ÷ 10 bar	0,15 ÷ 3 bar 0,5 ÷ 10 bar
OPERATING TEMPERATURE	-10° ÷ +90° ... 140°C	-10° ÷ +140°C	0°C ÷ +60°C	0° ÷ +60°C	10 ÷ +50°C	10 ÷ +50°C	0° ÷ +50°C	0 ÷ 50°C
MEDIA	inert gases and liquids	inert gases and liquids	inert gases and liquids	inert gases and liquids	inert gases, oxygen	inert gases, oxygen	inert gases	inert gases
SEALS	NBR FKM EPDM	FKM	NBR	NBR	FKM	FKM	NBR	NBR
VOLTAGE	12 ... 24 V DC 24 ... 230 V AC	12 ... 24 V DC 24 ... 230 V AC	12-24 V DC	12-24 V DC	6-12-24 V DC	6-12-24 V DC	24 V DC (supply) 0-10 V DC (input) 4-20 mA (input)	19-28 V DC 0-1 V (input) 4-20 mA (input)
POWER CONSUMPTION	10 ... 30 W 9 ... 29 VA	19 W 15 VA	3 W	5 W	3,2 W	3; 3,7 W	1 W	1 W
DUTY CYCLE	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%	ED 100%
ELECTRICAL CONNECTION	DIN 43650 (A Shape) connector	DIN 43650 (A Shape) connector	DIN 43650 8mm connector	DIN 43650 (B Shape) connector	cables	cables	M8 4 Pin (male) connector	M8 4 Pin (male) connector

BQF (BUSINESS QUALIFICATION FORMULAR)

BQF ▶ ACCOUNT _____ SALES REP _____

*Function n° Way	☐ 2/2 NO	☐ 2/2 NC	☐ 3/2 NO	☐ 3/2 NC		
*Function	☐ direct	☐ servo	☐ membrane separate flow			
*Actuation	☐ monostable	☐ bistable	☐ proportional			
*Orifice size (mm)	☐ 1>2	☐ 2>3				
*Connection Ports body/base	☐ m5	☐ 1/8	☐ 1/4	☐ other	☐ flange	
*Flow rate	☐ 1>2	☐ 2>3				
Flow Factor (Kv)	_____					
*Pressure range (bar)	☐ min	☐ max	☐ working pressure	☐ back pressure		
*Ambient temperature (°C)	☐ min	☐ max				
*Media temperature (°C)	☐ min	☐ max				
* Media	_____					
Water Hammer	☐ no	☐ yes				

*Body material	_____				
*Seal material	_____ static	_____ dynamic			
*Valve assembling	☐ single	☐ manifold			
Coil assembling	☐ 0°	☐ 180°			
* Manual override	☐ bistable	☐ monostable	☐ no		

*Electrical connection (ex. Cable, pins, PCB etc)	_____				
Response time (msec)	☐ on/off	☐ off/on			
*Coil voltage (Volt)	☐ 12	☐ 24	☐ 48	☐ 110	☐ 220
	☐ others	☐ DC	☐ AC		
Power consumption (Watt/VA)	_____				
Protection degree IP	_____				
Frequency (Hz)	_____				
*Appruvals	_____				

* = mandatory data

NOTE:

Fluid Control. Your fluid solutions

Camozzi Solutions for Fluids
Fluid Control

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