VALVES FOR ANALYTICAL AND MEDICAL TECHNOLOGY

Valves for Analytical and Medical Technology

ASCO™

EMERSON™

Analytical and Medical Technology

Analytical and Medical Technology

Enhanced Quality and Performance

In analytical and medical technology, the demands customers place on the performance of the products are increasing year by year.
As a worldwide leading manufacturer of solenoid valves, ASCO Numatics offers a wide range of fluid isolation, non-isolation and proportional valves designed to meet these demands.

Our dedicated catalogue "Valves for Analytical and Medical Technology" describes this family of products.

For more information on our portfolio of valves and pneumatic components, please visit our website at www.asconumatics.eu.

ASCO™

Analytical and Medical Technology

Imprint:

ASCO Numatics GmbH
Registered Office: 75248 Ölbronn-Dürrn, Germany
Executive Managing Director: Jean-Louis Tenu
Commercial Register/Reg. No.: Amtsgericht (Local Court) Mannheim, HRB 505275

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Analytical and Medical Technology

ASCO Numatics

... Your Partner in Analytical and Medical Technology

The Emerson Group based in St. Louis, U.S.A., has a workforce of 140,000 employees worldwide, with production facilities and sales offices in over 150 countries.

ASCO Numatics, a division of the EMERSON Group of companies, is a global leader in the field of fluid control and fluid power.
The company employs over 4,000 people and is represented in 43 countries. Its product portfolio includes more than 50,000 valves, a broad line of air service and air regulation equipment and a full range of actuators.

Analytical and Medical Technology

With its technological innovations, ASCO Numatics has been setting the standards in analytical and medical technology for over 20 years. The valves and assemblies developed for this purpose are especially adapted to gas and fluid handling applications in the fields of medicine, biomedicine and industrial analytics. Special departments at ASCO Numatics possess the necessary knowledge of the sectors to fulfil the high requirements on accuracy, reliability and purity demanded in these sensitive fields. In addition, extensive international safety accreditations and certifications ensure the quality and safety of the products and their suitability for the applications in the various regions of the world. Available approvals: ATEX, TÜV, UL, FM, CSA, NEPSI, JE, DNV, CE etc.

Certificates of
our production facilities

Analytical and Medical Technology

Competence centres ...

... for the development and manufacture of valves and customer-specific multi-function modules for analytical and medical technology.

Europe:

- Germany, Ölbronn-Dürrn
- France, Lucé
- Italy, Milan

America:

- USA, Novi / Michigan
- Mexico, Mexicali

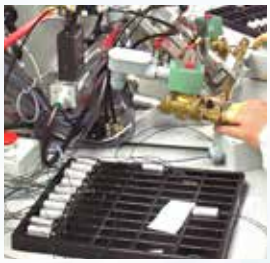
Asia:

- China, Shanghai
- Japan, Hyogo



Germany





Mexico



China

Introduction to analytical and medical technology

Analytical Technology

Highest precision and functionality – especially suitable for aggressive fluids

Analytical technology includes apparatus that is used for analytical purposes in laboratories or the industry. The valves used in this equipment or with these processes do not come into direct contact with the patient and are designed to handle aggressive gases and liquids. Analytical applications require resistance to aggressive fluids, a low internal volume and an easy-to-flush design. The use of valves with low power consumption will reduce heat transfer into the fluid.

Our range of valves is ideal for use in applications in the following areas of analytical technology:

- Chromatography (GC, IC and HPLC)
- Haematology
- Immunology
- Cytology
- Biotechnology (DNA synthesis)
- Emission analysis
- Water analysis
- Leak measurement
- etc.

Medical Technology

Focus on safety for patients

Medical technology includes apparatus and processes in which valves come partly into direct contact with fluids introduced into, or taken from patients, be it in handling medical gases in respirators or liquids in dialysis. This field of application requires the use of inert materials, a low internal volume, low power consumption as well as easy-to-flush internal valve or system cavities.

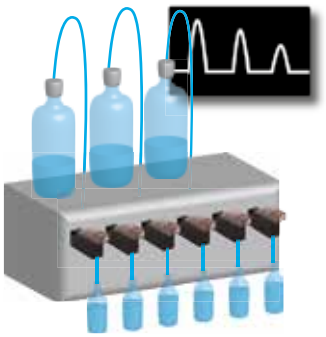
Our range of valves is ideal for use in applications in the following areas of medical technology:

- Artificial respiration
- Anaesthesia
- Oxygen concentration
- Dialysis
- Dentistry
- Clinical sterilisation
- Minimally invasive surgery
- Cryosurgery
- Cellulitis treatment
- etc.

Application examples

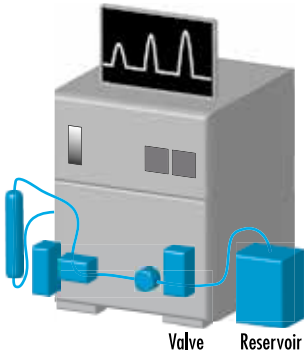
Analytical technology

DNA synthesis



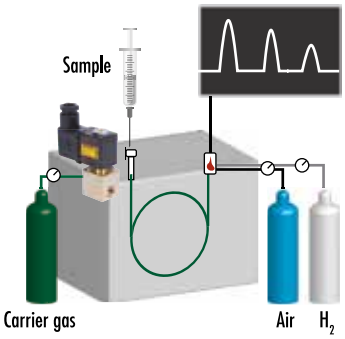
The valves are used as pilot valves to control, via diaphragms, the handling of fluids in a DNA synthesizer.

HPLC analysis



The valves are used for supplying and dosing samples in the process.

Gas chromatography

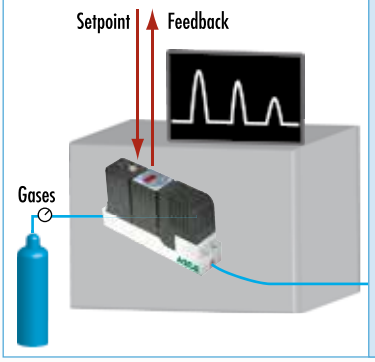


The valves adjust and control the upstream pressure of the carrier gas.

Emission analysis

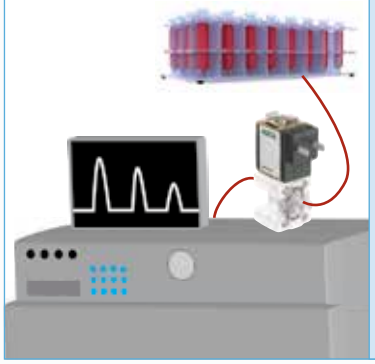
The battery-operated valves open and close the channel feeding the gases to the analysers.

Mass Flow Controllers



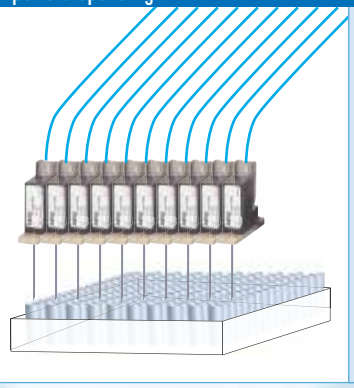
The valve is used for the precise proportional control of flow in response to a signal from a sensor.

Haematology



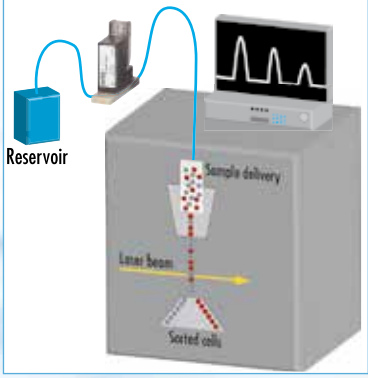
The valves control the supply and dosing of blood in the analytical process.

Pipette dispensing



The valves are used for supplying and dispensing volumes to and from pipettes. The aim is to supply/dispense equal volumes at regular intervals over a number of individual pipettes.

Cytometry

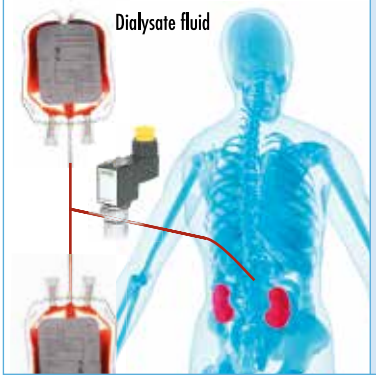


The valves are used for the delivery of sample solution, marker and fluid sheath in the analytical process.

Application examples

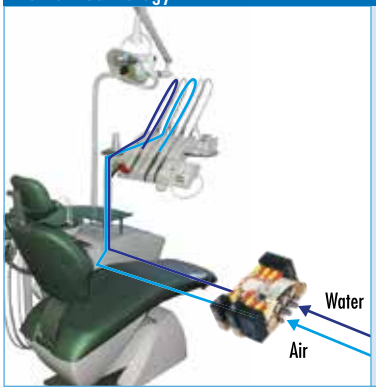
Medical technology

Dialysis



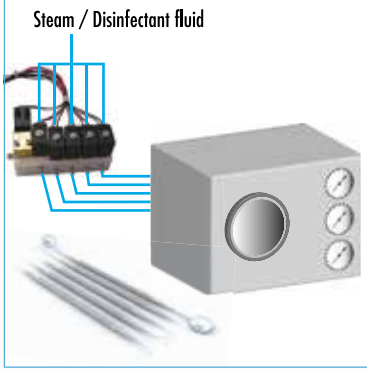
The pinch valve controls the supply of dialysate fluid from the reservoir to the patient.

Dental technology



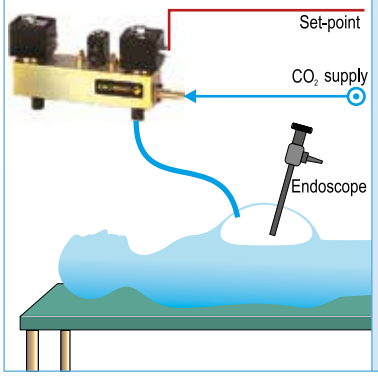
The unit regulates and controls the supply of water and air to the instruments of a dental treatment chair.

Clinical sterilisers



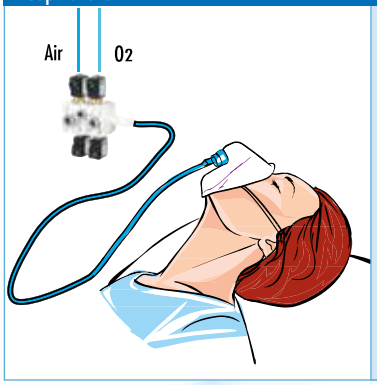
The valve module regulates and controls the supply of steam and/or disinfectant fluid for the sterilisation process.

Endoscopy



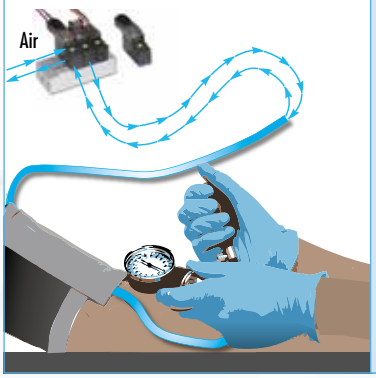
The valve module controls the CO_2 supply to enlarge the operating area in minimally-invasive surgery.

Respirators



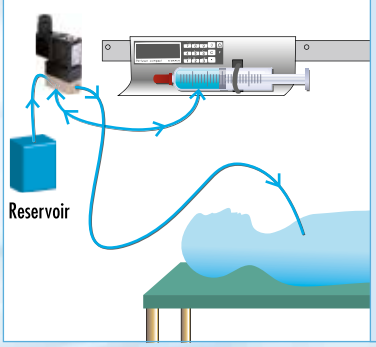
The valve module regulates the volume and/or mixture of oxygen and air supplied to the patient.

Blood pressure instruments



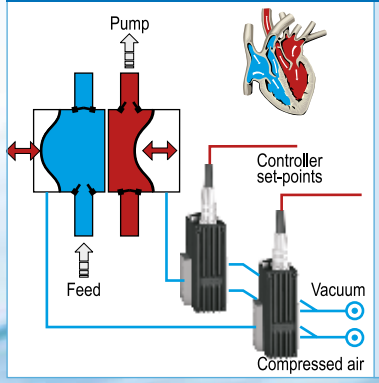
Micro valves allow control of the inflation and deflation of the cuff for blood pressure measurement.

Injector pumps



A 3/2 valve delivers the drug to the injector pump and from the injector pump to the patient. It operates in the vacuum range (suction phase) and overpressure range (dosing phase).

Artificial heart



Blood is pumped through an artificial heart by alternately applying pressure or vacuum.

Special Solutions

Analytical and medical technology

Solenoid valve module:
fluid isolation - diaphragm mechanism

6 solenoid-operated diaphragm valves assembled in a star-like configuration on a manifold to be used in chemical analysis.

Application: chemical analysis

Multi-function module:
fluid isolation valve – bellows seal system

Customer special assembly consisting of an injection moulded manifold with a fluid isolation valve, series 296, for the handling of ultrapure water.

Application: lab water system

Solenoid valve module:
fluid isolation - rocker mechanism

Fluid isolation solenoid valves, series 067, including power save circuit board, on a PMMA manifold (acrylic).

Application: cell analyzer

Modular-manifold: fluid isolation
– proportional – miniature solenoid valves

Injection moulded modular valve manifold with proportional and miniature fluid isolation valves. Suitable to shut off or proportionally control liquids and gaseous fluids.

Application: dental

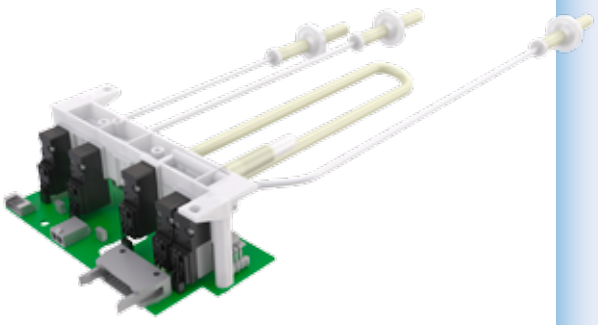
Special Solutions

Analytical and medical technology

Multi-function module: micro valves

Customized solution consisting of an injection moulded manifold with Micro 10 general service valves, series 188, printed circuit board, and tubing connection.

Application: dialysis system



Multi-function module: micro valves

Ventilator assembly consisting of an injection moulded valve manifold, pressure sensors, and Micro 10 valves, series 188.

Application: ventilator

Solenoid valve module:
fluid isolation - diaphragm mechanism

Fluid isolation solenoid valves, series 282, with low internal volume on PMMA manifold (acrylic).

Application: bioanalytical system

Multi-function module:
fluid isolation valve – flapper mechanism

Valve module with several fluid isolation valves, series 068, including a pressure sensor mounted on a customized acrylic manifold.

Application: blood analyzer

Selection of valves

Selection according to specifications

Page	Series	Function			Fluid isolation	Fluid			Pressure range			Nominal diameter			Power consumption		
		2/2-way	3/2-way	Proportional		Gases	Liquids	Vacuum	< 1 bar	1 to 3 bar	3 to 15 bar	Up to 0,5 mm	0,6 to 2 mm	2 to 12,5 mm	≤ 1 Watt	1 to 4 Watt	> 5 Watt
29	282	•			•	•	•	•	•			•			•		
31	067	•	•		•	•	•	•		•			•		•		
35	385		•		•	•	•			•			•			•	
37	110	•	•		•	•	•	•		•			•				•
45	068	•	•		•	•	•	•		•	•		•			•	
49	068	•	•		•	•	•	•		•	•			•		•	
53	068	•		•	•	•	•	•	•	•	•			•			•
57	282	•			•	•	•			•			•			•	•
59	283	•			•	•	•			•	•			•			•
63	383		•		•	•	•			•	•			•			•
67	296	•			•	•	•			•	•			•			•
69	396		•		•	•	•			•				•			•
71	284	•			•	•	•		•				•	•		•	•
75	384		•		•	•	•		•				•	•		•	•
77	188		•			•		•		•	•	•	•		•		
81	188		•			•		•		•	•		•			•	
85	302	•	•			•		•			•		•			•	
97	630	•	•			•		•			•		•		•		
99	RB	•	•			•				•	•		•		•	•	
105	S	•	•			•		•			•		•			•	
109	065	•	•			•		•	•	•	•		•			•	
111	065	•	•			•					•		•			•	
115	630	•		•		•		•			•		•		•		
117	202	•		•		•		•	•	•	•	•	•		•	•	
119	202	•		•		•		•			•	•	•			•	•
121	202	•		•		•		•			•	•	•		•	•	
123	202	•		•		•		•			•			•		•	
125	202	•		•		•	•	•		•	•		•	•		•	•
129	203	•		•			•				•			•			•
135	614		•	•		•		•	•	•	•		•	•			•
131	617		•	•		•				•	•			•		•	
141	607	•		•		•					•			•			•

Selection of valves

Selection according to type of connection and material

Page	Series	Connection type								Body materials					Seal materials					
		Flange	G thread	NPT thread	M5 thread	UNF thread	Hose connection	Spade plug	Cable ends	Stainless steel	Brass	PEEK	PPS	Other	NBR	EPDM	PTFE	FPM	FFPM	Other
29	282	•							•			•							•	
31	067	•			•	•		•	•			•				•		•	•	
35	385	•						•				•		•		•		•	•	
37	110	•				•	•	•				•		•		•		•		
45	068	•				•	•	•	•			•				•		•	•	
49	068	•	•					•	•			•				•		•	•	
53	068	•	•					•				•				•		•	•	
57	282		•	•				•		•				•		•	•	•		•
59	283						•	•	•					•				•		•
63	383						•	•	•					•				•		•
67	296		•					•	•	•		•					•		•	
69	396		•					•	•	•		•					•		•	
71	284						•	•						•						•
75	384						•	•						•						•
77	188	•			•			•	•					•	•			•		
81	188	•			•			•	•					•				•		
85	302	•			•		•	•	•					•	•			•		
97	630	•			•			•	•				•		•					
99	RB	•				•	•	•	•		•			•	•			•		
105	S	•			•			•	•	•								•		
109	065	•							•				•					•		
111	065	•			•			•	•	•								•		
115	630	•			•			•	•				•		•					
117	202	•							•		•							•	•	
119	202	•	•		•			•	•	•	•			•				•		
121	202	•	•						•	•	•							•		
123	202	•	•						•	•	•							•		
125	202		•		•			•		•	•			•		•		•		•
129	203		•					•			•				•			•		
135	614	•	•	•				•		•	•			•	•	•		•		
131	617	•	•					•						•	•					
141	607		•					•						•	•					

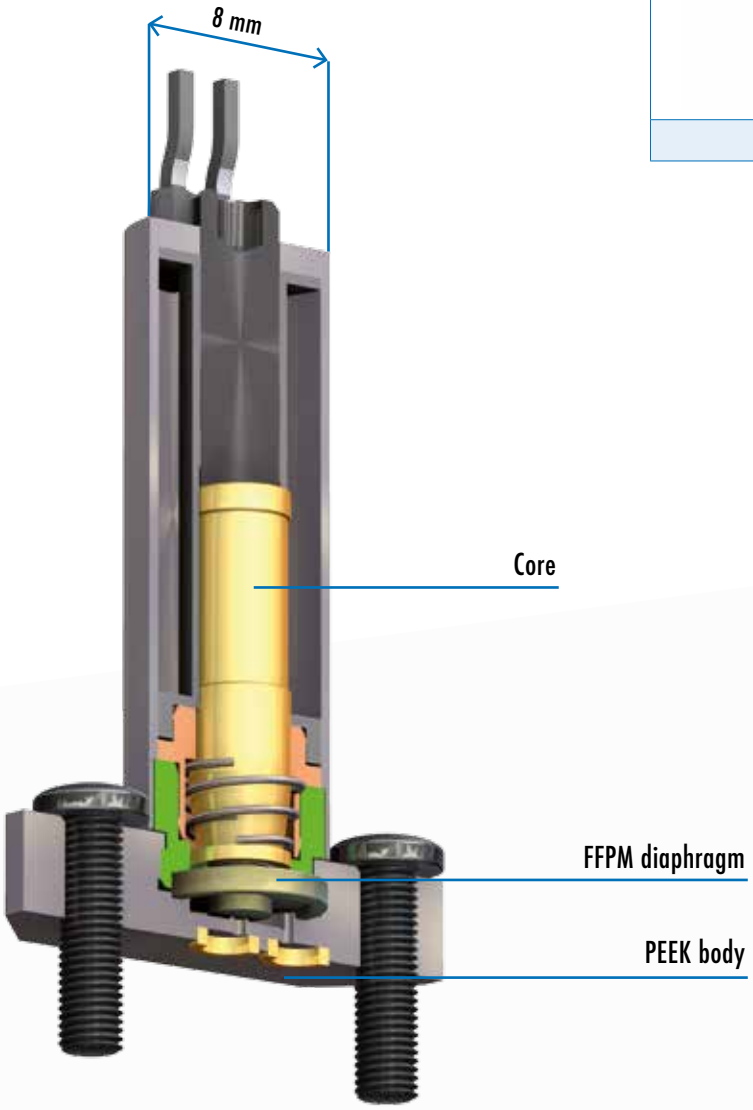
Fluid isolation 2/2 solenoid valves with

DIAPHRAGM MECHANISM

Series 282 solenoid valves with diaphragm mechanism are characterised by their compact size, long service life and very low internal volume. They are ideal for controlling aggressive fluids. The valve bodies are made of stainless steel or synthetic material (PEEK/PVDF/PP). Fluid isolation is ensured by the incorporated diaphragm made of VMQ (silicone), FPM (fluoroelastomer), FFPM (perfluoroelastomer) or EPDM (ethylene-propylene).

SERIES 282

SERIES 282



More information on Series 282 ▶ p.29

More information on Series 282 ▶ p.57

TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	0 – 2,5 bar
Function:	NC
Connection:	M5, G1/8, cartridge or flange
Construction:	Poppet valve
Valve body:	PEEK, PVDF, PP or stainless steel
Seals:	FFPM, FPM, VMQ and EPDM
Overall width:	8 mm, 17 mm, 27 mm and 32 mm

FEATURES
Compact design
Low power consumption (1,0 Watt)
Low internal volume (<10 µl)
Good self-draining capability
Good flushability
High-quality materials

Fluid isolation 2/2 and 3/2 solenoid valves with

ROCKER MECHANISM

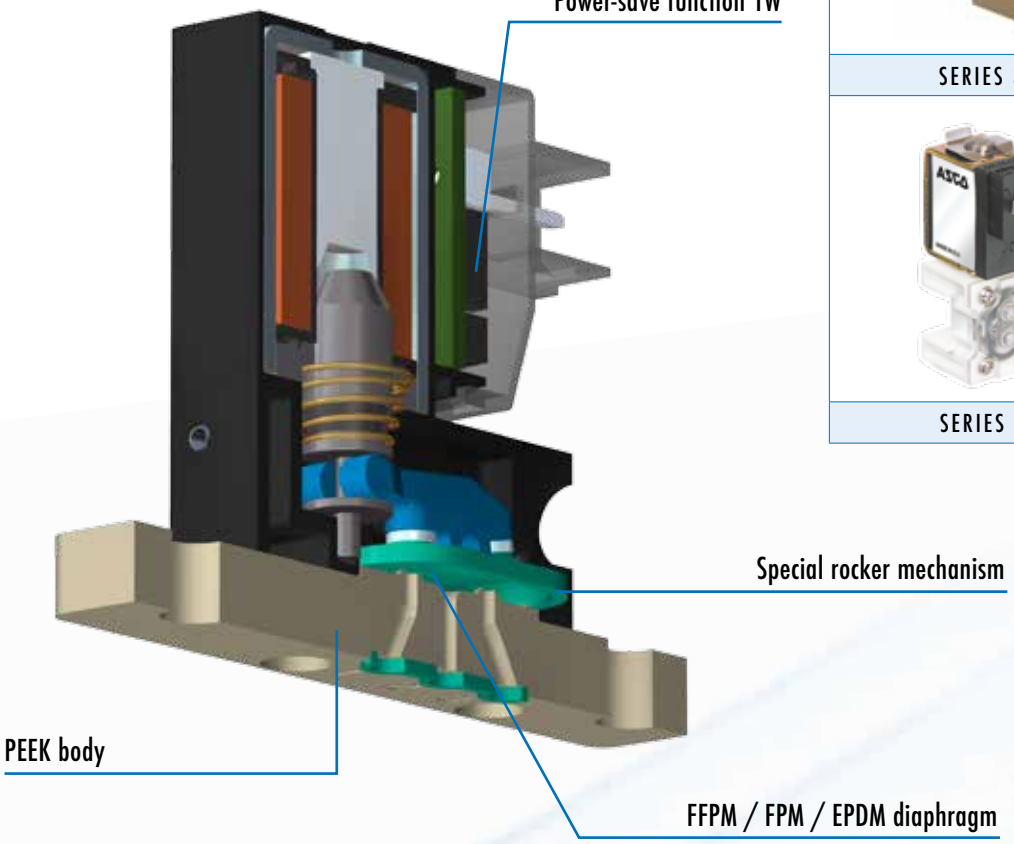
Series 067 fluid isolation solenoid valves with rocker mechanism are characterised by their compact size and hermetic separation between the control mechanism and the fluid. The solenoid valves are ideal for controlling aggressive fluids or applications requiring high fluid purity.

SERIES 067

Similar function:

SERIES 385

SERIES 110



More information on Series 067 ▶ p.31

More information on Series 385 ▶ p.35

More information on Series 110 ▶ p.37

TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	-0,9 to 3 bar
Function:	NC, NO and U
Connection:	Flange, hose connection, 1/4 - 28 UNF, 5/16 - 24 UNF
Construction:	Poppet valve
Valve body:	PEEK, polyamide
Seals:	FFPM, FPM and EPDM
Overall width:	Series 067: 10 mm Series 110/ 385: 16 mm

FEATURES
Compact design
Low power consumption (1,0 Watt)
Low heat transfer into the fluid
Low internal volume (< 13 µl)
Good self-draining capability
Good flushability
High-quality materials
Various electrical connection options

Fluid isolation 2/2 and 3/2 solenoid valves with

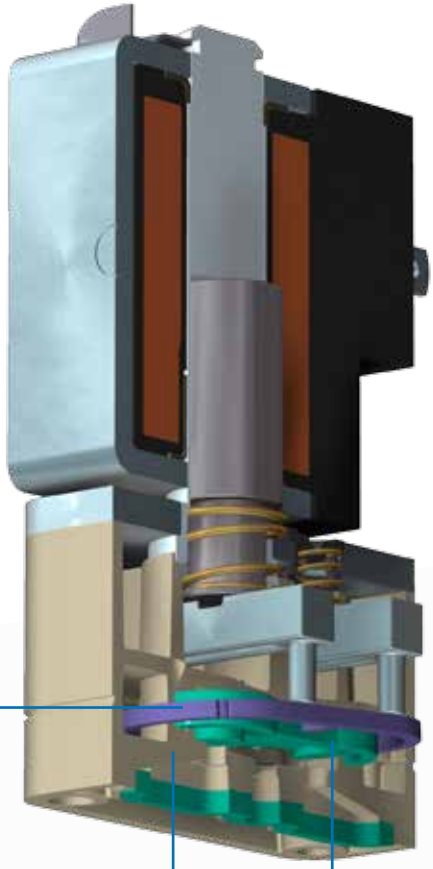
FLAPPER MECHANISM

Series 068 fluid isolation solenoid valves are suitable for use with neutral or aggressive liquids and gases. The isolation design and use of high-quality materials (PEEK and FFPM/FPM/EPDM) prevents fluid contamination. The special flapper mechanism and large orifice sizes (0,8 to 4 mm) allow high pressures (up to 10 bar). A power-save connector lowers the holding power down to 1,5 watts, thus minimising the heat transfer into the fluid.

SERIES 068 (16 mm)

SERIES 068 (22 mm)

SERIES 068
PROPORTIONAL VALVE



More information on Series 068, 16mm ▶ p. 45

More information on Series 068, 22mm ▶ p. 49

Proportional valve Series 068 ▶ p. 53

TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	-0,9 to 10 bar
Function:	NC, NO and U
Connection:	G1/8, flange, 1/4 - 28 UNF, hose connection
Construction:	Poppet valve
Valve body:	PEEK
Seals:	FFPM, FPM and EPDM
Overall width:	16 mm and 22 mm

FEATURES
Low power consumption (up to 1,5 watt)
Low heat transfer into the fluid
Wide pressure range
Low internal volume
Good self-draining capability
Good flushability
High-quality materials
Various electrical connection options

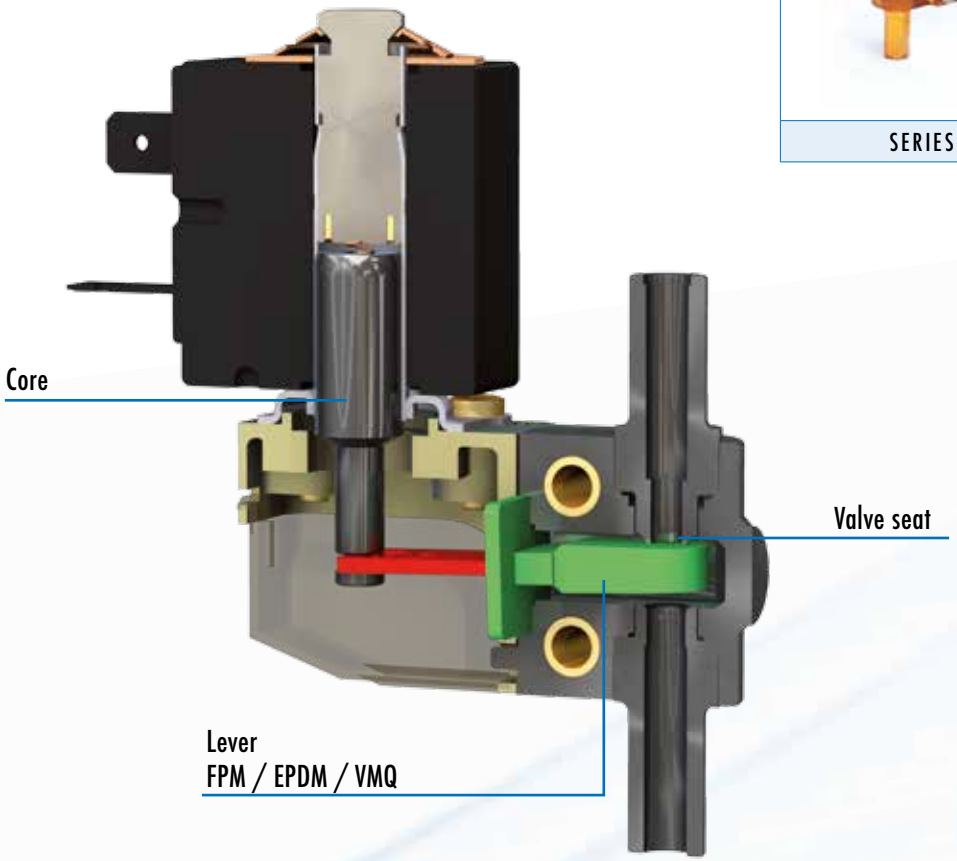
Fluid isolation 2/2 and 3/2 solenoid valves with

LEVER MECHANISM

Series 283 and 383 fluid isolation valves with lever mechanism can be used at high differential pressures and large flow volumes. Since the offset control mechanism provides optimal heat dissipation in the electromagnetic component, the valves are suitable for use at high ambient temperatures.

SERIES 283

SERIES 383



More information on Series 283 ▶ p.59

More information on Series 383 ▶ p.63

TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	0 to 10 bar
Function:	NC, NO and U
Connection:	G1/4 - G1/2, Smooth spigots 8 - 11 mm O.D.
Construction:	Poppet valve
Valve body:	PEI (Polyetherimide)
Seals:	VMQ / FPM / EPDM
Overall width:	25 mm and 32 mm

FEATURES
Large flow
Wide pressure range
Low internal volume
Good self-draining capability
Good flushability
Various types of seal materials
Various electrical connection options

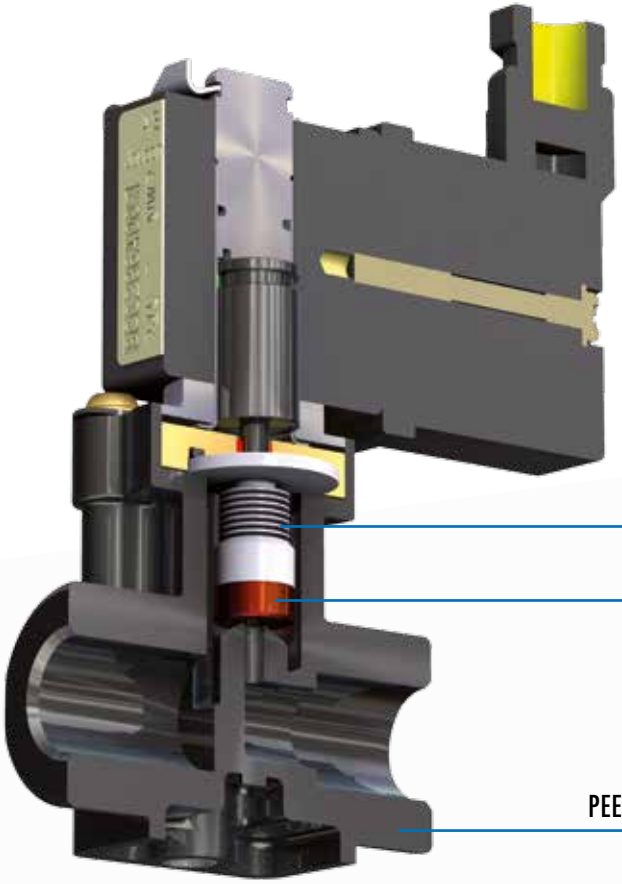
Fluid isolation 2/2 and 3/2 solenoid valves with

BELLOWS SEAL SYSTEM

Series 296 and 396 fluid isolation solenoid valves with bellows seals are characterised by their high functional reliability under harsh conditions and their long service life. PEEK and stainless steel bodies, PTFE bellows and FFPM seals allow the valves to be used with extremely corrosive fluids. The valves are designed for high pressure and flow rates.

SERIES 296

SERIES 396



More information on Series 296 ▶ p.67

More information on Series 396 ▶ p.69

TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	0 to 6 bar
Function:	NC
Connection:	G1/4 and G3/8
Construction:	Poppet valve
Valve body:	PEEK and stainless steel
Seals:	PTFE (bellows), FFPM / FPM (disc)
Overall width:	22 mm and 45 mm

FEATURES
Large nominal diameter (2 - 6 mm)
Wide pressure range
High-quality materials
Good self-draining capability
Good flushability
Low weight (with plastic body)
Optional operation with power-save connector

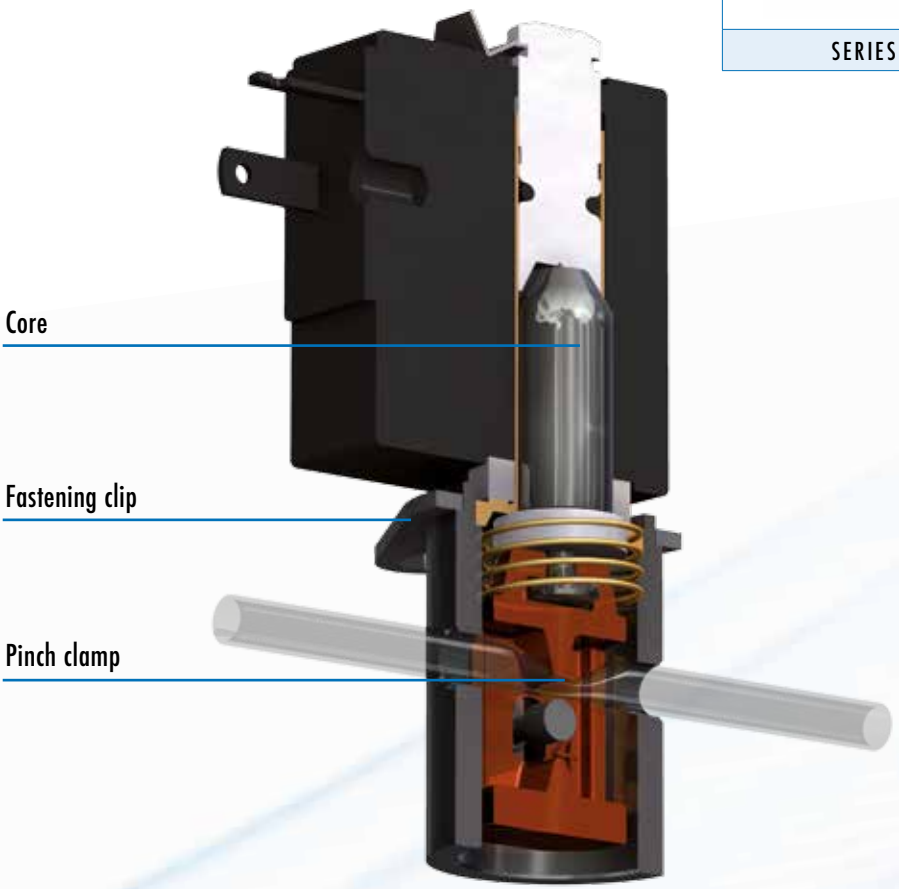
Fluid isolation 2/2 and 3/2 solenoid valves with

PINCH MECHANISM

Series 284 and 384 fluid isolation pinch valves are characterised by their uninterrupted flow path and the long service life of their tubes. This is achieved using the pinch mechanism which provides a smooth, constant pressure on the soft tubing. Any risk of contamination is reliably avoided by changing the tubes.

SERIES 284

SERIES 384



More information on Series 284 ▶ p.71

More information on Series 384 ▶ p.75

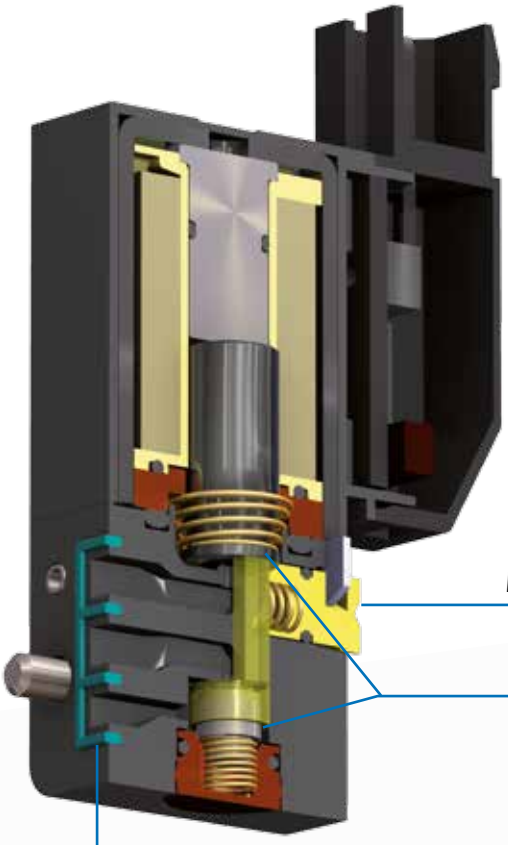
TECHNICAL CHARACTERISTICS	
Fluid:	Gases and liquids
Pressure range:	0 to 0,8 bar
Function:	NC, NO and U
Connection:	Tubes 1,65 mm to 9,5 mm O.D.
Construction:	Tube clamp
Valve body:	Aluminium
Tube:	VMQ (Silicone)
Overall width:	17 mm, 32 mm and 42 mm

FEATURES
Compact design
Low to very high flow
Flow in both directions
Straight, uninterrupted flow path
Good flushability
Various tube material options
Various electrical connection options

2/2 and 3/2 micro solenoid valves

MICRO SOLENOID VALVES

Series 188, 302, S, RB and Piezotronic micro solenoid valves are used mainly as pilot valves or for the handling of inert gases. These series are suitable for applications in almost all areas of analytical and medical technology. Their compact size and easy installation allows several valves to be mounted on a subbase or custom valve module.



SERIES 188, MICRO 10

SERIES 188, LARGE FLOW

Similar function:

SERIES 302

SERIES S

SERIES RB

PIEZOTRONIC - 15 mm

More information on MICRO 10 ▶ p.77
More information on Series 188 Large Flow ▶ p.81
More information on Series 302 ▶ p.85
More information on Series S ▶ p.105
More information on Series RB ▶ p.99
More information on Piezotronic 15mm ▶ p.97

TECHNICAL CHARACTERISTICS	
Fluid:	Inert gases
Pressure range:	0 to 10 bar
Function:	NC and NO
Connection:	Flange, threaded connection, 1/4 - 28 UNF, hose connection, screw-in type M5
Construction:	Poppet valve
Valve body:	Polyamide, stainless steel, brass, PBT
Seals:	NBR, FPM, TPE
Overall width:	Series 188: 10 mm Series 302: 15 mm Series S: 19 mm Series RB: 15 and 19 mm Piezotronic: 15 mm

FEATURES
Compact design
Low power consumption (1 Watt)
Wide range of nominal diameters (0,6 - 2 mm)
Other bodies and seals on request
Suitable for vacuum applications
Suitable for mounting on multiple subbase
Various electrical contact options

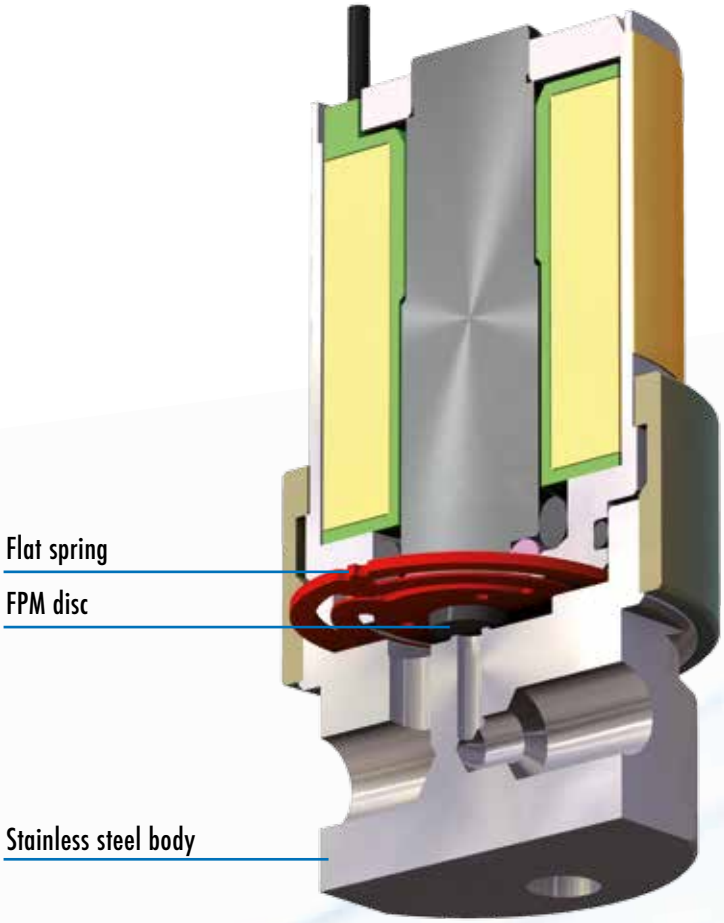
2/2 and 3/2 solenoid valves with

FLAT SPRING TECHNOLOGY

Series 065 flat spring valves are used mainly in medical and analytical apparatus, gas analysers and leak detectors. The valves are characterised by their long service life and extremely short response times. High-quality stainless steels and sealing materials make the valves suitable for use with a wide range of gases.

SERIES 065

SERIES 065, 15 mm



More information on Series 065 ▶ p.111

Flat spring valve, 15 mm Series 065 ▶ p.109

TECHNICAL CHARACTERISTICS	
Fluid:	Gases
Pressure range:	0 to 9 bar
Function:	NC and NO
Connection:	M5 or flange
Construction:	Poppet valve
Valve body:	Stainless steel and PPS
Seals:	FPM
Overall width:	15 mm, 22 mm

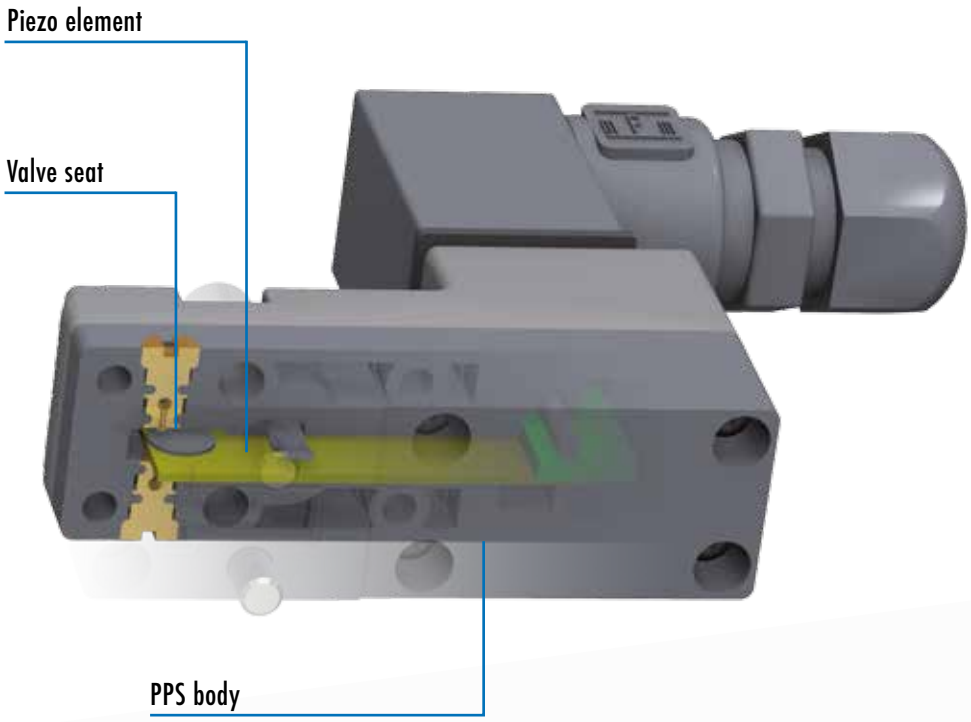
FEATURES
Long service life (> 1 billion cycles)
Short response times (< 10 ms)
Low power consumption (2 Watt)
Wide range of nominal diameters (0,6 - 2 mm)
Compact design
High-quality materials (Stainless steel / FPM)
Other seals on request
Easy integration into systems

2-way proportional valve for flow control

PIEZOTRONIC

Series 630 2/2 piezo valves for flow control are a high-tech solution designed in particular for applications requiring extremely low power consumption. They are suitable for use in battery-operated equipment or in potentially explosive areas.

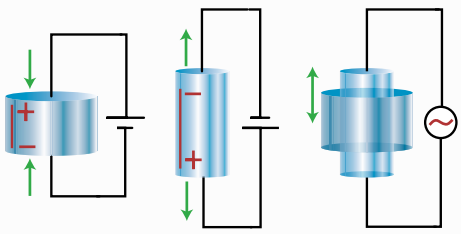
PIEZOTRONIC, SERIES 630



More information on Piezotronic ▶ p.115

Piezoelectric effect

A mechanical deformation occurs under an electrical charge (this can also occur vice-versa). The multi-layer piezoelectric element is the essential part of a piezoelectric valve. It consists of elementary dipoles which are polarised during manufacture. The length of the material changes as soon as the piezo ceramics are exposed to an electrical field.



TECHNICAL CHARACTERISTICS	
Fluid:	Air and gases
Pressure range:	0 to 8 bar
Function:	NC and NO
Flow:	max. 0,007 m^3/h
Connection:	Flange (CNOMO), M5, G1/8
Construction:	Poppet valve
Valve body:	PPS
Seals:	NBR
Piloting voltage:	0 - 40 V
Overall width:	15 mm

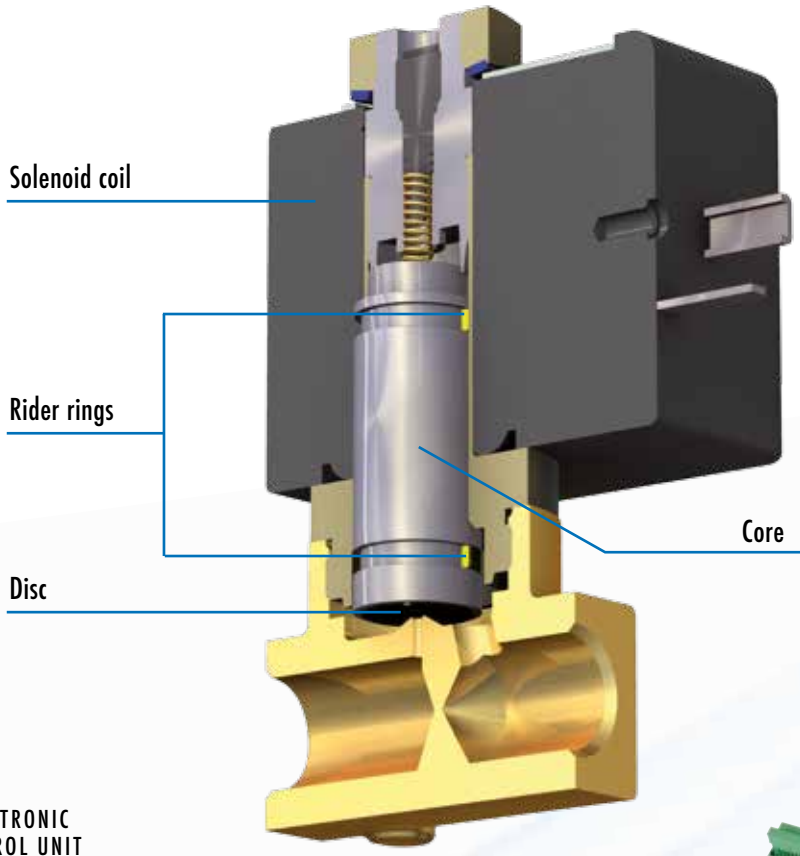
FEATURES
Extremely low power consumption (0,007 Watt)
Large electrical control range
Long service life (> 1 billion cycles)
Pad mounting to industrial standard
No overheating
EExia option

2-way proportional valve for flow control

POSIFLOW

Series 202 and 203 Posiflow proportional valves can be used in practically all applications in which the flow of a liquid or gas needs to be controlled. Since a single proportional valve can replace two or three conventional valves connected in parallel (NC or NO) to obtain low, medium or high flow rates, it provides a cost-effective and space-saving solution.

POSIFLOW, SERIES 202/203



ELECTRONIC CONTROL UNIT

CONTROL^{D}

Electronic control unit or Control^{D}

The electronic control unit converts a standard signal (e.g. 0 to 10 V) into an output current (0 to 1,0 A). The output current, which is pulse-width modulated, provides low-hysteresis control, irrespective of temperature influences. The current values are set with a potentiometer.

The stand-alone control device CONTROL^{D} is used for open-loop, closed-loop or double-loop (cascaded) process control. It is designed to control proportional valves by regulating the current in the valve's solenoid coil. The control parameters can be set by PC software.

More information on Posiflow (202) ▶ p.125

More information on Posiflow (203) ▶ p.129

Control^{D} ▶ p.143

Electronic control unit ▶ p.145

TECHNICAL CHARACTERISTICS	
Fluid:	Air, gases, liquids
Pressure range:	Vacuum to 16 bar
Function:	NC
Flow:	0 to 35 Nl/min
Connection:	M 5 to G 1/2
Construction:	Poppet valve
Valve body:	Stainless steel, brass
Seals:	NBR, FPM, CR, EPDM and PTFE

FEATURES
Compact design
Large flow
Wide pressure range
Low hysteresis (< 5 % of span)
Low power consumption
Direct operated
Variable flow proportional to solenoid current

2-way proportional valve for flow control

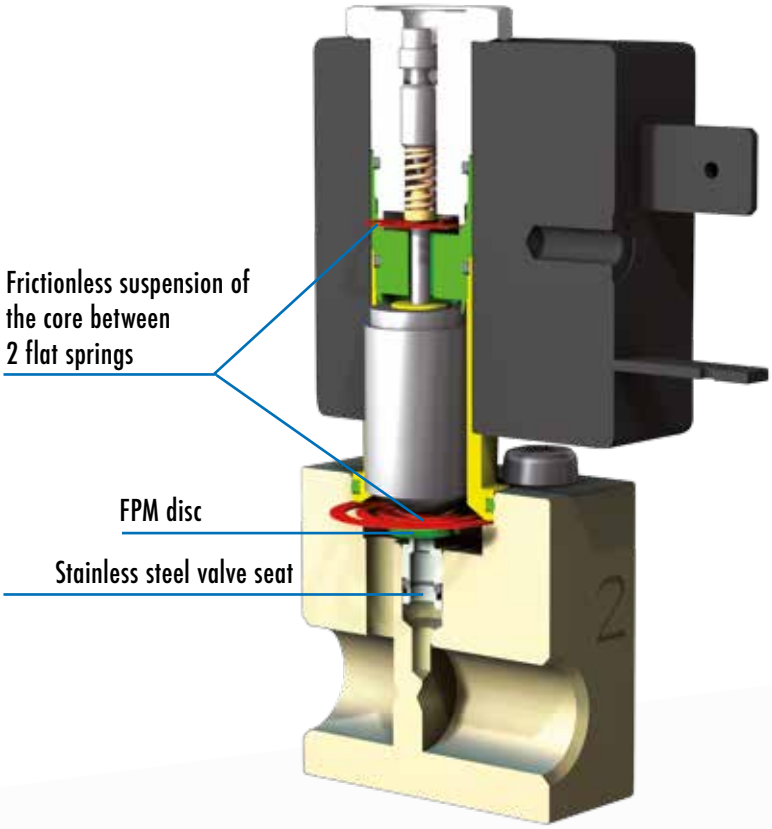
PRECIFLOW

Series 202 2/2 proportional valves are ideal for use in applications in many areas of analytical and medical technology. Frictionless suspension of the core reduces hysteresis and provides stepless control in the lower and upper ranges. Typical applications include respirators or mass flow controllers.

PRECIFLOW 15mm, Series 202

PRECIFLOW 19mm, Series 202

PRECIFLOW 12,7mm, Series 202



ELECTRONIC CONTROL UNIT

CONTROL^{D}

Electronic control unit or Control^{D}

The electronic control unit converts a standard signal (e.g. 0 to 10 V) into an output current (0 to 1,0 A). The output current, which is pulse-width modulated, provides low-hysteresis control, irrespective of temperature influences. The current values are set with a potentiometer.

The stand-alone control device CONTROL^{D} is used for open-loop, closed-loop or double-loop (cascaded) process control. It is designed to control proportional valves by regulating the current in the valve's solenoid coil. The control parameters can be set by PC software.

More information on Preciflow 15mm ▶ p.119

More information on Preciflow 19mm ▶ p.121

More information on Preciflow 12,7mm ▶ p.117

Control^{D} ▶ p.143

Electronic control unit ▶ p.145

TECHNICAL CHARACTERISTICS	
Fluid:	Air, gases
Pressure range:	Vacuum to 10 bar
Function:	NC
Flow:	max. 0,096 m^3/h
Connection:	Flange (CNOMO), cartridge, M5, G1/8
Construction:	Poppet valve
Valve body:	PVDF, brass or stainless steel
Seals:	FPM, FFPM
Actuation:	Electronic control unit or Control^{D}

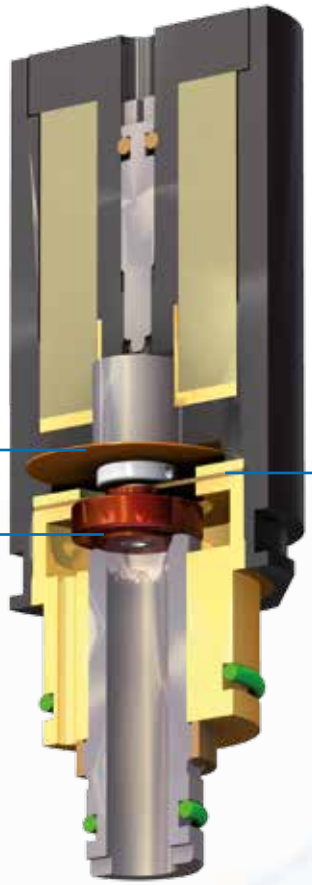
FEATURES
Compact design
Low to high flow
Wide pressure range
Minimum hysteresis
Direct operated
Variable flow proportional to solenoid current
Stepless flow characteristic

2-way proportional valve for flow control

PRECIFLOW IPC

Series 202 Preciflow IPC valves are inlet pressure compensated flow control valves. Inlet pressure compensation allows high pressures and flows at low solenoid coil power consumption. Typical applications for these valves are in medical (e.g. respirators) and analytical apparatus (e.g. mass flow controllers).

PRECIFLOW IPC, SERIES 202



CONTROL^D

Control^D

The stand-alone control device CONTROL^D is used for open-loop, closed-loop or double-loop (cascaded) process control. It is designed to control proportional valves by regulating the current in the valve's solenoid coil. The control parameters can be set by PC software.

More information on Preciflow IPC ▶ p.123

Control^D ▶ p.143

TECHNICAL CHARACTERISTICS	
Fluid:	Air, gases
Pressure range:	0 to 7 bar
Function:	NC
Flow:	0,17m³/h
Connection:	Flange, cartridge, G1/8
Construction:	Poppet valve
Valve body:	Stainless steel
Seals:	FPM
Actuation:	Control^D

FEATURES
Compact design
High flow
Wide pressure range
Low hysteresis (< 5 % of span)
Low power consumption (2,5 W)
Direct operated
Variable flow proportional to solenoid current

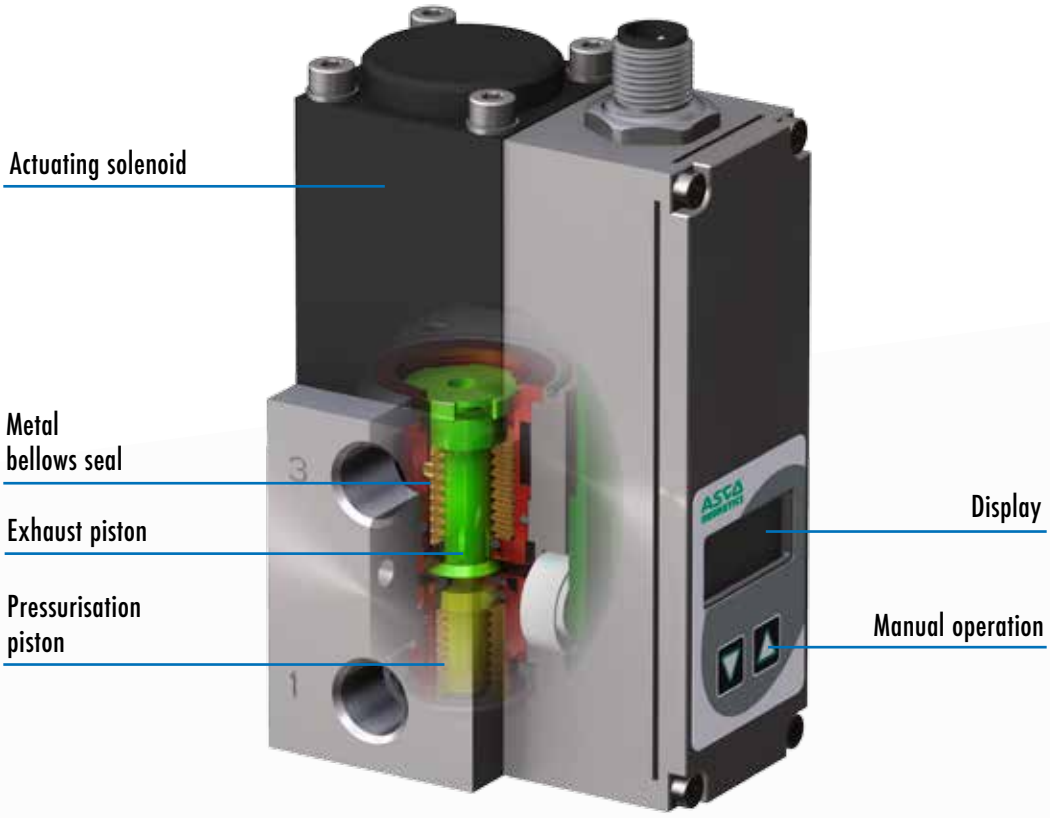
3-way proportional valve for pressure control

SENTRONIC^{PLUS} / SENTRONIC^{LP}

SENTRONIC^{Plus} and SENTRONIC^{LP} are digital pressure regulator valves. With the Data Acquisition Software (DaS) and the USB interface, it's now possible to adapt the pressure regulators to the control loop in an optimal way. The scope function allows you to log and read out the system's transient response in real time.

SENTRONIC^{PLUS}, SERIES 614

SENTRONIC^{LP}, SERIES 617



More information on Sentronic^{PLUS} ▶ p.135

More information on Sentronic^{LP} ▶ p.131

TECHNICAL CHARACTERISTICS	
Fluid:	Air or inert gases
Pressure range:	Vacuum to 50 bar
Function:	NC, pressure held
Connection:	G1/8 to G1, flange
Construction:	Poppet valve
Body:	Aluminium, brass, stainless steel
Seals:	NBR and FPM
Setpoint input:	0 – 10 V, 0 – 20 mA, 4 – 20 mA, 2 bit
Feedback output:	0 – 10 V, 0 – 20 mA, 4 – 20 mA

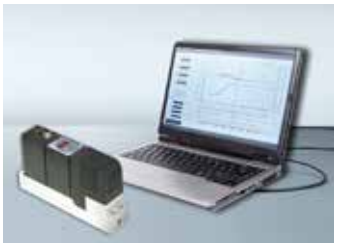
FEATURES
Very short response times
Extremely low sensitivity
Wide pressure range
Low hysteresis (< 1 % of span)
50 µm filtration
Direct operated, pilot operated
No constant air consumption
Digital control
PC communication

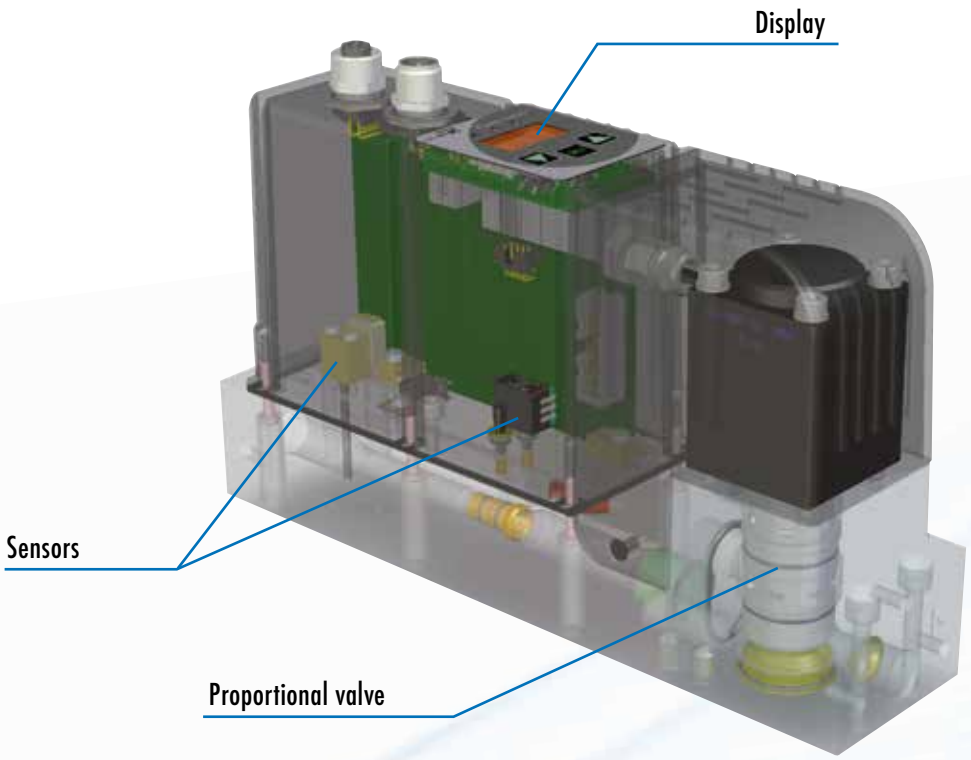
2-way proportional valve for flow control

FLOWTRONIC^{D}

FLOWTRONIC^{D} is a digitally operated flow regulator valve for gases up to 1000 Nl/min. It is especially designed for applications placing extreme dynamic demands on flow control. The FLOWTRONIC^{D} consists of a fast, direct-operated 2-port proportional valve that operates independently of the inlet pressure (max. 8 bar), and a control unit which contains all the control electronics and sensors. The FLOWTRONIC^{D} offers precise flow adjustment and responds to outside influences within no time at all.

FLOWTRONIC^{D}, SERIES 607





More information on Flowtronic^{D} ▶ p.141

TECHNICAL CHARACTERISTICS	
Fluid:	Air or inert gases
Inlet pressure:	max. 8 bar
Control range:	5-2000 Nl/min
Nominal diameter:	2 mm, 3 mm, 5 mm, 6 mm, 8 mm
Connection:	G1/4, G3/8, G1/2
Construction:	Poppet valve
Body:	Aluminium
Seals:	NBR
Setpoint input:	0 – 10 V, 0 – 20 mA, 4 – 20 mA
Feedback output:	0 – 10 V, 0 – 20 mA, 4 – 20 mA

FEATURES
Very short response times
Extremely low sensitivity
Wide pressure range
High flow accuracy (< 3 % of span)
50 µm filtration
Easy change of control parameters
Digital control
Integrated display (optionally without)
PC communication

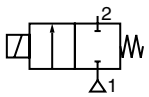
Annex

TECHNICAL SPECIFICATIONS

MICRO SOLENOID VALVE

diaphragm mechanism, fluid isolation
pad-mounting body

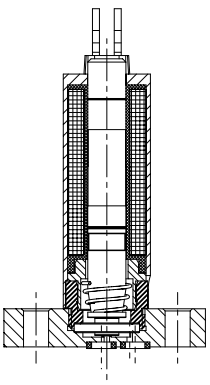
NC



2/2
Series
282

FEATURES

- *Miniature solenoid valves for medical and gas analysers and biotechnology equipment*
- *Designed to control acids, bases and analytical reagents*
- *Hermetic separation of control mechanism and fluid:*
  - *Particulate contamination caused by friction of moving parts is excluded*
  - *Reliable operation in applications with highly aggressive fluids is ensured*
- *Easy-to-flush internal cavity and good self-draining capability*
- *Low internal volume*
- *Low power consumption*
- *Easy installation*



pad-mounting body

GENERAL

Differential pressure 0 to +0,5 bar [1 bar =100 kPa]
Maximum viscosity 20 cSt (mm²/s)
Response time < 20 ms
Internal volume < 10 µl

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases (filtered 50 µm)	+10°C to + 40°C	FFPM (perfluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PEEK
Diaphragm FFPM

OTHERS MATERIALS

Internal parts Stainless steel

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Coil connection Pin header with 2 contacts
Electrical safety IEC 335
Standard voltages DC (=) : 12V - 24V

prefix option	power ratings				operator ambient temperature range (TS)	replacement coil		type (1)
	inrush ~	holding ~		cold =				
	(VA)	(VA)	(W)	(W)	(C°)			
L	-	-	-	1	+10 to + 40	-	-	01

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number cable ends
				min.	max. (PS) liquids, gases (∗)		pad-mounting body
	(mm)	(m³/h)	(l/min)		=	=	
NC - Normally closed							
pad mounting	0,5	0,0066	0,11	0	0,5	1	**LS282A010**

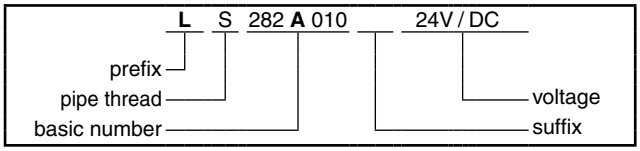
OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) seals and diaphragm. Contact us

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation

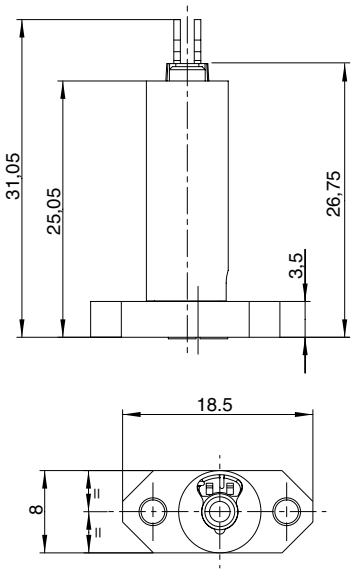
ORDERING EXAMPLES:



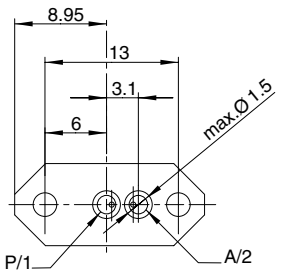
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "L" solenoid
IEC 335 / with pin header with 2 contacts
Weight: 0,006

LS282A010



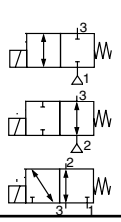
Pad-mounting pattern



MICRO SOLENOID VALVES

rocker mechanism, fluid isolation
pad mounting body
MICRO 10

2/2 NC
2/2 NO
3/2 U



2/2
3/2
Series
067

CE

FEATURES

- *Solenoid valve for use with neutral or aggressive liquids and gases in analytical and medical systems*
- *Hermetic separation of control mechanism and fluid:*
  - *Prevents particulate contamination caused by friction of moving parts, assuring maximum purity of fluid*
  - *Ensures reliable operation in applications with highly aggressive fluids*
- *Special rocker mechanism combined with a separating diaphragm prevents heat transfer to the fluid and eliminates the sticking effect of the valve seat*
- *Good self-draining capability and easy-to-flush internal cavity*
- *Low internal volume*
- *Reduced heat exchange due to integrated **power-save** switch*
- *Various electrical connection options*

GENERAL

Differential pressure	-0,9 to +3 bar (usable in 0,1 bar abs. vacuum)
Maximum viscosity	20 cSt (mm²/s), filtered at 50 µm
Response time	< 10 ms
Internal volume	< 13 µl (connections not included)

fluids (✳)	temperature range (TS)	seal materials (✳)
liquids or gases	10 to 40 °C	FFPM, FPM
	5 to 40 °C	EPDM

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

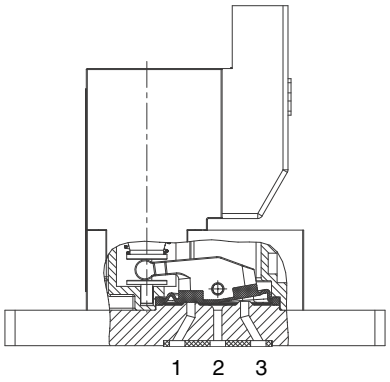
Body	PEEK
Diaphragm	FFPM (EPDM, FPM)
Seals	FFPM (EPDM, FPM)

OTHER MATERIALS

Internal parts	Stainless steel

ELECTRICAL CHARACTERISTICS

Coil insulation class	F
Coil connection	**Pin header with** 2 contacts
Electrical safety	EN 60335
Standard voltages	DC (=): 12V (+10% / -5%)
(Other voltages on request)	24V (+10% / -5%)



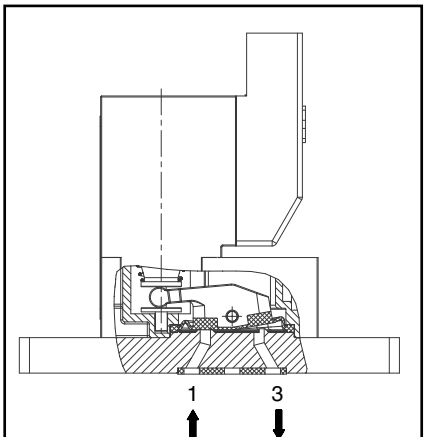
Function 3/2 U

coil type (1)	power ratings = inrush / holding	ambient temperature range (TS)	protection	electrical connection
	(W)	(°C)	IP40	Connector with two 0,5 mm² lead wires + built-in LED and electrical protection or cable ends, 0,5 m long
specific	2,5 / 1,0*	10 to 50		

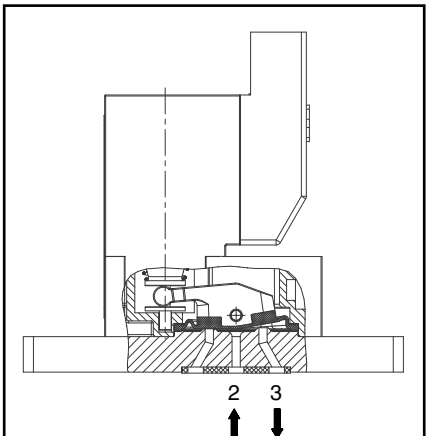
* With power-save electronics

(1) The coil used for orifice size 1,35 mm is longer by 12,5 mm than that used for the other orifice sizes, see drawings on page 33

FUNCTIONAL PRINCIPLE



Function 2/2 NC



Function 2/2 NO

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)			Electrical connection/ type (✳)	catalogue no.	OPTION	
				min.	max. (PS)				FPM	EPDM
					gases	liquids				
	(mm)	(m³/h)	(l/min)		=	=				
2/2 NC - normally closed										
Long flange (1)	0,6	0,006	0,10	-0,9	3	3	1 2 3 4 5	**SC S067A 021** **SC S067A 022** **SC S067A 023** **SC S067A 024** **L S067A 025**	V	E
	0,8	0,010	0,22	-0,9	2	2	1 2 3 4 5	**SC S067A 026** **SC S067A 027** **SC S067A 028** **SC S067A 029** **L S067A 030**	V	E
	1,0	0,017	0,34	-0,9	1,5	1,5	1 2 3 4 5	**SC S067A 031** **SC S067A 032** **SC S067A 033** **SC S067A 034** **L S067A 035**	V	E
	1,35	0,026	0,46	-0,9	1,0	1,0	1 2 3 4 5	**SC S067A 036** **SC S067A 037** **SC S067A 038** **SC S067A 039** **L S067A 040**	V	E
2/2 NO - normally open										
Long flange (1)	0,6	0,006	0,10	-0,9	3	3	1 2 3 4 5	**SC S067A 061** **SC S067A 062** **SC S067A 063** **SC S067A 064** **L S067A 065**	V	E
	0,8	0,010	0,22	-0,9	2	2	1 2 3 4 5	**SC S067A 066** **SC S067A 067** **SC S067A 068** **SC S067A 069** **L S067A 070**	V	E
	1,0	0,017	0,34	-0,9	1,5	1,5	1 2 3 4 5	**SC S067A 071** **SC S067A 072** **SC S067A 073** **SC S067A 074** **L S067A 075**	V	E
	1,35	0,026	0,46	-0,9	1,0	1,0	1 2 3 4 5	**SC S067A 076** **SC S067A 077** **SC S067A 078** **SC S067A 079** **L S067A 080**	V	E
3/2 U - universal										
Long flange (1)	0,6	0,006	0,10	-0,9	3	3	1 2 3 4 5	**SC S067A 101** **SC S067A 102** **SC S067A 103** **SC S067A 104** **L S067A 105**	V	E
	0,8	0,010	0,22	-0,9	2	2	1 2 3 4 5	**SC S067A 106** **SC S067A 107** **SC S067A 108** **SC S067A 109** **L S067A 110**	V	E
	1,0	0,017	0,34	-0,9	1,5	1,5	1 2 3 4 5	**SC S067A 111** **SC S067A 112** **SC S067A 113** **SC S067A 114** **L S067A 115**	V	E
	1,35	0,026	0,46	-0,9	1,0	1,0	1 2 3 4 5	**SC S067A 116** **SC S067A 117** **SC S067A 118** **SC S067A 119** **L S067A 120**	V	E

(✳) Types 1 to 5 with power-save electronics, LED and electrical protection
(1) 2 hexagon socket head cap mounting screws M3x6 mm, stainless steel, ISO4762 supplied

1 = width: 5,08 mm **4** = width: 2,54 mm
2 = width: 5,08 mm **5** = Flying leads, 0,5 m long, 0,25 mm²
3 = width: 2,54 mm (see drawings on page 33)

OPTIONS

- Subbase (consult us)
- Manual operator (impulse-type)

INSTALLATION

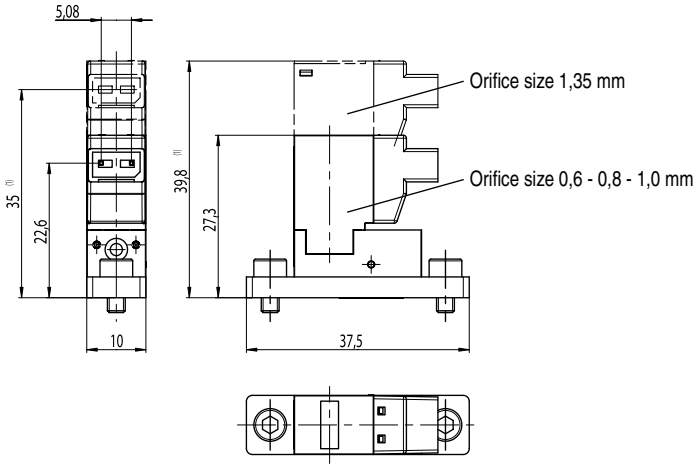
- The solenoid valves can be mounted in any position without affecting operation
- Installation/maintenance instructions are included with each valve

All leaflets are available on: **www.asconumatics.eu**

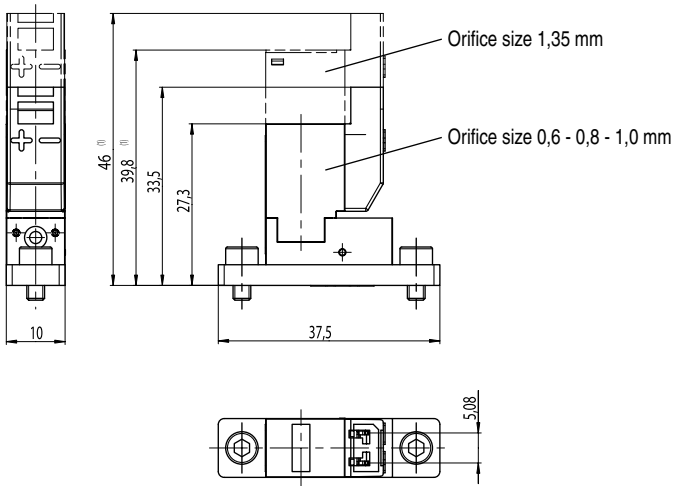
DIMENSIONS (mm)**, WEIGHT** (g)
Weight: 11,7 g

LONG FLANGE VERSION

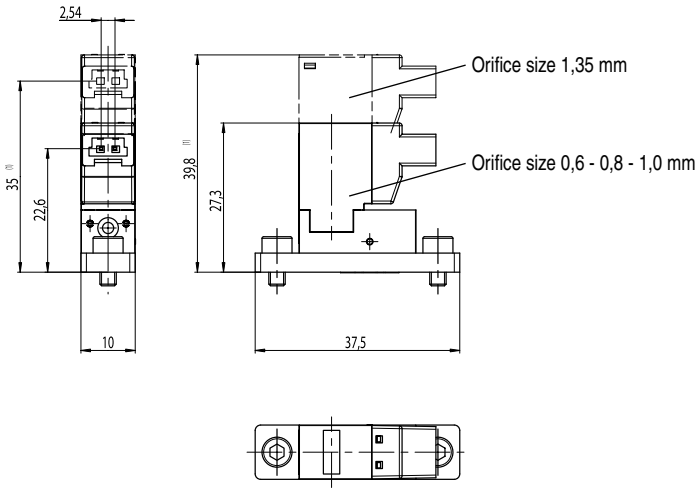
Type 1



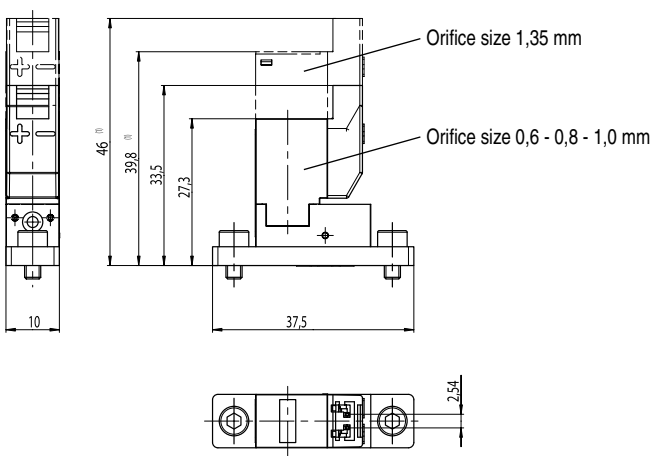
Type 2



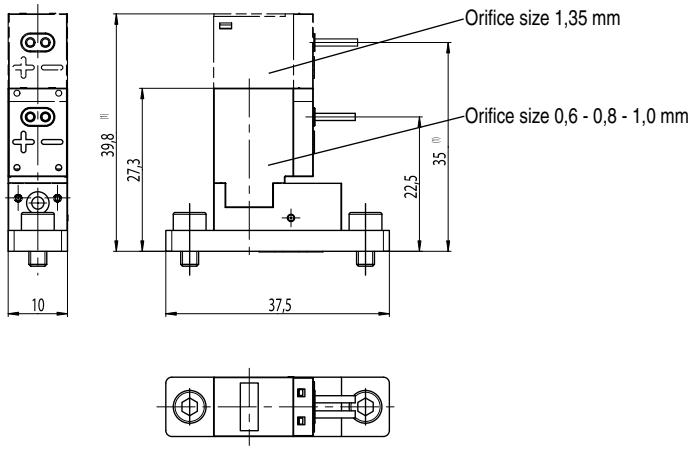
Type 3



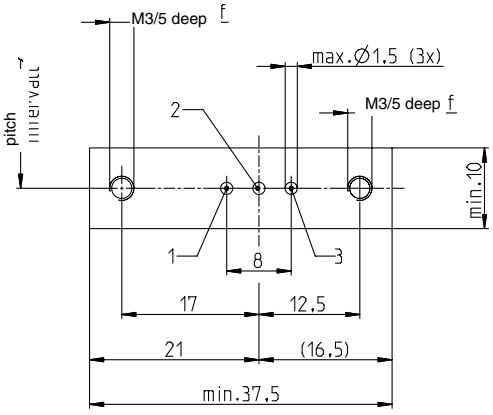
Type 4



Type 5



Mounting pad

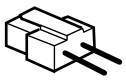


(1) The coil used for orifice size 1,35 mm is longer by 12,5 mm than that used for the other orifice sizes

***** Connectors must be ordered separately, please specify the quantity and catalogue numbers as required:

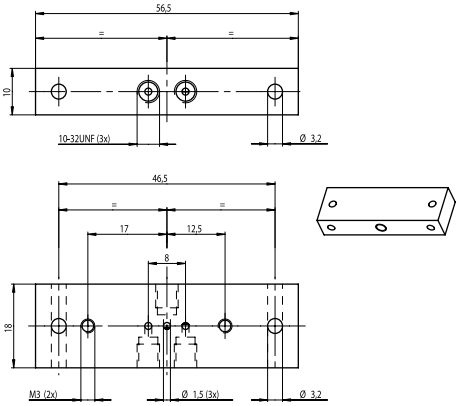
2-wire connector

Pin spacing 5,08 mm	- 0,5 m long	- **catalogue number: 88118801**
	- 1,5 m long	- **catalogue number: 88118802**
	- 3 m long	- **catalogue number: 88118803**
Pin spacing 2,54 mm	- 0,5 m long	- **catalogue number: 88118806**
	- 1,5 m long	- **catalogue number: 88118807**
	- 3 m long	- **catalogue number: 88118808**

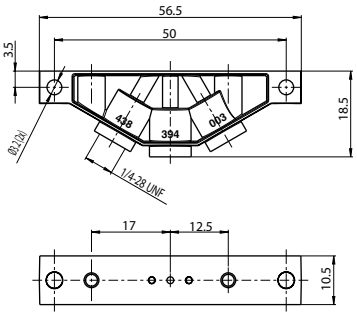


SINGLE SUBBASES
PEEK

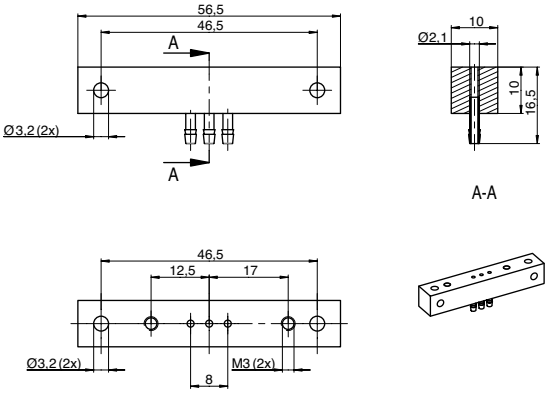
UNF thread - catalogue number 36100038



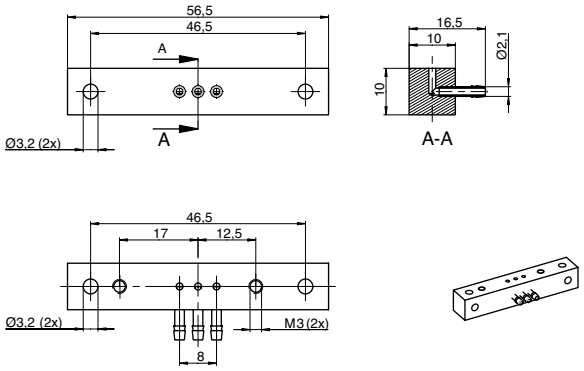
UNF thread - catalogue number 36100040



Bottom push-in hose connection - catalogue number 36100042



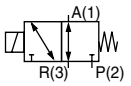
Side push-in hose connection - catalogue number 36100044



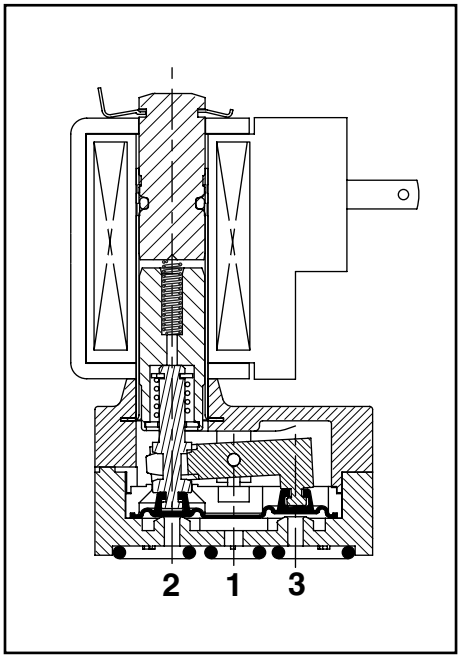
MINIATURE SOLENOID VALVES

rocker mechanism, fluid isolation
pad mounting body

U



3/2
Series
385



FEATURES

- *Valves for invitro diagnostics in biochemistry, hematology and immunology*
- *Can be used to control acids and bases, as well as analytical reagents*
- *The valves have easy-to-flush internal cavities and are ideal for controlling aggressive fluids or when high purity is demanded*
- *Very low internal volume*
- *Hermetic separation of control mechanism and fluid*
- *Reduced heat exchange between coil and fluid*
- *The use of first class materials and thorough valve testing ensure high reliability and a lifetime of at least 1 million cycles*
- *Suitable for vacuum applications*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
0,7 bar abs. (vacuum on polyamide body only)
Maximum viscosity 37 cSt (mm^2/s)
Response time 20 ms
Internal volume < 67 µl

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases	-10°C to +80°C (3)	FFPM (perfluoroelastomer)
		EPDM (ethylene-propylene)

CONSTRUCTION

	PEEK body	PA body
Body	PEEK	PA (polyamide 12)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Mounting pad	PEEK	PA
Diaphragm and discs	FFPM	EPDM
Mounting pad seal	FFPM	EPDM

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Coil Detachable and rotatable
Two spade terminals 2.8 x 0.5 mm (DIN 46340)
(or detachable size 15 connector)
Electrical enclosure protection IP40 (EN60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings inrush ~	power ratings holding ~		power ratings hot/cold =	operator ambient temperature range (TS)	replacement coil =	replacement coil =	type (1) (DNX-4)
	(VA)	(VA)	(W)	(W)	(C°)	12 V DC	24 V DC	
SC	-	-	-	- / 4	-10 to + 60	43005268	43005269	01

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

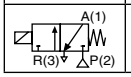
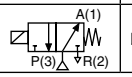
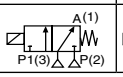
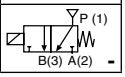
pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) gases (∗)	operating pressure differential (bar) max. (PS) liquids (∗)	power coil (W) ~	power coil (W) =	catalogue number	options FPM	options EPDM		
	(mm)	(m^3/h)	(l/min)		=	=			=				
U - Universal, PEEK body, FFPM seals													
pad mount	1,5	0,03	0,5	0	2,4	2,4	-	4	**SCS385A001**	**V**	**E**	**-**	**-**
U - Universal, PA body, EPDM seals													
pad mount	1,5	0,03	0,5	0	2	2	-	4	**SCS385A002E**	**-**	**-**	**-**	**-**

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) seals and diaphragm. Use the appropriate optional suffix letter for identification
- 2/2 NC function, catalogue number **SCS285A002**
- Leaded coil
- Power-save version (low holding power)
- Other types of connections are available (hose couplings etc.)
- Connector size 15, catalogue number **88143581**

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Can be used for the following functions, depending on how the ports are connected:

3/2 NC	3/2 NO	mixer	selector
			

- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

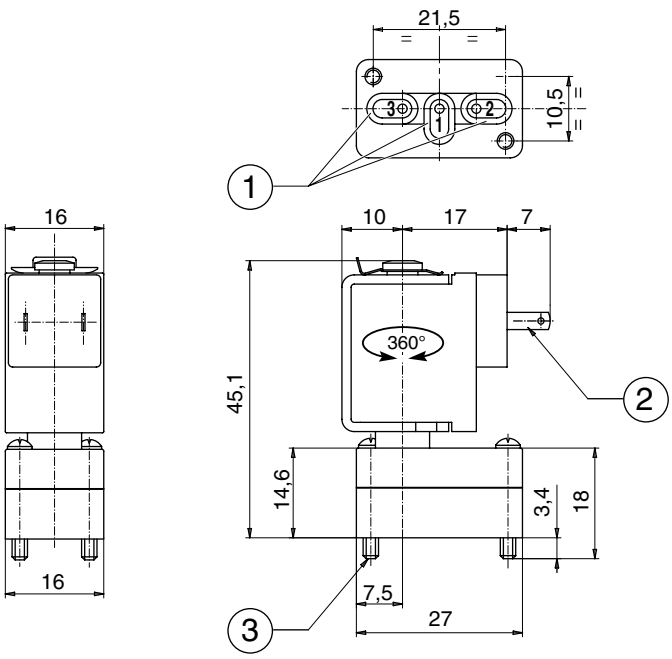
SC	S	385 **A** 001		12V / DC
SC	S	385 **A** 001	**E**	24V / DC
SC	S	385 **A** 002	**E**	24V / DC

prefix
pipe thread
basic number
suffix
voltage

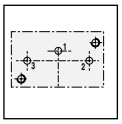
DIMENSIONS (mm), WEIGHT (kg)

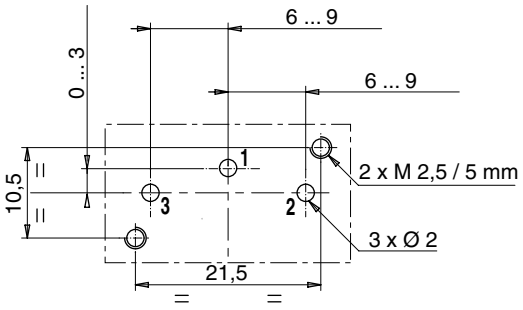
TYPE 01
Prefix "SC" Solenoid
DIN 43340

SCS385A001 / A002E



MOUNTING PAD





type	prefix option	weight (1)
01	SC	0,04

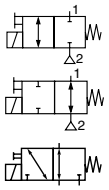
(1) Including coil, without connector.

(1) 1 mounting pad seal.
(2) Coil with 2 Faston-type terminals 2,8 x 0,5 (DIN 46340).
(3) Mounting : 2 screws M2,5 x 18.

MINIATURE SOLENOID VALVES

rocker mechanism, fluid isolation
hose connections

2/2 NC
2/2 NO
3/2 U



2/2
3/2
Series
110

CE

FEATURES

- *Valves for medical analysers, biotechnology, gas analysers*
- *Can be used to control acids and bases, as well as analytical reagents*
- *Any application where the fluid may not come into contact with metal parts and with the electromagnetic control section of the solenoid valves*
- *The valves are ideal for controlling aggressive fluids or when high purity is demanded and have easy to flush internal cavities*
- *They can also be used as a very small internal volume flow-through sampling valve due to rocker technology*
- *Hermetic separation of control mechanism and fluid*
- *Reduced heat exchange between coil and fluid*
- *Protected manual operator*
- *The use of first class materials and thorough valve testing ensure high reliability and a lifetime of at least 1 million cycles*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure -0,7 to +2 bar (usable in 0,3 bar abs. vacuum) [1 bar =100 kPa]
Maximum viscosity 20 cSt (mm^2/s)
Response time < 20 ms
Internal volume < 75 µl (connections not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases	0°C to + 40°C	EPDM (ethylene-propylene)

CONSTRUCTION

Body PA12
Internal parts Stainless steel

MATERIALS IN CONTACT WITH FLUID

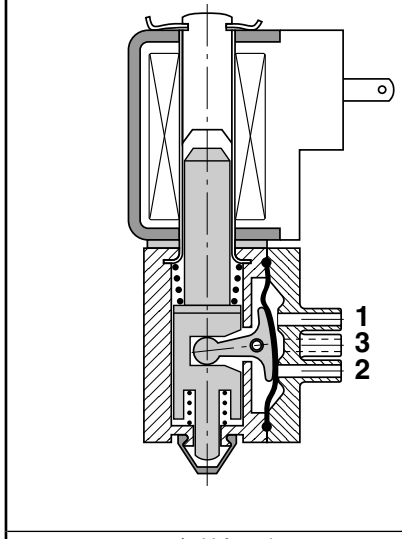
(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Cover PA12 (transparent), enabling flow of fluid to be seen
Diaphragm-poppets EPDM

ELECTRICAL CHARACTERISTICS

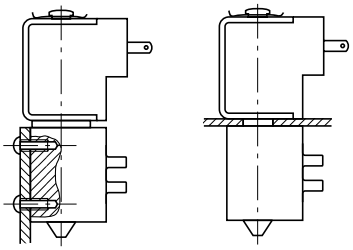
Coil insulation class F
Duty cycle 100 %
Coil Two spade terminals 2.8 x 0.5 mm (DIN 46340)
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

-	power ratings				operator ambient temperature range (TS)	replacement coil		type (1)
	inrush ~	holding ~		hot/cold =		-	=	
	(VA)	(VA)	(W)	(W)	(C°)	-	24 V DC	
-	-	-	-	4 / 5	-5 to + 40	-	43004663	01

(1) Refer to the dimensional drawings on the following page.



3/2 U function

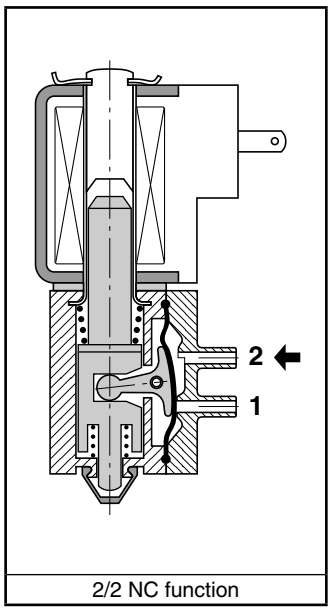


SPECIFICATIONS

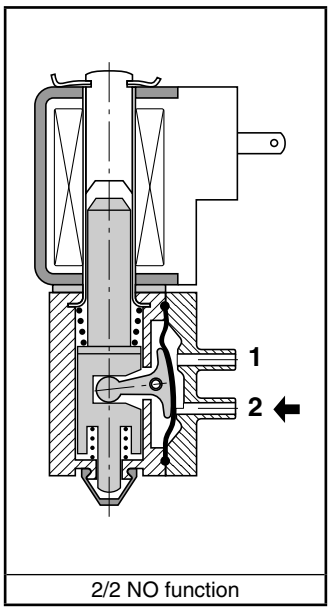
pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)			power coil (W)		catalogue number (protected impulse manual operator)	
				min.	max. (PS)				rear mounting	central support plate mounting
					gases (∗)	liquids (∗)				
	(mm)	(m^3/h)	(l/min)		=	=	~	=	=	=
2/2 NC - Normally closed / 2 connections										
(2)	1,5	0,05	0,75	-0,7	2	2	-	5	**11000006**	**11000010--P2**
2/2 NO - Normally open / 2 connections										
(2)	1,5	0,05	0,75	-0,7	2	2	-	5	**11000005--P2**	**11000009**
3/2 U - Universal / 3 connections										
(2)	1,5	0,05	0,75	-0,7	2	2	-	5	**11000007--P2**	**11000011--P2**
3/2 U - Universal / 4 connections										
(2)	1,5	0,05	0,75	-0,7	2	2	-	5	**11000008**	**11000012**

(2) Hose connection to ID 1,5 mm flexible tubing.

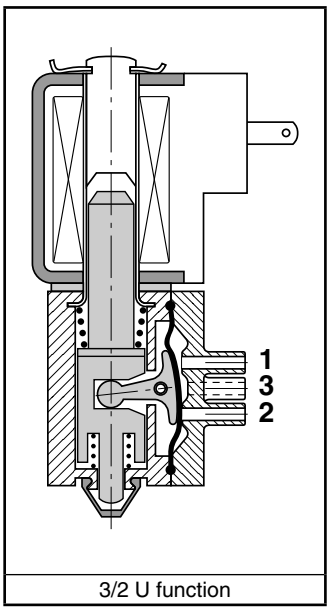
PRINCIPLE OF OPERATION



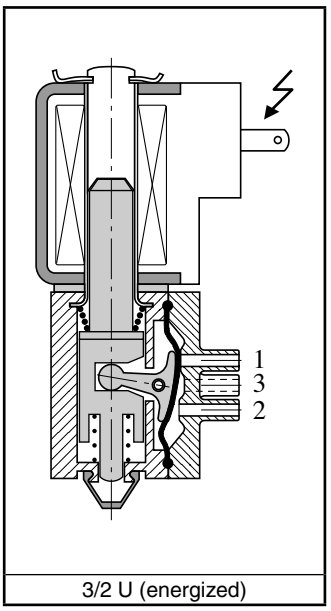
2/2 NC function



2/2 NO function



3/2 U function



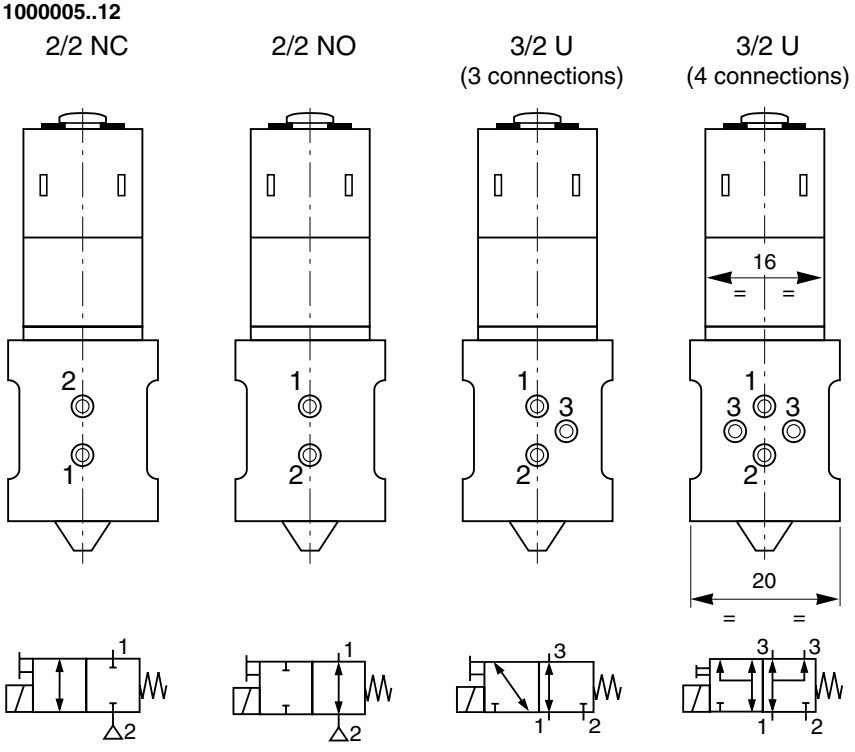
3/2 U (energized)

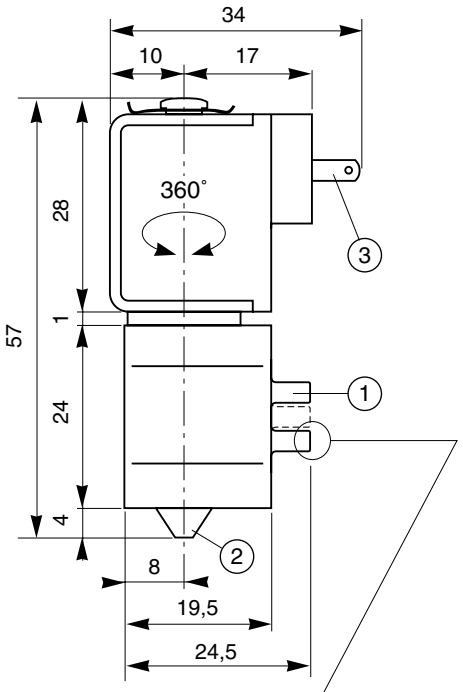
DIMENSIONS (mm), WEIGHT (kg)

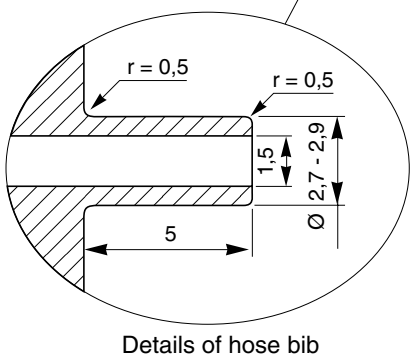
TYPE 01
Prefix "SC" Solenoid
DIN 43340

11000005..12

Scale: 1







Details of hose bib

(1) Hose bibs for connection of ID 1,5 mm flexible tubing
(2) Protected impulse type manual operator
(3) Coil with two spade terminals 2,8 x 0,5 (DIN 46340)

type	prefix option	weight (1)
01	SC	0,46

(1) Incl. coil.

OPTIONS

- Stainless steel support plate for mounting between body and coil for:
  - 1 solenoid valve, catalogue number **88211001**
  - 2 solenoid valves, catalogue number **88211002**
  - 3 solenoid valves, catalogue number **88211003**
  - 4 solenoid valves, catalogue number **88211004**
  - 5 solenoid valves, catalogue number **88211005**

  For more, contact us
- FPM (fluoroelastomer) diaphragm

INSTALLATION

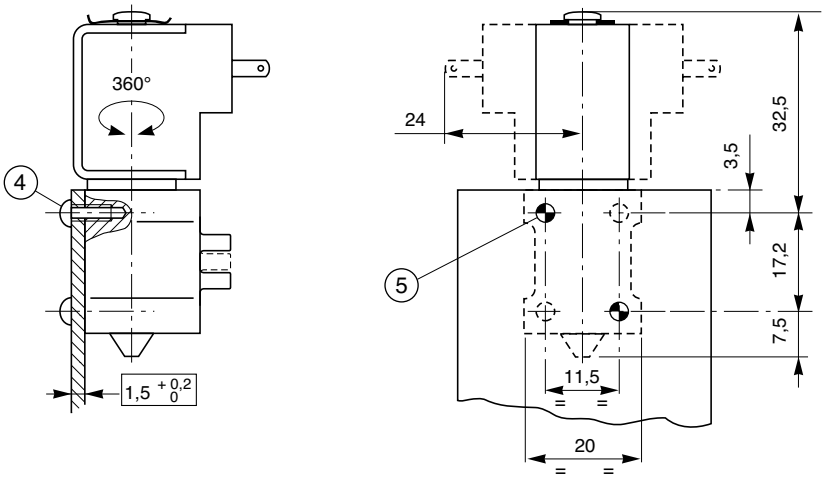
- The solenoid valves can be mounted in any position without affecting operation
- Rear or control support plate mounting possible (see below)
- Hose connection of flexible tubing Ø 1.5 mm ID
- Compact size and simple tubing (see following page)
- Replacement coils are available
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

catalogue number	voltage
11000006	12V / DC
11000010--P2	24V / DC

DIMENSIONS (mm), WEIGHT (kg)

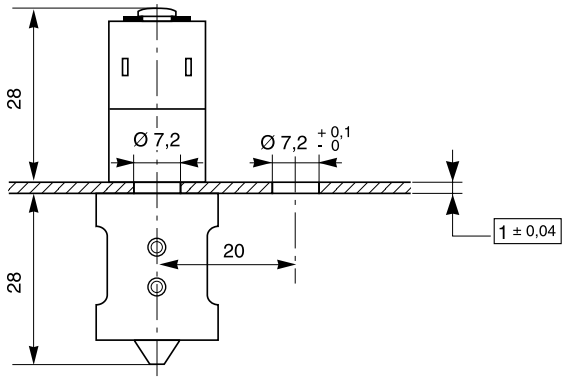
REAR MOUNTING



(4) 2 self thread cutting «Torx» screws K 22 x 6 - A2 stainless steel (screws delivered)
- use these screws only
- use plate with correct thickness
- max. torque: 0,3 Nm

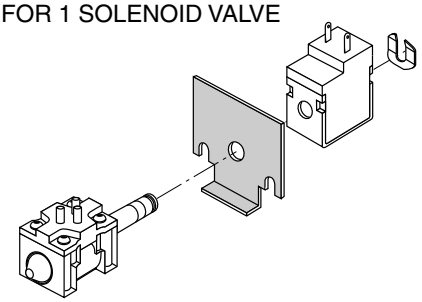
(5) Two mounting holes 2.5 mm dia. Solenoid valve body has four holes for mounting purpose

SUPPORT PLATE MOUNTING (For solenoid valve of corresponding type)

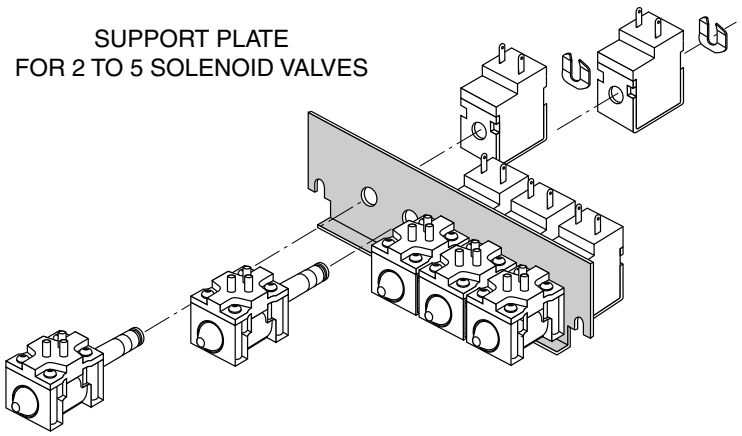


- The panel must be of non-magnetic material.
- To fit to panel, remove the clip and the solenoid valve coil and install as indicated below.

SUPPORT PLATE
FOR 1 SOLENOID VALVE

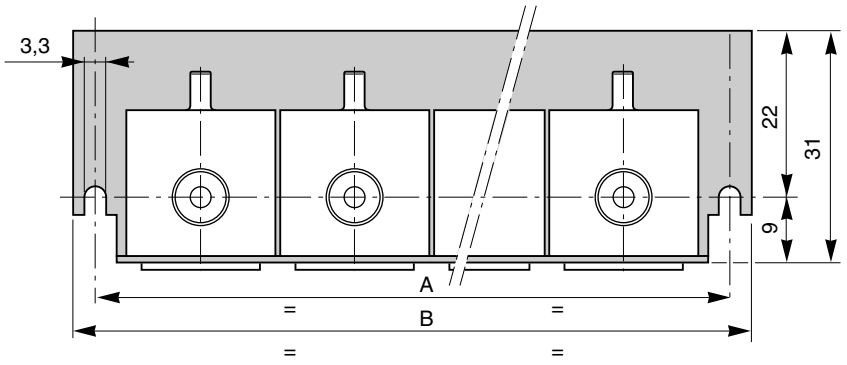


SUPPORT PLATE
FOR 2 TO 5 SOLENOID VALVES



DIMENSIONS (mm)**, WEIGHT** (kg)

SUPPORT PLATE FOR 1 TO 5 SOLENOID VALVES



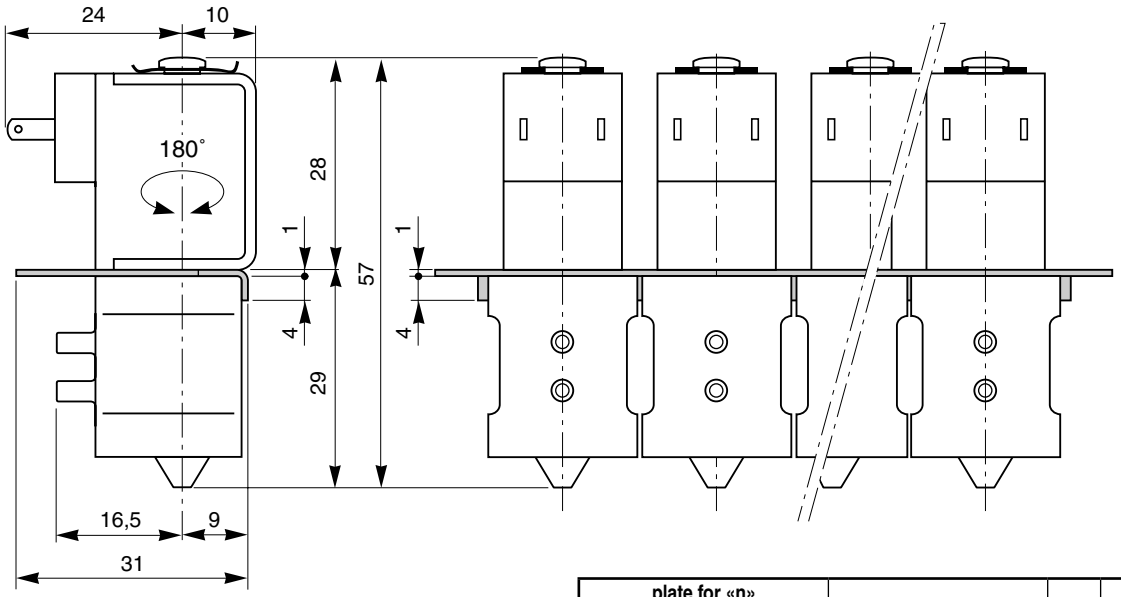
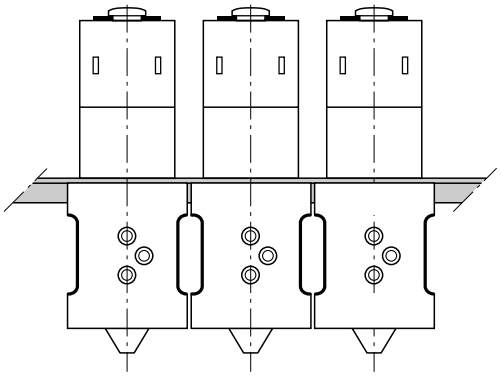


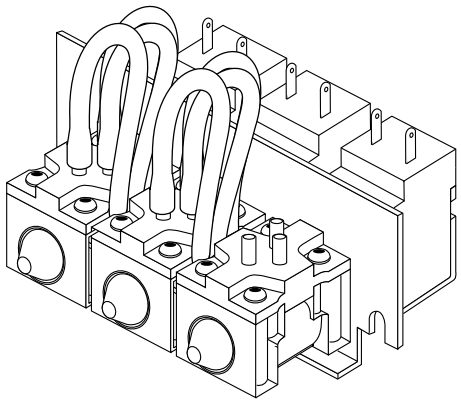
plate for «n» solenoid valves	plate catalogue number	A	B	weight (1)
1	**88211001**	31	40	0,1
2	**88211002**	51	60	0,15
3	**88211003**	72	80	0,2
4	**88211004**	92	100	0,25
5	**88211005**	113	121	0,3

(1) Plate only.

SIMPLE TUBING

When valves mounted side by side on a support plate, an area is left open so that tubes pass between valve bodies

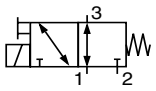




MINIATURE SOLENOID VALVES

rocker mechanism, fluid isolation
threaded connections
1/4-28 UNF

U



3/2
Series
360

FEATURES

- *Valves for medical analysers, biotechnology, gas analysers*
- *Can be used to control acids and bases, as well as analytical reagents*
- *Any application where the fluid may not come into contact with metal parts and with the electromagnetic control section of the solenoid valves*
- *The valves are ideal for controlling aggressive fluids or when high purity is demanded and have easy to flush internal cavities*
- *They can also be used as a very small internal volume flow-through sampling valve due to rocker technology*
- *Hermetic separation of control mechanism and fluid*
- *Reduced heat exchange between coil and fluid*
- *Protected manual operator*
- *The use of first class materials and thorough valve testing ensure high reliability and a lifetime of at least 1 million cycles*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure -0,7 to +2 bar (usable in 0,3 bar abs. vacuum) [1 bar =100 kPa]
Maximum viscosity 20 cSt (mm^2/s)
Response time < 20 ms
Internal volume < 75 µl (connections not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases	0°C to + 40°C	EPDM (ethylene-propylene)

CONSTRUCTION

Body PA12
Internal parts Stainless steel

MATERIALS IN CONTACT WITH FLUID

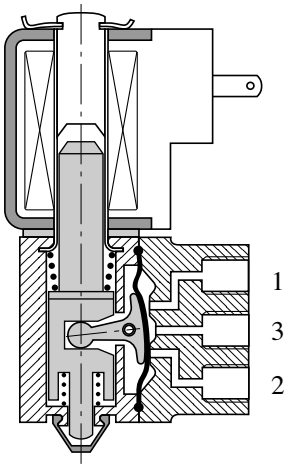
(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Cover PEEK
Diaphragm-poppets EPDM

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Coil Two spade terminals 2.8 x 0.5 mm (DIN 46340)
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature range (TS)	replacement coil -	replacement coil =	type (1)
	(VA)	(VA)	(W)	(W)	(C°)	-	24 V DC	
SC	-	-	-	4 / 5	-5 to + 40	-	43004663	01

(1) Refer to the dimensional drawings on the following page.



The connection ports are shown in vertical position in order to make the operation easier to understand.

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	max. (PS) gases (∗)	max. (PS) liquids (∗)	power coil (W) ~	power coil (W) =	catalogue number (protected impulse manual operator)
	(mm)	(m^3/h)	(l/min)		=	=	~	=	=
U - Universal									
1/4-28 UNF	1,5	0,05	0,75	-0,7	2	2	-	5	**SCE360A404**

OPTIONS

- Other diaphragm materials are available

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Standard mounting holes provided at the rear end of the body
- Port connection thread (1/4-28 UNF). Max. torque, see below
- Replacement coils are available
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

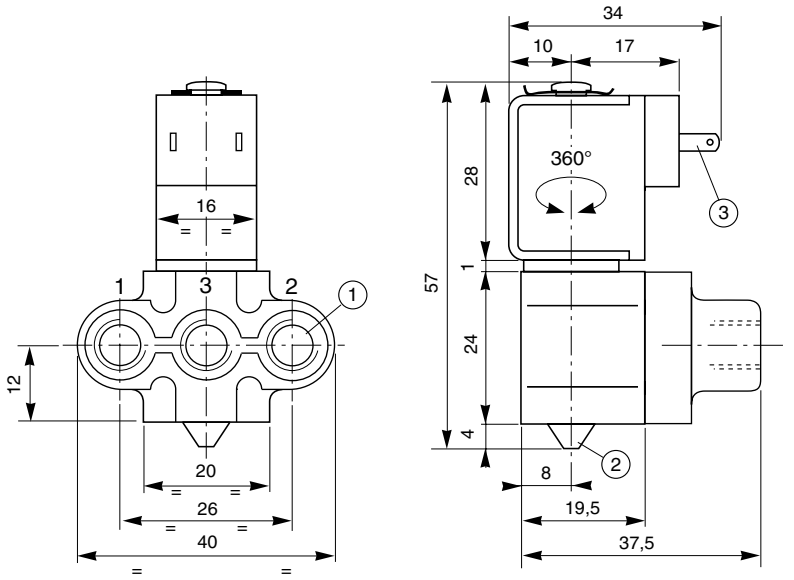
SC E 360 **A** 404 12V / DC
SC E 360 **A** 404 24V / DC

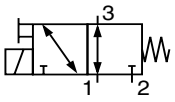
prefix
pipe thread
basic number
voltage
suffix

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
DIN 43340

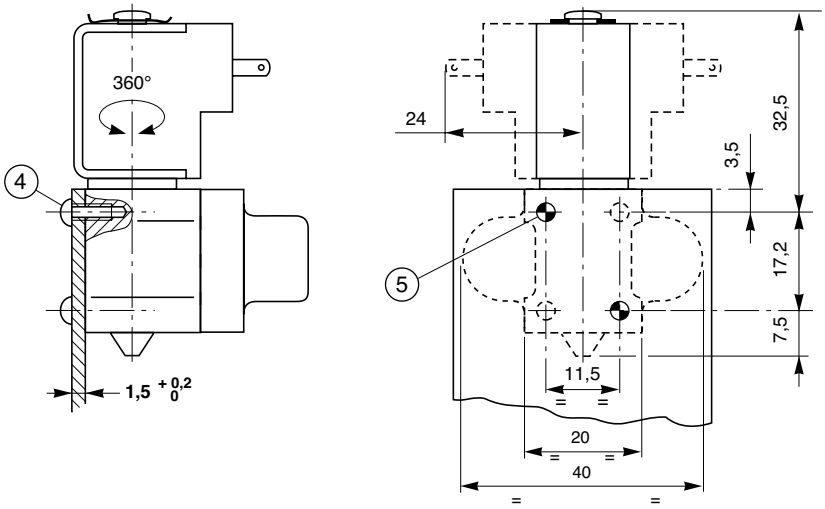
SCE360A404





(1) Threaded connection:
3 x 1/4-28 UNF.
Max. torque 3 N.m
(2) Protected impulse type manual operator
(3) Coil with two spade terminals 2,8 x 0,5 (DIN 46340)

REAR MOUNTING



(4) 2 self thread cutting «Torx» screws
K 22 x 6 - A2 stainless steel
(screws delivered)
- use these screws only
- use plate with correct thickness
- max. torque: 0,3 N.m

(5) Two mounting holes 2.5 mm dia.
Solenoid valve body has four
holes for mounting purpose

type	prefix option	weight (1)
01	SC	0,55

(1) Incl. coil.

MINIATURE SOLENOID VALVES

rocker mechanism, fluid isolation
pad mounting body

2/2 NC

2/2 NO

3/2 U

2/2
3/2
Series
260
360

FEATURES

- *Valves for medical analysers, biotechnology, gas analysers*
- *Can be used to control acids and bases, as well as analytical reagents*
- *Any application where the fluid may not come into contact with metal parts and with the electromagnetic control section of the solenoid valves*
- *The valves are ideal for controlling aggressive fluids or when high purity is demanded and have easy to flush internal cavities*
- *They can also be used as a very small internal volume flow-through sampling valve due to rocker technology*
- *Hermetic separation of control mechanism and fluid*
- *Reduced heat exchange between coil and fluid*
- *Protected manual operator*
- *The use of first class materials and thorough valve testing ensure high reliability and a lifetime of at least 1 million cycles*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure -0,7 to +2 bar (usable in 0,3 bar abs. vacuum) [1 bar =100 kPa]
Maximum viscosity 20 cSt (mm²/s)
Response time < 20 ms
Internal volume < 75 µl (connections not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases	0°C to + 40°C	EPDM (ethylene-propylene)

CONSTRUCTION

Body PA12
Internal parts Stainless steel

MATERIALS IN CONTACT WITH FLUID

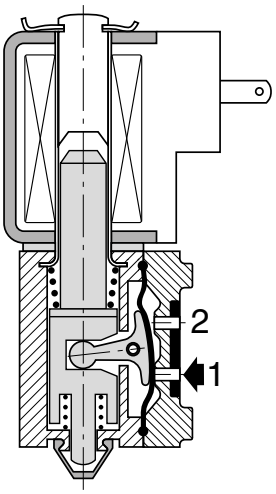
(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Cover PEEK
Diaphragm-poppets EPDM
Base PEEK
Seal of base FPM

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Coil Two spade terminals 2.8 x 0.5 mm (DIN 46340)
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings inrush ~	power ratings holding ~		power ratings hot/cold =	operator ambient temperature range (TS)	replacement coil -	replacement coil =	type (1)
	(VA)	(VA)	(W)	(W)	(C°)	-	24 V DC	
SC	-	-	-	4 / 5	-5 to + 40	-	43004663	01

(1) Refer to the dimensional drawings on the following page.



2/2 NC function

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) gases (∗)	operating pressure differential (bar) max. (PS) liquids (∗)	power coil (W) ~	power coil (W) =	catalogue number (protected impulse manual operator)	options FPM
	(mm)	(m³/h)	(l/min)		=	=	~	=	=	
2/2 NC - Normally closed										
pad mount	1,5	0,02	0,30	-0,7	2	2	-	5	**SCE260A420**	**V**
2/2 NO - Normally open										
pad mount	1,5	0,02	0,30	-0,7	2	2	-	5	**SCE260A430**	**V**
3/2 U - Universal										
pad mount	1,5	0,05	0,75	-0,7	2	2	-	5	**SCE360A420**	**V**

OPTIONS

- Other diaphragm materials are available
- Other subbase, contact us

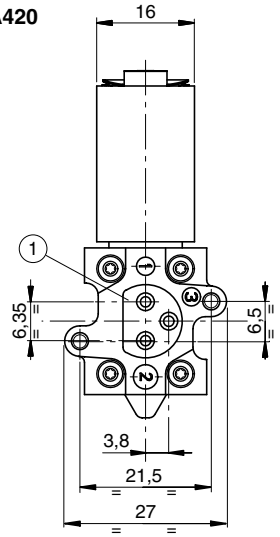
INSTALLATION

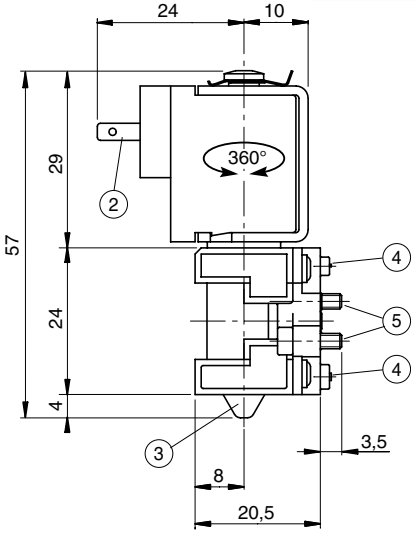
- The solenoid valves can be mounted in any position without affecting operation
- Standard mounting holes provided at the rear end of the body
- Replacement coils are available
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
DIN 43340

SCE260A420/430
SCE360A420

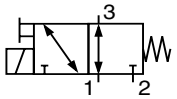




ORDERING EXAMPLES:

SC	E	260 **A** 430		24V / DC
SC	E	360 **A** 420		24V / DC

prefix
pipe thread
basic number
voltage
suffix

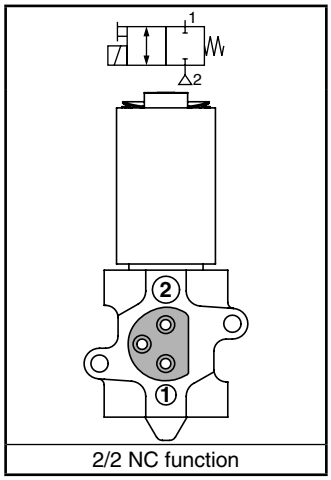


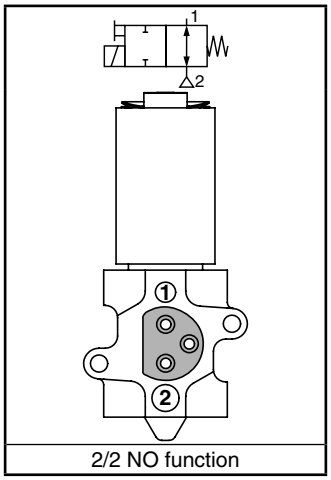
① Seal (FPM)
② Coil with two spade terminals 2,8 x 0,5 (DIN 46340)
③ Protected impulse type manual operator
④ Polarizing slot, ports marking off
⑤ Mounting: 2 M2,5 x 8 screws, supplied

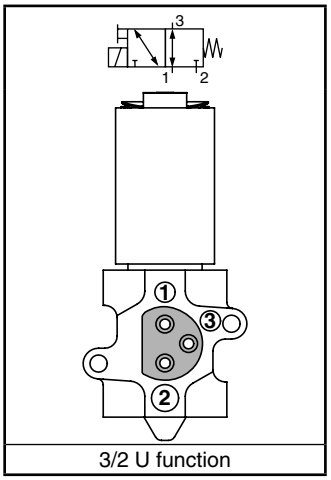
type	prefix option	weight (1)
01	SC	0,49

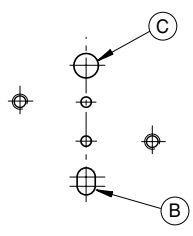
(1) Incl. coil.

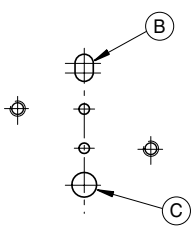
Pad mounting according to function :

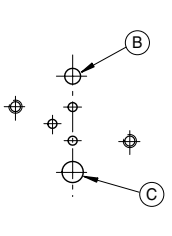

2/2 NC function

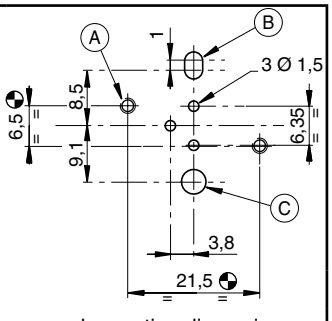

2/2 NO function


3/2 U function


Ⓐ Mounting: 2 M2,5, depth 5


Ⓑ Holes for blocking pin of port 1: Ø3 (tolerance D10), depth 2


Ⓒ Holes for blocking pin of port 2: Ø4 (tolerance D10), depth 2



pad mounting dimension

SOLENOID VALVES

flapper mechanism, fluid isolation
pad mounting body, 1/4-28UNF, push-in hose connection
size 16 mm

2/2 NC

2/2 NO

3/2 U

2/2
3/2
Series
068

FEATURES

- *Solenoid valves for use with neutral or aggressive liquids and gases in analytical and medical systems*
- *Hermetic separation of control mechanism and fluid:*
  - *Prevents particulate contamination caused by friction of moving parts, assuring maximum purity of fluid*
  - *Ensures reliable operation in applications with highly aggressive fluids*
- *Reduced heat transfer between control mechanism and fluid*
- *Good self-draining capability and easy-to-flush internal cavity*
- *Low internal volume*
- *Specific flapper mechanism: no pump effect, no stick effect*
- *Electrical spade-plug or cable-end connection*

GENERAL

Differential pressure -0,9 to +8 bar (usable in 0,1 bar abs. vacuum) [1 bar =100 kPa]
Maximum viscosity 20 cSt (mm^2/s)
Response time < 20 ms
Internal volume < 75 µl (connections not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases (filtered 50 µm)	+5°C to + 50°C	FFPM (perfluoroelastomer)
		FPM (fluoroelastomer)
		EPDM (ethylene-propylene)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PEEK
Diaphragm FFPM (FPM and EPDM option)
Seals FFPM (FPM and EPDM option)

OTHER MATERIALS

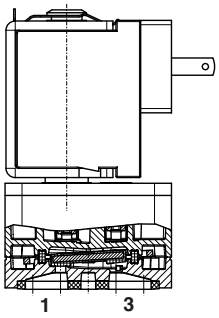
Internal parts Stainless steel

ELECTRICAL CHARACTERISTICS

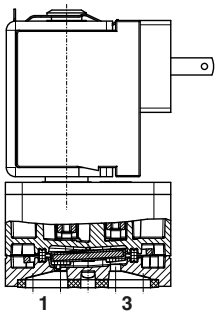
Coil insulation class F
Connector Spade terminals or cable ends (2)
Connector specification Spade terminals: DIN 46340, cable ends: AWG 24
Electrical safety IEC 335
Electrical enclosure protection Moulded IP40 spade terminals (EN 60529)
Moulded IP66 cable ends (EN 60529)
Standard voltages DC (=) : 12V - 24V -5% / +10%
(Other voltages on request)

electrical connection	power ratings				operator ambient temperature range (TS)	type (1)
	inrush ~	holding ~		(4) =		
	(VA)	(VA)	(W)	(W)	(C°)	
S0	-	-	-	4	+5 to + 50	01
L0	-	-	-			02

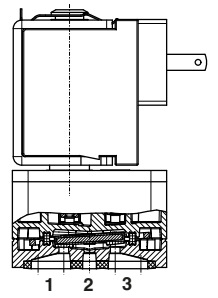
(1) Refer to the dimensional drawings on page 47.
(2) 0,5 m lead wires.



2/2 NC function



2/2 NO function



3/2 U function

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
				min.	max. (PS) gases liquids (✳)		body PEEK
	(mm)	(m^3/h)	(l/min)		=	=	x : see “HOW TO ORDER”
2/2 NC - Normally closed							
pad mounting (1)	0,8	0,021	0,35	-0,9	8	4	**R068A212xxx00xx**
	1,2	0,036	0,60	-0,9	4	4	**R068A214xxx00xx**
	1,6	0,042	0,70	-0,9	2	4	**R068A216xxx00xx**
2/2 NO - Normally open							
pad mounting (1)	0,8	0,021	0,35	-0,9	8	4	**R068A222xxx00xx**
	1,2	0,036	0,60	-0,9	4	4	**R068A224xxx00xx**
	1,6	0,042	0,70	-0,9	2	4	**R068A226xxx00xx**
3/2 U - Universal							
pad mounting (1	0,8	0,021	0,35	-0,9	8	4	**R068A232xxx00xx**
	1,2	0,036	0,60	-0,9	4	4	**R068A234xxx00xx**
	1,6	0,051	0,80	-0,9	2	4	**R068A236xxx00xx**
1/4-28UNF	0,8	0,021	0,35	-0,9	8	4	**0068A232xxx00xx**
	1,2	0,036	0,60	-0,9	4	4	**0068A234xxx00xx**
	1,6	0,051	0,80	-0,9	2	4	**0068A236xxx00xx**
push-in hose connection	0,8	0,021	0,35	-0,9	8	4	**6068A232xxx00xx**
	1,2	0,036	0,60	-0,9	4	4	**6068A234xxx00xx**
	1,6	0,051	0,80	-0,9	2	4	**6068A236xxx00xx**

(1) 2 hexagon socket head cap mounting screws M2,5 mm, 1,5 mm across flats, stainless steel, supplied.

HOW TO ORDER

15-DIGIT PRODUCT CODE

R068A212 **xx** **x** **00** **xx**

catalogue no.

electrical connection
S0 = spade terminals without connector
L0 = with cable ends 500 mm

seal materials
1 = FFPM
V = FPM
E = EPDM

voltages
F1 = 24 V DC
F3 = 12 V DC

catalogue no.

Ordering example: R068A216S0E00F1 = 2-way NC (normally closed), orifice size 1,6 mm, pad-mounting body width 16 mm, with spade terminals without connector, EPDM seals, 24 V DC

OPTIONS

- Other subbases, contact us

INSTALLATION

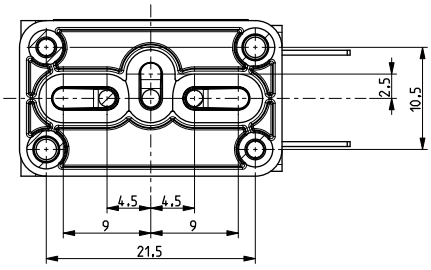
- The solenoid valves can be mounted in any position without affecting operation
- Pad-mounting solenoid valve supplied with seal

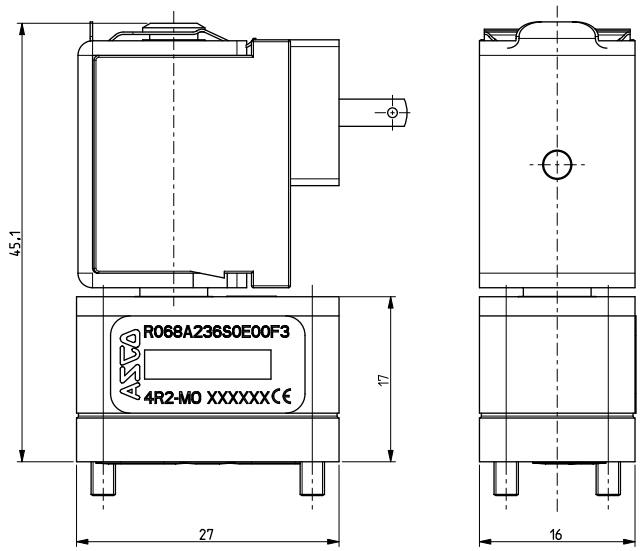
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01

Solenoid with spade terminals (S0)
DIN 46340
IP40

R068...S0...F...

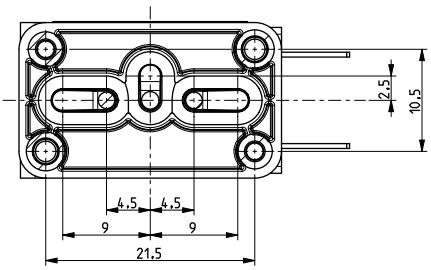


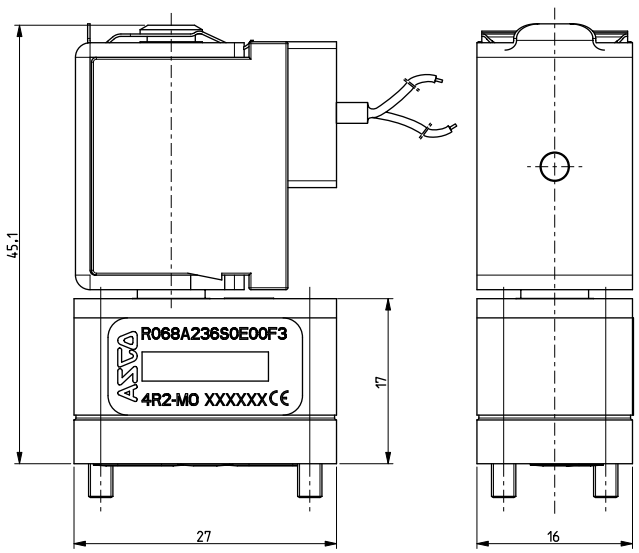


TYPE 02

Solenoid with cable ends (L0)
AWG 24, cable ends 500 mm long
IP66

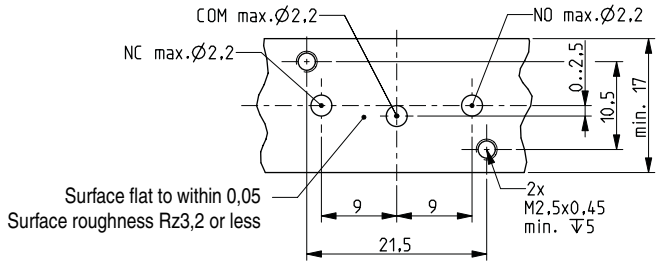
R068...L0...F...



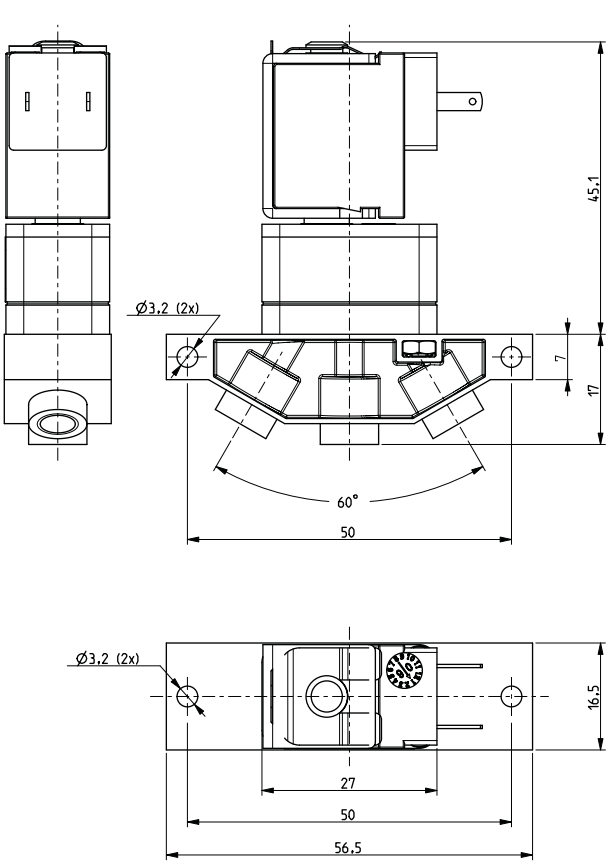


DIMENSIONS (mm), **WEIGHT** (kg)

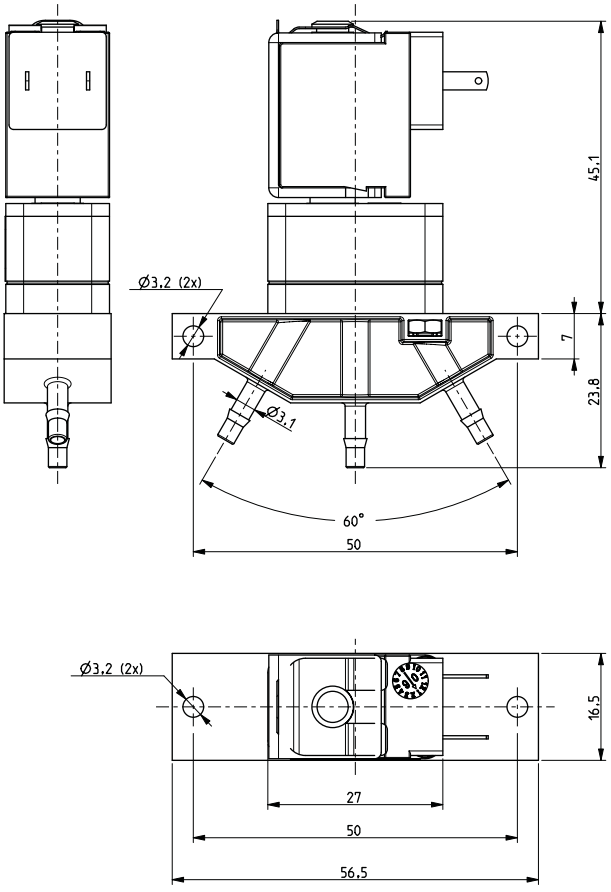
SUBBASE MOUNTING PATTERN



1/4 - 28 UNF VERSION



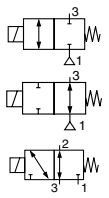
VERSION WITH PUSH-IN HOSE CONNECTION



SOLENOID VALVES

flapper mechanism, fluid isolation
1/8 or pad mounting body
size 22 mm

2/2 NC
2/2 NO
3/2 U



2/2
3/2
Series
068

FEATURES

- *Solenoid valves for use with neutral or aggressive liquids and gases in analytical and medical systems*
- *Hermetic separation of control mechanism and fluid:*
  - *Prevents particulate contamination caused by friction of moving parts, assuring maximum purity of fluid*
  - *Ensures reliable operation in applications with highly aggressive fluids*
- *Reduced heat transfer between control mechanism and fluid*
- *Good self-draining capability and easy-to-flush internal cavity*
- *Low internal volume*
- *Specific flappermechanism: no pump effect, no stick effect*
- *Possibility to adapt a power-save connector*
- *Electrical spade-plug or cable-end connection*

GENERAL

Differential pressure	-0,9 to +10 bar (usable in 0,1 bar abs. vacuum) [1 bar =100 kPa]
Maximum viscosity	20 cSt (mm²/s)
Response time	< 10 ms
Internal volume	< 0,48 ml (connections not included)

fluids (✳)	temperature range (TS)	seal materials (✳)
liquids or gases (filtered 50 μm)	+5°C to + 50°C	FFPM (perfluoroelastomer)
		FPM (fluoroelastomer)
		EPDM (ethylene-propylene)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Body	PEEK
Diaphragm	FFPM (FPM and EPDM option)
Seals	FFPM (FPM and EPDM option)

OTHER MATERIALS

Internal parts	Stainless steel

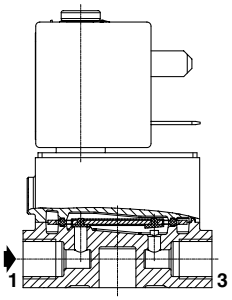
ELECTRICAL CHARACTERISTICS

Coil insulation class	F
Connector	Spade plug (cable Ø 6-8 mm) or cable ends (2)
Connector specification	DIN 43650, 11 mm, industry standard B
Electrical safety	IEC 335 (cable ends: EN 60730)
Electrical enclosure protection	Moulded IP65 (EN 60529)
Standard voltages	DC (=) : 12V - 24V -5% / +10%

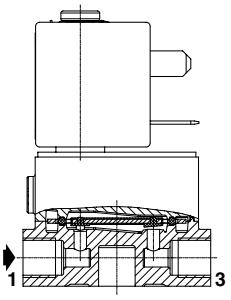
(Other voltages on request)

prefix option	power ratings inrush ~ (VA)	holding ~ (VA)	holding ~ (W)	(4) = (W)	operator ambient temperature range (TS) (C°)	replacement coil 12 V DC	replacement coil 24 V DC	type (1)
S1	-	-	-	9,6	+10 to + 50	400129-005	-	01
				10		-	400129-007	
L0	-	-	-	10	+10 to + 50	400119-011D	400119-008D	02

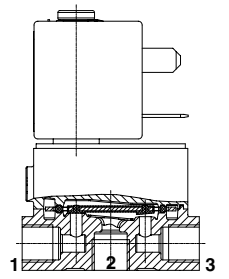
(1) Refer to the dimensional drawings on page 51.
(2) 0,45 m lead wires.



2/2 NC function

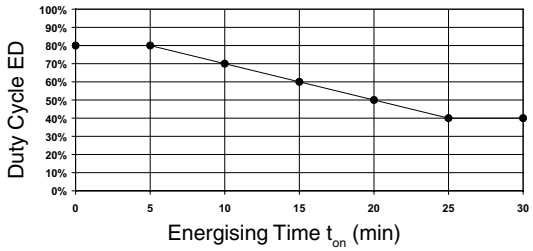


2/2 NO function



3/2 U function

RECOMMENDATION FOR MAXIMUM DUTY CYCLE



Note: 100% duty cycle possible when using the power-save connector (catalogue number [24 V DC]: **88100934,** catalogue number [12 V DC]: **833-150063**)

De-energising time: $t_{off} = t_{on} \times (100\% / ED - 1)$

Example:
1) Determine energising time in minutes (t_{on}):
   t_{on} = 15 min
2) Find maximum duty cycle value in diagram:
   ED = 60%
3) Calculate de-energising time:
   t_{off} = 15 min x (100% / 60% - 1) = 10 min
4) Complete cycle time:
   $t_{cycle} = t_{on} + t_{off}$ = 15 min + 10 min = 25 min

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
				min.	max. (PS) gases liquids (✳)		body PEEK
	(mm)	(m^3/h)	(l/min)		=	=	x : see “HOW TO ORDER”
2/2 NC - Normally closed							
G 1/8	2	0,10	1,66	-0,9	10	10	**G068A317xxx00xx**
	3	0,16	2,66	-0,9	3	10	**G068A318xxx00xx**
	4	0,3	4,99	-0,9	1,5	10	**G068A319xxx00xx**
pad mounting (1)	2	0,10	1,66	-0,9	10	10	**R068A317xxx00xx**
	3	0,16	2,66	-0,9	3	10	**R068A318xxx00xx**
	4	0,3	4,99	-0,9	1,5	10	**R068A319xxx00xx**
2/2 NO - Normally open							
G 1/8	2	0,10	1,66	-0,9	5	10	**G068A327xxx00xx**
	3	0,16	2,66	-0,9	2	10	**G068A328xxx00xx**
	4	0,3	4,99	-0,9	1	10	**G068A329xxx00xx**
pad mounting (1)	2	0,10	1,66	-0,9	5	10	**R068A327xxx00xx**
	3	0,16	2,66	-0,9	2	10	**R068A328xxx00xx**
	4	0,3	4,99	-0,9	1	10	**R068A329xxx00xx**
3/2 U - Universal							
G 1/8	2	0,10	1,66	-0,9	5	10	**G068A337xxx00xx**
	3	0,16	2,66	-0,9	2	10	**G068A338xxx00xx**
	4	0,3	4,99	-0,9	1	10	**G068A339xxx00xx**
pad mounting (1)	2	0,10	1,66	-0,9	5	10	**R068A337xxx00xx**
	3	0,16	2,66	-0,9	2	10	**R068A338xxx00xx**
	4	0,3	4,99	-0,9	1	10	**R068A339xxx00xx**

(1) 4 hexagon socket head cap mounting screws M3 x 8 mm, stainless steel, ISO 4762 supplied.

HOW TO ORDER

15-DIGIT PRODUCT CODE

G068A317 **xx** **x** **00** **xx**

catalogue no.

voltages
F1 = 24 V DC
F3 = 12 V DC

electrical connection
S1 = spade terminals with connector
L0 = with cable ends 457 mm

seal materials
1 = FFPM
V = FPM
E = EPDM

catalogue no.

Ordering example: R068A317S1E00F1 = 2-way NC (normally closed), orifice size 2 mm, pad-mounting body width 22 mm, with spade terminals with connector, EPDM seals, 24 V DC

OPTIONS

- Other subbases, contact us
- Power-save connector (2,5 W after 140 ms of operation), catalogue number of 24 V DC version: **88100934**, catalogue number of 12 V DC version: **833-150063**
- Impulse manual operator

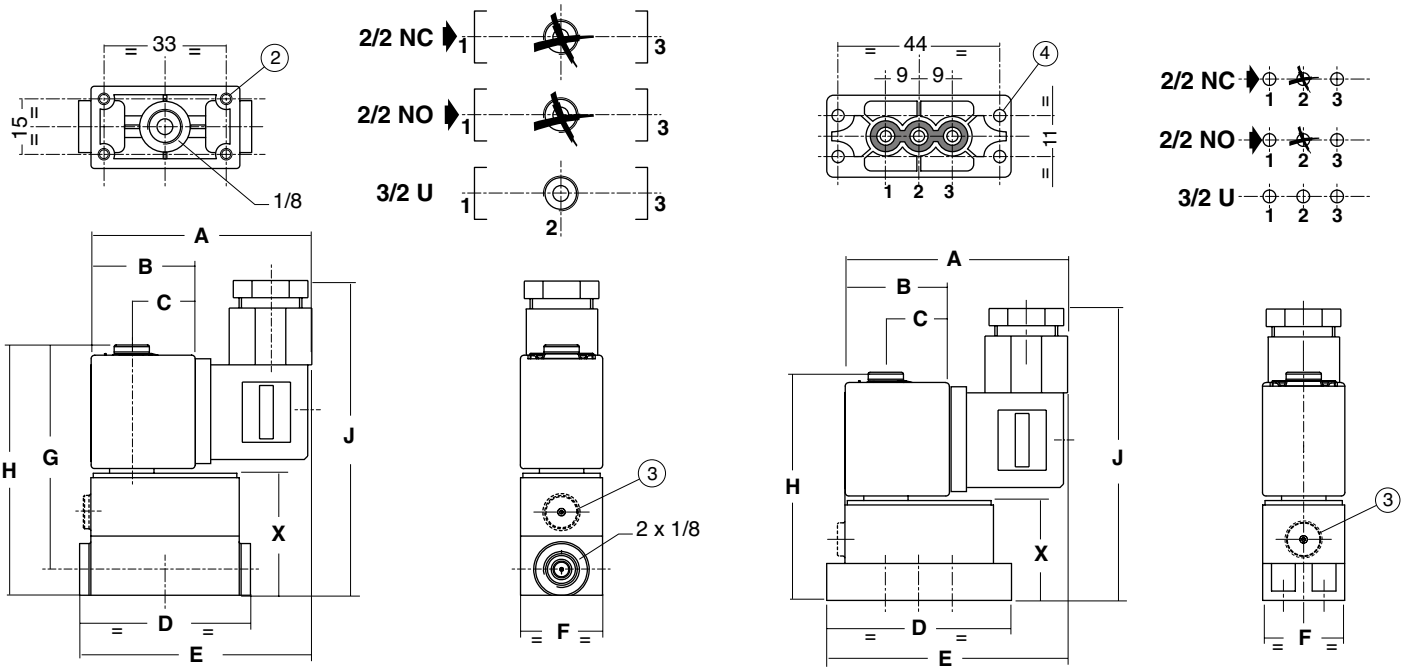
INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Pad-mounting solenoid valve supplied with seal
- Pipe connections 1/8 have standard thread according to ISO 228/1

DIMENSIONS (mm), WEIGHT (kg)

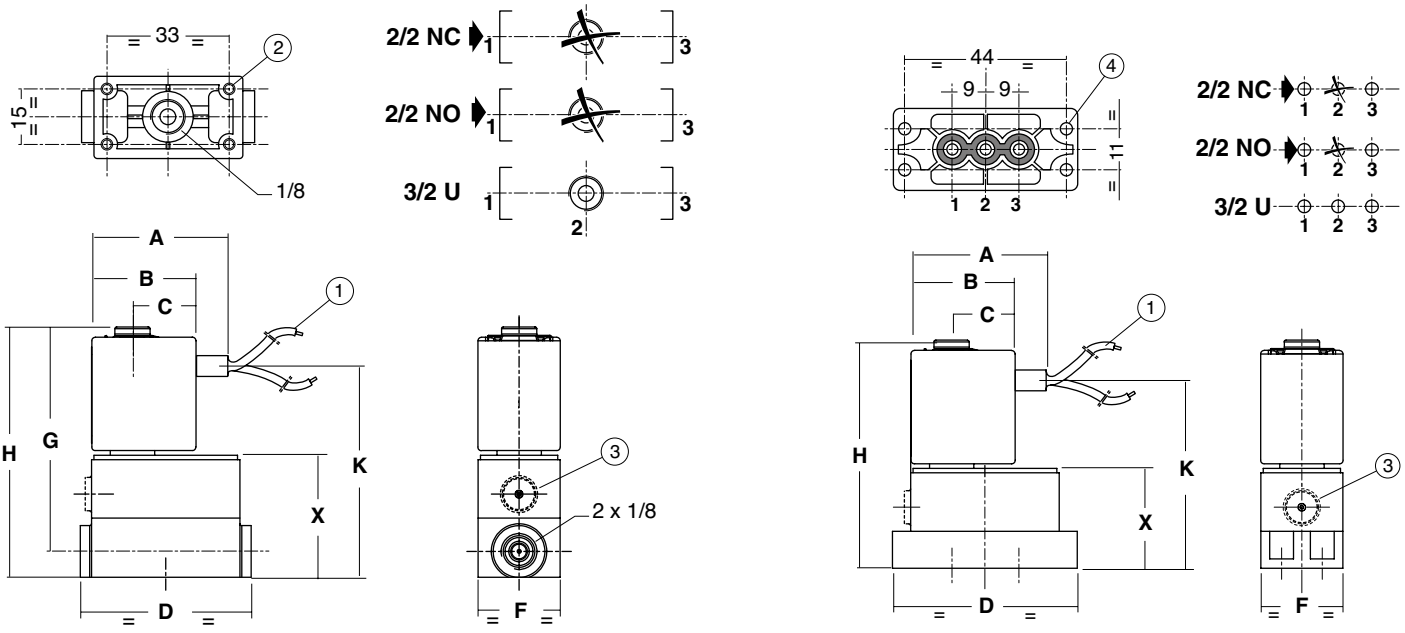
TYPE 01
Solenoid with spade plug connector (S1)
Epoxy moulded
IEC 335 / DIN 43650
IP65

R068A200..214



TYPE 02
Solenoid with cable ends (L0)
IEC 335 / cable ends, length 0,45 m
IP40

G068A200..214



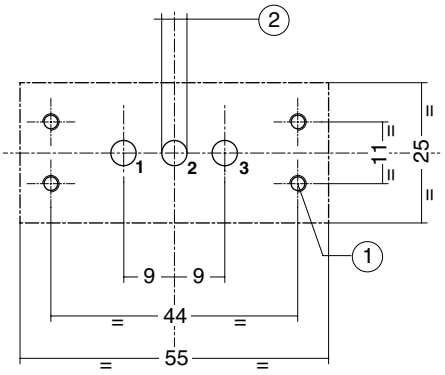
type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	X	weight (1)
01	S1	G068A...S1..	60	28,5	17,5	46,2	62,5	22,3	60,8	67,8	82	-	33	0,130
		R068A...S1..	60	28,5	17,5	50	65	22,3	-	61,8	76	-	27	0,124
02	L0	G068A...L0..	35	28,5	17,5	46,2	-	22,3	60,8	67,8	-	56,5	33	0,124
		R068A...L0..	35	28,5	17,5	50	-	22,3	-	61,8	-	50,5	27	0,120

(1) Type 01: Incl. coil(s) and connector(s).
Type 02: with 0,45 m cable ends

(1) 2 wires, length 0,45 m
(2) 4 mounting holes, max. depth 7 mm, for self-tapping screw (type EJOT PT, K30)
(3) Manual operator location
(4) 4 mounting holes Ø 3,2 mm (4 hexagon socket head cap mounting screws M3 x 8 mm, stainless steel, ISO 4762 supplied.)

DIMENSIONS (mm), **WEIGHT** (kg)

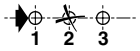
SUBBASE MOUNTING PATTERN



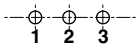
1 4 mounting holes Ø 3,2 mm
2 Max. diameter 4,5 mm (3 x)

2/2 NC

2/2 NO



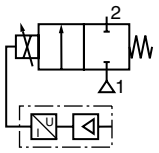
3/2 U



PROPORTIONAL VALVE

flapper mechanism, fluid isolation
1/8 or pad mounting body

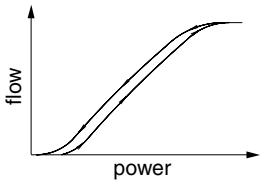
NC



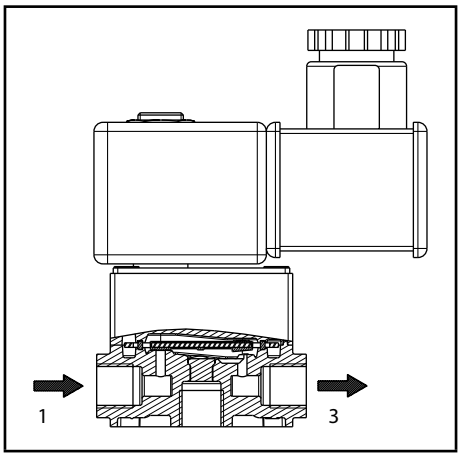
2/2

Series
068

FEATURES



- *Proportional valve for use with neutral or aggressive liquids and gases in industrial processes and in analytical and medical systems.*
- *RoHS compliant.*
- *Variable flow, proportional to the coil current.*
- *Valves do not require a minimum operating pressure.*
- *Hermetic separation of control mechanism and fluid:*
  - *Prevents particulate contamination caused by friction of moving parts, assuring maximum purity of fluid.*
  - *Ensures reliable operation in applications with highly aggressive fluids.*
- *Reduced heat transfer between control mechanism and fluid.*
- *Good self-draining capability and easy-to-flush internal cavity.*
- *Low internal volume.*
- *Specific flappermechanism: no pump effect, no stick effect.*
- *Electrical spade-plug connection (cable-ends: contact us).*



GENERAL

Differential pressure 0 to 4,5 bar (suitable for vacuum applications)
Maximum viscosity 20 cSt (mm²/s)
Response time < 20 ms
Internal volume < 0,48 ml (couplings not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
liquids or gases (filtered 50 µm)	+5°C to + 50°C	FFPM (perfluoroelastomer)
		FPM (fluoroelastomer)
		EPDM (ethylene-propylene)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified.
Body PEEK
Diaphragm FFPM or FPM or EPDM
Seals FFPM or FPM or EPDM

OTHER MATERIALS

Internal parts Stainless steel

ELECTRICAL CHARACTERISTICS

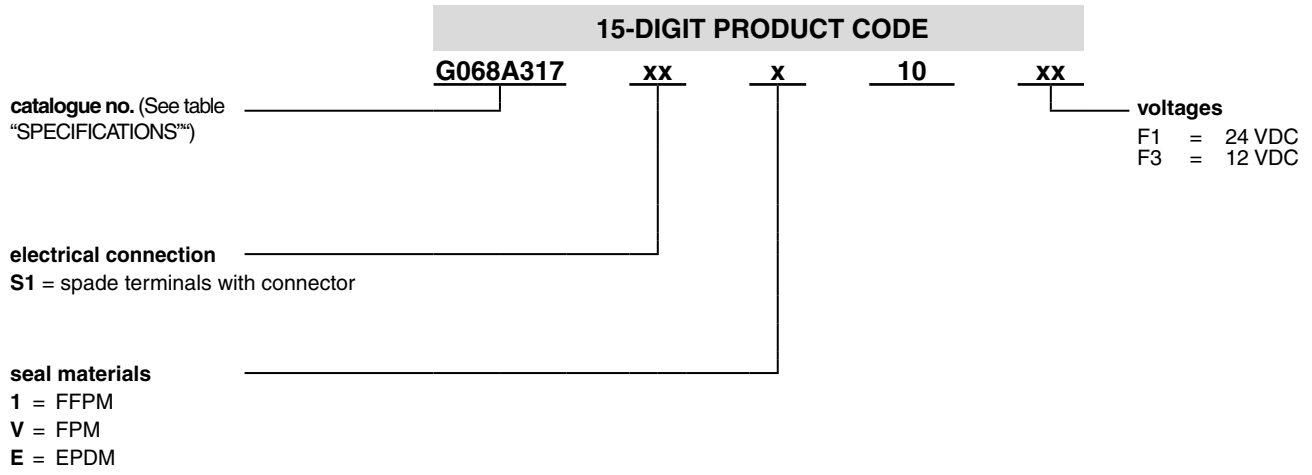
Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm) ISO 4400 / EN175301-803
Form A (Type 02), distance between contacts 18 mm, cable ends: contact us.
Electrical safety IEC 335
Electrical enclosure protection IP65 (EN 60529)
Standard voltages DC (=) : 12V, 24V -5% / +10% (other volrages: contact us)
Power 9W at 20°C
Duty cycle 100% at ambient temperature +5°C to +55°C
Regelbereich 0 - 375mA with 24V coil
0 - 750mA with 12V coil
pulse-width modulation (1000 Hz)
Flow regulation characteristic Hysteresis typ. 20%; Repeatability typ. 5%; Sensitivity typ. 1%

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
				min.	max. Gases, liquids (∗)		body PEEK
	(mm)	(m³/h)	(l/min)		=	=	**x**: see **ORDERING**
2/2 NC - Normally closed							
G 1/8	2	0,069	1,15	0	4,5	9	**G068A317xxx10xx**
	3	0,123	2,05	0	2,0	9	**G068A318xxx10xx**
pad mounting (1)	2	0,069	1,15	0	4,5	9	**R068A317xxx10xx**
	3	0,123	2,05	0	2,0	9	**R068A318xxx10xx**

(1) 4 hexagon socket screws M3 x 8 mm, stainless steel, ISO 4762 (supplied).

ORDERING



Ordering example: R068A317S1E10F1 = orifice size 2 mm, pad-mounting body, spade terminals with connector, EPDM seals, 24 VDC

OPTIONS

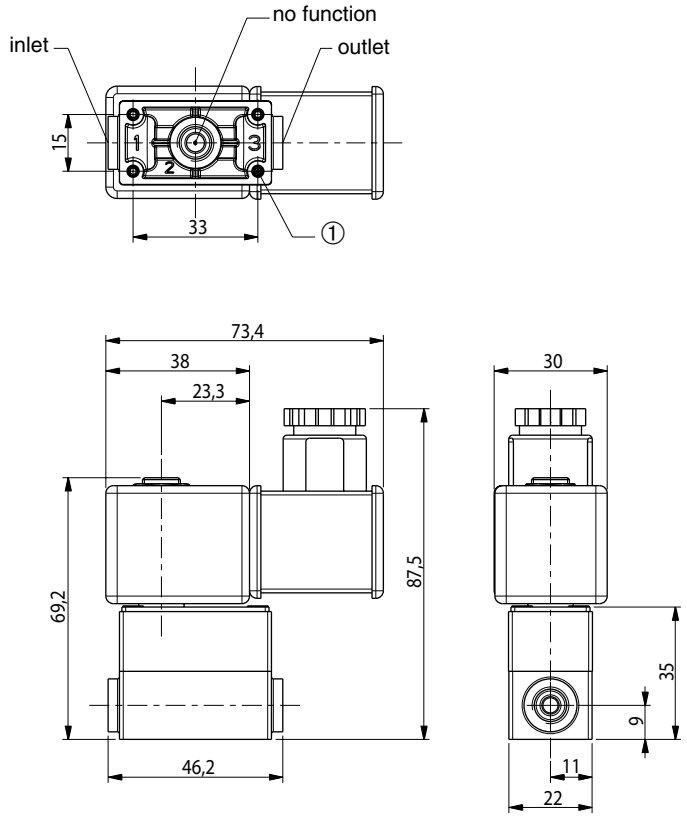
- Other subbases, contact us
- Digital control module CONTROL^D for DIN EN 50022 rail mounting (see page 143)
  - Used as a current regulator in open loop applications
  - Used with an external sensor for closed-loop applications
- Electronic proportional control unit (see page 145)
  catalogue number: X90850164500100 (setpoint 0 - 10V) / X90850164500200 (setpoint 4 - 20mA)
- Other voltages and coils with flying leads on request.
- Plug with visual indication and peak voltage suppression or with cable (see "Solenoids, Coils & Accessories" section in the catalogue "Fluid Automation, Solenoid and Pressure Operated Valves").

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation.
- Pad-mounting solenoid valve supplied with seal.
- Pipe connections 1/8 have standard thread according to ISO 228/1.

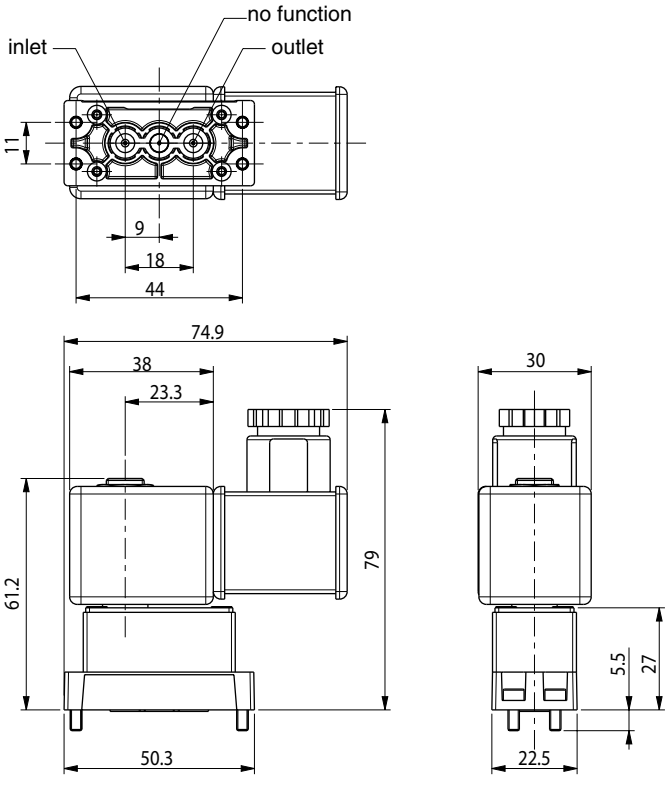
DIMENSIONS (mm)**, WEIGHT** (kg)

G 1/8
Weight: 0,189 kg

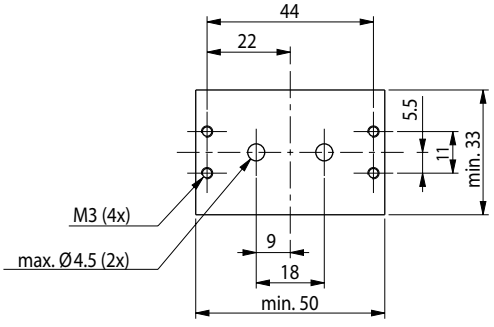


① 4 mounting holes, max. depth 7 mm, for self-tapping screw (type EJOT PT, K30)

Pad mounting body
Weight: 0,186 kg



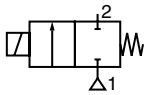
SUBBASE MOUNTING PATTERN



MINIATURE SOLENOID VALVES

diaphragm mechanism, fluid isolation
threaded connections
M5 - 1/8

NC



FEATURES

- *Solenoid valves for medical analysers, biotechnology and chemical industry*
- *Any application where the fluid may not come into contact with the electromagnetic control section of the solenoid valves*
- *The solenoid valves are ideal for controlling aggressive fluids and have easy to flush internal cavities*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 37 cSt (mm²/s)
Response time 10 ms (SCE282B001) ; 20 ms (SCG282C003)
Internal volume < 70 µl (coupling not included)

fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases, water, oil and liquids	- 10°C to + 100°C	VMQ (silicone)

MATERIALS IN CONTACT WITH FLUID

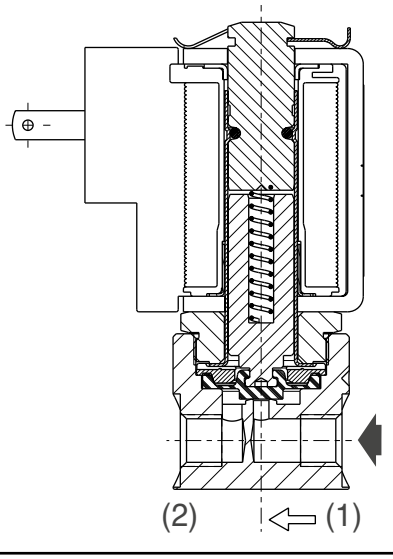
(✳) Ensure that the compatibility of the fluids in contact with the materials is verified
Body Stainless steel AISI 316 or PVDF (polyvinylidene fluoride)
Diaphragm VMQ, FPM or EPDM

OTHERS MATERIALS

Internal parts Stainless steel

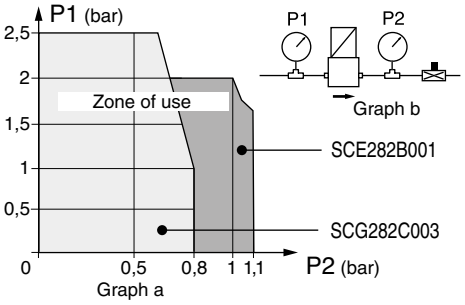
ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm or Ø 6-10 mm)
Connector specification
2,5 W (DMX) 2 spade terminals, 2,8 x 0,5 mm (DIN 46340)
8 W /9 W (ANX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Type 01: Moulded IP40 (EN 60529), Type 02: PPS (Polyphenylene sulfide) glass-fibre reinforced, IP 67 (EN 60529) with plug connector
Standard voltages DC (=) : 12V - 24V
(Other voltages on request) AC (~) : 24V - 115V - 230V / 50 Hz



prefix option	power ratings: inrush ~ (VA)	power ratings: holding ~ (VA)	power ratings: holding ~ (W)	power ratings: hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil ~ 230 V/50 Hz	replacement coil = 24 V DC	type (1)
SC	-	-	-	2,5	-10 to + 60	-	500701-006	01
	23	14	8	9	-10 to + 60	511239-009	511239-002	02

(1) Refer to the dimensional drawings on the following page.



SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air, inert gases (✳) ~	air, inert gases (✳) =	liquids (✳) ~	liquids (✳) =	power coil (W) ~	power coil (W) =	catalogue number stainless steel =	catalogue number PVDF ~/=	options FPM	options EPDM
	(mm)	(m³/h)	(l/min)											
NC - Normally closed														
M5	1,6	0,04	0,66	0	-	2 (2)	-	2 (2)	-	2,5	**SCE282B001**	-	V	E
G 1/8	4	0,32	5,33	0	2,5 (2)	2,5 (2)	2,5 (2)	2,5 (2)	8	9	-	**SCG282C003**	V	E

(2) See graphs (a) and (b) variation of inlet pressure (P2) for outlet pressure (P1) maintained.

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) seals. Use the appropriate optional suffix letter for identification
- Other pipe connections are available on request
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Pipe connection identifier is G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve
- Replacement coils are available:
  2,5 W (DMX): DC, 12 V, catalogue number **500701-005**; AC, 24 V, catalogue number **500701-006**
  8 W/9 W (ANX): DC, 12 V, catalogue number **511239-001**; AC, 24 V, catalogue number **511239-002**;
  115 V, catalogue number **511239-007**

ORDERING EXAMPLES:

SC	E	282 **B** 001		24V / DC
SC	G	282 **C** 003		115V / 50 Hz
SC	G	282 **C** 003	**V**	230V / 50 Hz

prefix
pipe thread
basic number
voltage
suffix

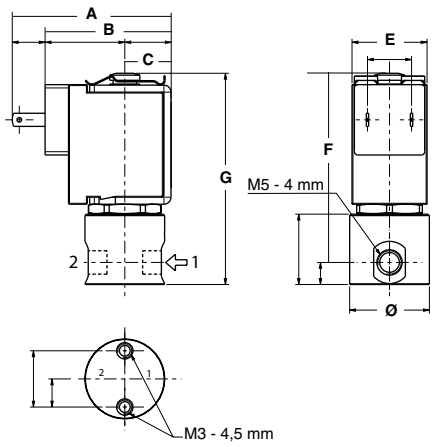
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix “SC” Solenoid
IEC 335 / DIN 46340
IP40

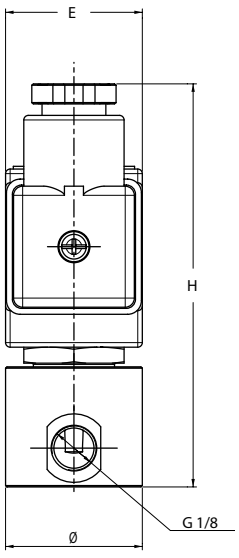
SCE282B001

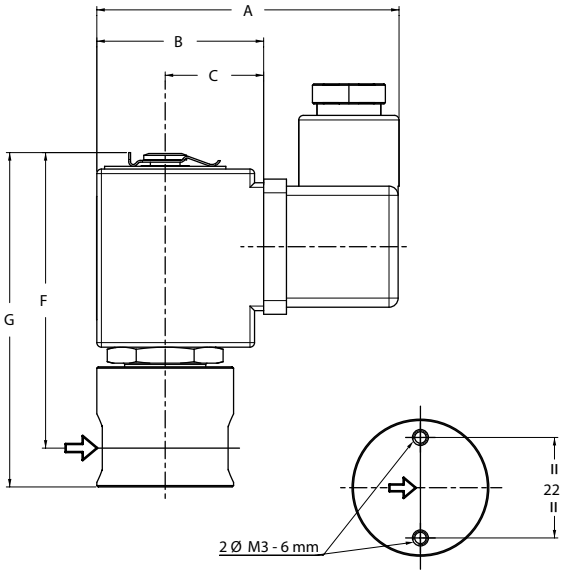
TYPE 02
Prefix “SC” Solenoid
IEC 335 / DIN 46340
IP 67 (EN 60529) with plug connector

SCG282C003



bottom view





bottom view

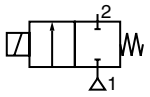
type	prefix option	catalogue number	Ø	A	B	C	D	E	F	G	H	weight
01	SC	SCE282B001	17	33,9	26,9	9,9	-	16	40,3	45	-	0,06 (1)
02	SC	SCG282C003	30	71,6	36,6	21,6	-	30	64,5	73	89	0,22 (2)

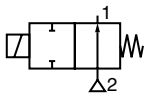
(1) Including coil, without connector.
(2) Incl. coil(s) and connector(s).

All leaflets are available on: **www.asconumatics.eu**

SOLENOID VALVES

lever mechanism, fluid isolation
with smooth spigots
O.D. 8 - 11 mm

NC 

NO 

FEATURES

- *Solenoid valves for medical analysers, biotechnology and chemical industry*
- *Ideal solenoid valves to control corrosive fluids*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 37 cSt (mm²/s)
Response time 25 ms

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases, filtered, water, oil and liquid fluids	-10°C to + 100°C	VMQ (silicone)
		FPM (fluoroelastomer)
		EPDM (ethlyene-propylene)

MATERIALS IN CONTACT WITH FLUID

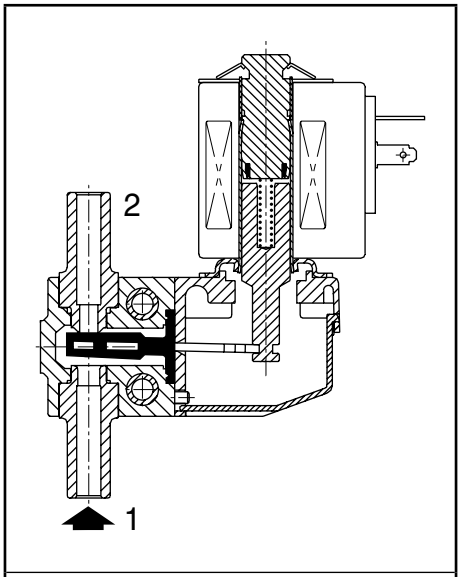
(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PEI (polyetherimide)
Poppet seal VMQ, EPDM or FPM

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 6-8 mm or Ø 6-10 mm)
Connector specification
with coil 6W/6W (BMX) DIN 43650, 11 mm, industry standard B
with coil 8W/9W (AMX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages and 60 Hz on request) AC (~) : 24V - 115V - 230V / 50 Hz (BMX = 50-60 Hz)

prefix option	power ratings inrush ~ (VA)	power ratings holding ~ (VA)	power ratings holding ~ (W)	power ratings hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil ~ 230 V/50 Hz	replacement coil = 24 V DC	type (1)
SC	16	10	6	6	-10 to + 60	43005164	43005159	01 (BMX)
	23	14	8	9	-10 to + 60	43005149	43005144	02 (AMX)

(1) Refer to the dimensional drawings on the following page.



NC function

SPECIFICATIONS

spigot O.D.	spigot I.D.	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air, inert gases, liquids (∗) ~	operating pressure differential (bar) max. (PS) air, inert gases, liquids (∗) =	power coil (W) ~	power coil (W) =	catalogue number	options FPM	options EPDM		
	(mm)	(m³/h)	(l/min)						~/=				
NC - Normally closed, VMQ seals													
8	2,7	0,23	3,83	0	5 (10)	5	6	6	**SCH283A003**	**V**	**E**	-	-
8	3,4	0,30	5,00	0	3 (6)	3	6	6	**SCH283A004**	**V**	**E**	-	-
11	5,5	0,55	9,16	0	1,5	1	8	9	**SCH283A010**	-	-	-	-
NC - Normally closed, EPDM seals (optional: FPM)													
11	5,5	0,55	9,16	0	4,5	1	8	9	**SCH283A008E**	**V**	-	-	-
NO - Normally open, VMQ seals													
8	3,4	0,30	5,00	0	3	2,5	6	6	**SCH283A016**	**V**	**E**	-	-
NO - Normally open, FPM seals													
11	5,5	0,55	9,16	0	1,5	1	8	9	**SCH283A018V**	-	-	-	-

( ) Value for differential pressure with FPM and EPDM seals.

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) poppet seal. Use the appropriate optional suffix letter for identification
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Replacement coils are available:
  BMX: DC: 12 V, cat. no.: **43005158** / AC: 24 V, cat. no.: **43005161** ; 115 V, cat. no.: **43005162**
  AMX: DC: 12 V, cat. no.: **43005143** / AC: 24 V, cat. no.: **43005146** ; 115 V, cat. no.: **43005147**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC	H	283 **A** 003		12V / DC
SC	H	283 **A** 004	**V**	24V / DC
SC	H	283 **A** 010		230V / 50Hz

prefix — pipe thread — basic number — suffix — voltage

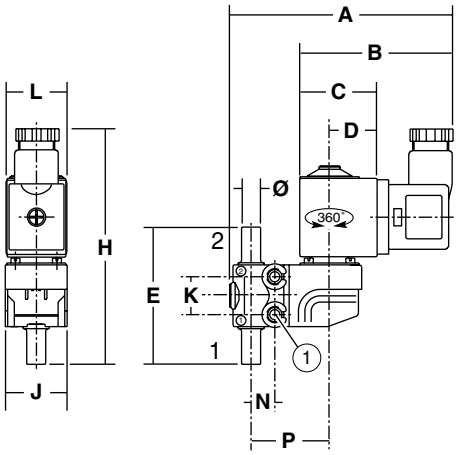
DIMENSIONS (mm), WEIGHT (kg)

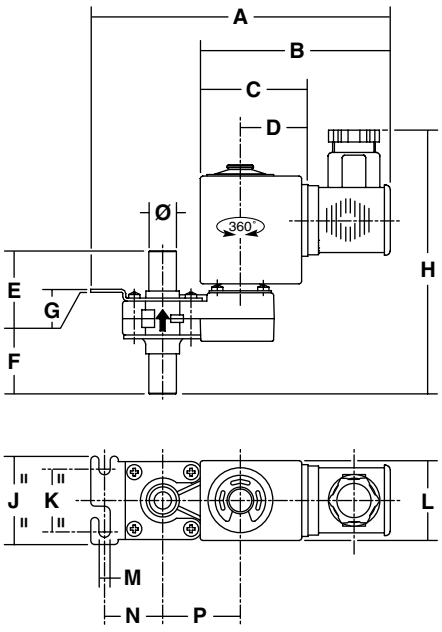
TYPE 01
Prefix "SC" Solenoid
DIN 43650

SCH283A003 / A004 / A016

TYPE 02
Prefix "SC" Solenoid
ISO 4400

SCH283A010 / A008 / A018V





Pressure inlet:
NC function: orifice 1 (type 01) or arrow on body (type 02)
NO function: orifice 2 (type 01) or arrow on body (type 02)

type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	weight (2)
01	SC	SCH283A003 / A004	94	64,5	33,5	21	58	-	-	97	26	16	25	-	10	33	0,170
		SCH283A016															0,200
02	SC	SCH283A010 / A008E / 018V	121,5	78	43	27	16,5	40,5	1,2	105	35	25	32	4,5	23	31	0,285

(1) Mounting: 2 holes Ø 4,3 mm

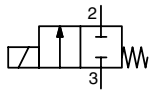
(2) Incl. coil(s) and connector(s).

All leaflets are available on: **www.asconumatics.eu**

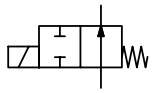
SOLENOID VALVES

lever mechanism, fluid isolation
threaded connections
1/4 - 1/2

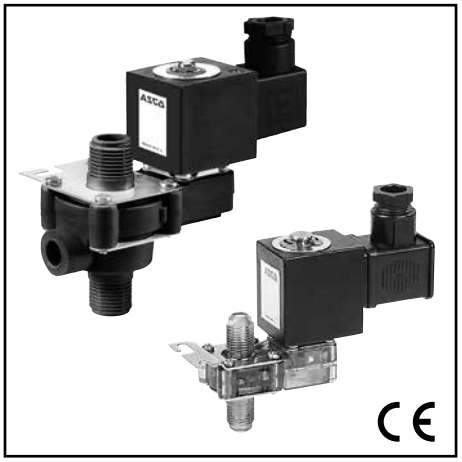
NC



NO



2/2
Series
283



FEATURES

- *Solenoid valves for medical analysers, biotechnology and chemical industry*
- *Ideal solenoid valves to control corrosive fluids*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 37 cSt (mm²/s)
Response time 25 to 30 ms (opening/closing)

fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases, water, oil and liquid fluids	-10°C to + 100°C	VMQ (silicone)
	-10°C to + 100°C (1/2: + 90°C)	EPDM (ethylene-propylene)

MATERIALS IN CONTACT WITH FLUID

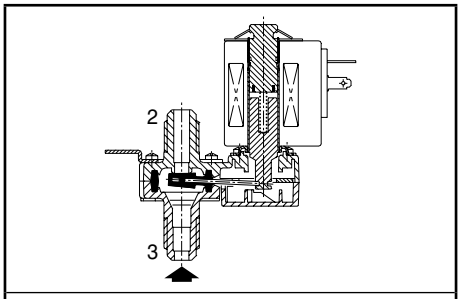
(✳) Ensure that the compatibility of the fluids in contact with the materials is verified
Body 1/4: PEI (polyetherimide)
1/2: PPS (polyphenylene sulphide)
Poppet seal VMQ, EPDM or FPM

ELECTRICAL CHARACTERISTICS

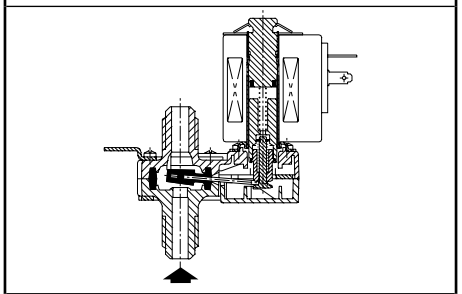
Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm)
Connector specification ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages and 60 Hz on request) AC (~) : 24V - 115V - 230V / 50 Hz

prefix option	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature range (TS)	replacement coil ~	replacement coil =	type (1)
	(VA)	(VA)	(W)	(W)	(C°)	230 V/50 Hz	24 V DC	
SC	23	14	8	9	-10 to + 60	43005149	43005144	01 (AMX)
	44	24	13	13	-10 to + 60	43005320	43005317	02 (FNX)

(1) Refer to the dimensional drawings on the following page.



NC function



NO function

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	max. (PS) air, inert gases, liquids (✳) ~	=	power coil (W) ~	=	catalogue number ~/=	options FPM			
G	(mm)	(m³/h)	(l/min)										
NC - Normally closed, VMQ seals													
1/4	3,2	0,32	5,33	0	1,5	1,5	8	9	**SCG283A013**	-	-	-	-
	5,5	0,55	9,16	0	1,5	1	8	9	**SCG283A014**	-	-	-	-
NC - Normally closed, EPDM seals (optional: FPM)													
1/4	3,2	0,32	5,33	0	10	2,4	8	9	**SCG283A011E**	V	-	-	-
	5,5	0,55	9,16	0	4,5	1	8	9	**SCG283A012E**	V	-	-	-
1/2	10	1,6	26,66	0	1,6	0,25	13	13	**SCG283C006E**	V	-	-	-
NO - Normally open, FPM seals													
1/4	3,2	0,3	5	0	3	1	8	9	**SCG283A019V**	-	-	-	-

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) poppet seal. Use the appropriate optional suffix letter for identification
- Other pipe connections are available on request
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Pipe connection identifier is G = G (ISO 228/1)
- Replacement coils are available:
  Type 01(AMX): DC: 12 V, cat. no.: **43005143** / AC: 24 V, cat. no.: **43005146** ; 115 V, cat. no.: **43005147**
  Type 02 (FNX): DC: 12 V, cat. no.: **43005316** / AC: 24 V, cat. no.: **43005318** ; 115 V, cat. no.: **43005319**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC	G	283 **A** 013		12V / DC
SC	G	283 **A** 011	**V**	24V / DC
SC	G	283 **C** 006		230V / 50Hz

prefix
pipe thread
basic number
voltage
suffix

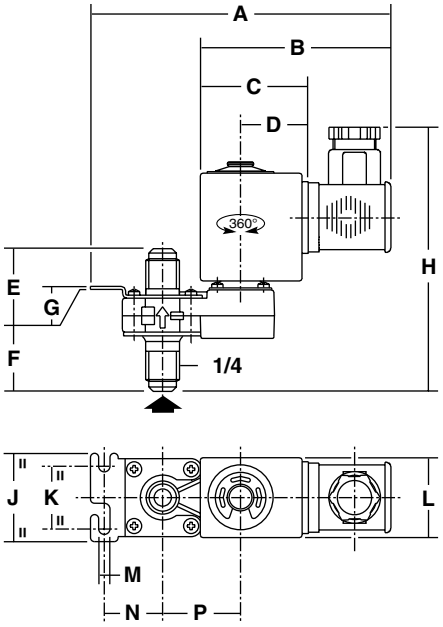
DIMENSIONS (mm), WEIGHT (kg)

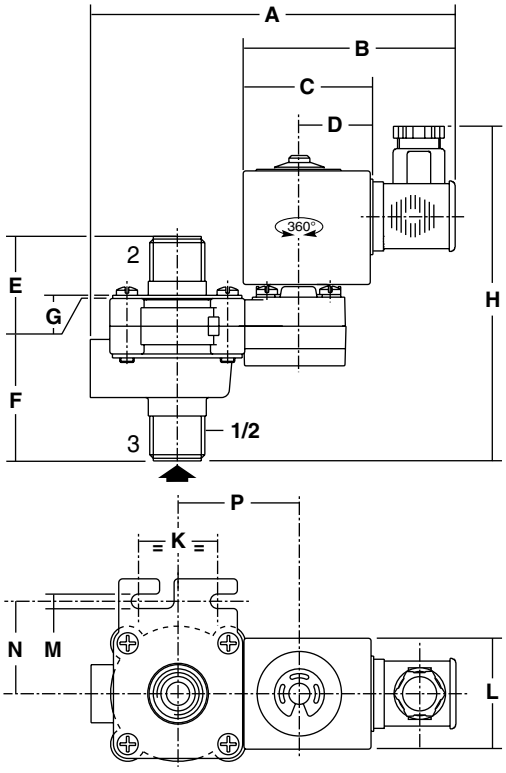
TYPE 01
Prefix "SC" Solenoid
ISO 4400

SCG283A011/012/013/014/019V

TYPE 02
Prefix "SC" Solenoid
ISO 4400

SCG283C006





Pressure inlet:
NC function: arrow on body (type 01) or orifice 3 (type 02)
NO function: arrow on body (type 01)

type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	weight (2)
01	SC	SCG283A011E/012E 013/014/019V	121,5	78	43	27	16,5	40,5	1,2	105	35	25	32	4,5	23	31	0,285
02	SC	SCG283C006E	142,5	84	49	28	23,5	61,5	1,2	128	-	30	42	5,5	35	46	0,57

(2) Incl. coil(s) and connector(s).

SOLENOID VALVES

lever mechanism, fluid isolation
with smooth spigots
O.D. 8 - 11 mm

NC 

U 

NO 

3/2
Series
383

FEATURES

- *Solenoid valves for medical analysers, biotechnology and chemical industry*
- *Ideal solenoid valves to control corrosive fluids*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 37 cSt (mm²/s)
Response time 25 ms

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases, filtered, water, oil and liquid fluids	-10°C to + 100°C	VMQ (silicone)
		FPM (fluoroelastomer)
		EPDM (ethylene-propylene)

MATERIALS IN CONTACT WITH FLUID

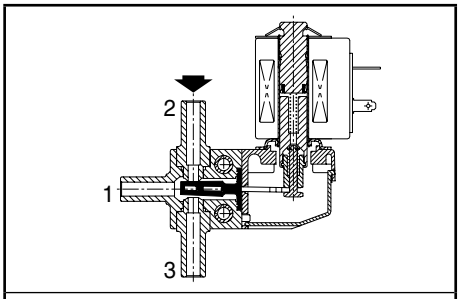
(∗) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PEI (polyetherimide)
Poppet seal VMQ, FPM or EPDM

ELECTRICAL CHARACTERISTICS

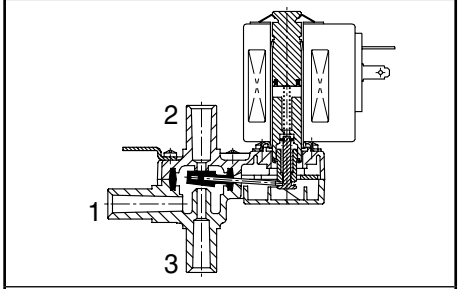
Coil insulation class F
Connector Spade plug (cable Ø 6-8 mm or Ø 6-10 mm)
Connector specification
with coil 6W/6W (BMX) DIN 43650, 11 mm, industry standard B
with coil 8W/9W (AMX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages and 60 Hz on request) AC (~) : 24V - 115V - 230V / 50 Hz (BMX = 50-60 Hz)

prefix option	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature range (TS)	replacement coil ~	replacement coil =	type (1)
	(VA)	(VA)	(W)	(W)	(C°)	230 V/50 Hz	24 V DC	
SC	16	10	6	6	-10 to + 60	43005164	43005159	01 (BMX)
	23	14	8	9	-10 to + 60	43005149	43005144	02 (AMX)

(1) Refer to the dimensional drawings on the following page.



NC function



U function

SPECIFICATIONS

spigot O.D.	spigot I.D.	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air, inert gases, liquids (∗) ~	operating pressure differential (bar) max. (PS) air, inert gases, liquids (∗) =	power coil (W) ~	power coil (W) =	catalogue number	options FPM	options EPDM		
	(mm)	(m³/h)	(l/min)						~/=				
NC - Normally closed, VMQ seals													
8	3,4	0,3	5,00	0	1	1	6	6	**SCH383A003**	**V**	**E**	-	-
NO - Normally open, FPM seals													
8	3,4	0,3	5,00	0	2,5	2	6	6	**SCH383A004V**	-	-	-	-
NO - Normally open, EPDM seals													
8	3,4	0,3	5,00	0	2,5	2	6	6	**SCH383A004E**	-	-	-	-
U - Universal, VMQ seals													
11	3,2	0,3	4,66	0	1,5	1,5	8	9	**SCH383A007**	**V**	**E**	-	-

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) poppet seal. Use the appropriate optional suffix letter for identification
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Replacement coils are available:
  BMX: DC: 12 V, cat. no.: **43005158** / AC: 24 V, cat. no.: **43005161** ; 115 V, cat. no.: **43005162**
  AMX: DC: 12 V, cat. no.: **43005143** / AC: 24 V, cat. no.: **43005146** ; 115 V, cat. no.: **43005147**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC	H	383 **A** 003		12V / DC
SC	H	383 **A** 004	**V**	24V / DC
SC	H	383 **A** 007		230V / 50Hz

prefix
pipe thread
basic number
voltage
suffix

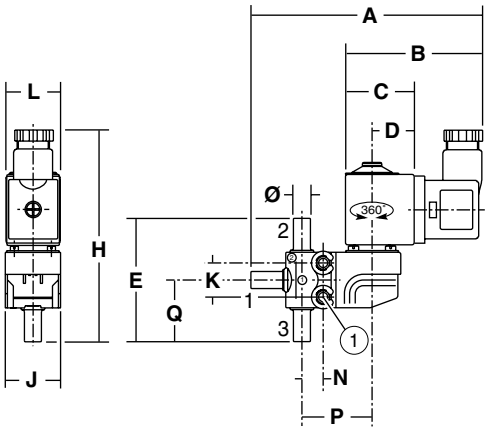
DIMENSIONS (mm), WEIGHT (kg)

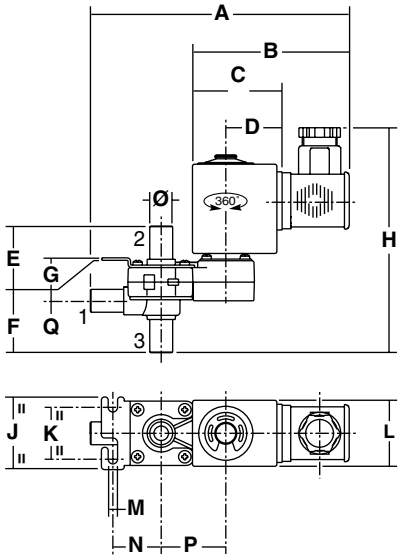
TYPE 01
Prefix "SC" Solenoid
DIN 43650

SCH383A003 / A004V / A004E

TYPE 02
Prefix "SC" Solenoid
ISO 4400

SCH383A007





Pressure inlet:
NC function: orifice 2 (type 01)
NO function: orifice 3 (type 01)
U function: all orifices (type 02)

type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	weight (2)
01	SC	SCH383A003/ A004V/A004E	111	64,5	33,5	21	58	-	-	97	26	16	25	-	10	33	29	0,200
02	SC	SCH383A007	127	78	43	27	16,5	40,5	1,2	105	35	25	32	4,5	23	31	19,5	0,345

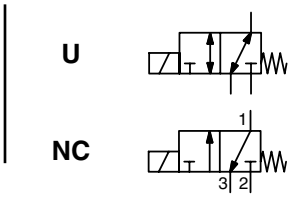
(1) Mounting: 2 holes Ø 4,3 mm

(2) Incl. coil(s) and connector(s).

All leaflets are available on: **www.asconumatics.eu**

SOLENOID VALVES

lever mechanism, fluid isolation
threaded connections
1/4 - 1/2



3/2
Series
383

FEATURES

- *Solenoid valves for medical analysers, biotechnology and chemical industry*
- *Ideal solenoid valves to control corrosive fluids*
- *The solenoid valves satisfy all relevant EC directives*

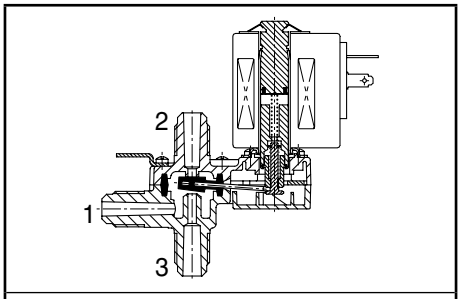
GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 37 cSt (mm²/s)
Response time 25 to 30 ms (opening/closing)

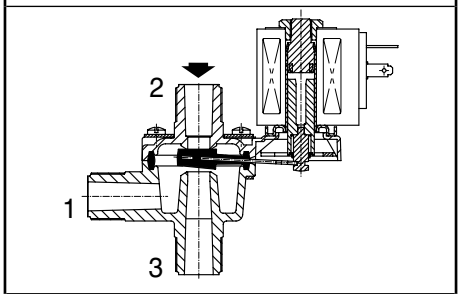
fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases, water, oil and liquid fluids	-10°C to + 100°C (1/2: + 90°C)	VMQ (silicone)
		FPM (fluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified
Body 1/4: PEI (polyetherimide)
1/2: PPS (polyphenylene sulphide)
Poppet seal VMQ or FPM



U function



NC function

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm)
Connector specification ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 12V - 24V
(Other voltages and 60 Hz on request) AC (~) : 24V - 115V - 230V / 50 Hz

prefix option	power ratings				operator ambient temperature range (TS)	replacement coil		type (1)
	inrush ~	holding ~		hot/cold =		~	=	
	(VA)	(VA)	(W)	(W)	(C°)	230 V/50 Hz	24 V DC	
SC	23	14	8	9	-10 to + 60	43005149	43005144	01 (AMX)
	44	24	13	-	-10 to + 60	43005320	-	02 (FNX)

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)			power coil (W)		catalogue number	options			
				min.	max. (PS) air, inert gases, liquids (✳)					FPM	EPDM		
G	(mm)	(m³/h)	(l/min)		~	=	~	=					
U - Universal, VMQ seals													
1/4	3,2	0,28	4,66	0	1,5	1,5	8	9	**SCG383A008**	**V**	**E**	**-**	**-**
NC - Normally closed, FPM seals													
1/2	9	1,6	26,66	0	0,4	-	13	-	**SCG383C006**	**-**	**-**	**-**	**-**

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) poppet seal. Use the appropriate optional suffix letter for identification
- Other pipe connections are available on request
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Pipe connection identifier is G = G (ISO 228/1)
- Replacement coils are available:
  Type 01(AMX): DC: 12 V, cat. no.: **43005143** / AC: 24 V, cat. no.: **43005146** ; 115 V, cat. no.: **43005147**
  Type 02 (FNX): AC: 24 V, cat. no.: **43005318** ; 115 V, cat. no.: **43005319**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC	G	383 **A** 008		12V / DC
SC	G	383 **A** 008	**V**	24V / DC
SC	G	383 **C** 006		230V / 50Hz

prefix
pipe thread
basic number
voltage
suffix

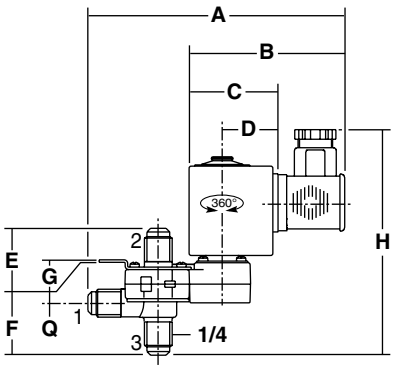
DIMENSIONS (mm), WEIGHT (kg)

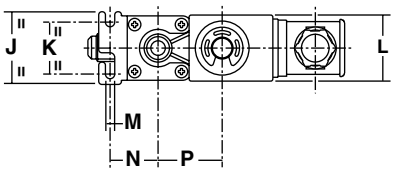
TYPE 01
Prefix "SC" Solenoid
ISO 4400

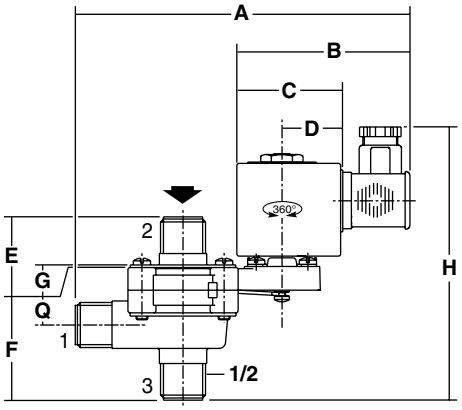
SCG383A008

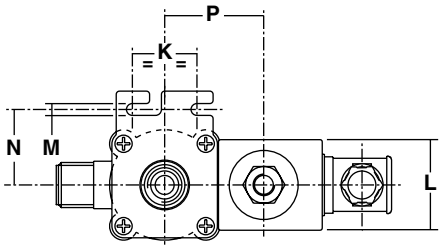
TYPE 02
Prefix "SC" Solenoid
ISO 4400

SCG383C006









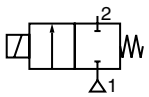
type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	weight (2)
01	SC	SCG383A008	127	78	43	27	16,5	44,5	1,2	109	35	25	32	4,5	23	31	19,5	0,345
02	SC	SCG383C006	159	84	49	28	23,5	61,5	1,2	128	-	30	42	5,5	35	46	26,5	0,51

(2) Incl. coil(s) and connector(s).

SOLENOID VALVES

bellows seal, fluid isolation
direct operated
1/4 - 3/8

NC



2/2
Series
296

FEATURES

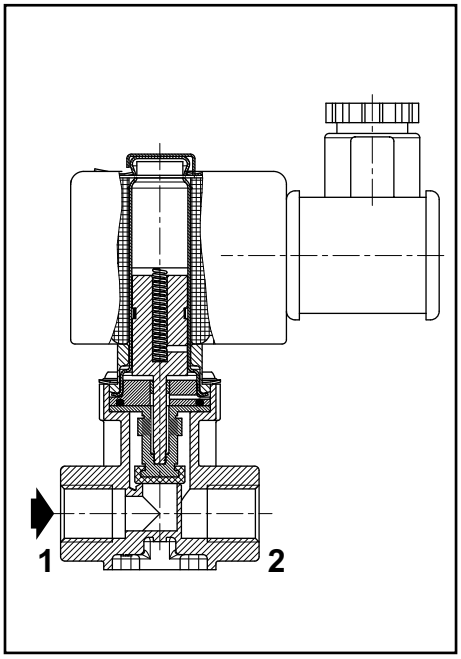
- *Valve for the control of agressive liquids and gases in the pharmaceutical, biochemical, photographic, chemical and analytical industries, in chip and wafer production*
- *The valve is suited for all applications in which the fluids must not come into contact with the metal parts (electromagnetic control of the solenoid valve)*
- *Bellows system made of PTFE and FFPM seals with high functional reliability*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 40 cSt (mm²/s)

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases, water, oil and liquids	-10°C to + 90°C (1)	FFPM (perfluoroelastomer)

(1) Total ambient + fluid temperature must not exceed 130°C.



MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Body PEEK (polyetheretherketone), or stainless steel, AISI 303 (1.4305)
Core tube Stainless steel
Core and plugnut Stainless steel
Springs Stainless steel
Seals FFPM
Bellows PTFE

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug
Connector specification
for coil type 01 DIN 43650, 11 mm, industry standard B
for coil type 02 ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V
AC (~) : 24V - 115V - 230V / 50 Hz

prefix option	power ratings inrush ~ (VA)	power ratings holding ~ (VA)	power ratings holding ~ (W)	power ratings hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil ~ 230 V/50 Hz	replacement coil = 24 V DC	type (1)
SC	-	-	-	5 / 6,9	-10 to + 60	43004649	43004647	01
	55	23	10,5	9 / 11,2		400425-117	400425-142	02
	78	35	16,7	14 / 19,7		400425-217	400425-342	02

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air inert gas (∗)	operating pressure differential (bar) max. (PS) liquids (∗)	power coil (W)		catalogue number		options FPM		
G	(mm)	(m³/h)	(l/min)		~/=	~/=	~	=	PEEK	stainless steel			
NC - Normally closed													
1/4	2	0,11	1,8	0	3	3	-	6,9	**SCG296A007**	**SCG296A021**	**V**	**-**	**-**
					6	6	10,5	11,2	**SCG296A008**	**SCG296A022**	**V**	**-**	**-**
	4	0,32	5,3	0	5	5	10,5	11,2	**SCG296A009**	**SCG296A023**	**V**	**-**	**-**
					6	6	16,7	19,7	**SCG296A010**	**SCG296A024**	**V**	**-**	**-**
3/8	6	0,73	12,2	0	2	2	10,5	11,2	**SCG296A011**	**SCG296A025**	**V**	**-**	**-**
					4	4	16,7	19,7	**SCG296A012**	**SCG296A026**	**V**	**-**	**-**

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) seals and diaphragm. Use the appropriate optional suffix letter for identification
- NPT thread
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation However, for optimum performance it is recommended that they be fitted with the solenoid operator at the top
- Solenoid valves have 2 or 4 mounting holes in body
- Pipe connection identifier is G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

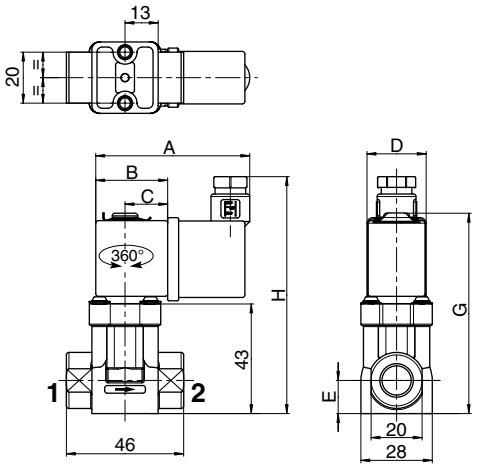
ORDERING EXAMPLES:

SC	G	296 **A** 007		24V / DC
SC	G	296 **A** 021		24V / 50 Hz
SC	G	296 **A** 025	**V**	230V / 50 Hz
prefix	pipe thread	basic number	suffix	voltage

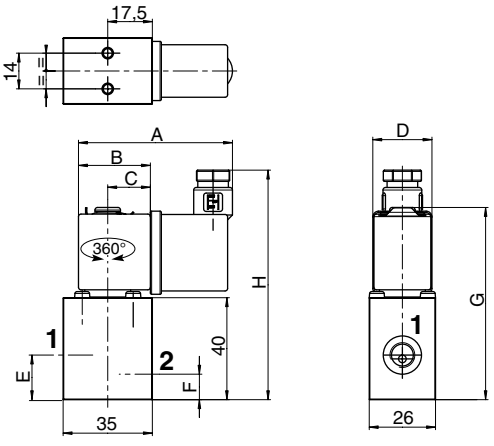
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
ISO 4400

PEEK: SCG296A007

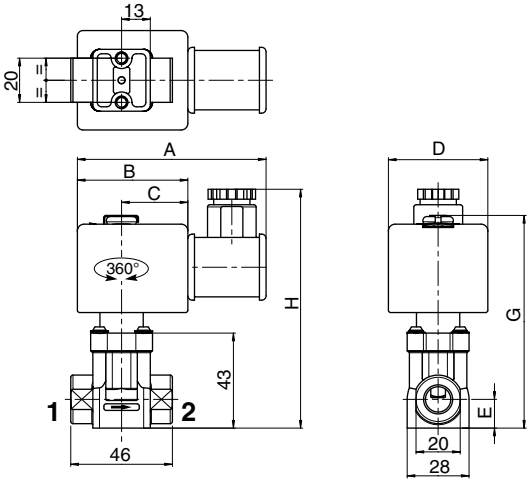


Stainless steel: SCG296A021

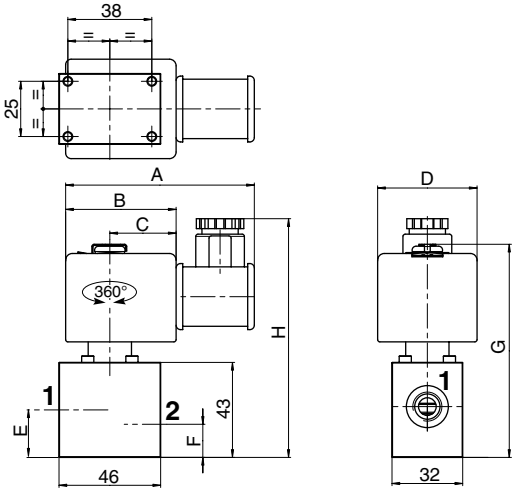


TYPE 02
Prefix "SC" Solenoid
ISO 4400

PEEK: SCG296A008/A009/A010/A011/A012



Stainless steel: SCG296A022/A023/A024/A025/A026



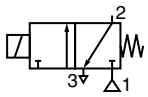
type	prefix option	catalogue number	A	B	C	D	E	F	G	H	weight (1)
01	SC	SCG296A007	60	28	17	22	13	-	79	94	0,145
		SCG296A021	60	28	17	22	17,5	10	76	91	0,310
02	SC	SCG296A008/A009/A010/A011/A012	85	50	30	45	13	-	100	110	0,420
		SCG296A022/A023/A024/A025/A026	85	50	30	45	21,5	15	100	110	0,650

(1) Incl. coil(s) and connector(s)..

SOLENOID VALVES

bellows seal, fluid isolation
direct operated
1/4

NC



3/2
Series
396

FEATURES

- *Valve for the control of agressive liquids and gases in the pharmaceutical, biochemical, photographic, chemical and analytical industries, in chip and wafer production, environmental technology as well as colour chemistry*
- *The valve is suited for all applications in which the fluids must not come into contact with the metal parts (electromagnetic control of the solenoid valve)*
- *Bellows system made of PTFE and FFPM seals with high functional reliability*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

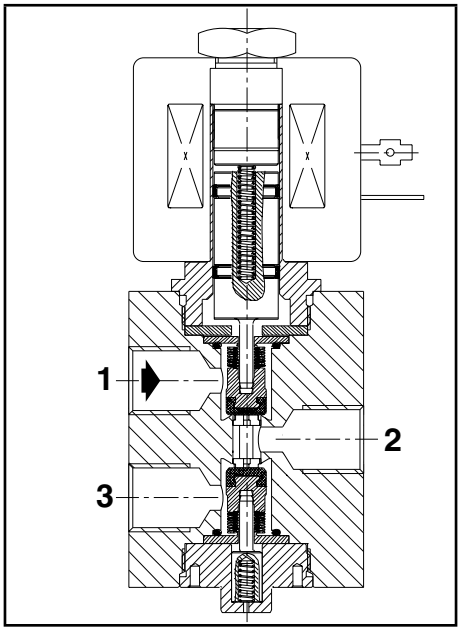
Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 40 cSt (mm²/s)

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases, water, oil and liquids	-10°C to + 90°C (1)	FFPM (perfluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Body PEEK (polyetheretherketone) or stainless steel, AISI 303 (1.4305)
Core tube Stainless steel
Core and plugnut Stainless steel
Springs Stainless steel
Seals FFPM
Bellows PTFE



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm)
Connector specification ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V

prefix option	power ratings				operator ambient temperature range (TS)	replacement coil		type (1)
	inrush ~	holding ~		hot/cold =		~	=	
	(VA)	(VA)	(W)	(W)	(C°)	-	24 V DC	
SC	-	-	-	9 / 11,2	-10 to + 75	-	400425-142	01

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)			power coil (W)		catalogue number		options		
				min.	max. (PS)								
					air inert gas (∗)	liquids (∗)					FPM	EPDM	
G	(mm)	(m³/h)	(l/min)		=	=	~	=	PEEK	stainless steel			
NC - Normally closed													
1/4	4	0,26	4,3	0	3	3	-	11,2	**SCG396A006**	**SCG396A003**	**V**	**E**	**-**

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) and EPDM (ethylene-propylene) seals. Use the appropriate optional suffix letter for identification
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation However, for optimum performance it is recommended that they be fitted with the solenoid operator at the top
- Solenoid valves have 4 mounting holes in body
- Pipe connection identifier is G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

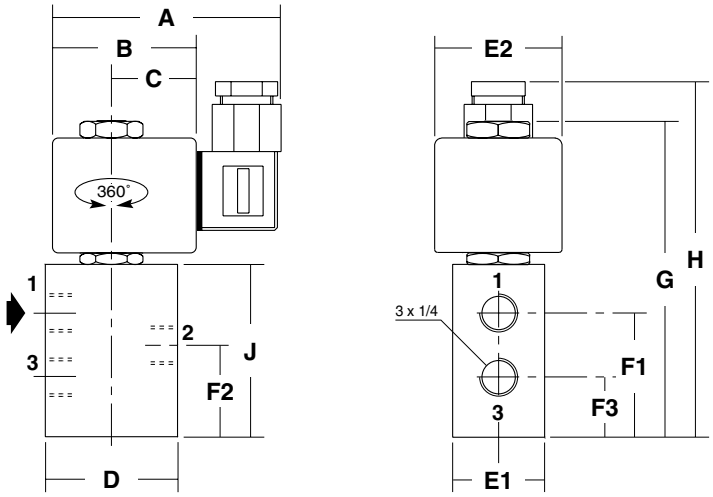
SC	G	396 **A** 006		24V / DC
SC	G	396 **A** 003		24V / 50 Hz
SC	G	396 **A** 006	**V**	230V / 50 Hz

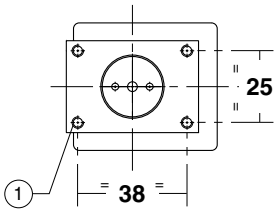
prefix — pipe thread — basic number — suffix — voltage

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
ISO 4400

PEEK: SCG396A006 PPS: SCG396A003





(1) 4 mounting holes Ø M4, depth 8 mm

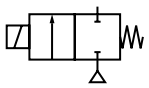
type	prefix option	catalogue number	A	B	C	D	E1	E2	F1	F2	F3	G	H	J	weight (1)
01	SC	SCG396A006	80	50	30	46	32	45	43	32	21	110	127	60	0,49
		SCG396A003													0,90

(1) Incl. coil(s) and connector(s)..

MICRO SOLENOID VALVE

pinch mechanism
for flexible tube
O.D. 1.65 to 9.5 mm

NC



2/2
Series
284

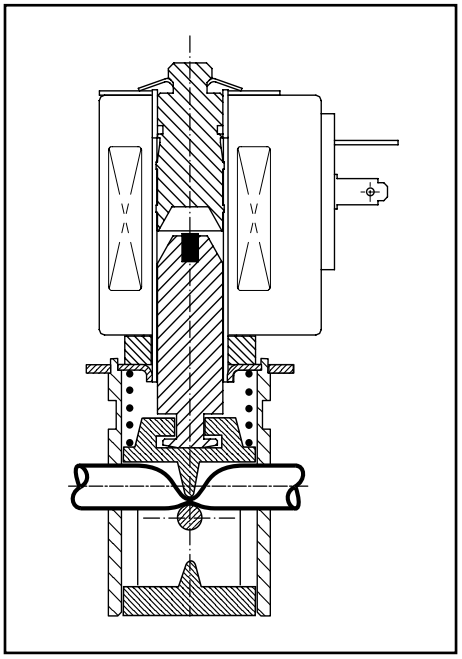
FEATURES

- *Solenoid valve suitable for cutting off the flow of a fluid by pinch*
- *For sterile, aseptic, physiological and food applications*
- *No turbulence when cutting off flow by pinch*
- *Silent operation*
- *Full bore output flow compared with a traditional solenoid valve*
- *Manual pulse control for fitting tube*
- *A single component in contact with the fluid, i.e. the tube*
- *Bi-directional flow*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]

fluids (∗)
air, inert gases, water, oil and liquids



MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Recommended flexible tube VMQ (silicone)
(max. hardness: 50 Shore A)
The silicone tube is not included in our supply

OTHER MATERIALS

Body Aluminium, anodised
Pinch mechanism POM (Graphite-reinforced polyacetal)
Internal parts Stainless steel
Guide tube Nickel-plated brass

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm or Ø 6-10 mm)
Connector specification
4 W (DNX-4) DIN 43650, 9,4 mm, industry standard B
6 W /13 W (AMX/FNX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Coil type 01 = IP40 / Coil type 02-03 = IP65
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings: inrush ~ (VA)	power ratings: holding ~ (VA)	power ratings: holding ~ (W)	power ratings: hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil = 12 V DC	replacement coil = 24 V DC	type (1)
SC	-	-	-	4	-10 to + 60	43005268	43005269	01 (DNX-4)
	-	-	-	9		43005143	43005144	02 (AMX)
	-	-	-	13		43005316	43005317	03 (FNX)

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

tube I.D. (mm)	tube O.D. (mm)	pinch force (daN)	operating pressure differential (bar) min.	max. (PS) air inert gas (∗) =	max. (PS) liquids (∗) =	power coil (W) ~	power coil (W) =	catalogue number =
NC - Normally closed								
0,76	1,65	0,18	0	0,8	0,8	-	4	**SCH284B001**
1,02	2,16	0,22	0	0,8	0,8	-	4	**SCH284B002**
1,57	3,18	0,28	0	0,8	0,8	-	4	**SCH284B003**
1,98	3,18	0,25	0	0,8	0,8	-	4	**SCH284B004**
2,7	4,9	0,65	0	0,8	0,8	-	9	**SCH284A005**
4,8	7,9	1,1	0	0,8	0,8	-	13	**SCH284B006**
6,4	9,5	1,4	0	0,8	0,8	-	13	**SCH284B007**

OPTIONS AND ACCESSORIES

- Flexible tubes having to use an external guiding device for optimum support (see dimensions):
  - with an outside diameter lower than 2,2 mm (catalogue numbers SCH284B001 to ..B004)
  - with an outside diameter lower than 3,5 mm (catalogue number SCH284A005)
  - with an outside diameter lower than 6 mm (catalogue numbers SCH284B006 and ..007)
- For use on tubes other than those recommended, contact us
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation However, for optimum performance it is recommended that they be fitted with the solenoid operator at the top
- Fixing plate built in between the body and the coil for assembly in a bank on a base plate
- Flexible tubes are not included in our supply
- **Do not connect the solenoid valve to the power supply without fitting a flexible tube beforehand**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC H 284 **B** 001 — 12V / DC
SC H 284 **B** 006 — 24V / DC

prefix
pipe thread
basic number
voltage
suffix

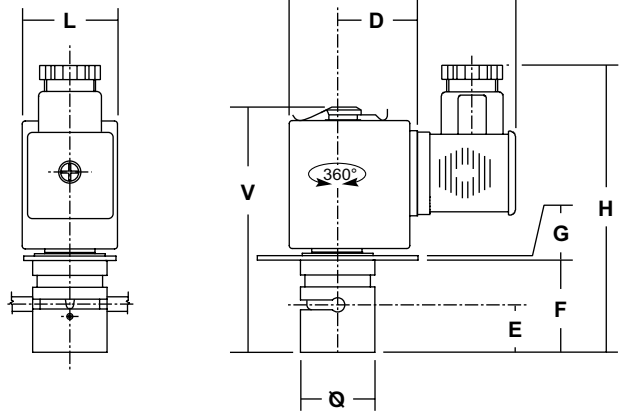
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
IEC 335 / DIN 43650
IP40

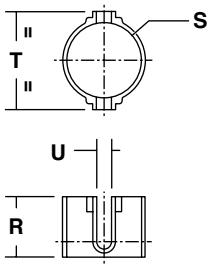
Type 01: SCH284B001/002/003/004

TYPE 02-03
Prefix "SC" Solenoid
IEC 335 / ISO 4400
IP65

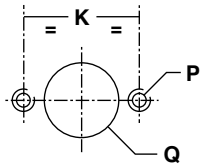
Type 02: SCH284A005
Type 03: SCH284B006/B007

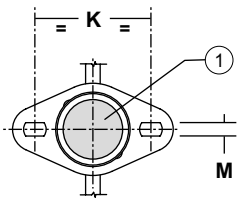


tube guiding device



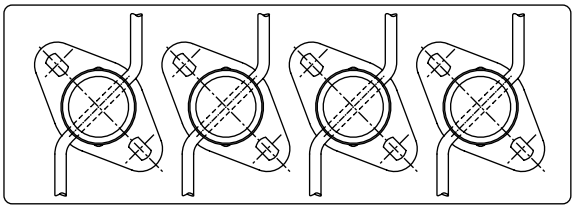
arrangement for wall-fitting





bottom view

example of banked assembly



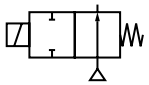
(1) Impulse manual operator

type	prefix option	catalaogue number	Ø	A	C	D	E	F	G	H	K	L	M	P	Q	R	S	T	U	V	weight (1)	tube guiding device	
																						catalogue numebr	weight
01	SC	SCH284B001/002 /003/004	16	49,5	23,5	15	11	20	1	66	24	17	3,3	M3	16,5	10,7	16	24	2,2	51,2	0,06	**C140094**	0,005
02	SC	SCH284A005	25	78	43	27	17,5	32	1,5	99	39	32	4,5	M4	25,5	14	25	33	3,2	82,5	0,28	**C140095**	0,009
03	SC	SCH284B006/B007	30	84	49	28	24,5	43,5	1,5	99	45,5	42	4,5	M4	30,5	24	30	39	6	99	0,47	**C140096**	0,015

(1) Incl. coil(s) and connectors..

MICRO SOLENOID VALVE

pinch mechanism
for flexible tube
O.D. 1.65 to 9.5 mm

NO 

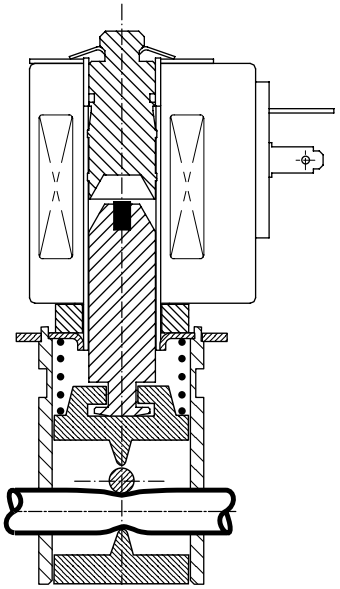
FEATURES

- *Solenoid valve suitable for cutting off the flow of a fluid by pinch*
- *For sterile, aseptic, physiological and food applications*
- *No turbulence when cutting off flow by pinch*
- *Silent operation*
- *Full bore output flow compared with a traditional solenoid valve*
- *Manual pulse control for fitting tube*
- *A single component in contact with the fluid, i.e. the tube*
- *Bi-directional flow*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]

fluids (∗)
air, inert gases, water, oil and liquids



MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Recommended flexible tube VMQ (silicone)
(max. hardness: 50 Shore A)
The silicone tube is not included in our supply

OTHER MATERIALS

Body Aluminium, anodised
Pinch mechanism POM (Graphite-reinforced polyacetal)
Internal parts Stainless steel
Guide tube Nickel-plated brass

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm or Ø 6-10 mm)
Connector specification
4 W (DMX) DIN 43650, 9,4 mm, industry standard B
6 W /13 W (AMX/FNX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Coil type 01 = IP40 / Coil type 02-03 = IP65
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings inrush ~ (VA)	holding ~ (VA)	holding ~ (W)	hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil = 12 V DC	replacement coil = 24 V DC	type (1)
SC	-	-	-	4	-10 to + 60	43005268	43005269	01 (DNX-4)
	-	-	-	9		43005143	43005144	02 (AMX)
	-	-	-	13		43005316	43005317	03 (FNX)

(1) Refer to the dimensional drawings on the following page.

SPECIFICATIONS

tube I.D. (mm)	tube O.D. (mm)	pinch force (daN)	operating pressure differential (bar) min.	max. (PS) air inert gas (∗) =	max. (PS) liquids (∗) =	power coil (W) ~	power coil (W) =	catalogue number =
NO - Normally open								
0,76	1,65	1,2	0	0,8	0,8	-	4	**SCH284B009**
1,02	2,16	1,3	0	0,8	0,8	-	4	**SCH284B010**
1,57	3,18	0,6	0	0,8	0,8	-	4	**SCH284B011**
1,98	3,18	0,9	0	0,8	0,8	-	4	**SCH284B012**
2,7	4,9	0,5	0	0,8	0,8	-	9	**SCH284A013**
4,8	7,9	2,3	0	0,8	0,8	-	13	**SCH284B014**
6,4	9,5	2,4	0	0,8	0,8	-	13	**SCH284B015**

OPTIONS AND ACCESSORIES

- Flexible tubes having to use an external guiding device for optimum support (see dimensions):
  - with an outside diameter lower than 2,2 mm (catalogue numbers SCH284B009 to ..B012)
  - with an outside diameter lower than 3,5 mm (catalogue number SCH284A013)
  - with an outside diameter lower than 6 mm (catalogue numbers SCH284B014 and ..015)
- For use on tubes other than those recommended, contact us
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation However, for optimum performance it is recommended that they be fitted with the solenoid operator at the top
- Fixing plate built in between the body and the coil for assembly in a bank on a base plate
- Flexible tubes are not included in our supply
- **Do not connect the solenoid valve to the power supply without fitting a flexible tube beforehand**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC H 284 **B** 009 — 12V / DC
SC H 284 **B** 014 — 24V / DC

prefix
pipe thread
basic number
voltage
suffix

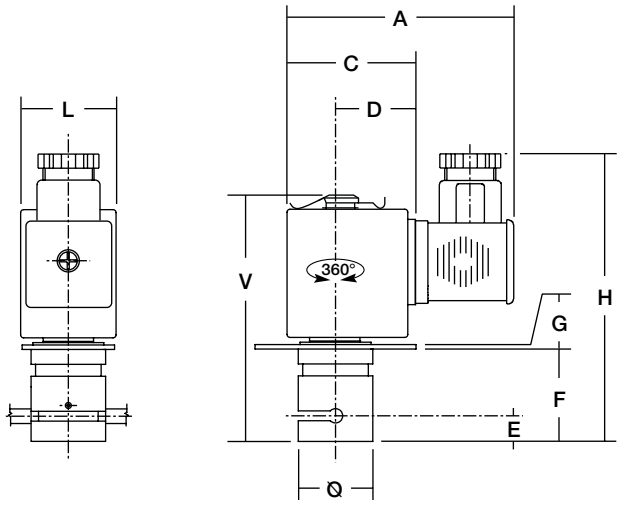
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" Solenoid
IEC 335 / DIN 43650
IP40

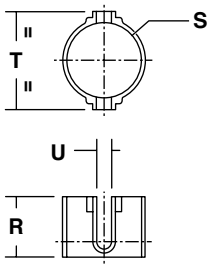
Type 01: SCH284B009/010/011/012

TYPE 02-03
Prefix "SC" Solenoid
IEC 335 / ISO 4400
IP65

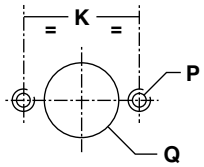
Type 02: SCH284A013
Type 03: SCH284B014/B015

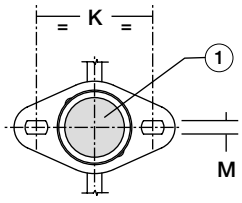


tube guiding device



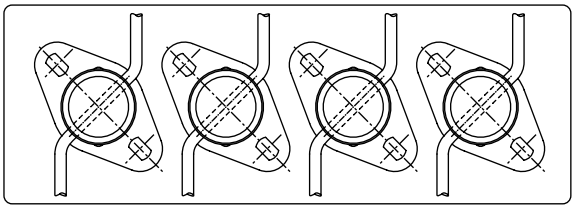
arrangement for wall-fitting





bottom view

example of banked assembly



① Impulse manual operator

type	prefix option	catalaogue number	Ø	A	C	D	E	F	G	H	K	L	M	P	Q	R	S	T	U	V	weight (1)
01	SC	SCH284B009/010 /011/012	16	49,5	23,5	15	11	20	1	66	24	17	3,3	M3	16,5	10,7	16	24	2,2	51,2	0,06
02	SC	SCH284A013	25	78	43	27	17,5	32	1,5	99	39	32	4,5	M4	25,5	14	25	33	3,2	82,5	0,29
03	SC	SCH284B014/B015	30	84	49	28	24,5	43,5	1,5	99	45,5	42	4,5	M4	30,5	24	30	39	6	99	0,45

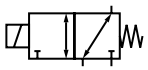
tube guiding device	
catalogue number	weight
C140094	0,005
C140095	0,009
C140096	0,015

(1) Incl. coil(s) and connectors..

MICRO SOLENOID VALVE

pinch mechanism
for flexible tube
O.D. 1.65 to 9.5 mm

U



3/2
Series
384

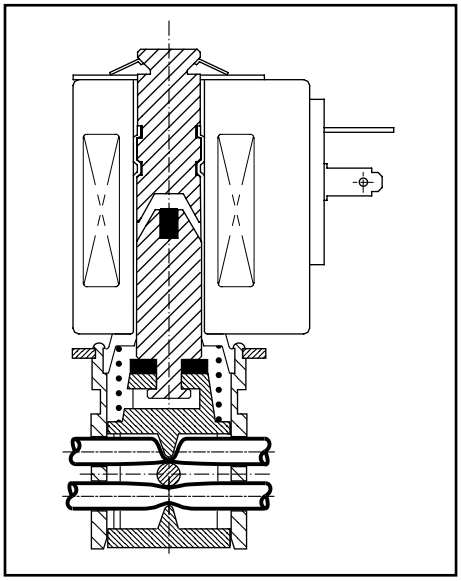
FEATURES

- *Solenoid valve suitable for cutting off the flow of a fluid by pinch*
- *For sterile, aseptic, physiological and food applications*
- *No turbulence when cutting off flow by pinch*
- *Silent operation*
- *Full bore output flow compared with a traditional solenoid valve*
- *Manual pulse control for fitting tube*
- *A single component in contact with the fluid, i.e. the tube*
- *Bi-directional flow*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]

fluids (✳)
air, inert gases, water, oil and liquids



MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Recommended flexible tube VMQ (silicone)
(max. hardness: 50 Shore A)
The silicone tube is not included in our supply

OTHER MATERIALS

Body Aluminium, anodised
Pinch mechanism POM (Graphite-reinforced polyacetal)
Internal parts Stainless steel
Guide tube Nickel-plated brass

ELECTRICAL CHARACTERISTICS

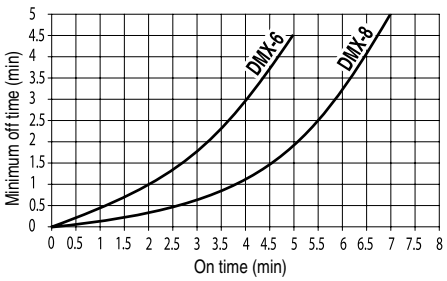
Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm or Ø 6-10 mm)
Connector specification
4 W/8 W/6 W (DMX) DIN 43650, 9,4 mm, industry standard B
6 W /13 W (AMX/FNX) ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Coil type 01 = IP40 / Coil type 02-03 = IP65
Standard voltages DC (=) : 12V - 24V
(Other voltages on request)

prefix option	power ratings: inrush ~ (VA)	power ratings: holding ~ (VA)	power ratings: holding ~ (W)	power ratings: hot/cold = (W)	operator ambient temperature range (TS) (C°)	replacement coil = 12 V DC	replacement coil = 24 V DC	type (1)
SC	-	-	-	4	-10 to + 60	43005268	43005269	01 (DNX-4)
	-	-	-	8		500701-001	500701-002	
	-	-	-	6		500701-003	500701-004	
	-	-	-	9		43005143	43005144	02 (AMX)
	-	-	-	13		43005316	43005317	03 (FNX)

(1) Refer to the dimensional drawings on the following page.

USE IN INTERMITTENT SERVICE

Minimum waiting time between each application of power



SPECIFICATIONS

tube I.D.	tube O.D.	pinch force	operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air inert gas (✳)	operating pressure differential (bar) max. (PS) liquids (✳)	power coil (W) ~	power coil (W) =	catalogue number
(mm)	(mm)	(daN)		=	=			=
U - Universal								
0,76	1,65	0,12	0	0,8	0,8	-	4	**SCH384B004**
1,02	2,16	0,18	0	0,8	0,8	-	4	**SCH384B001**
1,57	3,18	0,22	0	0,8	0,8	-	8	**SCH384B002** (1)
1,98	3,18	0,18	0	0,8	0,8	-	6	**SCH384B003** (1)
3,4	4,7	0,4	0	0,8	0,8	-	9	**SCH384A005**
4,8	7,9	0,85	0	0,8	0,8	-	13	**SCH384B006**
6,4	9,5	1,1	0	0,8	0,8	-	13	**SCH384B007**

(1) Observe the minimum of time stated, see graph above.

OPTIONS AND ACCESSORIES

- Flexible tubes having to use an external guiding device for optimum support (see dimensions):
  - with an outside diameter lower than 2,2 mm (catalogue numbers SCH384B001 to ..B004)
  - with an outside diameter lower than 3,5 mm (catalogue number SCH384A005)
  - with an outside diameter lower than 6 mm (catalogue numbers SCH384B006 and ..007)
- For use on tubes other than those recommended, contact us
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation However, for optimum performance it is recommended that they be fitted with the solenoid operator at the top
- Fixing plate built in between the body and the coil for assembly in a bank on a base plate
- Flexible tubes are not included in our supply
- **Do not connect the solenoid valve to the power supply without fitting a flexible tube beforehand**
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

SC H 384 **B** 001 — 12V / DC
SC H 384 **B** 006 — 24V / DC

prefix
pipe thread
basic number
voltage
suffix

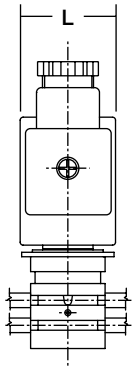
DIMENSIONS (mm), WEIGHT (kg)

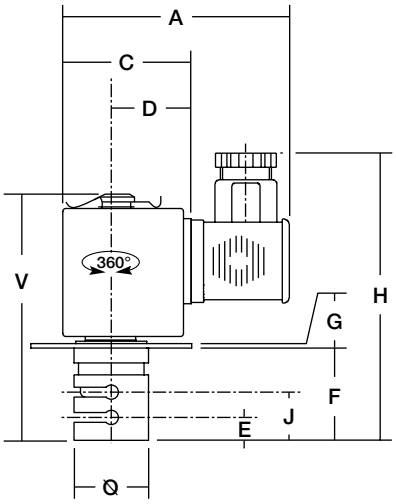
TYPE 01
Prefix "SC" Solenoid
IEC 335 / DIN 43650
IP40

Type 01: SCH384B001/002/003/004

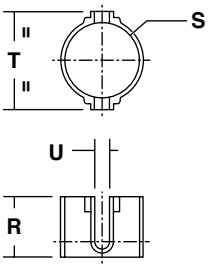
TYPE 02-03
Prefix "SC" Solenoid
IEC 335 / ISO 4400
IP65

Type 02: SCH384A005
Type 03: SCH384B006/B007

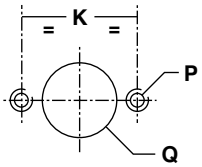


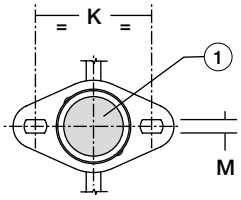


tube guiding device



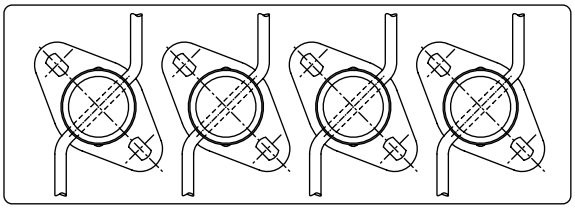
arrangement for wall-fitting





bottom view

example of banked assembly



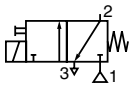
① Impulse manual operator

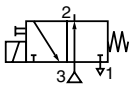
type	prefix option	catalaogue number	Ø	A	C	D	E	F	G	H	K	L	M	P	Q	R	S	T	U	V	weight (1)	tube guiding device	
																						catalogue number	weight
01	SC	SCH384B001/002 /003/004	16	49,5	23,5	15	11	20	1	66	24	17	3,3	M3	16,5	10,7	16	24	2,2	51,2	0,06	**C140094**	0,005
02	SC	SCH384A005	25	78	43	27	17,5	32	1,5	99	39	32	4,5	M4	25,5	14	25	33	3,2	82,5	0,30	**C140095**	0,009
03	SC	SCH384B006/B007	30	84	49	28	24,5	43,5	1,5	99	45,5	42	4,5	M4	30,5	24	30	39	6	99	0,45	**C140096**	0,015

(1) Incl. coil(s) and connectors..

MICRO SOLENOID VALVES

direct operated
pad-mounting body
for subbase M3/M5

NC 

NO 

3/2
Series
188
Type
Micro 10

CE

GENERAL

Fluid	Air or inert gas, non-lubricated, filtered at 25 µm
Operating pressure	7 bar max.
Ambient temperature	+5°C to +50°C
Flow (Qv at 6 bar)	See "SPECIFICATIONS"
Manual operator	Impulse-type (without manual operator on request)
Switching time	10 ms (<10 ms on request)

CONSTRUCTION

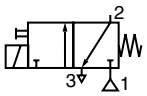
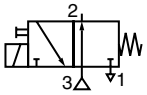
Body	PA (polyamide) MXD6
Internal parts	Stainless steel, nickel-plated steel, synthetic material, aluminium
Seals	NBR (nitrile), FPM (fluoroelastomer) on request

ELECTRICAL CHARACTERISTICS

voltage (other voltages on request)	**consumption**	**insulation class**	**degree of protection**	**electrical connection**
24V = 12 V = 5 V = (+10%, -15%)	1W - 1,3W	F	IP 40	connector with two 0.5 mm² lead wires + built-in LED and electrical protection or cable ends, 0,5 m long

The solenoid valves are designed for continuous operation within the maximum ambient temperature limits.

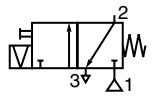
SPECIFICATIONS

symbol	**orifice size** (mm) 1 → 2	**orifice size** (mm) 2 → 3	**flow** at 6 bar l/min (ANR)	**flow** coeff. Kv	**operating pressure** (bar) min.	**operating pressure** (bar) max.	**consumption** (W)	**type of electrical connection** (✻)	**catalogue number**
NC 	0,5	0,7	8	0,12	0	8	1,3	1	**18801003**
								2	**18801076**
								3	**18801074**
								4	**18801078**
							1	5	**18801072**
	0,8	0,8	10	0,15	0	4	1,3	1	**18801081**
								2	**18801082**
								3	**18801083**
								4	**18801084**
							1	5	**18801085**
	1,0	1,0	12	0,18	0	2,5	1,3	1	**18801086**
								2	**18801087**
								3	**18801088**
								4	**18801089**
							1	5	**18801090**
NO 	0,5	0,5	8	0,12	0	6	1,3	1	**18801063**
								2	**18801077**
								3	**18801075**
								4	**18801079**
							1	5	**18801073**
	0,8	0,8	10	0,15	0	3	1,3	1	**18801091**
								2	**18801092**
								3	**18801093**
								4	**18801094**
							1	5	**18801095**
	1,0	1,0	12	0,18	0	1,5	1,3	1	**18801096**
								2	**18801097**
								3	**18801098**
								4	**18801099**
							1	5	**18801100**

(✻) Type 1,2,3, 4 with LED and electrical protection
1 = horizontal, width 5,08 mm
2 = vertical, width 5,08 mm
3 = horizontal, width 2,54 mm
4 = vertical, width 2,54 mm
5 = cable ends 0,5 m long, 0,25 mm²

MICRO SOLENOID VALVES

direct operated, **with latching coil**
pad-mounting body
for subbase M3/M5

NC / NO 

3/2
Series
188
Type
Micro 10

CE

GENERAL

Fluid	Air or inert gas, non-lubricated, filtered at 25 µm
Operating pressure	8 bar max.
Ambient temperature	+5°C to +50°C
Flow (Qv at 6 bar)	See “SPECIFICATIONS”
Manual operator	Impulse-type (without manual operator on request)
Switching time	10 ms (<10 ms on request)

CONSTRUCTION

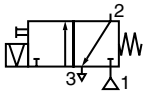
Body	PA (polyamide) MXD6
Internal parts	Stainless steel, nickel-plated steel, synthetic material, aluminium
Seals	NBR (nitrile), FPM (fluoroelastomer) on request

ELECTRICAL CHARACTERISTICS

voltage (other voltages on request)	**consumption**	**insulation class**	**degree of protection**	**electrical connection**
24V = 12 V = (+10%, -15%) 5 V =	1W - 1,3W	F	IP 40	connector with two 0.5 mm² lead wires + built-in LED and electrical protection or cable ends, 0,5 m long

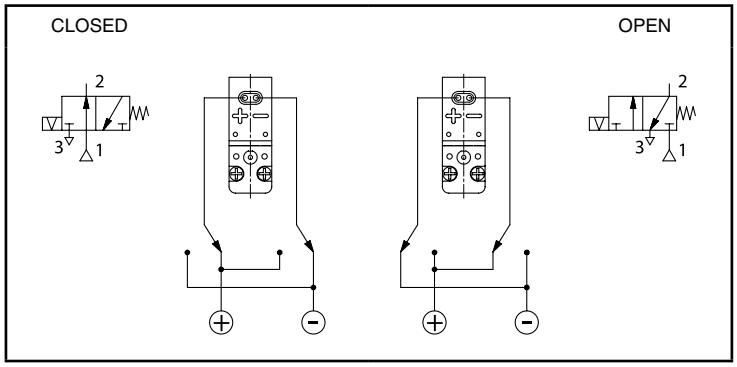
The solenoid valves are designed for continuous operation within the maximum ambient temperature limits.

SPECIFICATIONS

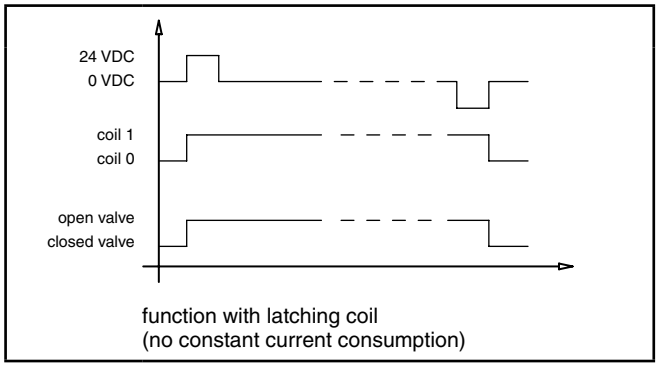
symbol	**orifice size** (mm) 1 → 2	**orifice size** (mm) 2 → 3	**flow** at 6 bar l/min (ANR)	**flow** coeff. Kv	**operating pressure** (bar) min.	**operating pressure** (bar) max.	**consumption** (W)	**type of electrical connection** (✻)	**catalogue number**
	0,5	0,7	8	0,12	0	7	1,3	1	**18801101**
								2	**18801102**
								3	**18801103**
								4	**18801104**
							1	5	**18801105**
	0,8	0,8	10	0,15	0	3	1,3	1	**18801106**
								2	**18801107**
								3	**18801108**
								4	**18801109**
							1	5	**18801110**
	1,0	1,0	12	0,18	0	1	1,3	1	**18801111**
								2	**18801112**
								3	**18801113**
								4	**18801114**
							1	5	**18801115**

(✻) type 1, 2, 3, 4 with LED and electrical protection
1 = horizontal, width 5,08 mm
2 = vertical, width 5,08 mm
3 = horizontal, width 2,54 mm
4 = vertical, width 2,54 mm
5 = cable ends, 0,5 m long, 0,25 mm²

WIRING DIAGRAM



FUNCTIONAL DIAGRAM

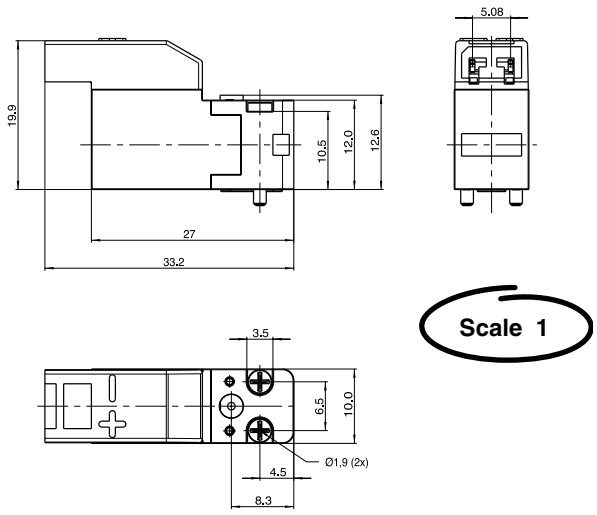


function with latching coil
(no constant current consumption)

DIMENSIONS (mm), WEIGHT (kg)

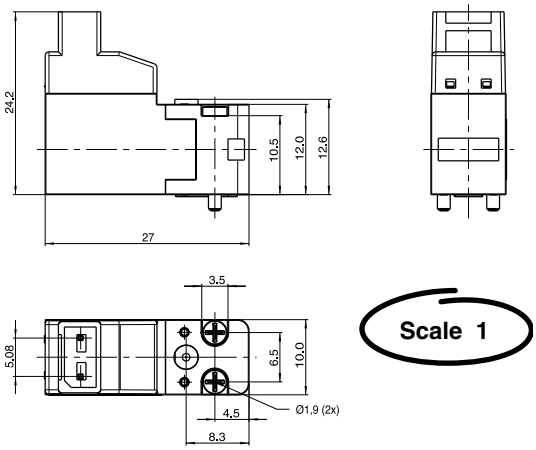
weight
0,0095

type 1



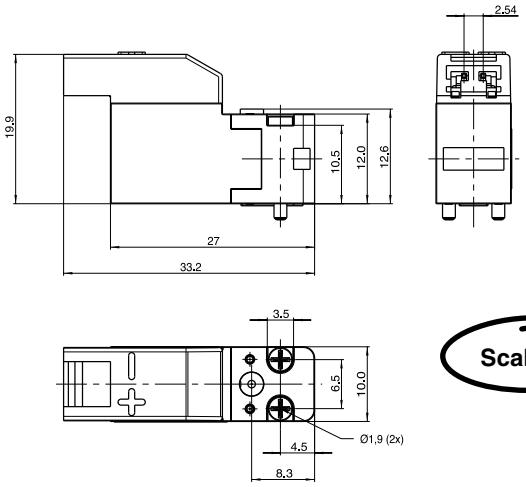
Scale 1

type 2



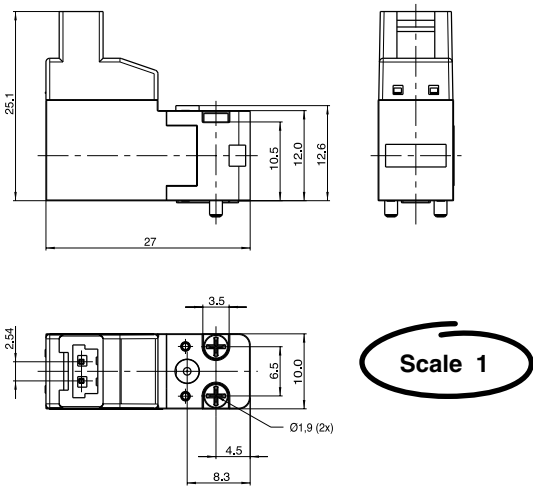
Scale 1

type 3



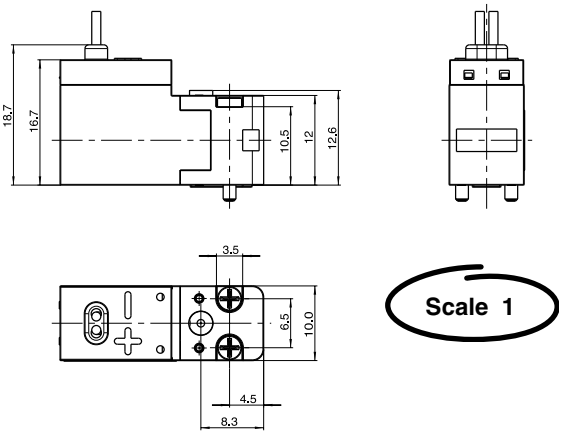
Scale 1

type 4



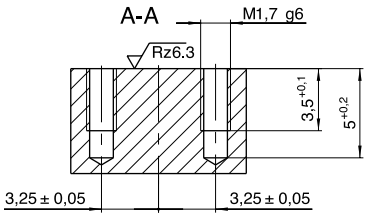
Scale 1

type 5



Scale 1

flange facing

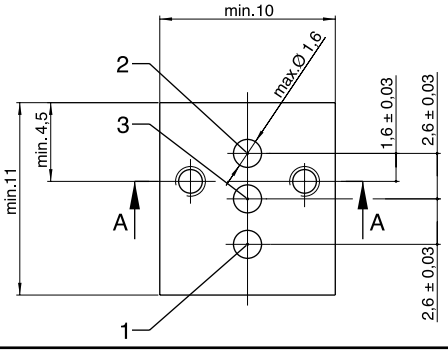


NO
3 = Pressure 2 = Outlet 1 = Exhaust

NC
1 = Pressure 2 = Outlet 3 = Exhaust

Use in vacuum (NO)
3 = Vacuum pump 2 = Outlet 1 = Atmosphere

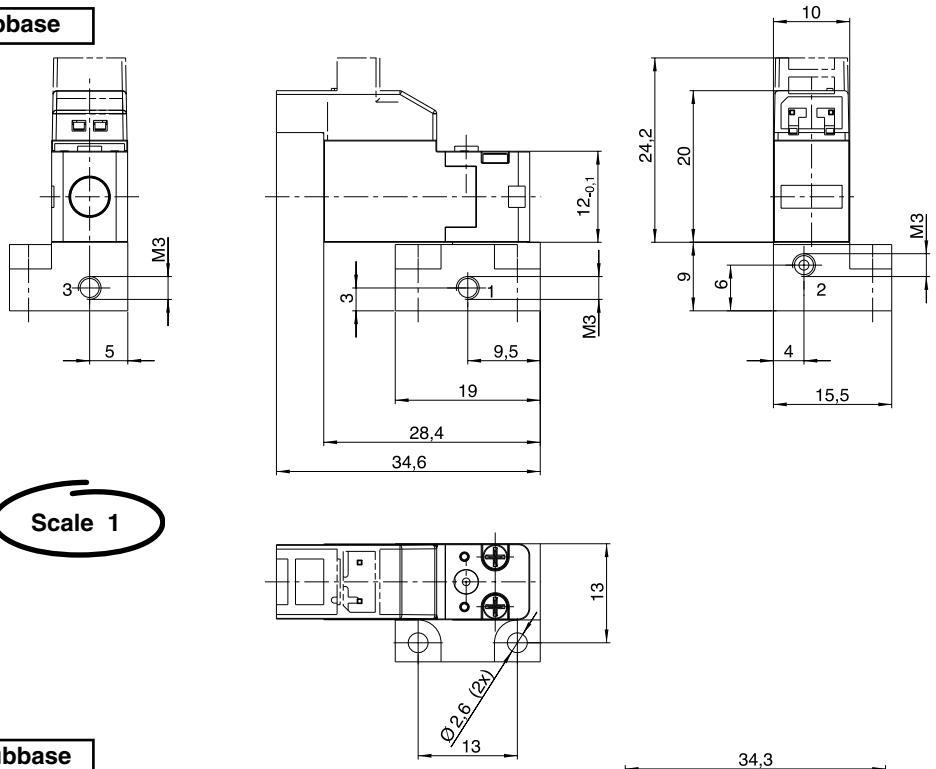
Use in vacuum (NC)
1 = Vacuum pump 2 = Outlet 3 = Atmosphere



DIMENSIONS (mm), WEIGHT (kg)

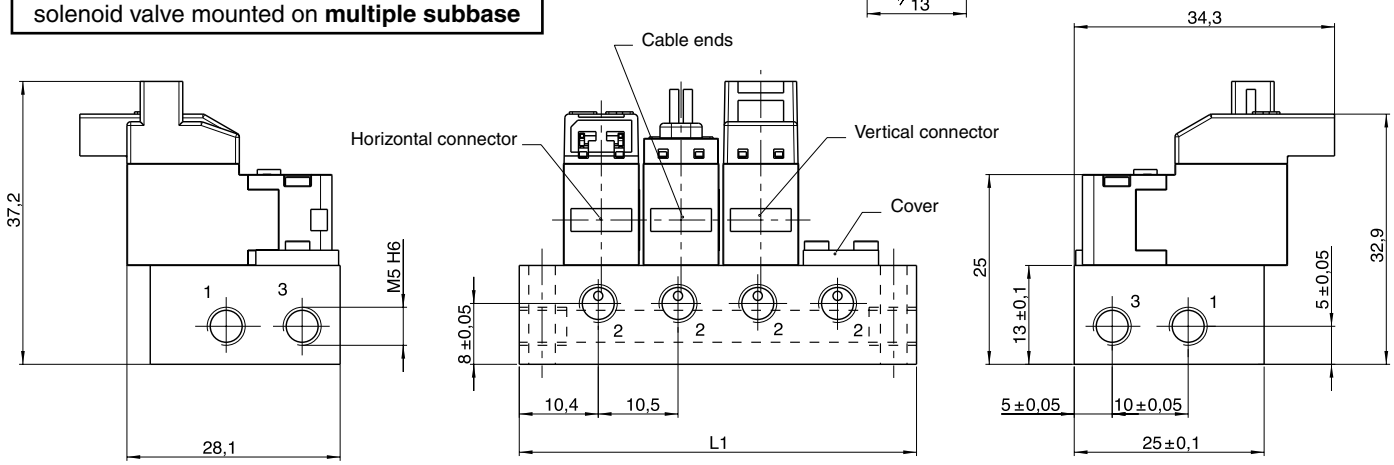
solenoid valve mounted on **single subbase**

number of valves	subbase catalogue number*	weight
1	**35300101**	0,015

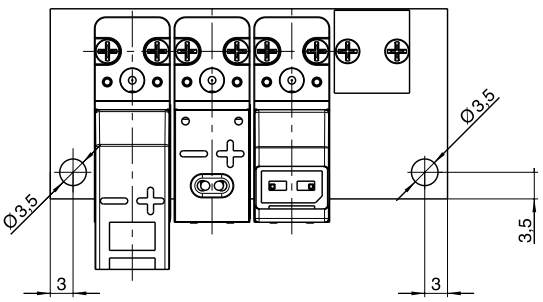


Scale 1

solenoid valve mounted on **multiple subbase**



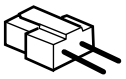
number of valves	subbase catalogue number*	length L1	length L2	weight
2	**35300102**	33,5	27,5	0,051
3	**35300103**	44	38	0,069
4	**35300104**	54,5	48,5	0,086
5	**35300105**	65	59	0,104
6	**35300106**	75,5	69,5	0,122
7	**35300107**	86	80	0,139
8	**35300108**	96,5	90,5	0,156
9	**35300109**	107	101	0,175
10	**35300110**	117,5	111,5	0,193



Scale 1

A : Blanking plate, **cat. no. 88135305**

* The connectors must be ordered **separately**, please indicate the quantity and one of the following codes:
Connector, 2 wires

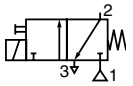


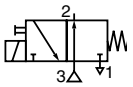
Distance between contacts 5,08 mm
- Length 0,5 m - **cat. no.: 88118801**
- Length 1,5 m - **cat. no.: 88118802**
- Length 3 m - **cat. no.: 88118803**

Distance between contacts 2,54 mm
- Length 0,5 m - **cat. no.: 88118806**
- Length 1,5 m - **cat. no.: 88118807**
- Length 3 m - **cat. no.: 88118808**

MICRO SOLENOID VALVES

direct operated, **Large Flow**
pad-mounting body
for subbase M5

NC 

NO 

3/2
Series
188
Type
Micro 10

GENERAL

Fluid	Air or inert gas, non-lubricated, filtered at 25 µm
Operating pressure	10 bar max.
Ambient temperature	+5°C to +50°C
Flow (Qv at 6 bar)	See «SPECIFICATIONS»
Switching time	10 ms

CONSTRUCTION

Body	PBT (polybutylene terephthalate)
Internal parts	Stainless steel synthetic material
Seals	FPM (fluoroelastomer)

ELECTRICAL CHARACTERISTICS

voltage ± 10 % (other voltages on request)	**power ratings** [1] **inrush**	**holding**	**insulation class**	**degree of protection**	**electrical connection**
24V =	3,2 W	1,3 W	F	IP40	X1, X2, X3, X4, X5 *see Electrical Connection Type
12 V =					

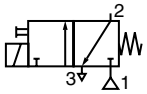
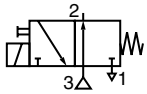
The solenoid valves are designed for continuous operation within the maximum ambient temperature limits.
[1] The valves are provided with power save electronics and LED which switch to holding power after 100 msec.

*Electrical Connection Type

X1 = type 1, horizontal, distance between contacts 5,08 mm
X2 = type 2, vertical, distance between contacts 5,08 mm
X3 = type 3, horizontal, distance between contacts 2,54 mm
X4 = type 4, vertical, distance between contacts 2,54 mm
X5 = type 5, two leads 0,5 m long, 0,25 mm²

Type 1,2,3,4,5 with LED, protection and power save electronics.

SPECIFICATIONS

symbol	**orifice size** (mm)		**flow**		**operating pressure** (bar)		**consumption**	**catalogue number**
	1 → 2	2 → 3	**at 6 bar** l/min (ANR)	**coefficient Kv** m³/h	min.	max.	(W)	
NC 	1,0	1,0	13	0,012	0	10	1,3	**R188B213XXV11XX**
	1,3	1,3	29	0,027	0	6	1,3	**R188B214XXV11XX**
	1,6	1,6	42	0,039	0	3,5	1,3	**R188B215XXV11XX**
NO 	1,0	1,0	13	0,012	0	8	1,3	**R188B223XXV11XX**
	1,3	1,3	29	0,027	0	4	1,3	**R188B224XXV11XX**
	1,6	1,6	42	0,039	0	1,5	1,3	**R188B225XXV11XX**

ORDERING

15-DIGIT PRODUCT CODE

R	188	B	1	1	1	XX	1	0	1	XX

Fluid Connection Type
R = Pad Mount

Product Series
188 = Series 188 Micro 10

Revision
B = Micro 10, Revision B (grey)

Coil Size & Power-Save
2 = 10 mm with power-save

Valve Type
1 = 3/2 NC
2 = 3/2 NO

Valve Orifice
3 = 1,0 mm
4 = 1,3 mm
5 = 1,6 mm

Electrical Connection Type
X1 = Type 1, horizontal 5,08 mm
X2 = Type 2, vertical 5,08 mm
X3 = Type 3, horizontal 2,54 mm
X4 = Type 4, vertical 2,54 mm
X5 = Type 5, 2 leads 0,5 m x 0,25 mm^2

Sealing Material
V = FPM

Fastening Screws
0 = without srews
1 = with metric screws M1,7x12,5
2 = with selftapping screws KB18x14

Manual Override
1 = without manual override

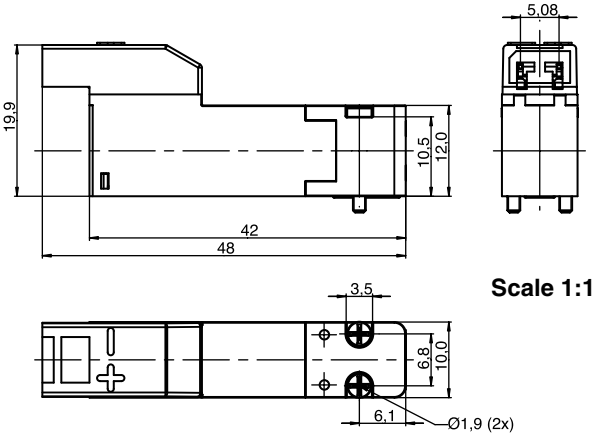
Voltage
F1 = 24 VDC
F3 = 12 VDC

ORDERING EXAMPLE: R188B213X1V11F1 = pad mount, series 188, Micro 10 Revision B (grey), with power-save, 3/2 NC, orifice 1,0 mm, Type 1, FPM, M 1,7 x 12,5, without manual override, 24 VDC

DIMENSIONS (mm), WEIGHT (kg)

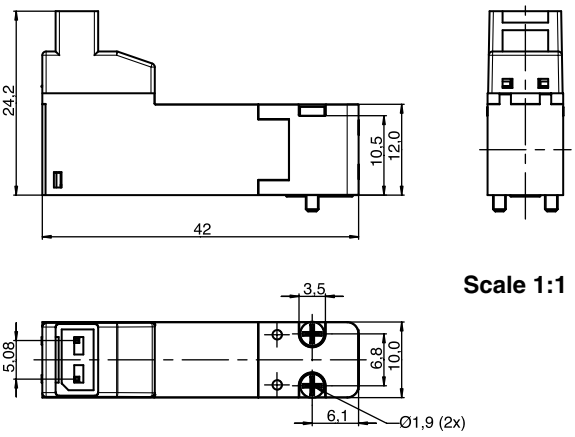
weight
0,0017

type 1



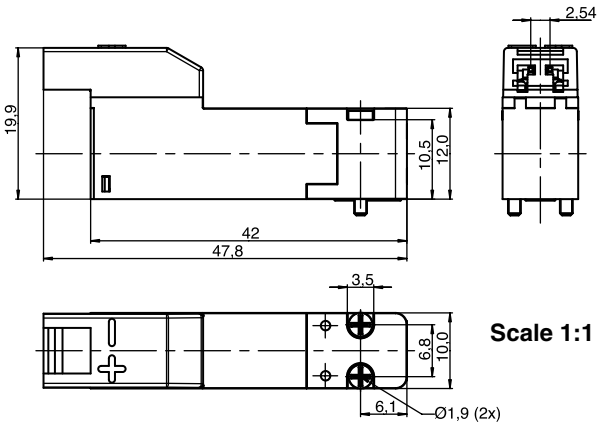
Scale 1:1

type 2



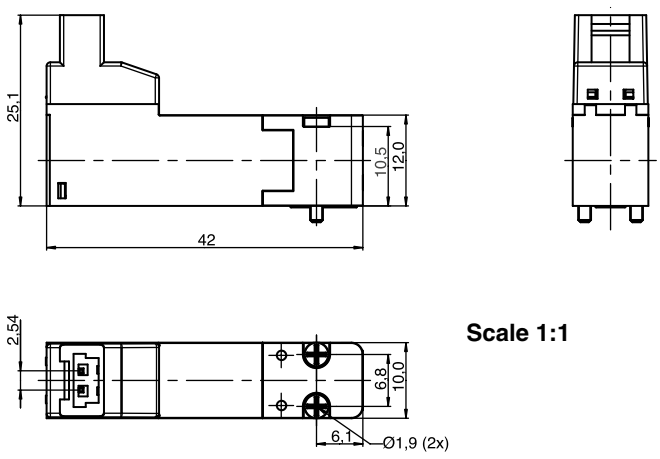
Scale 1:1

type 3



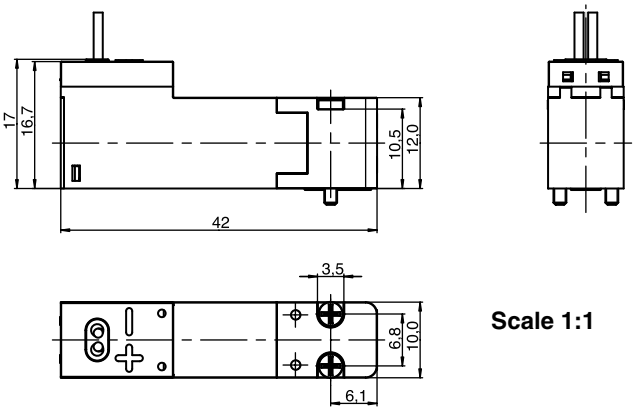
Scale 1:1

type 4



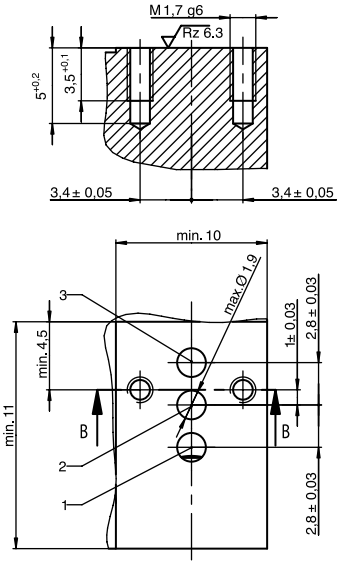
Scale 1:1

type 5



Scale 1:1

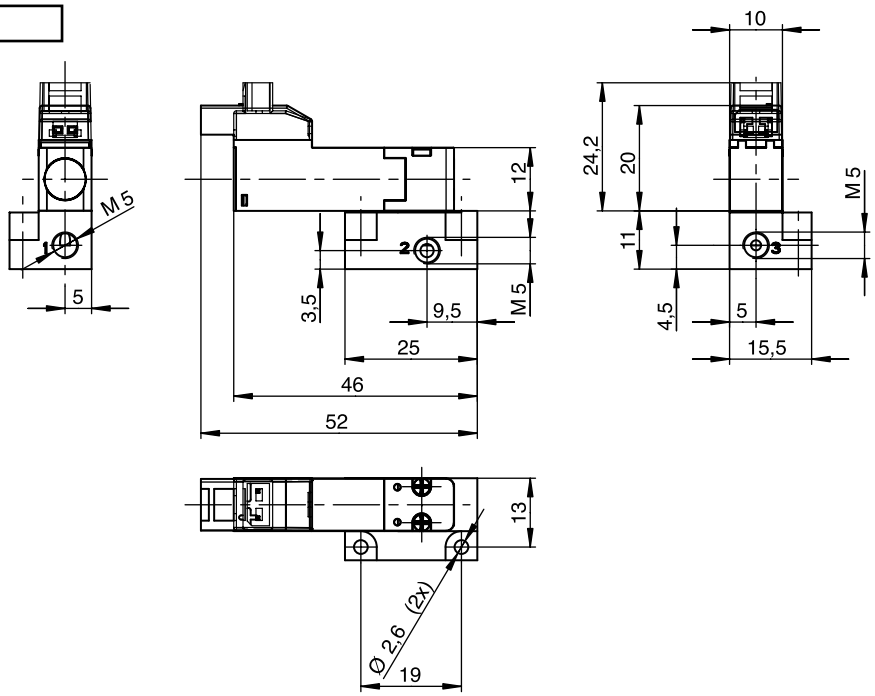
flange facing



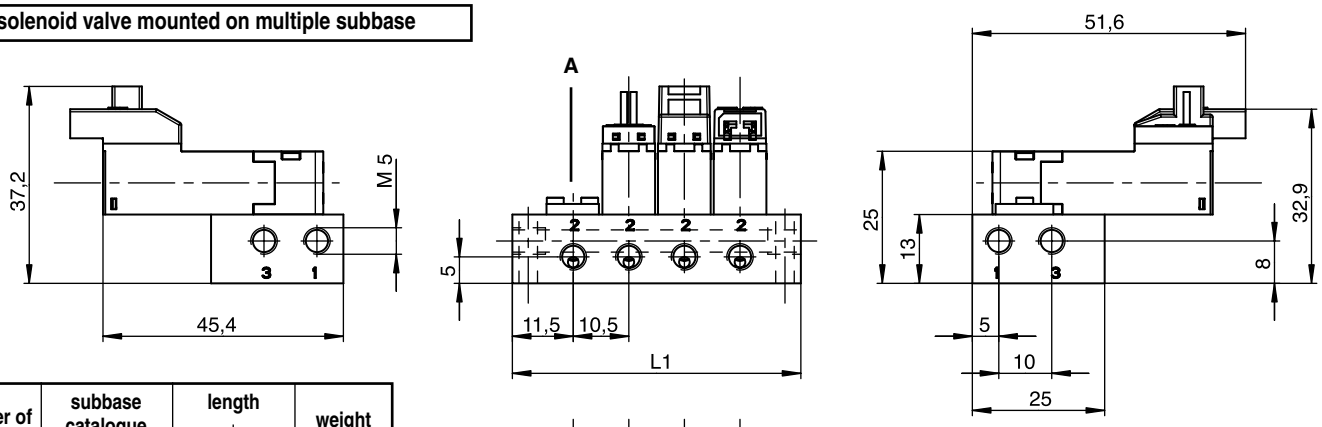
DIMENSIONS (mm), WEIGHT (kg) (kg)

solenoid valve mounted on single subbase

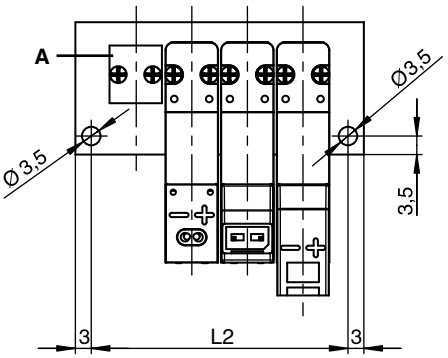
number of valves	subbase catalogue number*	weight
1	**35300207**	0,027



solenoid valve mounted on multiple subbase



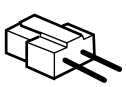
number of valves	subbase catalogue number*	length L1	length L2	weight
2	**35300198**	35,7	29,7	0,066
3	**35300199**	46,2	40,2	0,091
4	**35300200**	56,7	50,7	0,116
5	**35300201**	67,2	61,2	0,141
6	**35300202**	77,7	71,7	0,167
7	**35300203**	88,2	82,2	0,191
8	**35300204**	98,7	92,7	0,216
9	**35300205**	109,2	103,2	0,242
10	**35300206**	119,7	113,7	0,268



A: Blanking plate, catalogue number: 513697-001

* The connectors must be ordered separately, please indicate the quantity and one of the following codes:

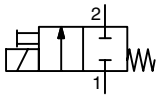
Connector, 2 wires



Distance between contacts 5,08 mm	-length 0,5 m	- catalogue number**: 88118801**
	-length 1,5 m	- catalogue number**: 88118802**
	-length 3 m	- catalogue number**: 88118803**
Distance between contacts 2,54 mm	-length 0,5 m	- catalogue number**: 88118806**
	-length 1,5 m	- catalogue number**: 88118807**
	-length 3 m	- catalogue number**: 88118808**

MINI-SOLENOID VALVES

ISO 15218 (CNOMO, size 15) interface
direct operated, pad mounting body
connector size 15

NC 

2/2
Series
302

FEATURES

- *Compact, monobloc solenoid pilot valve with spade-plug connector type DIN 43650, form C, with 9,4 mm spacing, or to ISO 15217/DIN 43650 form C, with 8 mm spacing.*
- *Version with or without integrated LED and electrical protection. LED indicator visible from 3 sides.*
- *The solenoid valves satisfy all relevant EC directives.*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar = 100 kPa]
Pneumatic base ISO 15218 (CNOMO E06.36.120N, size 15)
Connection Subbase
Response time 8 - 15 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air or inert gas filtered at 50 µm, lubricated or not	-25°C to +60°C (LP2) (1)	NBR (nitrile)
	-25°C to +60°C /+50°C (LP3) (1)	FPM (fluoroelastomer)

(1) LP2, LP3: see "electrical characteristics" table

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

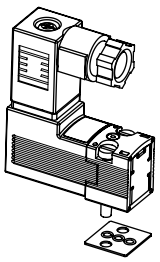
Body PARA
Internal parts POM, PET, stainless steel and brass
Seals NBR (disc), FPM (others)
Pneumatic interface seal TPE

OTHER MATERIALS

Coil Thermoplastic PET

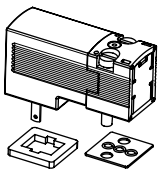
ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm)
Connector specification DIN 43650, 9,4 mm, form C
or ISO 15217 / DIN 43650, 8 mm, form C
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V
(Other voltages on request) AC (~) : 24V - 115V - 230V / 50-60 Hz



PNEUMATIC CNOMO interface (standard)

PNEUMATIC-ELECTRIC interface (available on request)



coils			power ratings (✧)				operator ambient temperature range (4) (TS)	type (2)
power ranges	voltages (V)		inrush ~	holding ~		hot/cold =		
	~	=	(VA)	(VA)	(W)	(W)	(°C)	
LP2	24-115	24	1,4	1,2	1,1	1 / 1,2	-25 to +60	01
LP3	230	24	2,1	1,6	1,5	2 / 2,65	-25 to +60 (~)/+50 (=)(3)	

(✧) **Nominal power ratings of versions without LED indicator and electrical protection.**
For versions with LED indicator and electrical protection, add:
0,15 W with DC (=)
0,4 W / VA with AC (~)

(2) Refer to the dimensional drawings on the following page.. (3) With LED, see page 90 (4) For joinable subbase mounting, see page 90.

SPECIFICATIONS

orifice size	flow at 6 bar l/min (ANR)		coefficient Kv		operating pressure differential (bar)		power ranges	basic catalogue number			
								manual operator			
								impulse		maintained	
								9,4 mm	8 mm	9,4 mm	8 mm
(mm)	1 → 2	2 → 3	1 → 2	2 → 3	min.	max. (PS)		~ =	=	~ =	=
NC - Normally closed (Without LED and protection)											
0,6	11	20	0,11	0,26	0	10	LP2	**30211007**	**30210007**	**30211008**	**30210008**
0,8	17	28	0,22	0,35	0	8	LP2	**30211010**	**30210010**	**30211011**	**30210011**
1,1	32	51	0,35	0,50	0	5	LP2	**30211016**	**30210016**	**30211017**	**30210017**
					0	10	LP3	**30211019**	**30210019**	**30211020**	**30210020**
1,5	39	53	0,50	0,56	0	3	LP2	**30211022**	**30210022**	**30211023**	**30210023**
					0	6	LP3	**30211025**	**30210025**	**30211026**	**30210026**
NC - Normally closed (With LED and protection) (5)											
0,6	11	20	0,11	0,26	0	10	LP2	**30215007**	**30214007**	**30215008**	**30214008**
0,8	17	28	0,22	0,35	0	8	LP2	**30215010**	**30214010**	**30215011**	**30214011**
1,1	32	51	0,35	0,50	0	5	LP2	**30215016**	**30214016**	**30215017**	**30214017**
					0	10	LP3	**30215019**	**-**	**30215020**	**-**
1,5	39	53	0,50	0,56	0	3	LP2	**30215022**	**30214022**	**30215023**	**30214023**
					0	6	LP3	**30215025**	**-**	**30215026**	**-**

(5) Only available in 24 V AC/DC and 115 V AC.

When ordering, please specify in addition to the basic catalogue number:
the type of current: voltage / frequency + the version: with or without connector

	~	=
with connector	--A	--D
without connector	--L	--P

to be inserted after the basic catalogue number

Examples: • with connector 24V DC : **30211007**--D 24V DC
• without connector 24V DC : **30211007**--P 24V DC

All leaflets are available on: **www.asconumatics.eu**

OPTIONS AND ACCESSORIES

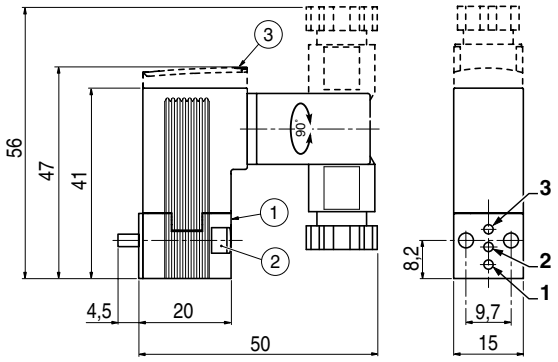
- Seals and disc made of FPM (fluoroelastomer)
- Versions without manual operator and NO (Normally Open): contact us
- Version with pneumatic-electric interface
- Version 12 V DC, LP2, connector DIN 43650, 9,4 mm, industry standard B
- Connector ISO 15217 / DIN 43650, 8 mm, form C:
  - standard: catalogue number **88130211**
  - with cable 2 m length: catalogue number **88130214**
- Connector DIN 43650, 9,4 mm, form C:
  - standard: catalogue number **88143581**
  - with cable 2 m length: catalogue number **88143567**
- Explosionproof enclosures for use in zones 0/20-1/21-2/22, categories 1-2-3 to ATEX Directive 94/9/EC (see "Explosionproof solenoids" section)

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Solenoid valve supplied with mounting screws and mounting pad seal(s)
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

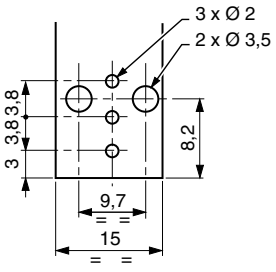
TYPE 01
IEC 335 / DIN 43650
IP65



	connection		
function	**1**	**2**	**3**
NC	P	O	-

P: Pressure
O: Outlet

Subbase mounting surface: ISO 15218
(CNOMO E06.36.120N, size 15)



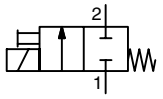
① Manual operator location
② 2 mounting screw M3 x 20
③ Version with LED and electrical protection

weight (1)
0,047

(1) with standard connector.

MINI-SOLENOID VALVES

ISO 15218 (CNOMO, size 15) interface
direct operated, pad mounting body
connection M12 or with cable ends

NC 

2/2
Series
302

FEATURES

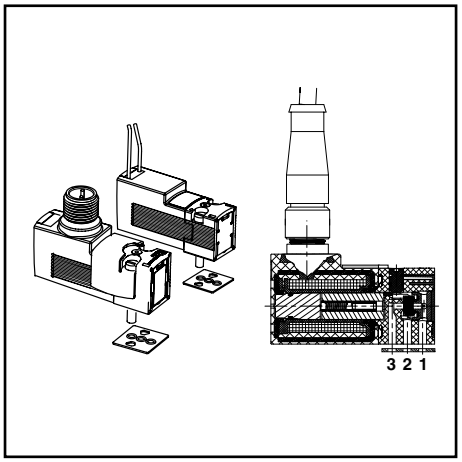
- *Compact, monobloc solenoid pilot valve with M12 connector or cable ends*
- *Version with integrated LED indicator and electrical protection.*
  LED indicator visible from 3 sides
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar = 100 kPa]
Pneumatic base ISO 15218 (CNOMO E06.36.120N, size 15)
Connection Subbase
Response time 8 - 15 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air or inert gas filtered at 50 µm, lubricated or not	- 25°C to + 60°C (LP2) (1)	NBR (nitrile) FPM (fluoroelastomer)

(1) LP2: see "electrical characteristics" table



MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PAA
Internal parts POM, PET, stainless steel and brass
Pneumatic interface seal TPE

OTHER MATERIALS

Coil Thermoplastic PET

ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connection Connector M12 or cable ends
Electrical safety IEC 335
connector M12 CNOMO E03.62.520.N
cable ends EN 60730
Electrical enclosure protection Moulded IP67 (EN 60529)
Standard voltages DC (=) : 24V

coils			power ratings (✧)				operator ambient temperature range (3) (TS)	type (2)
power ranges	voltages (V)		inrush ~	holding ~		hot/cold =		
	~	=	(VA)	(VA)	(W)	(W)	(°C)	
LP2	-	24	-	-	-	1,15 / 1,35	-25 to + 60	01-02-03

(✧) **Nominal power ratings of standard versions (with LED indicator and electrical protection)**

(2) Refer to the dimensional drawings on the following page.
(3) For joinable subbase mounting, see page 90.

SPECIFICATIONS

orifice size	flow at 6 bar l/min (ANR)		coefficient Kv		operating pressure differential (bar)		power ranges	basic catalogue number	
								manual operator	
(mm)	1 → 2	2 → 3	1 → 2	2 → 3	min.	max. (PS)		impulse	maintained
NC - Normally closed, connection M12 + LED and protection									
1,5	39	53	0,50	0,56	0	3	LP2	**30212022**	**30212023**
NC - Normally closed, cable ends + LED and protection									
1,5	39	53	0,50	0,56	0	3	LP2	**30213022**	**30213023**

When ordering:

	M12	cable
with connector	--D	
without connector	--P	
complete		--D

(to be inserted after the basic catalogue number)

Examples:
- M12 with connector : **30212022**--D
- M12 without connector : **30212022**--P
- cable ends : **30213022**--D

OPTIONS AND ACCESSORIES

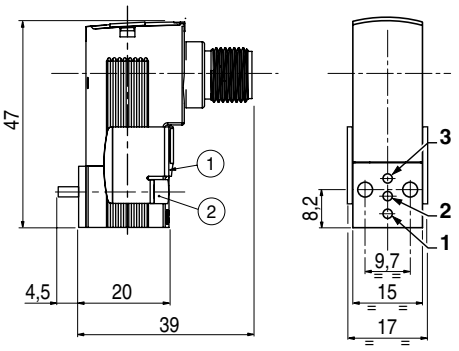
- Seals and disc made of FPM (fluoroelastomer)
- Versions without manual operator and NO (Normally Open): contact us
- Version with pneumatic-electric interface
- Straight M12 connector:
  - with 5 m cable length: catalogue number **88130212**
- Explosionproof enclosures for use in zones 0/20-1/21-2/22, categories 1-2-3 to ATEX Directive 94/9/EC (see "Explosionproof solenoids" section)

INSTALLATION

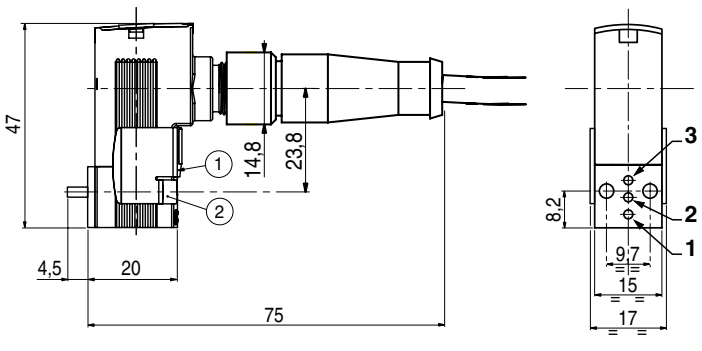
- The solenoid valves can be mounted in any position without affecting operation
- Solenoid valve supplied with mounting screws and mounting pad seal(s)
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
IEC 335
Connection M12
IP67



TYPE 02
IEC 335
Straight M12 connector, 5 m cable length
IP67



① Manual operator location.

② 2 mounting screw M3 x 20

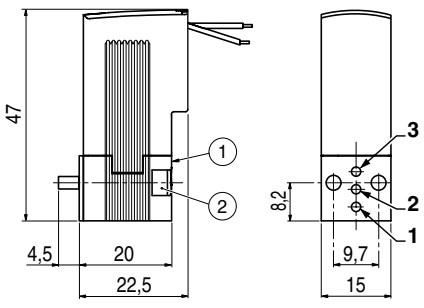
weight		
M12 (1)		cable ends
(1)	(2)	
0,049	0,288	0,040

(1) Without connector
(2) With connector

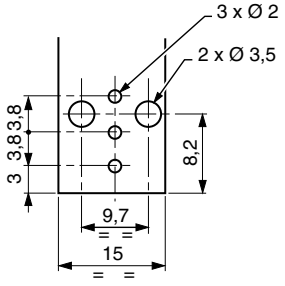
	connection		
function	1	2	3
NC	P	O	-

P: Pressure O: Outlet

TYPE 03
IEC 335
Cable ends 0,3 m length
IP67

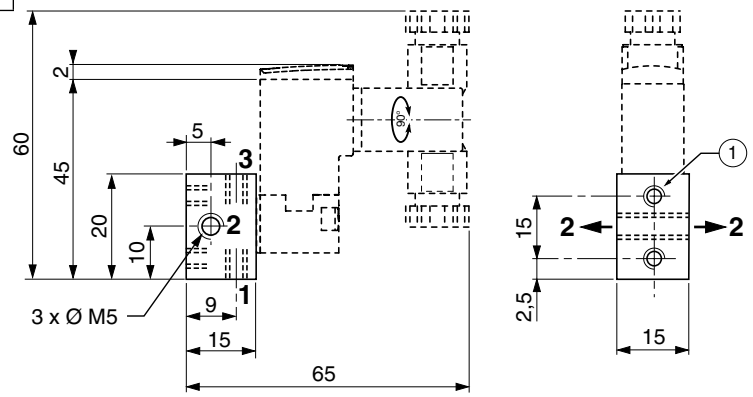


Subbase mounting surface: ISO 15218
(CNOMO E06.36.120N, size 15)



DIMENSIONS (mm), WEIGHT (kg)

Single subbase
Aluminium or brass



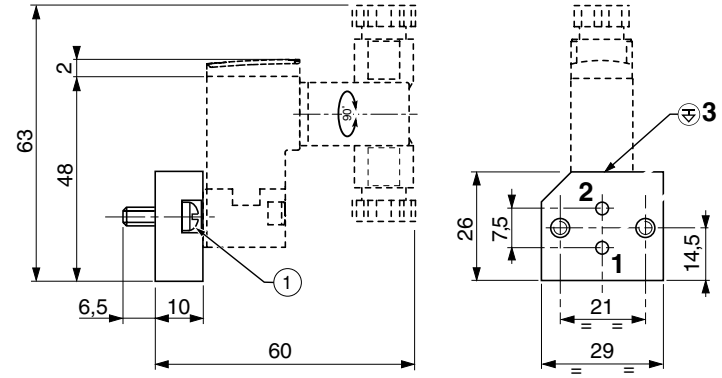
① Mounting: 2 holes M3, depth 4,5

Orifice (2) can be connected on the left or on the right of the subbase.

material	catalogue number	weight (1)
aluminium	**88263002**	0,011
brass	**30300001**	0,034

(1) subbase alone

Adapter CNOMO size 30
(**only for NC version**)
Aluminium

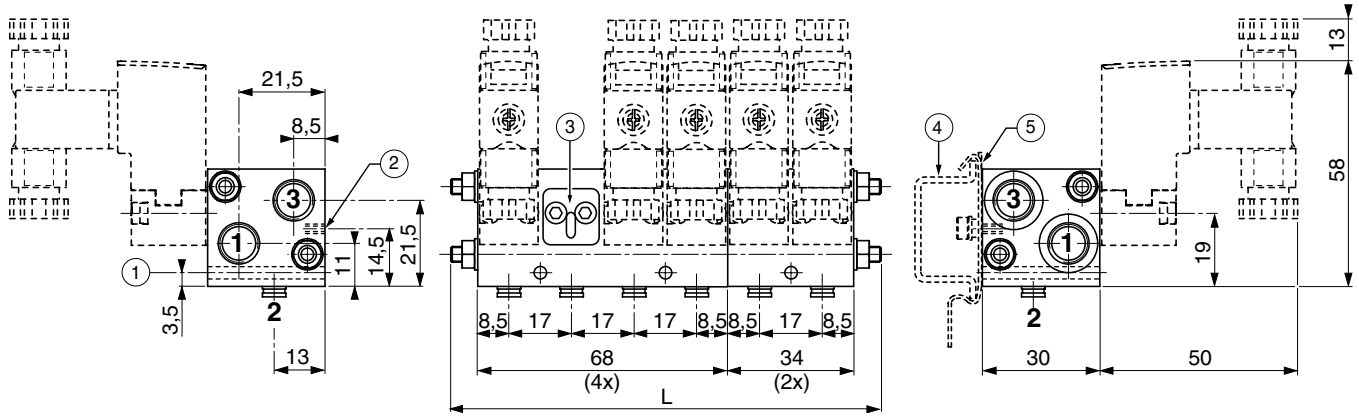


① Mounting: 2 screws M4 x 10 (supplied)

catalogue number	weight (2)
88263001	0,018

(2) adapter alone

Joinable subbases
Aluminium



Ports 1 and 3: G1/8

Port 2: coupling for 4mm OD tube

① Fixing hole Ø 3,2 (2 for 4x ; 1 for 2x)
② Fixing hole M3, depth 8 (2 for 4x ; 1 for 2x)
③ Mating surface blanking plates (option)
④ TS35 DIN rail (not supplied)
⑤ Clip for DIN rail mounting (option)

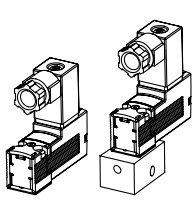
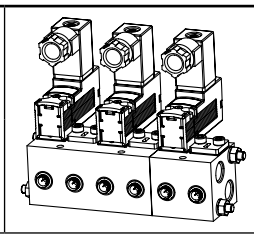
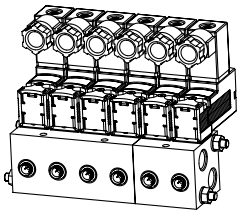
catalogue number	x	subbases	L	weight (3)
35500564	2	2x	-	0,076
35500565	4	4x	-	0,148
35500566	6	4x + 2x	114	0,236
35500567	8	4x + 4x	148	0,313
35500568	10	4x + 4x + 2x	182	0,389
35500569	12	4x + 4x + 4x	216	0,466

(3) subbases alone
x = place for mini-solenoid valves.
2 plugs R1/8 supplied.

OPTIONS AND ACCESSORIES

- Additional subbase with 2 places (with seals): catalogue number **35500570**
- 2 tie-rods + nuts for a subbase with:
  4 places: catalogue number **88100752**
  6 places: catalogue number **88100753**
  8 places: catalogue number **88100754**
  10 places: catalogue number **88100755**
  12 places: catalogue number **88100756**
- Mounting kit for DIN rail (2 clips + screws + washers): catalogue number **88100757**
- Mating surface blanking plate: catalogue number **88130203**

AMBIENT TEMPERATURE RANGES

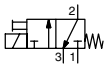
current type	power range	power coil		version			
		inrush/ holding (VA) ~	hot/cold (W) =				
DC (=)	LP2 (1)	-	1/1,2	standard	-25°C ; +60°C		-25°C ; +60°C
		-	1,15/1,35	LED + protection			-25°C ; +40°C
	LP3 (2)	-	2/2,65	standard	-25°C ; +50°C		-25°C ; +40°C
		-	2,15/2,8	LED + protection	-25°C ; +40°C		-
AC (~)	LP2 (2)	1,4/1,2	-	standard	-25°C ; +60°C		-25°C ; +40°C
		1,8/1,6	-	LED + protection			
	LP3 (2)	2,1/1,6	-	standard	-25°C ; +60°C		-25°C ; +40°C
		2,5/2	-	LED + protection	-25°C ; +50°C		-

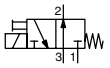
(1) Voltage: -15% / +20%

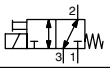
(2) Voltage: -15% / +10%

MINI-SOLENOID VALVES

ISO 15218 (CNOMO, size 15) interface
direct operated, pad mounting body
connector size 15

NC 

NO 

U 

3/2
Series
302

FEATURES

- *Compact, monobloc solenoid pilot valve with spade-plug connector type* DIN 43650*, industry standard form C, with 9,4 mm spacing, or to ISO 15217/DIN 43650 form C, with 8 mm spacing*
- *Version with or without integrated LED and electrical protection LED indicator visible from 3 sides*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar = 100 kPa]
Pneumatic base ISO 15218 (CNOMO E06.36.120N, size 15)
Connection Subbase
Response time 8 - 15 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air or inert gas filtered at 50 µm, lubricated or not	-10°C to +50°C (LP1) (1)	NBR (nitrile) FPM (fluoroelastomer)
	-25°C to +60°C (LP2) (1)	
	-25°C to +60°C /+50°C (LP3) (1)	

(1) LP1, LP2, LP3: see "electrical characteristics" table

MATERIALS IN CONTACT WITH FLUID

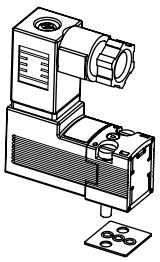
(✳) Ensure that the compatibility of the fluids in contact with the materials is verified
Body PARA
Internal parts POM, PET, stainless steel and brass
Seals NBR (disc), FPM (others)
Pneumatic interface seal TPE

OTHER MATERIALS

Coil Thermoplastic PET

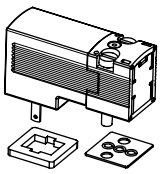
ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm)
Connector specification DIN 43650, 9,4 mm, form C
or ISO 15217 / DIN 43650, 8 mm, form C
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V
(Other voltages on request) AC (~) : 24V - 115V - 230V / 50-60 Hz



PNEUMATIC CNOMO interface (standard)

PNEUMATIC-ELECTRIC interface (available on request)



coils			power ratings (✧)				operator ambient temperature range (4) (TS)	type (2)
power ranges	voltages (V)		inrush ~	holding ~		hot/cold =		
	~	=	(VA)	(VA)	(W)	(W)	(°C)	
LP1	-	24	-	-	-	0,5 / 0,55	-10 to +50	01
LP2	24-115	24	1,4	1,2	1,1	1 / 1,2	-25 to +60	
LP3	230	24	2,1	1,6	1,5	2 / 2,65	-25 to +60 (~)/+50 (=)(3)	

(✧) **Nominal power ratings of versions without LED indicator and electrical protection.**
For versions with LED indicator and electrical protection, add:
0,15 W with DC (=)
0,4 W / VA with AC (~)

(2) Refer to the dimensional drawings on the following page.. (3) With LED, see page 96 (4) For joinable subbase mounting, see page 96.

SPECIFICATIONS (NO and U, following page)

orifice size	flow at 6 bar l/min (ANR)		flow coefficient Kv		operating pressure differential (bar)		power ranges	basic catalogue number					
								manual operator					
								impulse			maintained		
								9,4 mm		8 mm	9,4 mm		8 mm
(mm)	1 → 2	2 → 3	1 → 2	2 → 3	min.	max. (PS)		~	=	=	~	=	=
NC - Normally closed (Without LED and protection)													
0,6	11	20	0,11	0,26	0	8	LP1	-	**30211106**	-	-	**30211107**	-
					0	10	LP2	**30211109**		**30210109**	**30211110**		**30210110**
0,8	17	28	0,22	0,35	0	8	LP2	**30211112**		**30210112**	**30211113**		**30210113**
1,1	32	51	0,35	0,50	0	5	LP2	**30211118**		**30210118**	**30211119**		**30210119**
					0	10	LP3	**30211121**		**30210121**	**30211122**		**30210122**
1,5	39	53	0,50	0,56	0	3	LP2	**30211124**		**30210124**	**30211125**		**30210125**
					0	6	LP3	**30211127**		**30210127**	**30211128**		**30210128**
NC - Normally closed (With LED and protection) (5)													
0,6	11	20	0,11	0,26	0	10	LP2	**30215109**		**30214109**	**30215110**		**30214110**
0,8	17	28	0,22	0,35	0	8	LP2	**30215112**		**30214112**	**30215113**		**30214113**
1,1	32	51	0,35	0,50	0	5	LP2	**30215118**		**30214118**	**30215119**		**30214119**
					0	10	LP3	**30215121**		-	**30215122**		-
1,5	39	53	0,50	0,56	0	3	LP2	**30215124**		**30214124**	**30215125**		**30214125**
					0	6	LP3	**30215127**		-	**30215128**		-

(5) Only available in 24 V AC/DC and 115 V AC.

When ordering, please specify in addition to the basic catalogue number:
the type of current: voltage / frequency + the version: with or without connector

	~	=
with connector	--A	--D
without connector	--L	--P

to be inserted after the basic catalogue number

Examples: • with connector 24V DC : **30211109**--D 24V DC
• without connector 24V DC : **30211109**--P 24V DC

All leaflets are available on: **www.asconumatics.eu**

SPECIFICATIONS: NO, U

orifice size	flow at 6 bar l/min (ANR)		flow coefficient Kv		operating pressure differential (bar)		power ranges	basic catalogue number			
								manual operator			
								impulse		maintained	
								9,4 mm	8 mm	9,4 mm	8 mm
(mm)	1 → 2	2 → 3	1 → 2	2 → 3	min.	max. (PS)		~ =	=	~ =	=
NO - Normally open (Without LED and protection)											
0,8	20	17	0,26	0,20	0	8	LP2	**30211130**	**30210130**	**30211131**	**30210131**
					0	10	LP2	**30211133**	**30210133**	**30211134**	**30210134**
1	28	32	0,35	0,35	0	5	LP2	**30211136**	**30210136**	**30211137**	**30210137**
					0	8	LP3	**30211139**	**30210139**	**30211140**	**30210140**
1,5	53	39	0,56	0,50	0	2	LP2	**30211142**	**30210142**	**30211143**	**30210143**
					0	6	LP3	**30211145**	**30210145**	**30211146**	**30210146**
NO - Normally open (With LED and protection) (5)											
0,8	20	17	0,26	0,20	0	8	LP2	**30215130**	**30214130**	**30215131**	**30214131**
					0	10	LP2	**30215133**	**30214133**	**30215134**	**30214134**
1	28	32	0,35	0,35	0	5	LP2	**30215136**	**30214136**	**30215137**	**30214137**
					0	8	LP3	**30215139**	-	**30215140**	-
1,5	53	39	0,56	0,50	0	2	LP2	**30215142**	**30214142**	**30215143**	**30214143**
					0	6	LP3	**30215145**	-	**30215146**	-
	1 ↔ 2	2 ↔ 3	1 ↔ 2	2 ↔ 3							
U - universal (Without LED and protection)											
0,8	17	20	0,20	0,26	0	6	LP2	**30211148**	**30210148**	**30211149**	**30210149**
U - universal (With LED and protection) (5)											
0,8	17	20	0,20	0,26	0	6	LP2	**30215148**	**30214148**	**30215149**	**30214149**

(5) Only available in 24 V AC/DC and 115 V AC.

When ordering, please specify in addition to the basic catalogue number:
the type of current: voltage / frequency + the version: with or without connector

	~	=
with connector	--A	--D
without connector	--L	--P

to be inserted after the basic catalogue number

Examples:
- with connector 24V DC : **30211130**--D 24V DC
- without connector 24V DC : **30211130**--P 24V DC

OPTIONS AND ACCESSORIES

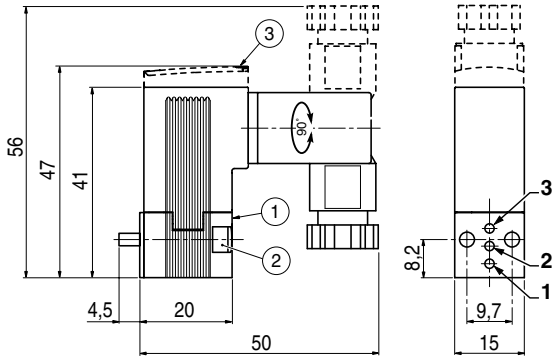
- Seals and disc made of FPM (fluoroelastomer)
- Versions without manual operator and Uv (Universal vacuum): contact us
- Version with pneumatic-electric interface
- Version 12 V DC, LP2, connector DIN 43650, 9,4 mm, industry standard B
- Connector ISO 15217 / DIN 43650, 8 mm, form C:
  - standard: catalogue number **88130211**
  - with cable 2 m length: catalogue number **88130214**
- Connector EN 175301-803 industry standard form C (9,4 mm):
  - standard: catalogue number **88143581**
  - with cable 2 m length: catalogue number **88143567**
- Explosionproof enclosures for use in zones 0/20-1/21-2/22, categories 1-2-3 to ATEX Directive 94/9/EC (see "Explosionproof solenoids" section)

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Solenoid valve supplied with mounting screws and mounting pad seal(s)
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

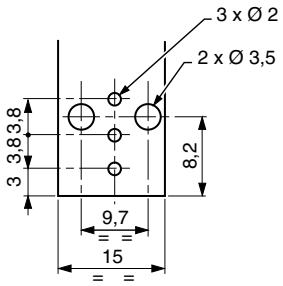
TYPE 01
IEC 335 / DIN 43650
IP65



function		connection 1	2	3
	NC	P	O	E
	NO	E	O	P
universal	MIX	P2	O	P1
universal	SEL	O 2	P	O 1

P: Pressure O: Outlet
E: Exhaust

Subbase mounting surface: ISO 15218 (CNOMO E06.36.120N, size 15)



weight (1)
0,047

(1) with standard connector.

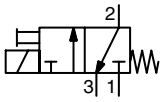
① Manual operator location
② 2 mounting screw M3 x 20
③ Version with LED and electrical protection

All leaflets are available on: **www.asconumatics.eu**

MINI-SOLENOID VALVES

ISO 15218 (CNOMO, size 15) interface
direct operated, pad mounting body
connection M12 or with cable ends

NC



3/2
Series
302

FEATURES

- *Compact, monobloc solenoid pilot valve with M12 connector or cable ends*
- *Version with integrated LED indicator and electrical protection. LED indicator visible from 3 sides*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar = 100 kPa]
Pneumatic base ISO 15218 (CNOMO E06.36.120N, size 15)
Connection Subbase
Response time 8 - 15 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air or inert gas filtered at 50 µm, lubricated or not	-25°C to +60°C (LP2) (1)	NBR (nitrile) FPM (fluoroelastomer)

(1) LP2: see "electrical characteristics" table

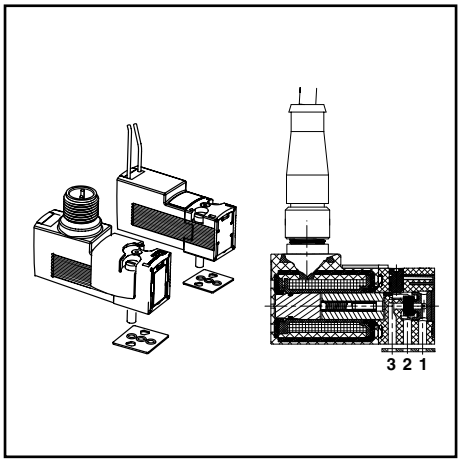
MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Body PAA
Internal parts POM, PET, stainless steel and brass
Pneumatic interface seal TPE

OTHER MATERIALS

Coil Thermoplastic PET



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connection Connector M12 or cable ends
Electrical safety IEC 335
connector M12 CNOMO E03.62.520.N
cable ends EN 60730
Electrical enclosure protection Moulded IP67 (EN 60529)
Standard voltages DC (=) : 24V

coils			power ratings (✧)				operator ambient temperature range (3) (TS)	type (2)
power ranges	voltages (V)		inrush ~	holding ~		hot/cold =		
	~	=	(VA)	(VA)	(W)	(W)	(°C)	
LP2	-	24	-	-	-	1,15 / 1,35	-25 to +60	01-02-03

(2) Refer to the dimensional drawings on the following page. (3) For joinable subbase mounting, see page 96.

(✧) **Nominal power ratings of standard versions (with LED indicator and electrical protection)**

SPECIFICATIONS

orifice size	flow at 6 bar l/min (ANR)		coefficient Kv		operating pressure differential (bar)		power ranges	basic catalogue number	
								manual operator	
(mm)	1 → 2	2 → 3	1 → 2	2 → 3	min.	max. (PS)		impulse	maintained
NC - Normally closed, connection M12 + LED and protection									
0,6	11	20	0,11	0,26	0	10	LP2	**30212109**	**30212110**
0,8	17	28	0,22	0,35	0	8	LP2	**30212112**	**30212113**
1,1	32	51	0,35	0,50	0	5	LP2	**30212118**	**30212119**
1,5	39	53	0,50	0,56	0	3	LP2	**30212124**	**30212125**
NC - Normally closed, cable ends + LED and protection									
0,6	11	20	0,11	0,26	0	10	LP2	**30213109**	**30213110**
0,8	17	28	0,22	0,35	0	8	LP2	**30213112**	**30213113**
1,1	32	51	0,35	0,50	0	5	LP2	**30213118**	**30213119**
1,5	39	53	0,50	0,56	0	3	LP2	**30213124**	**30213125**

When ordering:

	M12	cable	
with connector	--D		to be inserted after the basic catalogue number
without connector	--P		
complete		--D	

Examples:
- M12 with connector : **30212109**--D
- M12 without connector : **30212109**--P
- cable ends : **30213109**--D

OPTIONS AND ACCESSORIES

- Seals and disc made of FPM (fluoroelastomer)
- Versions without manual operator, NO (Normally Open), U (Universal) and Uv (Universal vacuum): contact us
- Version with pneumatic-electric interface
- Straight M12 connector:
  - with 5 m cable length: catalogue number **88130212**
- Explosionproof enclosures for use in zones 0/20-1/21-2/22, categories 1-2-3 to ATEX Directive 94/9/EC (see "Explosionproof solenoids" section)

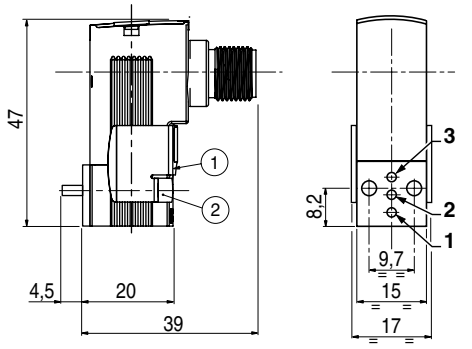
INSTALLATION

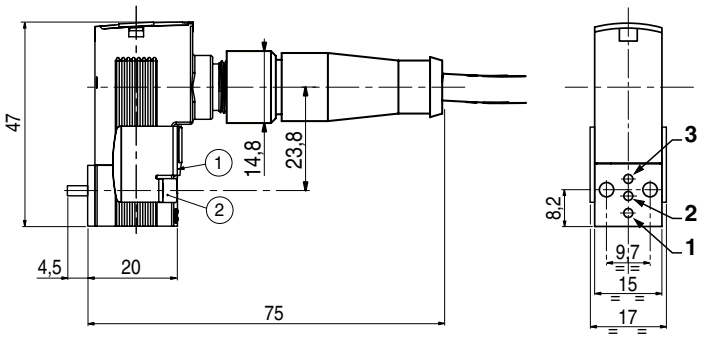
- The solenoid valves can be mounted in any position without affecting operation
- Solenoid valve supplied with mounting screws and mounting pad seal(s)
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
IEC 335
Connection M12
IP67

TYPE 02
IEC 335 /
Straight M12 connector, 5 m cable length
IP67





(1) Manual operator location.

(2) 2 mounting screw M3 x 20

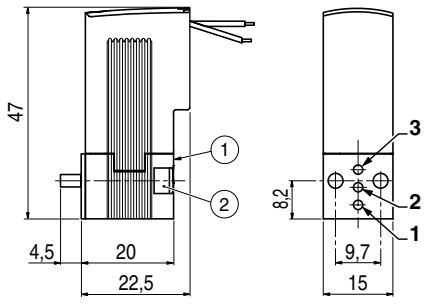
weight		
M12 (1)		cable ends
(1)	(2)	
0,049	0,288	0,040

(1) Without connector
(2) With connector

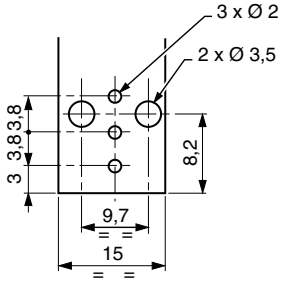
	connection		
function	1	2	3
NC	P	O	E

P: Pressure O: Outlet
E: Exhaust

TYPE 03
IEC 335
Cable ends 0,3 m length
IP67

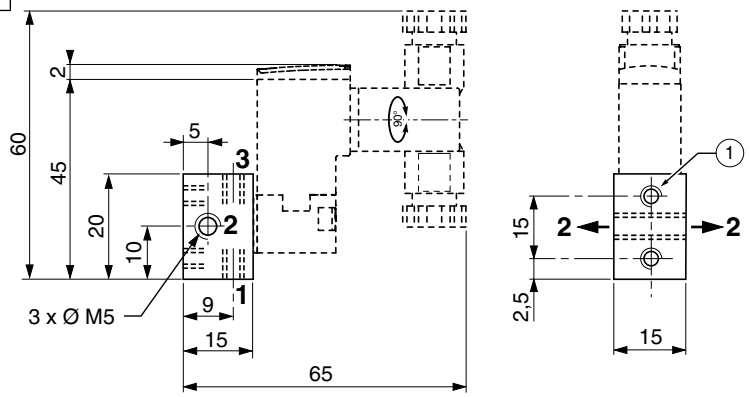


Subbase mounting surface: ISO 15218
(CNOMO E06.36.120N, size 15)



DIMENSIONS (mm), WEIGHT (kg)

Single subbase
Aluminium or brass



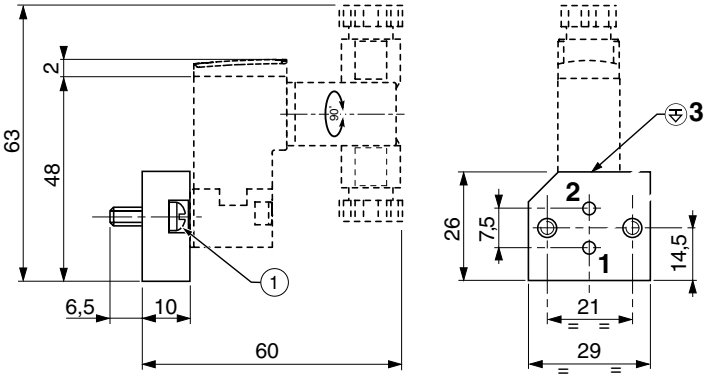
① Mounting: 2 holes M3, depth 4,5

Orifice (2) can be connected on the left or on the right of the subbase.

material	catalogue number	weight (1)
aluminium	**88263002**	0,011
brass	**30300001**	0,034

(1) subbase alone

Adapter CNOMO size 30
(**only for NC version**)
Aluminium

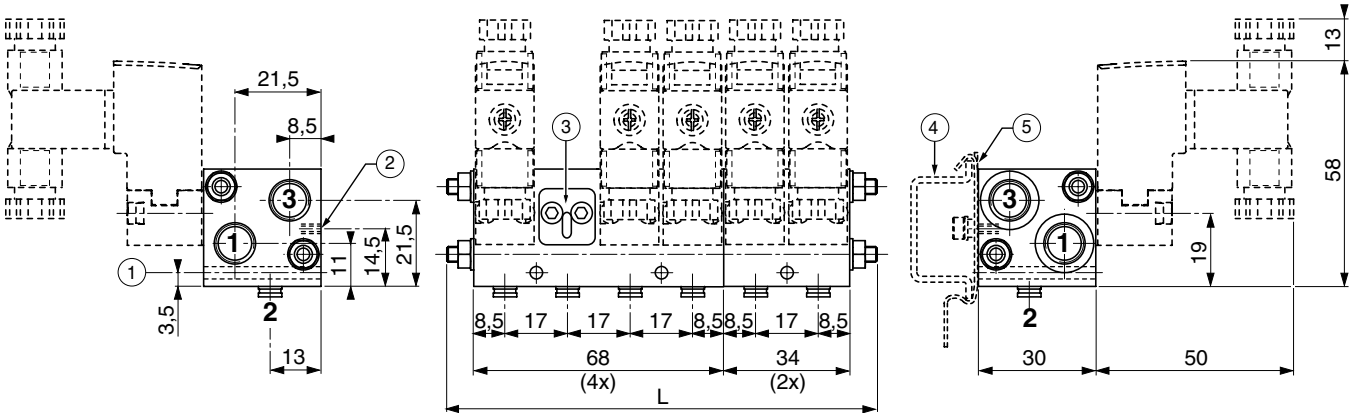


① Mounting: 2 screws M4 x 10 (supplied)

catalogue number	weight (2)
88263001	0,018

(2) adapter alone

Joinable subbases
Aluminium



Ports 1 and 3: G1/8

Port 2: coupling for 4mm OD tube

① Fixing hole Ø 3,2 (2 for 4x ; 1 for 2x)
② Fixing hole M3, depth 8 (2 for 4x ; 1 for 2x)
③ Mating surface blanking plates (option)
④ TS35 DIN rail (not supplied)
⑤ Clip for DIN rail mounting (option)

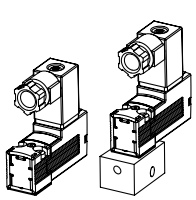
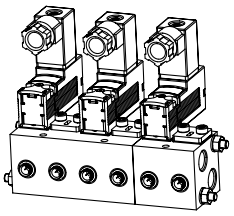
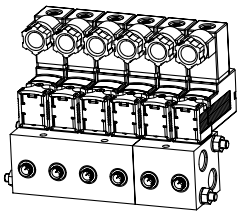
catalogue number	x	subbases	L	weight (3)
35500564	2	2x	-	0,076
35500565	4	4x	-	0,148
35500566	6	4x + 2x	114	0,236
35500567	8	4x + 4x	148	0,313
35500568	10	4x + 4x + 2x	182	0,389
35500569	12	4x + 4x + 4x	216	0,466

(3) subbases alone
x = place for mini-solenoid valves.
2 plugs R1/8 supplied.

OPTIONS AND ACCESSORIES

- Additional subbase with 2 places (with seals): catalogue number **35500570**
- 2 tie-rods + nuts for a subbase with:
  4 places: catalogue number **88100752**
  6 places: catalogue number **88100753**
  8 places: catalogue number **88100754**
  10 places: catalogue number **88100755**
  12 places: catalogue number **88100756**
- Mounting kit for DIN rail (2 clips + screws + washers): catalogue number **88100757**
- Mating surface blanking plate: catalogue number **88130203**

AMBIENT TEMPERATURE RANGES

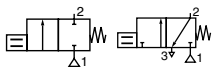
current type	power range	power coil		version			
		inrush/ holding (VA) ~	hot/cold (W) =				
DC (=)	LP1 (1)	-	0,5/0,55	standard	-10°C ; +50°C		-10°C ; +50°C
	LP2 (1)	-	1/1,2	standard	-25°C ; +60°C		-25°C ; +60°C
		-	1,15/1,35	LED + protection			-25°C ; +40°C
	LP3 (2)	-	2/2,65	standard	-25°C ; +50°C		-25°C ; +40°C
		-	2,15/2,8	LED + protection	-25°C ; +40°C		-
AC (~)	LP2 (2)	1,4/1,2	-	standard	-25°C ; +60°C		-25°C ; +40°C
		1,8/1,6	-	LED + protection			
	LP3 (2)	2,1/1,6	-	standard	-25°C ; +60°C		-25°C ; +40°C
		2,5/2	-	LED + protection	-25°C ; +50°C		-

(1) Voltage: -15% / +20%

(2) Voltage: -15% / +10%

MINI PIEZO-VALVES PIEZOTRONIC

direct operated
ISO 15218 (CNOMO, size 15) interface
pad mounting body, M5, G1/8 or instant fittings subbase

NC 

NO 

2/2-3/3
Series
630

SPECIFICATIONS

FLUIDS : air or inert gas, filtered at 25 µm, condensate free dow point -10°C
PRESSURE : 0 to 4 or 8 bar
MAX. ALLOWABLE PRESSURE (MAP) : 8 bar
FLUID TEMPERATURE : 0°C to +60° C
AMBIENT TEMPERATURE : 0°C to +60° C
STORAGE TEMPERATURE : -40°C to +60°C
BASE : ISO 15218 (CNOMO E06.36.120N, size15) or ISO 15218 (CNOMO E06.05.80, size 30) with adapter
MOUNTING : on subbases ØM5, G1/8 or instant fittings
SERVICE LIFE : > 10^9 cycles at 6 bar
MOUNTING POSITION : all

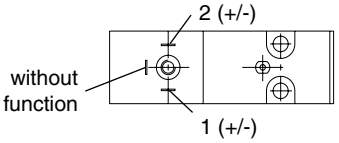
CONSTRUCTION

Body : synthetic material (PPS)
Internal parts : piezo ceramics
Sealings : nitrile (NBR)
Manual override : without or impulse type
Subbase : brass, polyamide, zinc diecast

ELECTRICAL CONNECTION

version with pins

Non polarized solenoid valve



Version with wires

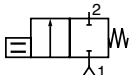
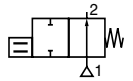
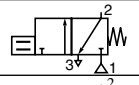
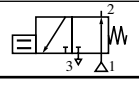
Non polarized solenoid valve

ELECTRICAL CHARACTERISTICS

Voltage (Maximum ripple : 10 %)	Power consumption at 24 V inrush	Power consumption at 24 V hold	Response time	Protection degree	Electrical connection
24 to 70 V AC/DC ±10%	0,6 W	**0,007 W**	50 ms (DC) 70 ms (AC)	IP 65	Spade plug size 15 connector, DIN 43650, 9,4 mm, industry standard B, rotatable by 90°, Option : with wires, length 1 m

Switching current = 25 mA/30ms

SPECIFICATIONS

Symbols Functions		Flow at 6 bar l/min (ANR)	Flow Coefficient Kv	Allowable differential pressure (Δ p in bar) min.	Allowable differential pressure (Δ p in bar) max.	(M)	catalogue number PIEZOTRONIC with pins **with** standard connector	catalogue number PIEZOTRONIC with 2 wires, 1m long
2/2 NC		6	0,086	0	8	X ▼	**63000065 63000071**	**63000015 63000021**
		6,5(1)	0,12	0	**4**	X ▼	**63000067 63000073**	**63000017 63000023**
2/2 NO		6	0,086	0	8	X ▼	**63000066 63000072**	**63000016 63000022**
		6,5(1)	0,12	0	**4**	X ▼	**63000068 63000074**	**63000018 63000024**
3/2 NC		7	0,10	2	8	X ▼	**63000063 63000069**	**63000013 63000019**
3/2 NO		6	0,086	2	8	X ▼	**63000064 63000070**	**63000014 63000020**

(M) Manual operator: X : without ▼ : Impulse
(1) Flow at **4** bar in l/min (ANR)

SUBBASES: Single subbase with lateral connection Ø M5 - cat no.: **88263002**
Single subbase - connection G1/8 - cat no.: **35300047**
Joinable subbase - connection G1/8 - cat no.: **35300048**

OPTION : Minivalve operated, intrinsically safe EEx **ia**, 12V - 24V DC

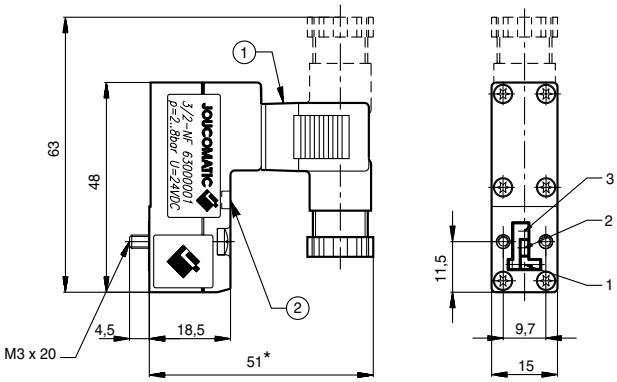
ACCESSORIES

DESCRIPTION	catalogue number
Visual indicator LED (Caution, consumption 0,25W and **voltage 24V max.**)	**88130401**
Plug size 15 with 2 m cable	**88143567**
Plug size 15 with built-in visual indicator (LED), with 2 m cable **24V =/~ max.**	**88143580**
Adapter for mounting PIEZOTRONIC on base ISO 15218 (CNOMO E06.05.80, size 30)	**88263001**

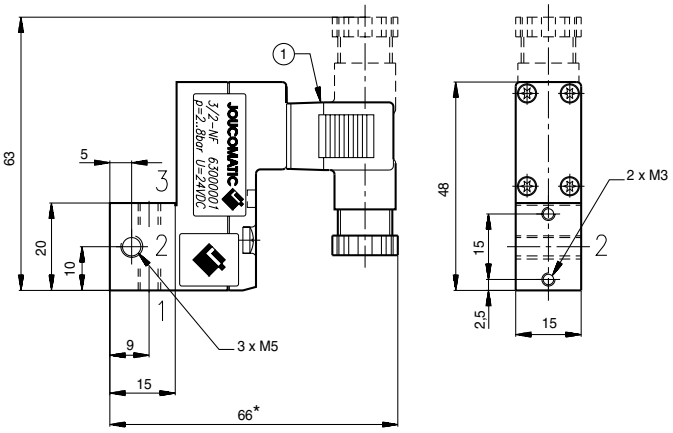
All leaflets are available on: **www.asconumatics.eu**

DIMENSIONS AND WEIGHTS

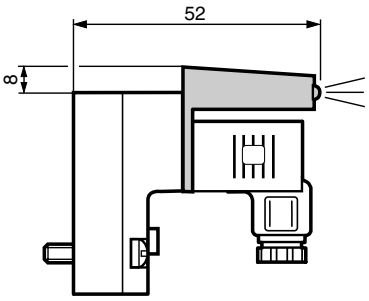
MINI PIEZO-VALVE WITH STANDARD CONNECTOR
Weight : 24 g without connector
34 g with connector



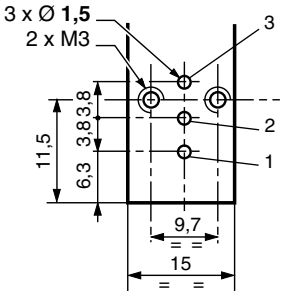
MINI PIEZO-VALVE ON SINGLE SUBBASE **88263002**
Weight : 45 g



ASSEMBLY WITH LED INDICATOR
(accessory, rotatable x180°)



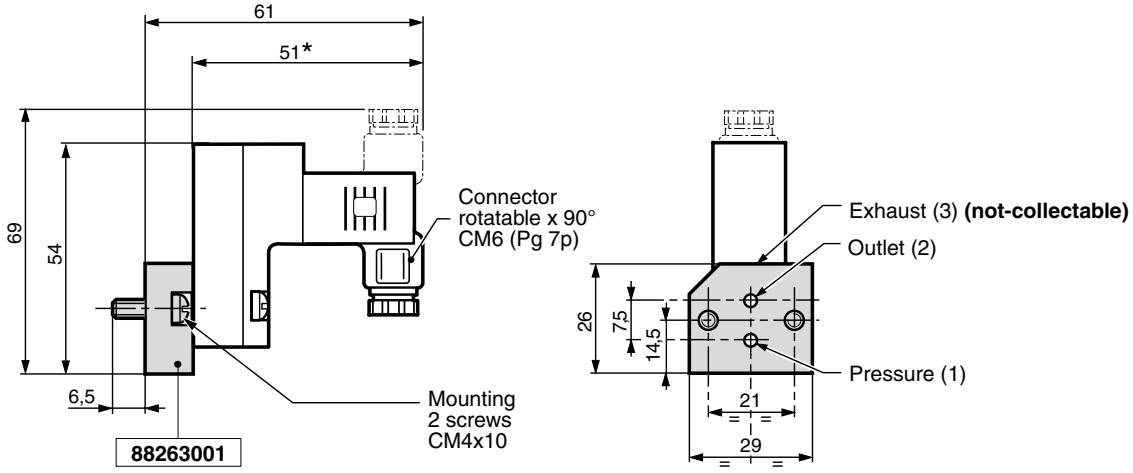
MOUNTING FACE
Subbase for mini piezo-valve ISO 15218 (CNOMO E06.36.120N, size15)



Single subbase connection :
Outlet (2) can be connected on the left or on the right of subbase ; closed unused port with a Ø M5 plug (supplied).

(1) Connector size 15 rotatable by 90°
(2) Manual operator by impulse
(✳) + 10 mm for clearance

MINI VALVE + Intermediate subbase (**Adapter** CNOMO size 30 : cat no.: **88263001**)
Total weight : 53 g

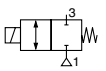


❇ + 10 mm for clearance

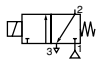
SOLENOID VALVES

direct operated, quick switching
manifold mount, pad-mount or inline version,
or push-in hose connection

2/2 NC



3/2 NC



2/2
3/2
Series
RB

FEATURES

- *Miniature solenoid valves for medical and gas analysers and leak detectors*
- *Suitable for the control of gases*
- *The valves have a service life of more than 100 million cycles when used with inert gas*
- *Short response times*
- *Easy to integrate thanks to the valve's small size*
- *Available in a variety of versions for a wide range of applications: threaded connections or pad-mount for installation on multiple manifolds*
- *Vacuum application up to -0.1 bar*
- *Low power consumption and light weight offers extended battery life for portable devices*
- *Multiple body configurations to suit all application needs*

GENERAL

Differential pressure See "SPECIFICATIONS" [1 bar =100 kPa]
Response time < 10 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases (filtered 10 µm)	0 °C to +60 °C	FPM (fluoroelastomer) NBR (nitrile)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

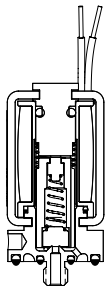
Body PBT, brass
Internal parts Stainless steel
Seat PBT, brass
Seals FPM, NBR

ELECTRICAL CHARACTERISTICS

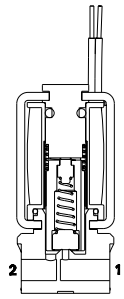
Coil insulation class B (130°C)
Connection Cable ends 26 AWG or circuit board mount
Electrical safety IEC 335
Electrical enclosure protection IP30 (EN 60529)
Standard voltages DC (=) : 5V - 12V - 24V

prefix option	power ratings				operator ambient temperature range (TS)	raplacement coil	
	inrush ~	holding ~		hot/cold =			
	(VA)	(VA)	(W)	(W)	(C°)		
-	-	-	-	0,5 / 1,0 / 2.0	0 to +60	-	-

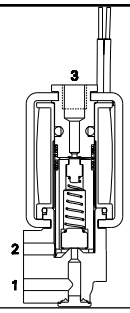
(1) Refer to the dimensional drawings on the following page.



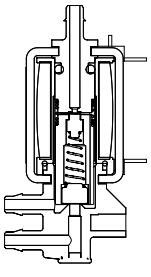
2/2 NC manifold mount



2/2 NC line mount



3/2 NC pad mount



3/2 NC push-in hose connection

All leaflets are available on: **www.asconumatics.eu**

SPECIFICATIONS

pipe size	orifice size (mm)	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
				min,	max, (PS) air, inert gas (✳)		
		(m^3/h)	(l/min)		=	=	
2/2 NC - Normally closed							
10-32 UNF Stud Manifold Mount, Brass (M)	0,8	0,021	0,35	-0,9	3,4	0,5	**RLM20xx30x**
	0,8	0,021	0,35	-0,9	6,9	2,0	**RHM20xx30x**
	1,3	0,047	0,78	-0,9	1,7	0,5	**RLM20xx50x**
	1,3	0,047	0,78	-0,9	3,4	1,0	**RMM20xx50x**
	1,3	0,047	0,78	-0,9	6,9	2,0	**RHM20xx50x**
	2,0	0,07	1,16	-0,9	1,7	2,0	**RHM20xx80x**
10-32 UNF Female In-Line, Brass (L)	0,8	0,021	0,35	-0,9	3,4	0,5	**RLL20xx30x**
	0,8	0,021	0,35	-0,9	6,9	2,0	**RHL20xx30x**
	1,3	0,047	0,78	-0,9	1,7	0,5	**RLL20xx50x**
	1,3	0,047	0,78	-0,9	3,4	1,0	**RML20xx50x**
	1,3	0,047	0,78	-0,9	6,9	2,0	**RHL20xx50x**
	2,0	0,07	1,16	-0,9	1,7	2,0	**RHL20xx80x**
3,17 mm Push-in Hose Connecton PBT (B)	0,8	0,021	0,35	-0,9	1,0	0,5	**RLB20xx30x**
	0,8	0,021	0,35	-0,9	3,4	1,0	**RMB20xx30x**
	0,8	0,021	0,35	-0,9	6,9	2,0	**RHB20xx30x**
	1,3	0,047	0,78	-0,9	0,7	0,5	**RLB20xx50x**
	1,3	0,047	0,78	-0,9	2,4	1,0	**RMB20xx50x**
	1,3	0,047	0,78	-0,9	4,8	2,0	**RHB20xx50x**
	2,0	0,07	1,16	-0,9	1,7	2,0	**RHB20xx80x**
Pad Mount, PBT (F)	0,8	0,021	0,35	-0,9	1,0	0,5	**RLF20xx30x**
	0,8	0,021	0,35	-0,9	3,4	1,0	**RMF20xx30x**
	0,8	0,021	0,35	-0,9	6,9	2,0	**RHF20xx30x**
	1,3	0,047	0,78	-0,9	0,7	0,5	**RLF20xx50x**
	1,3	0,047	0,78	-0,9	2,4	1,0	**RMF20xx50x**
	1,3	0,047	0,78	-0,9	4,8	2,0	**RHF20xx50x**
	2,0	0,07	1,16	-0,9	1,7	2,0	**RHF20xx80x**

HOW TO ORDER

10-DIGIT PRODUCT CODE

RLM20 **x** **x** **30** **x**

catalogue no.

voltages
4 = 5 VDC
6 = 12 VDC
7 = 24 VDC

electrical connection
H = cable ends
P = PCB pins (circuit board)

catalogue no.

seal materials
B = NBR
V = FPM
O = Oxygen service (FPM)

Ordering example: RLM204H30B = 2-way (normally closed), 5 VDC, manifold mount with 0,8 mm orifice, 0,5 watt, cable ends, NBR seals

SPECIFICATIONS

pipe size	orifice size (mm)		flow coefficient Kv		operating pressure differential (bar) min,	operating pressure differential (bar) max, (PS) air, inert gas (✳)	power coil (W)	catalogue number
	1 → 2	2 → 3	(m^3/h)	(l/min)		=	=	
3/2 NC - Normally closed								
10-32 UNF Stud Manifold Mount, Brass (M)	0,8	1,0	0,021	0,35	-0,9	3,4	0,5	**RLM3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	6,9	2,0	**RHM3xxx34x**
	1,3	1,3	0,047	0,78	-0,9	1,0	0,5	**RLM3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	3,4	1,0	**RMM3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	6,9	2,0	**RHM3xxx55x**
	2,0	1,3	0,07 / 0,047	1,16 / 0,78	-0,9	1,7	2,0	**RHM3xxx85x**
10-32 UNF Female In-Line, Brass (L)	0,8	1,0	0,021	0,35	-0,9	3,4	0,5	**RLL3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	6,9	2,0	**RHL3xxx34x**
	1,3	1,3	0,047	0,78	-0,9	1,0	0,5	**RLL3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	3,4	1,0	**RML3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	6,9	2,0	**RHL3xxx55x**
	2,0	1,3	0,07 / 0,047	1,16 / 0,78	-0,9	1,7	2,0	**RHL3xxx85x**
3,17 mm push-in hose PBT (B)	0,8	1,0	0,021	0,35	-0,9	1,0	0,5	**RLB3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	3,4	1,0	**RMB3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	6,9	2,0	**RHB3xxx34x**
	1,3	1,3	0,047	0,78	-0,9	0,7	0,5	**RLB3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	2,4	1,0	**RMB3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	4,8	2,0	**RHB3xxx55x**
	2,0	1,3	0,07 / 0,047	1,16 / 0,78	-0,9	1,7	2,0	**RHB3xxx85x**
Pad Mount, PBT (F)	0,8	1,0	0,021	0,35	-0,9	1,0	0,5	**RLF3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	3,4	1,0	**RMF3xxx34x**
	0,8	1,0	0,021	0,35	-0,9	6,9	2,0	**RHF3xxx34x**
	1,3	1,3	0,047	0,78	-0,9	0,7	0,5	**RLF3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	2,4	1,0	**RMF3xxx55x**
	1,3	1,3	0,047	0,78	-0,9	4,8	2,0	**RHF3xxx55x**
	2,0	1,3	0,07 / 0,047	1,16 / 0,78	-0,9	1,7	2,0	**RHF3xxx85x**

HOW TO ORDER

10-DIGIT PRODUCT CODE

RLM3 **x** **x** **x** **30** **x**

catalogue no.

port 3 style
B = 3,17 mm push-in hose connection
F = 10-32 UNF female

voltages
4 = 5 VDC
6 = 12 VDC
7 = 24 VDC

electrical connection
H = cable ends
P = PCB pins (circuit board)

seal materials
B = NBR
V = FPM
O = Oxygen service (FPM)

catalogue no.

Ordering example: RLM3B7P34V = 3-way (normally closed), 24 VDC, port 3 with push-in hose connection, manifold mount with 0,8 mm orifice, 0.5 watt, PCB pins, FPM seals

OPTIONS

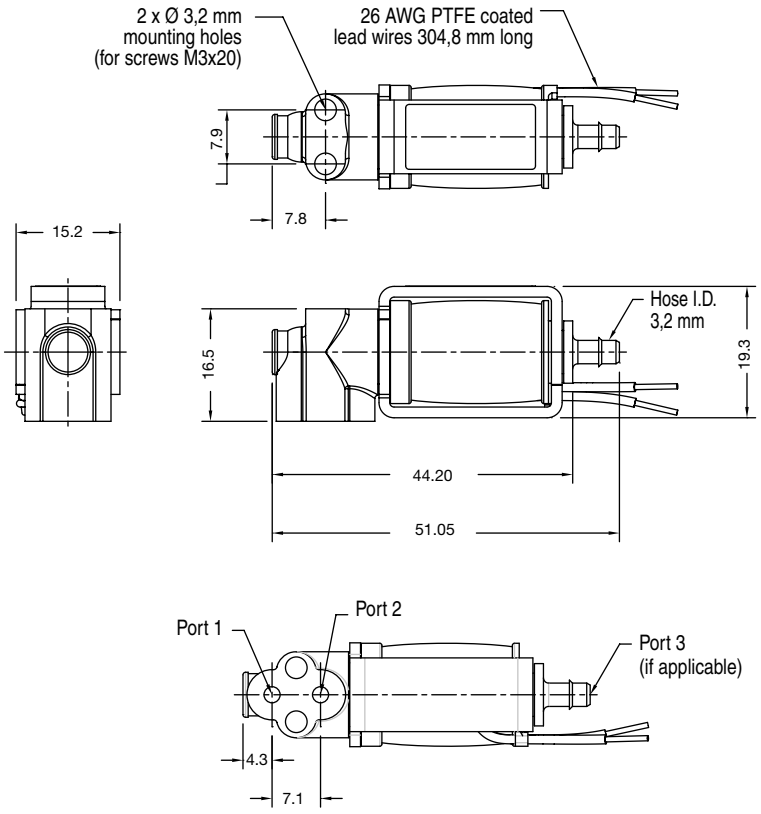
- Other voltages
- Other seal materials
- Other electrical connectors
- Oxygen service
- Other pipe connections

INSTALLATION

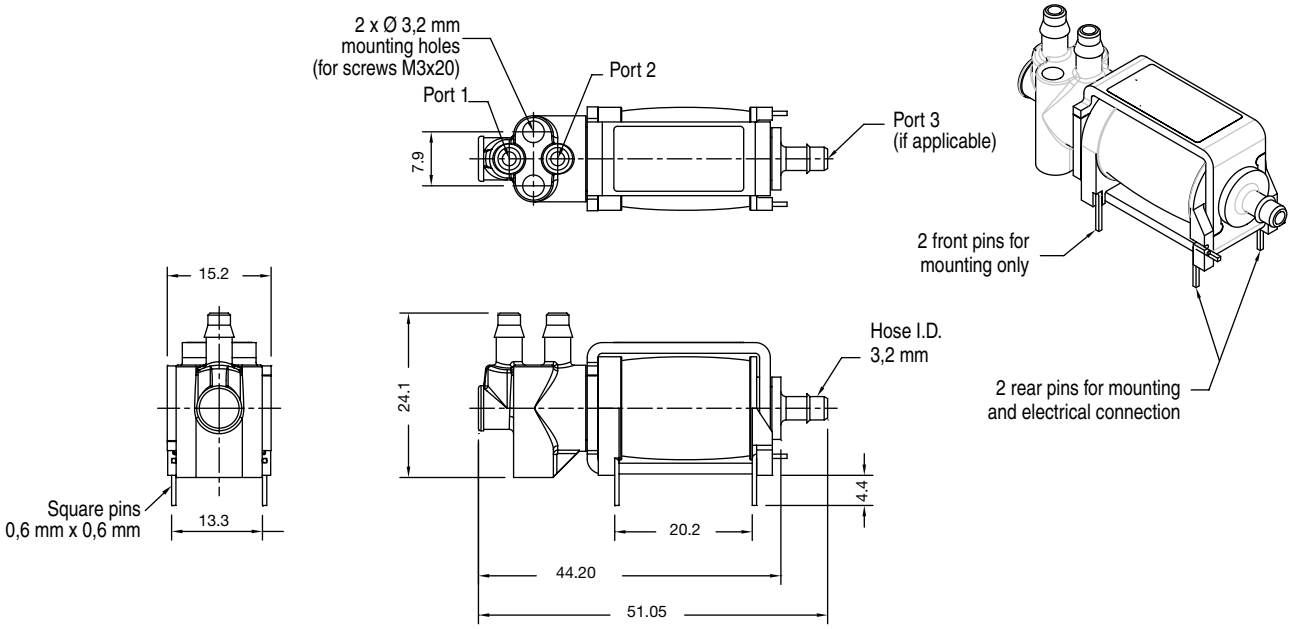
- The solenoid valves can be mounted in any position without affecting operation
- Threaded solenoid valves have 2 mounting holes in body
- Pad-mount valves and o-ring seals for multiple manifolds

DIMENSIONS (mm), **WEIGHT (k**g)

2- and 3-way pad mount solenoid valve

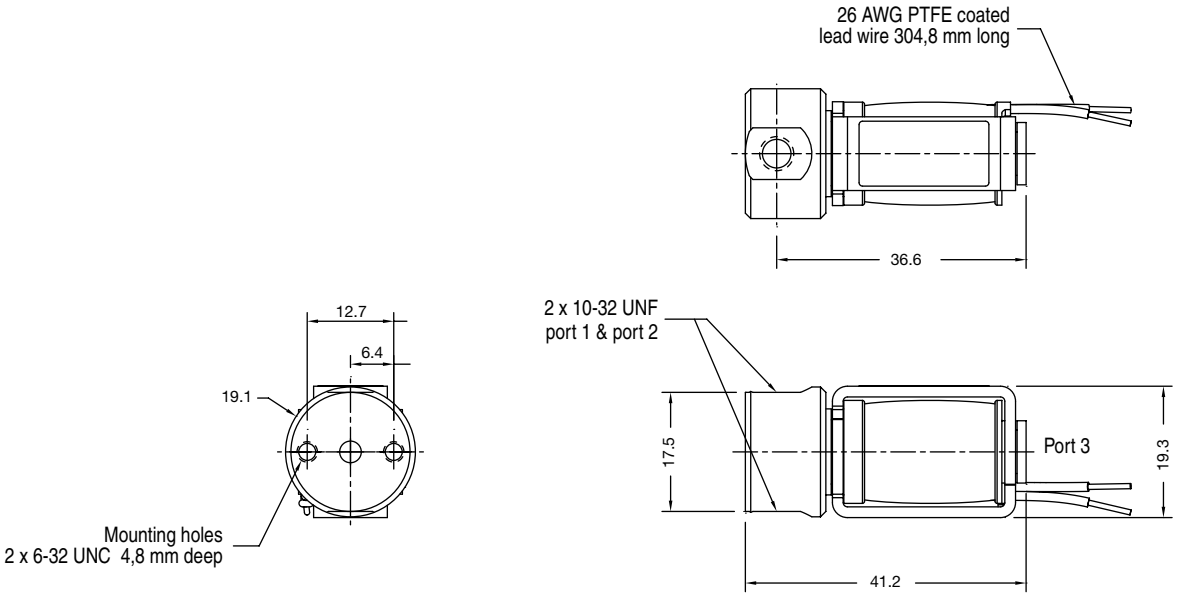


2- and 3-way solenoid valve with push-in hose connection

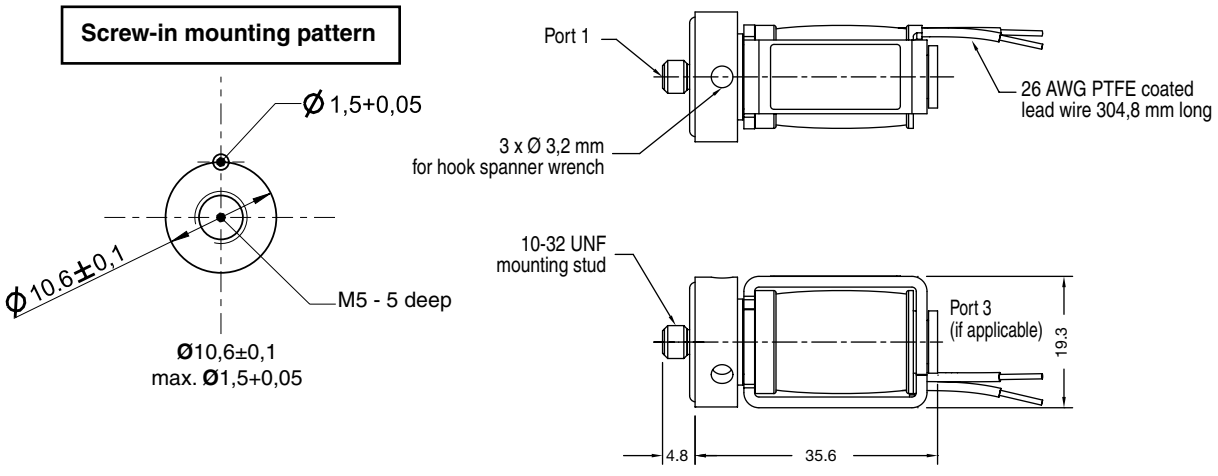


DIMENSIONS (mm), **WEIGHT (k**g)

2- and 3-way line mount solenoid valve

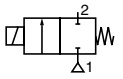


2- and 3-way manifold mount solenoid valve



SOLENOID VALVE

direct operated, quick switching
threaded or screw-in type body
M5

NC 

2/2
Series
S

FEATURES

- *Miniature solenoid valves for medical and gas analysers and leak detectors*
- *Suitable for the control of gases*
- *Short response times*
- *Compact size for easy integration into systems*
- *Available in a variety of versions for a wide range of applications: threaded or screw-in type valve bodies for installation on multiple manifolds*
- *Approved to UL standards*
- *Vacuum application up to -0.9 bar*

GENERAL

Differential pressure See "SPECIFICATIONS" [1 bar =100 kPa]
Response time < 10 ms

fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases (filtered 10 µm)	0 °C to +60 °C	FPM (fluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

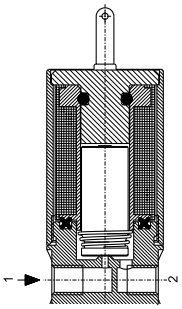
Body Stainless steel
Internal parts Stainless steel
Seals FPM (fluoroelastomer) [EPDM (ethylene-propylene), contact us]

ELECTRICAL CHARACTERISTICS

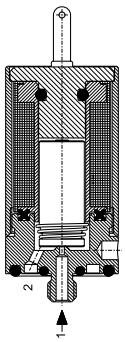
Coil insulation class B
Connection Spade plug or cable ends AWG 20, length 300 mm
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN 60529)
Standard voltages DC (=) : 12V - 24V

prefix option	power ratings: inrush ~	power ratings: holding ~		power ratings: hot/cold =	operator ambient temperature range (TS)	raplacement coil		Typ (1)
	(VA)	(VA)	(W)	(W)	(C°)			
-	-	-	-	1,5 / 1,5	-20 to +60	-	-	01

(1) Refer to the dimensional drawings on the following page.



Function NC, threaded body



Function NC, screw-in type body

SPECIFICATIONS

pipe size	orifice size	flow coefficient kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. air and gases (✳)		power coil (W)		catalogue no. threaded body	catalogue no. screw-in type body
	(mm)	(m^3/h)	(l/min)		~	=	~	=	xx : see "HOW TO ORDER"	
NC - Normally closed										
M5	0,75	0,016	0,26	-0,9	-	7	-	1,5	**HSM2Lxx00V**	**HSM2Mxx00V**
	1	0,025	0,42	-0,9	-	7	-	1,5	**HSM2Lxx10V**	**HSM2Mxx10V**
	2	0,058	0,97	-0,9	-	3,5	-	1,5	**HSM2Lxx50V**	**HSM2Mxx50V**

HOW TO ORDER

10-DIGIT PRODUCT CODE

HSM2L **x** **x** **00** **V**

catalogue no.

voltages
6 = 12 VDC
7 = 24 VDC

electrical connection
F = Spade plug
H = cable ends

seal materials
V = FPM

catalogue no.

OPTIONS

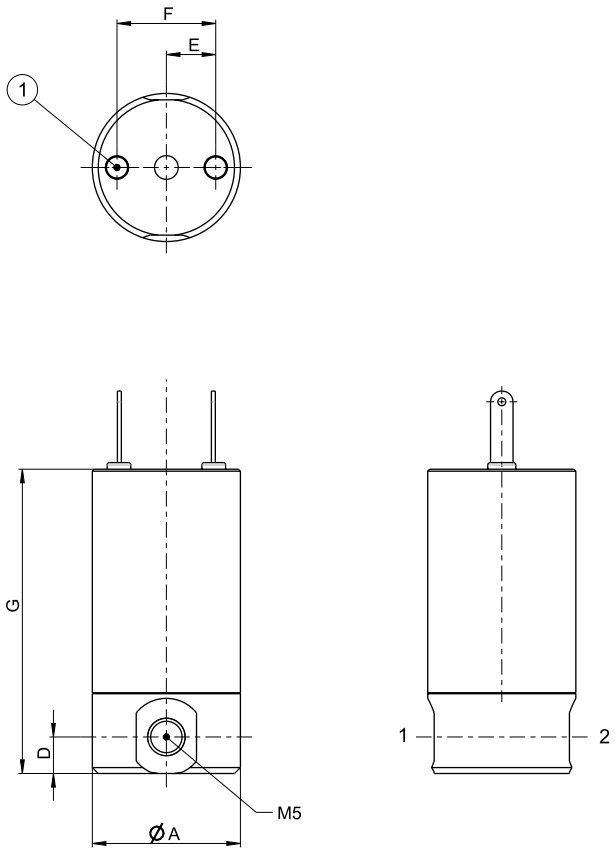
- Seals made from EPDM (ethylene-propylene) (contact us)
- Oxygen service

INSTALLATION

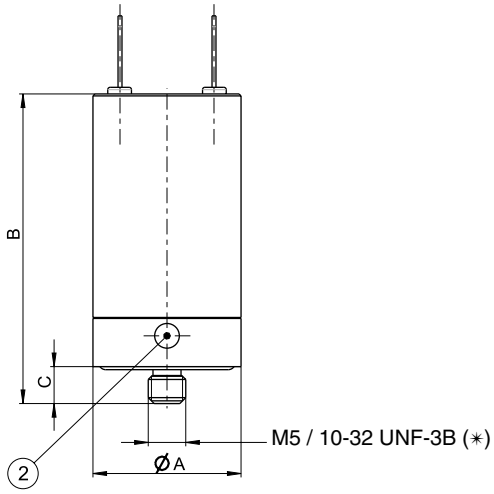
- The solenoid valves can be mounted in any position without affecting operation
- Threaded solenoid valves have 2 mounting holes in body
- Screw-in type valves and o-ring seals for multiple manifolds

DIMENSIONS (mm), WEIGHT (kg)

HSM2Lxx00V / HSM2Lxx10V / HSM2Lxx50V
HSM2Lxx00V / HSM2Lxx10V / HSM2Lxx50V

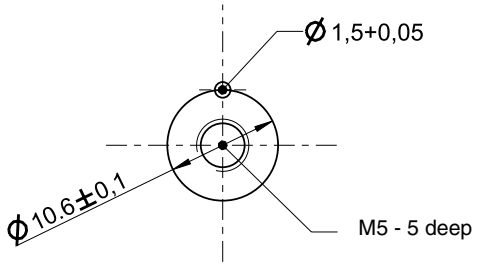


HSM2Mxx00V / HSM2Mxx10V / HSM2Mxx50V
HSM2Mxx00V / HSM2Mxx10V / HSM2Mxx50V



(✳) Supplied with 10-32 UNF-3B male thread compatible with M5 female counter-thread

screw-in mounting pattern



Ø10,6±0,1
max. Ø1,5+0,05

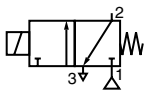
(1) 2 mounting holes Ø M3x0,5
(2) Mounting with hook spanner wrench DIN 1810B

connection type	catalogue no.	A	B	C	D	E	F	G	weight
threaded body	HSM2Lxx00V/HSM2Lxx10V/HSM2Lxx50V HSM2Lxx00V/HSM2Lxx10V/HSM2Lxx50V	19,05	-	-	4,7	6,35	12,7	39,11	0,059
screw-in type body	HSM2Mxx00V/HSM2Mxx10V/HSM2Mxx50V HSM2Mxx00V/HSM2Mxx10V/HSM2Mxx50V	19,05	39,62	4,8	-	-	-	-	0,053

SOLENOID VALVE

direct operated, quick switching
threaded or screw-in type body
M5

NC



3/2
Series
S

FEATURES

- *Miniature solenoid valves for medical and gas analysers and leak detectors*
- *Suitable for the control of gases*
- *Short response times*
- *Compact size for easy integration into systems*
- *Available in a variety of versions for a wide range of applications: threaded or screw-in type valve bodies for installation on multiple manifolds*
- *Approved to UL standards*
- *Vacuum application up to -0.9 bar*

GENERAL

Differential pressure See "SPECIFICATIONS" [1 bar =100 kPa]
Response time < 10 ms

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases (filtered 10 µm)	0 °C to +60 °C	FPM (fluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

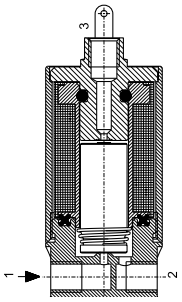
Body Stainless steel
Internal parts Stainless steel
Seals FPM (fluoroelastomer) [EPDM (ethylene-propylene), contact us]

ELECTRICAL CHARACTERISTICS

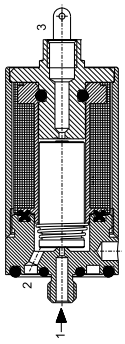
Coil insulation class B
Connection Spade plug or cable ends AWG 20, length 300 mm
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN 60529)
Standard voltages DC (=) : 12V - 24V

prefix option	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature range (TS)	raplacement coil		type (1)
	(VA)	(VA)	(W)	(W)	(C°)			
-	-	-	-	1,5 / 1,5	-20 to +60	-	-	01

(1) Refer to the dimensional drawings on the following page.



Function NC, threaded body



Function NC, screw-in type body

SPECIFICATIONS

pipe size	orifice size 1 → 2	orifice size 2 → 3	flow coefficient Kv		operating pressure differential (bar) min.	max. (PS) air and gases (∗) ~	max. (PS) air and gases (∗) =	power coil (W) ~	power coil (W) =	catalogue no. threaded body	catalogue no. screw-in type body
	(mm)		(m³/h)	(l/min)						xx : see "HOW TO ORDER"	
NC - Normally closed											
M5	0,75	1	0,016	0,26	-0,9	-	7	-	1,5	**HSM3Lxx00V**	**HSM3Mxx00V**
	1	1	0,025	0,42	-0,9	-	7	-	1,5	**HSM3Lxx10V**	**HSM3Mxx10V**
	2	1	0,058	0,97	-0,9	-	3,5	-	1,5	**HSM3Lxx50V**	**HSM3Mxx50V**

HOW TO ORDER

10-DIGIT PRODUCT CODE

HSM3L	x	x	00	V

catalogue no.

voltages
6 = 12 VDC
7 = 24 VDC

electrical connection
F = Spade plug
H = cable ends

catalogue no.

seal materials
V = FPM

OPTIONS

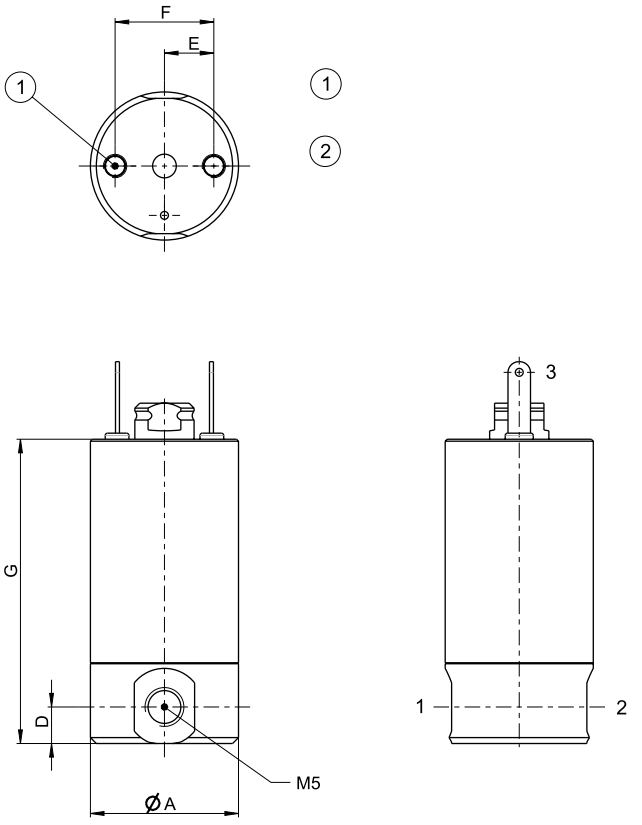
- Seals made from EPDM (ethylene-propylene) (contact us)
- Oxygen service
- Other pipe connections (10-32 UNF-3B)

INSTALLATION

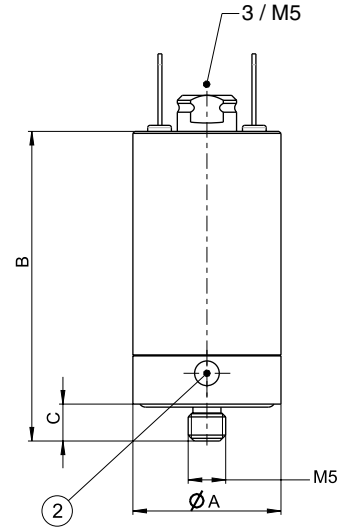
- The solenoid valves can be mounted in any position without affecting operation
- Threaded solenoid valves have 2 mounting holes in body
- Screw-in type valves and o-ring seals for multiple manifolds

DIMENSIONS (mm), WEIGHT (kg)

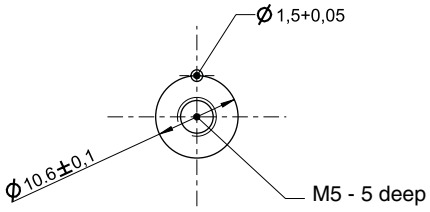
HSM3Lxx00V / HSM3Lxx10V / HSM3Lxx50V
HSM3Lxx00V / HSM3Lxx10V / HSM3Lxx50V



HSM3Mxx00V / HSM3Mxx10V / HSM3Mxx50V
HSM3Mxx00V / HSM3Mxx10V / HSM3Mxx50V



screw-in mounting pattern



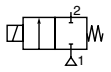
(1) 2 mounting holes Ø M3x0,5
(2) Mounting with hook spanner wrench DIN 1810B

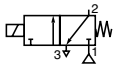
Ø10,6±0,1
max. **Ø**1,5+0,05

connection type	catalogue no.	A	B	C	D	E	F	G	weight
threaded body	HSM3Lxx00V/HSM3Lxx10V/HSM3Lxx50V HSM3Lxx00V/HSM3Lxx10V/HSM3Lxx50V	19,05	-	-	4,7	6,35	12,7	39,11	0,059
screw-in type body	HSM3Mxx00V/HSM3Mxx10V/HSM3Mxx50V HSM3Mxx00V/HSM3Mxx10V/HSM3Mxx50V	19,05	39,62	4,8	-	-	-	-	0,053

SOLENOID VALVE

flat-spring technology,
precise response time, quick switching,
Ø 15 mm, pad-mount body

2/2 NC 

3/2 NC 

2/2
3/2
Series
065

FEATURES

- *Miniature solenoid valve for respirators, medical analyzers, gas analyzers and control units, as well as for use as a pilot valve.*
- *RoHS compliant.*
- *New flat-spring technology enables*
  - short response times and their precise adjustment
  - very low switching noise
  - exceptional long service life
- *Suitable for oxygen service*
- *Easy to integrate thanks to the valves' small size.*
- *Pad-mount for installation on multiple manifolds.*
- *Vacuum application up to 0,1 bar abs.*
- *All 3 connections of the 3/2 way valve are contactable via the flange.*

GENERAL

Differential pressure	See "SPECIFICATIONS" [1 bar =100 kPa]
Maximum viscosity	20 cSt (mm²/s)
Response time	< 10 ms
Internal volume	≤ 150 µl (couplings not included)

fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gases, oxygen (filtered 50 µm)	0°C to + 60°C	FPM (fluoroelastomer)

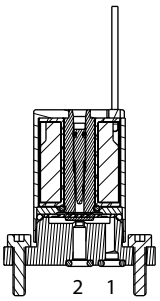
MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified.

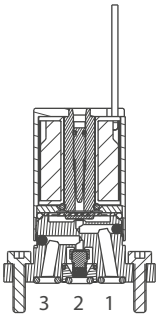
Body	Stainless steel
Plugnut	Stainless steel
Flat-spring	Stainless steel
Seat and housing base	PPS
Seals	FPM (other materials: contact us)

ELECTRICAL CHARACTERISTICS

Coil insulation class	F
Connection	Cable leads AWG 26/7, 80mm length
Electrical safety	IEC 335
Electrical enclosure protection	IP40 (EN 60529)
Standard voltages	DC (=) : 12V, 24V
Power	2W at 20°C
Duty cycle	100% at ambient temperature 0°C to 60°C



2/2 NC function



3/2 NC function

SPECIFICATIONS

function	orifice size	flow coefficient kv		operating pressure differential (bar)		power coil	catalogue number
	(mm)	(m³/h)	(l/min)	min.	max.	(W)	
2/2 NC	0,6	0,010	0,159	0	9	2	**R065A131L0V00xx**
	1,2	0,035	0,580	0	3	2	**R065A134L0V00xx**
3/2 NC	0,6	0,010	0,159	0	5	2	**R065A141L0V00xx**
	1,2	0,024	0,404	0	1,3	2	**R065A144L0V00xx**

ORDERING

R065A131L0V00 **F1**

According to table „SPECIFICATIONS"

Voltage
F1 = 24 VDC
F3 = 12 VDC

OPTIONS (on request)

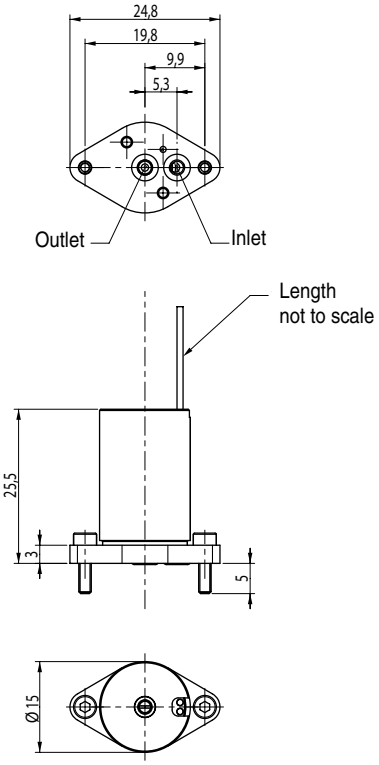
- Other seal materials
- Specitic response times
- Optimised operating noise level

INSTALLATION

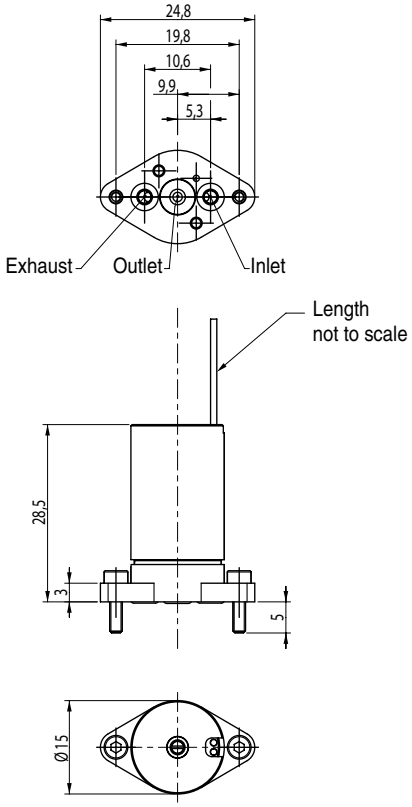
- The solenoid valves can be mounted in any position without affecting operation.
- Seals and mounting screws (M2, hexagon socket, DIN912) for flange connection are standard supplied.

DIMENSIONS (mm), WEIGHT (kg)

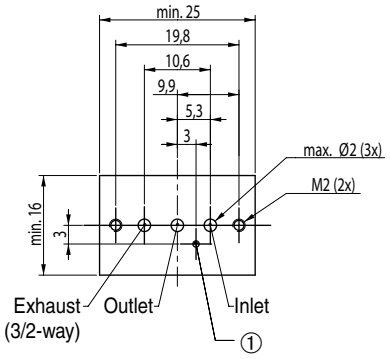
2/2 way
weight*: 0,020kg



3/2 way
weight*: 0,021kg



Subbase mounting surface

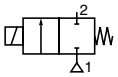


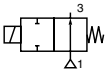
① Optional orientation pin Ø=1,0mm (m6), DIN EN ISO 2338 (not supplied). Must project not more than 3mm.

* Incl. mounting screws

SOLENOID VALVES

direct operated, quick switching
threaded or pad-mount body
M5

NC 

NO 

2/2
Series
065

FEATURES

- *Miniature solenoid valve for medical analyzers, gas analyzers and leak detectors*
- *New flat-spring technology ensures no contamination of fluids (no friction)*
- *Suitable for the control of gases*
- *The valves have a service life of more than 1 billion cycles when used with inert gas*
- *Short response times*
- *Easy to integrate thanks to the valves' small size*
- *Available in a variety of versions for a wide range of applications: threaded connections or pad-mount for installation on multiple manifolds*
- *Vacuum application up to 0,1 bar abs. (0,6 mm and 1 mm dia. orifice sizes)*

GENERAL

Differential pressure	See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity	20 cSt (mm²/s)
Response time	< 10 ms
Internal volume	I 350 Kl (couplings not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
Air, inert gases (filtered 50 µm)	0°C to + 60°C	FPM (fluoroelastomer) [2]

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

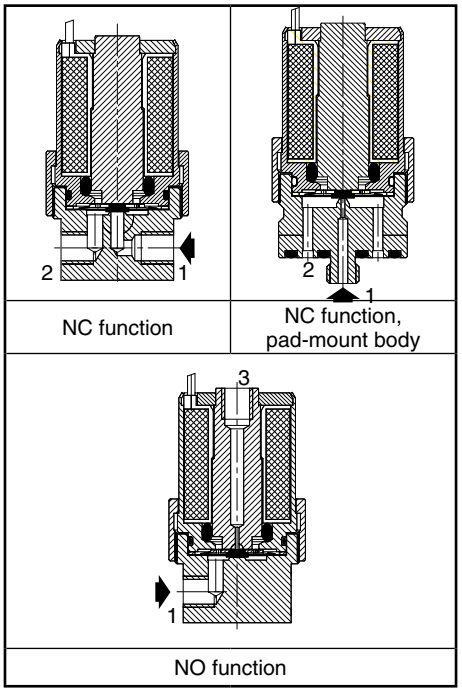
Body	Stainless steel, AISI 303 (1.4305)
Plugnut	Stainless steel
Spring disc	Stainless steel
Seat	Stainless steel
Seals	FPM
Disc	FPM

ELECTRICAL CHARACTERISTICS

Coil insulation class	F
Connection	Cable leads (ETFE); 0,35 m length
Electrical safety	IEC 335
Electrical enclosure protection	IP40 (EN 60529)
Standard voltages	DC (=) : 6V - 12V - 24V

prefix option	power ratings				operator ambient temperature range (TS)	replacement coil		type [1]
	inrush ~	holding ~		hot/cold =				
	(VA)	(VA)	(W)	(W)	(C°)			
L	-	-	-	2,1 / 2,1	0 to + 60	-	-	01

[1] Refer to the dimensional drawings on the following page.



NC function | NC function, pad-mount body

NO function

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	max. (PS) air, inert gases (∗)		power coil (W)		catalogue number threaded	catalogue number pad-mount body
	(mm)	(m³/h)	(l/min)		~	=	~	=	=	=
NC - Normally closed										
M5 [3]	0,6	0,013	0,22	0	-	7	-	2,1	**LE065A001V**	**LS065A001V**
	1	0,025	0,43	0	-	5	-	2,1	**LE065A002V**	**LS065A002V**
	1,4	0,032	0,54	0	-	3	-	2,1	**LE065A003V**	**LS065A003V**
	2	0,057	0,95	0	-	1,5	-	2,1	**LE065A004V**	**LS065A004V**
NO - Normally open										
M5	0,6	0,013	0,22	0	-	7	-	2,1	**LE065A005V**	**-**
	1	0,025	0,43	0	-	5	-	2,1	**LE065A006V**	**-**
	1,4	0,032	0,54	0	-	3	-	2,1	**LE065A007V**	**-**
	2	0,057	0,95	0	-	1,5	-	2,1	**LE065A008V**	**-**

[2] FFPM seals for corrosive fluids (Contact us).
[3] External thread with pad-mount body.

OPTIONS (on request)

- Other seal materials
- Response time 2-3 ms
- Oxygen service
- Other pipe connections are available
- 0,7 W rated coil

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Threaded solenoid valves have 2 mounting holes in body
- Pad-mount valves and o-ring seals for multiple manifolds

ORDERING EXAMPLES:

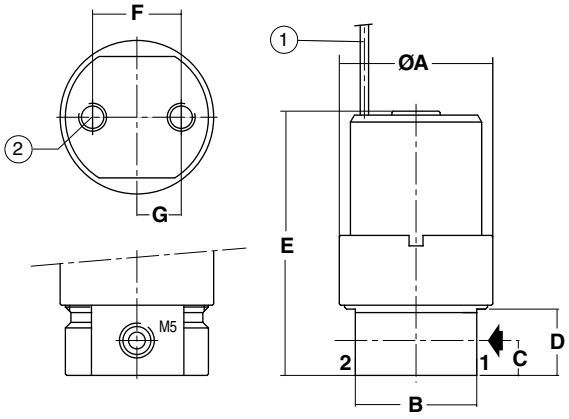
L	E	065 **A** 001	**V**	6V / DC
L	E	065 **A** 002	**V**	24V / DC
L	S	065 **A** 006	**V**	12V / DC
L	S	065 **A** 007	**V**	6V / DC

prefix — pipe thread — basic number — suffix — voltage

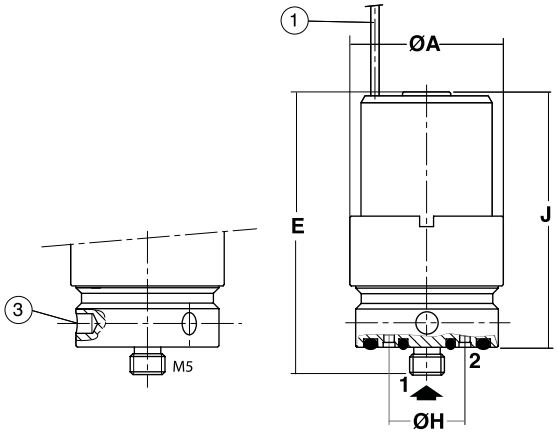
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "L" Solenoid
Cable ends
IP40

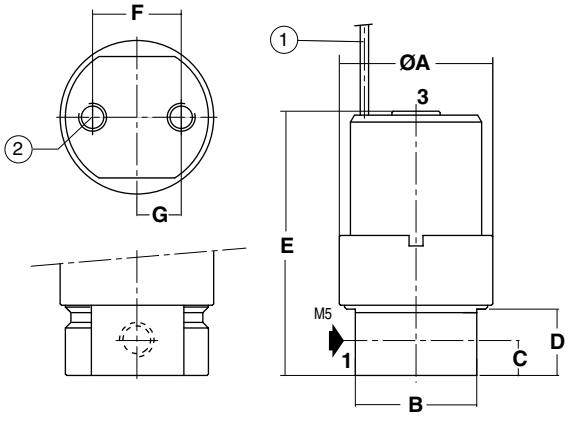
LE065A001V/002V/003V/004V



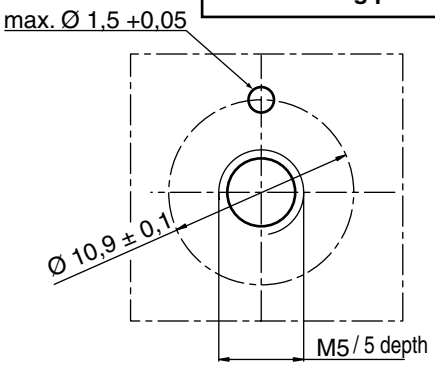
LS065A001V/002V/003V/004V



LE065A005V/006V/007V/008V



Mounting pad



type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	weight (1)
01	L	LE065A001V/002V/003V/004V	22	17,4	5	9,5	38	12,7	6,35	-	-	0,074
		LS065A001V/002V/003V/004V	22	-	-	-	41	-	-	10,9	37	0,066
		LE065A005V/006V/007V/008V	22	17,4	5	9,5	38	12,7	6,35	-	-	0,071

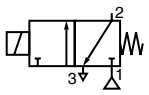
(1) Including leads, length 0,35 m.

(1) 2 electrical supply wires, length: 0,35 m.
(2) 2 mounting holes Ø M4, depth 6 mm.
(3) Mounting with hook spanner wrench DIN 1810B.

SOLENOID VALVES

direct operated, quick switching
threaded or pad-mount body
M5

NC



3/2
Series
065

FEATURES

- *Miniature solenoid valve for medical analyzers, gas analyzers and leak detectors*
- *New flat-spring technology ensures no contamination of fluids (no friction)*
- *Suitable for the control of gases*
- *The valves have a service life of more than 1 billion cycles when used with neutral gas*
- *Short response times*
- *Easy to integrate thanks to the valves' small size*
- *Available in a variety of versions for a wide range of applications: threaded connections or pad-mount for installation on multiple manifolds*
- *Vacuum application up to 0,1 bar abs. (0,6 mm and 1 mm dia. orifice sizes)*

GENERAL

Differential pressure	See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity	20 cSt (mm²/s)
Response time	< 10 ms
Internal volume	≤ 350 µl (couplings not included)

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gases (filtered 50 µm)	0°C to + 60°C	FPM (fluoroelastomer) (2)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

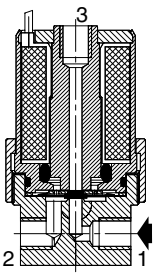
Body	Stainless steel, AISI 303 (1.4305)
Plugnut	Stainless steel
Spring disc	Stainless steel
Seat	Stainless steel
Seals	FPM
Disc	FPM

ELECTRICAL CHARACTERISTICS

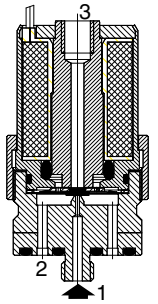
Coil insulation class	F
Connection	Cable leads (ETFE); 0,35 m length
Electrical safety	IEC 335
Electrical enclosure protection	IP40 (EN 60529)
Standard voltages	DC (=) : 6V - 12V - 24V

prefix option	power ratings				operator ambient temperature range (TS)	replacement coil		type (1)
	inrush ~	holding ~		hot/cold =				
	(VA)	(VA)	(W)	(W)	(C°)			
L	-	-	-	2,1 / 2,1	0 to + 60	-	-	01

(1) Refer to the dimensional drawings on the following page.



NC function



NC function, pad-mount body

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air, inert gases (∗)		power coil (W)		catalogue number threaded	catalogue number pad-mount body
	(mm)	(m³/h)	(l/min)		~	=	~	=	=	=
NC - Normally closed										
M5 (3)	0,6	0,013	0,22	0	-	7	-	2,1	**LE065A009V**	**LS065A009V**
	1	0,025	0,43	0	-	5	-	2,1	**LE065A010V**	**LS065A010V**
	1,4	0,032	0,54	0	-	3	-	2,1	**LE065A011V**	**LS065A011V**
	2	0,057	0,95	0	-	1,5	-	2,1	**LE065A012V**	**LS065A012V**

(2) FFPM seals for corrosive fluids (Contact us).
(3) External thread with pad-mount body.

OPTIONS (on request)

- Other seal materials
- Response time 2-3 ms
- Oxygen service
- Other pipe connections are available
- 0,7 W rated coil

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Threaded solenoid valves have 2 mounting holes in body
- Pad-mount valves and o-ring seals for multiple manifolds

ORDERING EXAMPLES:

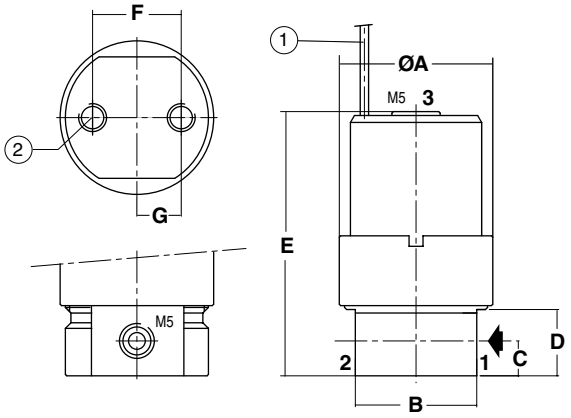
L	E	065 **A** 009	**V**	6V / DC
L	E	065 **A** 010	**V**	24V / DC
L	S	065 **A** 009	**V**	12V / DC
L	S	065 **A** 011	**V**	6V / DC

prefix
pipe thread
basic number
voltage
suffix

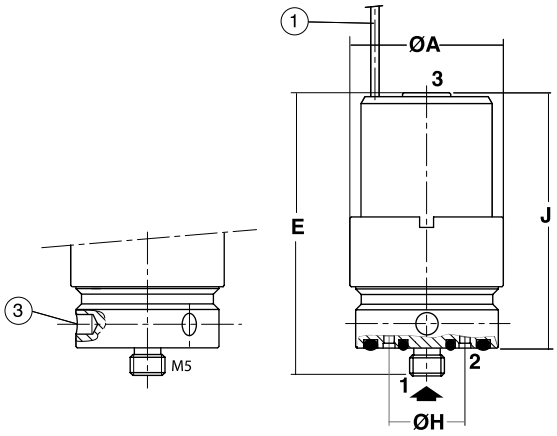
DIMENSIONS (mm), WEIGHT(kg)

TYPE 01
Prefix "L" Solenoid
Cable ends
IP40

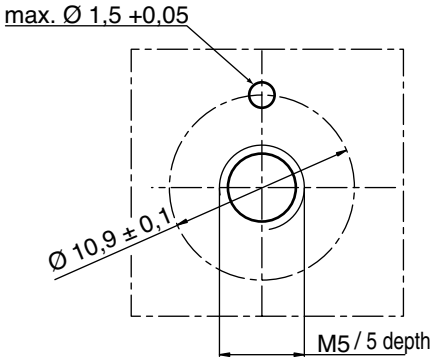
LE065A009V/010V/011V/012V



LS065A009V/010V/011V/012V



Mounting pad



type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	weight (1)
01	L	LE065A009V/010V/011V/012V	22	17,4	5	9,5	38	12,7	6,35	-	-	0,068
		LS065A009V/010V/011V/012V	22	-	-	-	41	-	-	10,9	37	0,066

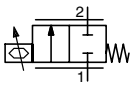
(1) Including leads, length 0,35 m.

(1) 2 electrical supply wires, length: 0,35 m.
(2) 2 mounting holes Ø M4, depth 6 mm.
(3) Mounting with hook spanner wrench DIN 1810B.

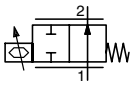
PROPORTIONAL MINI PIEZO-VALVES PIEZOTRONIC

ISO 15218 (CNOMO, size 15) interface
pad mounting body, M5 subbase

NC



NO



2/2
Series
630

FEATURES

- *Miniature, ultra-low power consumption (0,004 W), almost no heat dissipation*
- *Pad mounting proportional mini piezo-valves available with single subbase M5*
- *Variable flow, proportional to the control signal*
- *No wearing parts: practically unlimited service life*
- *No inductive peaks when switching: no circuit protection necessary*
- *Valves do not require a minimum operating pressure*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar = 100 kPa]
Pneumatic base ISO 15218 (CNOMO E06.36.120N, size 15)
Response time 8 - 15 ms

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gas filtered at 5 µm, unlubricated, condensate free, dew point -10°C	0°C to + 60°C	NBR (nitrile)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Body PPS
Internal parts Piezo ceramics, brass
Seals NBR
Subbases Brass or aluminium

ELECTRICAL CHARACTERISTICS

Connector Spade plug (cable Ø 6-7 mm)
Connector specification DIN 43650, 9,4 mm, form C
or 2 leads outlet AWG 28, length 1 m
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages (U_N) DC (=) : 0 to 40 V

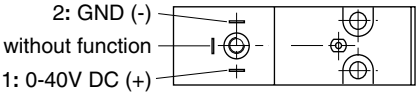
holding current	power ratings				ambient temperature range (TS)	type (1)
	inrush ~	holding ~		hot/cold =		
(mA)	(VA)	(VA)	(W)	(W)	(C°)	
< 100	-	-	-	0,004	0 to + 60	01-02

Voltage regulation 0 - 40 V DC
Flow regulation characteristic Hysteresis < 10 to 15%

ELECTRICAL CONNECTION

(Polarized piezo valve)

Version with spade plug connection:



Version with 2 leads:
red wire: +
black wire: -

SPECIFICATIONS

connection	flow coefficient Kv		operating pressure differential (bar)			holding power (W)		catalogue number			
			min.	max. (PS) air (∗)				without manual operator		with impulse manual operator	
								connector	leads	connector	leads
	(m^3/h)	(l/min)		~	=	~	=	=	=	=	=
NC - Normally closed											
pad mounting	0,005	0,086	0	-	8	-	0,004	**63000075**	**63000035**	**63000079**	**63000039**
	0,007	0,12	0	-	4	-	0,004	**63000076**	**63000036**	**63000080**	**63000040**
NO - Normally open											
pad mounting	0,005	0,086	0	-	8	-	0,004	**63000077**	**63000037**	**63000081**	**63000041**
	0,007	0,12	0	-	4	-	0,004	**63000078**	**63000038**	**63000082**	**63000042**

SUBBASES (2)

pipe size	mounting type	description	catalogue number	
			aluminium	brass
Single subbase, ISO 15218 (CNOMO E06.36.120N, size 15)				
M5	individual mounting	M5 lateral connection	**88263002**	**30300001**

(1) Refer to the dimensional drawings on the following page.
(2) Multiple subbases, contact us.

OPTIONS

- Plug with cable length of 2m

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Mounting on single subbases
- Unlike the on/off type, the proportional version is not equipped with electronics. Please check for correct polarity when connecting the valve. The piezo element will be damaged if the polarity of the connections is inversed. The control system of the user must be used for charging and discharging.

Important note: The peak current must be limited by serial resistor greater than 30 ohms

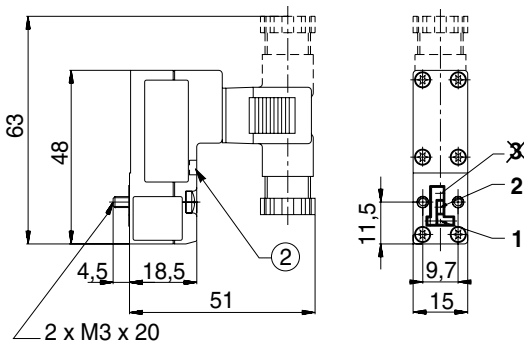
- Installation/maintenance instructions are included with each valve

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01

IEC 335 / DIN 43650
IP65

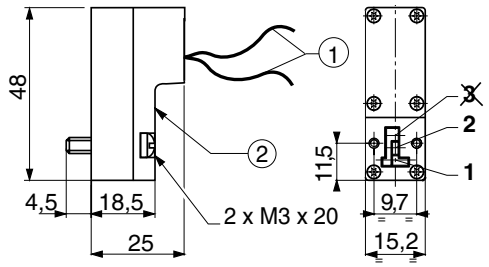
63000075/76/77/78/79/80/81/82

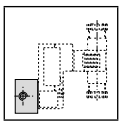


TYPE 02

IEC 335
IP65

63000035/36/37/38/39/40/41/42

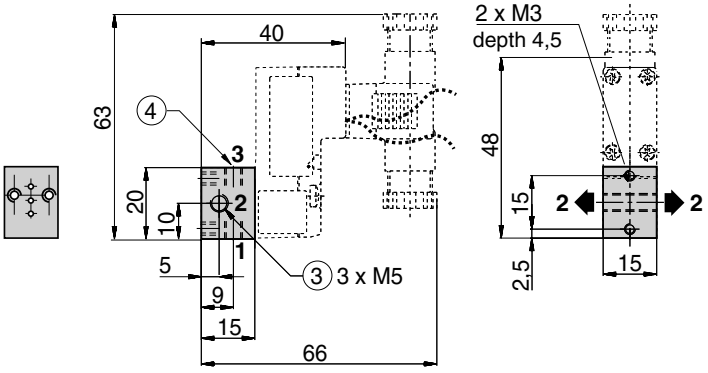


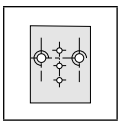


SINGLE SUBBASE M5

Aluminium or brass

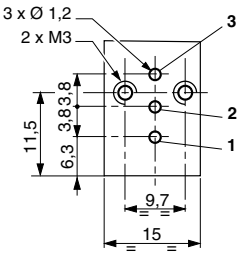
88263002 - 30300001





SUBBASE MOUNTING PATTERN

ISO 15218/CNOMO E06.36.120N, size 15

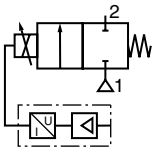


type	catalogue number	weight
01	63000075/76/77/78/79/80/81/82	0,040
02	63000035/36/37/38/39/40/41/42	0,032
-	88263002	0,012
-	30300001	0,034

(1) 2 leads AWG 28, length 1 m
(2) Manual operator location
(3) Outlet (2) can be connected on the left or on the right of subbase; close the unused port with a Ø M5 plug (supplied)
(4) Port (3) not used (to be provided with protection)

PROPORTIONAL SOLENOID VALVE
PRECIFLOW 12,7 mm
direct operated, pad mount

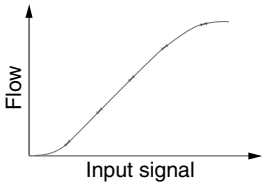
NC



2/2
Series
202

FEATURES

- *Low hysteresis*
- *Variable flow, proportional to the control signal*
- *Valves do not require a minimum operating pressure.*
- *Suitable for vacuum operation.*
- *Solenoid valves satisfy all relevant EC directives.*
- *RoHS compliant.*



GENERAL

Differential pressure See "Specifications" [1 bar =100 kPa]
Pneumatic base (subbase mount) Refer to the dimensional drawings on the following page.

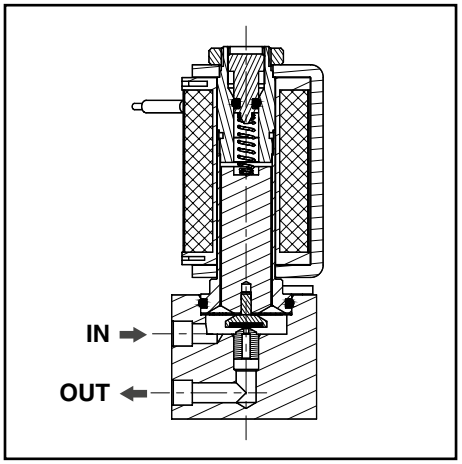
fluids (✳)	temperature range (TS)	seal materials (✳)
Air, oxygen, inert gas (1)	0°C to + 55°C	FPM / FFPM

(1) Filtration: 5 µm

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified.

Body Brass
Core tube Brass
Core and plugnut Stainless steel
Springs Stainless steel
Seat Stainless steel
Seals FPM / FFPM
Other materials on request.



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Cable ends AWG 24; L = 500mm
Electrical safety IEC 335
Electrical enclosure protection IP50
Standard voltages DC (=) : 6V/12V/24V

Voltage	max. operating current	power ratings				operator ambient temperature ranges (TS)
		inrush ~	holding ~		hot/cold =	
(V)=	(mA)	(VA)	(VA)	(W)	(W)	(C°)
6	170	-	-	-	1	0 to + 55
	420				2,5	
12	85				1	
	210				2,5	
24	45				1	
	110				2,5	

Voltage regulation 0-6 V DC; 0-12 V DC; 0-24 V DC
6V/12V/24V DC pulse-width modulated (>1000Hz)

Flow regulation characteristics Hysteresis typ. 5%; repeatability typ. 1%; sensitivity typ. 0,1%

SPECIFICATIONS

orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
(mm)	Kv (m³/h)	kv (l/min)	min.	max.	=	pad mount version
0,045	0,00006	0,001	-0,9	10	1	R202A540L0XXXXX
0,07	0,00012	0,002	-0,9	10	1	R202A541L0XXXXX
0,1	0,0003	0,005	-0,9	10	1	R202A542L0XXXXX
0,2	0,0012	0,02	-0,9	10	1	R202A543L0XXXXX
0,4	0,0048	0,08	-0,9	10	2,5	R202A544L0XXXXX
0,6	0,0096	0,16	-0,9	10	2,5	R202A545L0XXXXX
0,8	0,018	0,3	-0,9	10	2,5	R202A546L0XXXXX

ORDERING

15-DIGIT PRODUCT CODE

R202A540	L0	XXX	XX

catalogue number
(see table "SPECIFICATIONS")

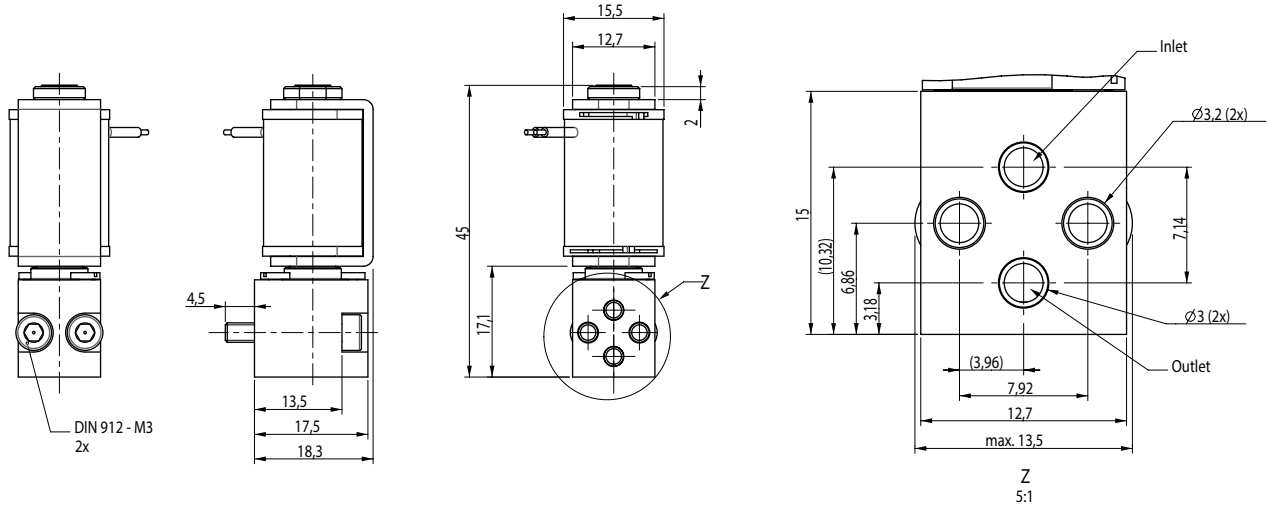
Connector

Voltage
E7 = 6VDC
F3 = 12VDC
F1 = 24VDC

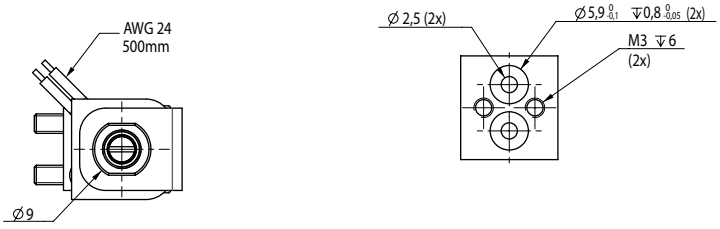
Seal materials
V00 = FPM
100 = FFPM

ORDERING EXAMPLE: R202A542L0V00F1 = 2-way NC (normally closed), orifice size 0,045 mm, pad mount version width 12,7 mm, with cable ends L=500 mm, FPM seal, 24 VDC

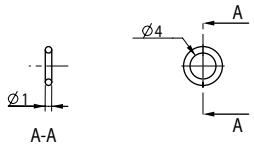
DIMENSIONS (mm)



Mounting pattern



Sealing (optional)



OPTIONS

- Digital control module CONTROL^{D} for DIN EN 50022 rail mounting
  - Used as a current regulator in open loop applications
  - Used with an external sensor for closed-loop applications
- Stainless steel version available on request.
- Other seal materials on request.
- Other voltages on request.
- Subbase with M5 connections and O-ring seals available on request.
- Sealing FFPM: 514684-002 , FPM: 514684-001 (minimum order quantity required).

INSTALLATION

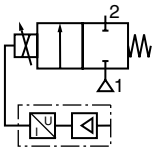
- The solenoid valves can be mounted in any position without affecting operation.

PROPORTIONAL SOLENOID VALVE PRECIFLOW

direct operated, M5-1/8

ISO 15218 (CNOMO size 15) interface, M5 subbase

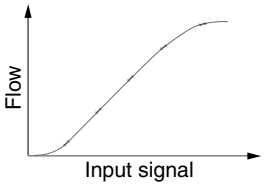
NC



2/2
Series
202

FEATURES

- *Proportional solenoid valve with very low hysteresis*
- *Variable flow, proportional to the control signal*
- *Valves do not require a minimum operating pressure*
- *Suitable for vacuum operation*
- *Solenoid valves satisfy all relevant EC directives*



GENERAL

Differential pressure See "Specifications" [1 bar =100 kPa]
Pneumatic base (subbase mount) ISO 15218 (CNOMO E06.36.120N, size 15)

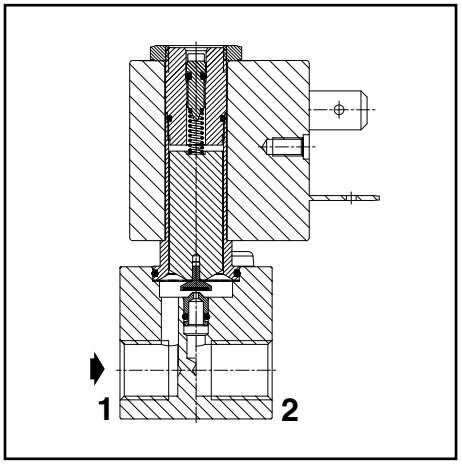
fluids (✳)	temperature range (TS)	seal materials (✳)
air, inert gas (1)	0°C to + 50°C	FPM (fluoroelastomer)

(1) Filtration: M5 or pad mount version: 5 µm - 1/8 : 50 µm.

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Body Brass or PVDF (polyvinyledine fluoride)
Core tube Brass
Core and plugnut Stainless steel
Springs Stainless steel
Seat Stainless steel
Seals FPM



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 4-6 mm, Ø 6-8 mm, Ø 6-10 mm)
connector specification DIN 43650, 9,4 mm, industry standard B (type 01)
DIN 43650, 11 mm, industry standard B (type 02)
ISO 4400 / EN 175301-803, form A (type 03)
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 12V, 24V (other voltages on request)

prefix option	max. operating current (mA)		power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature ranges (TS) (2)	replacement coil =		type (2)
	12 V	24 V	(VA)	(VA)	(W)	(W)	(C°)	12 V DC	24 V DC	
SC	85	40	-	-	-	1	0 to + 50	-	-	01
	340	170	-	-	-	4		-	-	
	400	230	-	-	-	5	0 to + 50	43004151	43004158	02
	760	380	-	-	-	9	0 to + 50	-	-	03

Voltage regulation 0 - 12 V DC, 0 - 24 V DC
12 V and 24 V DC pulse-width modulated (1000 Hz)

Flow regulation characteristics Hysteresis < 3%; repeatability 1%; sensitivity < 1%

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	operating pressure differential (bar) max. (PS) air, inert gas (✳)	power coil (W)	catalogue number threaded body brass	catalogue number threaded body PVDF	catalogue number ISO 15218 (CNOMO, size 15) interface brass
	(mm)	(m³/h)	(l/min)		=	=	(=)	(=)	(=)
NC - Normally closed									
M5 or pad mount	0,1	0,0003	0,005	-0,9	10	1	**SCG202A500**	-	**SCS202A505**
	0,2	0,0012	0,02			1	-	**SCG202A501**	**SCS202A506**
	0,4	0,0048	0,08			4	-	**SCG202A502**	**SCS202A507**
	0,6	0,0096	0,16			4	-	**SCG202A503**	**SCS202A508**
	0,8	0,018	0,3			4	-	**SCG202A504**	**SCS202A509**
G 1/8	0,8	0,018	0,3	-0,9	10	5	**SCG202A510**	-	-
	1,2	0,041	0,68			5	**SCG202A511**	-	-
	1,6	0,071	1,18	-0,9	8	5	**SCG202A512**	-	-
	2,0	0,096	1,6	-0,9	6	9	**SCG202A513**	-	-

(2) Refer to the dimensional drawings on the following page.

SUBBASES (for pad mount ISO 15218 versions)

port connections	type of subbase	description	catalogue number	
			aluminium	brass
Single subbase, ISO 15218 (CNOMO E06.36.120N, size 15)				
M5	single	with lateral M5 connections	**88263002**	**30300001**

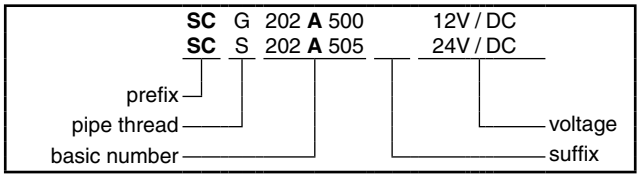
OPTIONS

- Digital control module CONTROL^{D} for DIN EN 50022 rail mounting: (see page 143)
  - Used as a current regulator in open loop applications
  - Used with an external sensor for closed-loop applications
- Electronic control units for proportional control
- Stainless steel version available on request
- Other coil currents on request
- Other pipe connections available on request
- Plug with visual indication and peak voltage suppression or with cable length of 2 m

INSTALLATION

- The valves can be mounted in any position without affecting operation
- Pipe connection identifier is: G = G (ISO 228/1)
- Installation/maintenance instructions are included with each solenoid valve

ORDERING EXAMPLES:

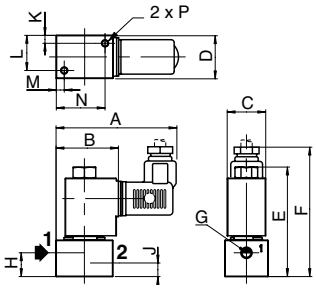


DIMENSIONS (mm), WEIGHT (kg)

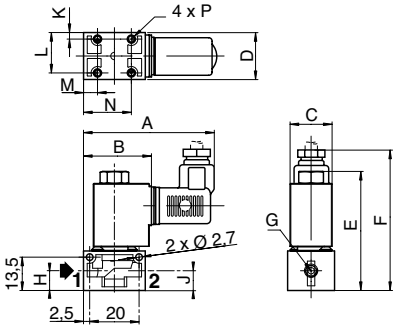
TYPE 01

Prefix "SC" solenoid
Epoxy moulded
IEC 335 / DIN 43650, 9,4 mm
IP65

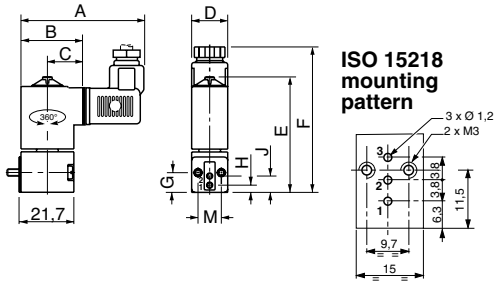
SCG202A500



SCG202A501/A502/A503/A504



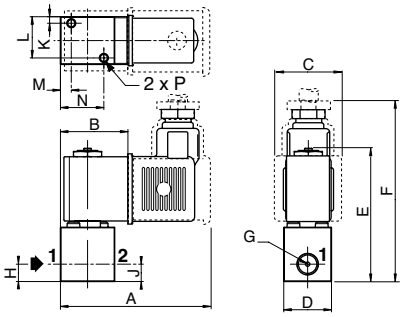
SCS202A505/A506/A507/A508/A509
(Version with ISO 15218 interface for installation on single subbase M5)

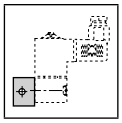


TYPE 02-03

Prefix "SC" solenoid
Epoxy moulded
IEC 335 / DIN 43650 or ISO 4400
IP65

Type 02 : SCG202A510/A511/A512
Type 03 : SCG202A513

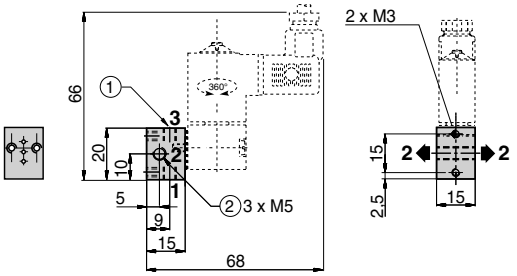




SINGLE SUBBASE M5

Aluminium or brass

88263002 - 30300001



(1) Outlet (2) can be connected to the left or right of the subbase; plug the unused port with a Ø M5 plug (supplied)
(2) Port (3) unused (to be protected with a plug)

type	prefix option	catalogue number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	weight (1)
01	SC	**SCG202A500**	53,9	27,5	17	19	48,2	59,5	M5	10,5	6	3,5	15,5	3,5	21,5	M3	0,100
		SCG202A501/A502/A503/A504	53,9	27,5	17	19	48,2	59,5	M5	8	8	2,65	16,35	5,65	19,35	Ø2,6	0,060
		SCS202A505/A506/A507/A508/A509	53	25,6	14,8	17	48	59,5	8,7	3,5	7,3	-	-	9,7	-	-	0,100
02	SC	**SCG202A510/A511/A512**	63,3	31,1	23	22	60,4	75,4	G1/8	8	8	3	19	5	20	M4	0,200
03	SC	**SCG202A513**	73,3	38	30	22	60,4	79	G1/8	8	8	3	19	5	20	M4	0,200
-	-	**88263002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,012
-	-	**30300001**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,034

(1) Including coil and connector.

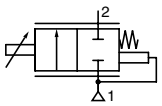
All leaflets are available on: **www.asconumatics.eu**

PROPORTIONAL SOLENOID VALVE
PRECIFLOW 19 mm CARTRIDGE

direct operated

1/8, pad-mount or inline version

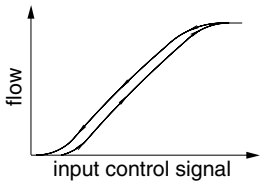
NC



2/2
Series
202

FEATURES

- *Variable flow, proportional to the applied current*
- *Valves do not require a minimum operating pressure*
- *2/2 NC function: fluid entry under the disc*
- *Suitable for the control of air and inert gases*
- *The solenoid valves satisfy all relevant EC directives*



GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Max. overload pressure 15 bar
Maximum viscosity 50 cSt (mm²/s)

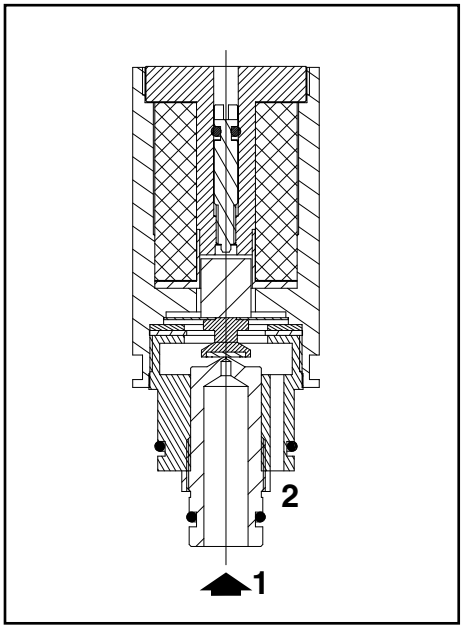
fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gas (1)	+10°C to + 50°C	FPM (fluoroelastomer)

(1) Filtration: 5 µm

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Body Stainless steel
Subbases POM (pad-mount version)
Brass (inline version)
Core and plugnut Stainless steel
Springs Stainless steel
Seat Stainless steel
Seals FPM (EPDM and FFPM on request)
Disc FPM (EPDM and FFPM on request)
Solenoid body PPS



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connection Cable leads (PTFE); 0,23 m length (AWG 24)
Electrical safety IEC 335
Electrical enclosure protection IP50 (EN 60529)
Standard voltages DC (=) : 6V - 12V - 24V
(other voltages on request)

prefix option	voltage	current consumption	power ratings				operator ambient temperature range (TS)	type (1)
			inrush ~	holding ~		hot/cold =		
	(V) =	(mA)	(VA)	(VA)	(W)	(W)	(C°)	
L	6	max. 90	-	-	-	0,5	0 to +50	01
		max. 420				2,5		
	12	max. 45				0,5		
		max. 210				2,5		
	24	max. 25				0,5		
		max. 110				2,5		

(1) Refer to the dimensional drawings on the following page.

Voltage regulation 0 - 6 V DC, 0 - 12 V DC, 0 - 24 V DC
6 V, 12 V and 24 V DC pulse-width modulated (min. 2000 Hz)
Flow regulation characteristics Hysteresis < 5%; Repeatability 1%; Sensitivity < 1%

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number
				min.	max. (PS) air, inert gas (∗)		
	(mm)	(m³/h)	(l/min)		=	=	(=)
NC - Normally closed							
Cartridge	0,1	0,0003	0,005	-0,9	10	0,5	**LS202A517**
	0,2	0,0012	0,02		10		**LS202A518**
	0,5	0,0072	0,12		10	2,5	**LS202A519**
	0,8	0,015	0,25		10		**LS202A520**
	1,2	0,021	0,35		10		**LS202A521**
	1,6	0,028	0,47		10		**LS202A522**

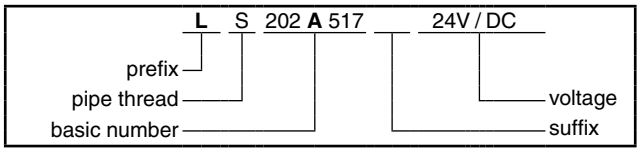
OPTIONS

- Digital control module CONTROL^{D} for DIN EN 50022 rail mounting (catalogue numbers: **60300117** - **60300118**)
  Features:
  - Control device for PWM (pulse-width modulated) proportional valve control
  - Designed for open-loop, closed-loop and double-loop (cascaded) control
  - Suitable for the control of flow, pressure, temperature, force etc.
  - Integrated display and LEDs
  - Control parameters adjustable via software (DigiCom, USB interface)
  - Auto-Adapt function/button for automatic adjustment of the CONTROL^{D} control device to the control valve
  - CONTROL^{D} software„ASCO-DigiCom“ for adjustment over PC. Setpoint and feedback values are viewed at the same time
  - Valve diagnostics, parameter setting and maintenance
- Other pipe connections are available on request
- Other seal materials are available on request

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Pipe connection identifier is G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

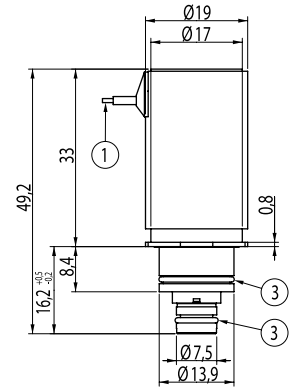
ORDERING EXAMPLES:

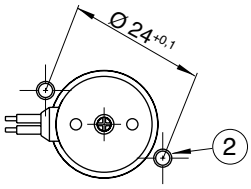


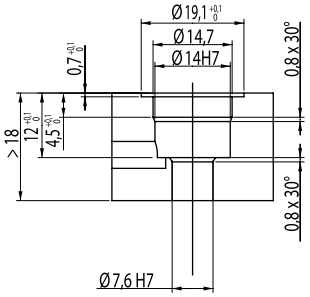
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix “L” Solenoid
Cable ends
IP40

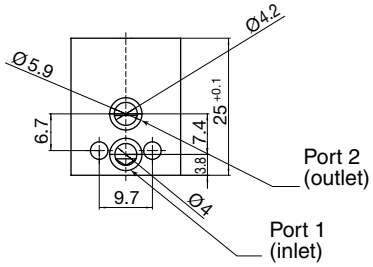
Preciflow 19 mm cartridge

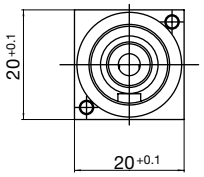


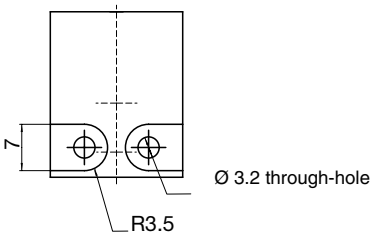




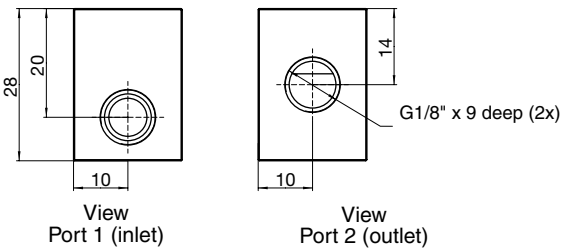
Pad-mount subbase 833-943762
POM (supplied with 2 screws M3x20 and O-rings)

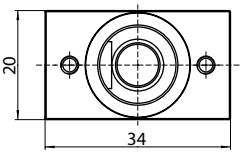


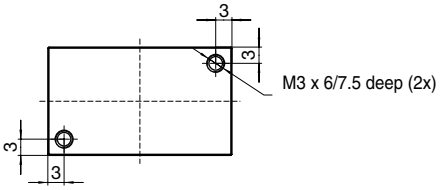




Inline subbase 833-943675
Brass







catalogue number	weight
LS202A517/518/519/520/521/522	0,063 (1)
833-943675	0,120
833-943762	0,010

(1) Including leads, length 0,23 m

(1) 2 electrical supply wires, length: 0,23 m
(2) Mounting: 2 screws M3 x 6 mm + washers
(3) O-ring

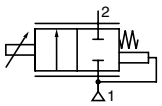
All leaflets are available on: **www.asconumatics.eu**

PROPORTIONAL SOLENOID VALVE
PRECIFLOW IPC

direct operated

1/8, cartridge or pad-mount version

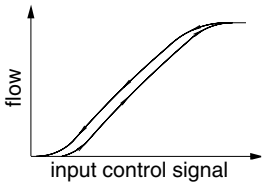
NC



2/2
Series
202

FEATURES

- *Variable flow, proportional to the applied current*
- *Inlet Pressure Compensated construction (IPC)*
- *Valves do not require a minimum operating pressure*
- *2/2 NC function: fluid entry under the disc*
- *The solenoid valves satisfy all relevant EC directives*



CE

GENERAL

Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Max. backpressure 10% of inlet pressure
Max. overload pressure 10 bar
Maximum viscosity 50 cSt (mm²/s)

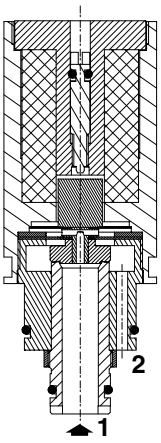
fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gas (1)	+10°C to + 50°C	FPM (fluoroelastomer)

(1) Filtration: 5 µm

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

Body Brass or stainless steel
or POM (pad-mount version)
Core and plugnut Stainless steel
Springs Stainless steel
Seat Stainless steel
Seals FPM, NBR
Disc FPM



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connection Cable leads (PTFE); 0,23 m length (AWG 24)
Electrical safety IEC 335
Electrical enclosure protection IP40 (EN 60529)
Standard voltages DC (=) : 6V - 12V - 24V
(other voltages on request)

prefix option	voltage	current consumption	power ratings				operator ambient temperature range (TS)	type (1)
			inrush ~	holding ~		hot/cold =		
	(V) =	(mA)	(VA)	(VA)	(W)	(W)	(C°)	
L	6	max. 420	-	-	-	2,5	+10 to + 50	01
	12	max. 210						
	24	max. 110						

(1) Refer to the dimensional drawings on the following page.

Voltage regulation 0 - 6 V DC, 0 - 12 V DC, 0 - 24 V DC
6 V, 12 V and 24 V DC pulse-width modulated (2000 Hz)
Flow regulation characteristics Hysteresis < 5%; Repeatability 1%; Sensitivity < 1%

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		power coil (W)	catalogue number		
				min.	max. (PS) air, inert gas (∗)		brass	stainless steel	POM
	(mm)	(m³/h)	(l/min)		=	=	(=)	(=)	(=)
NC - Normally closed									
G 1/8	3	0,17	2,8	0	7	2,5	**LG202A514**	-	-
13,9 mm cartridge	3	0,17	2,8	0	7	2,5	-	**LS202A515**	-
pad mounting	3	0,17	2,8	0	7	2,5	-	-	**LS202A516**

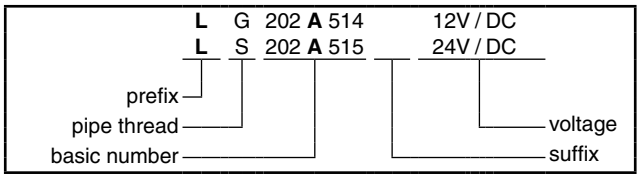
OPTIONS

- Digital control module CONTROL^D for DIN EN 50022 rail mounting (catalogue numbers: **60300117** - **60300118**)
  Features:
  - Control device for PWM (pulse-width modulated) proportional valve control
  - Designed for open-loop, closed-loop and double-loop (cascaded) control
  - Suitable for the control of flow, pressure, temperature, force etc.
  - Integrated display and LEDs
  - Control parameters adjustable via software (DigiCom, USB interface)
  - Auto-Adapt function/button for automatic adjustment of the CONTROL^D control device to the control valve
  - CONTROL^D software„ASCO-DigiCom“ for adjustment over PC. Setpoint and feedback values are viewed at the same time
  - Valve diagnostics, parameter setting and maintenance
- Other pipe connections are available on request

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Pipe connection identifier is G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

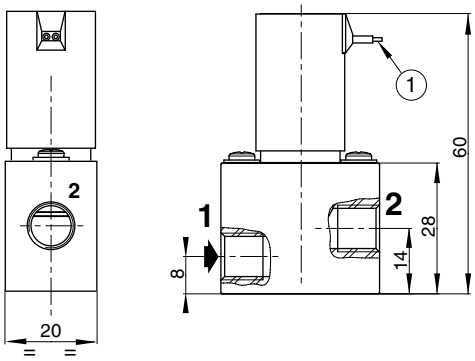
ORDERING EXAMPLES:

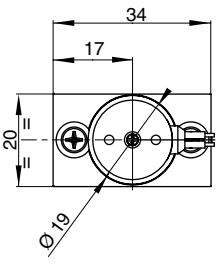


DIMENSIONS (mm), WEIGHT (kg)

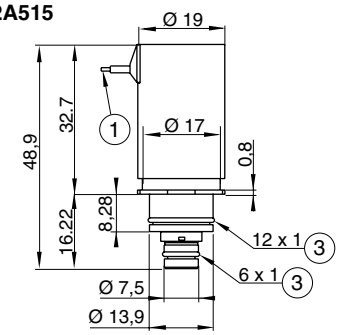
TYPE 01
Prefix “L” Solenoid
Cable ends
IP40

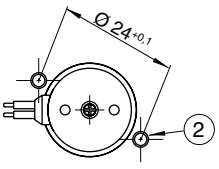
LG202A514

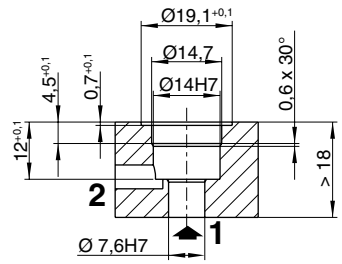




LS202A515

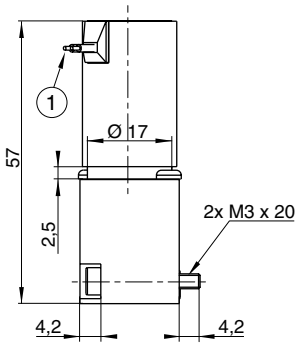


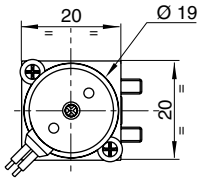


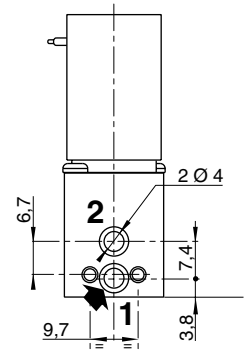


Mounting geometry

LS202A516







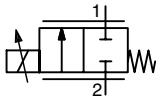
Mounting pad

(1) 2 electrical supply wires, length: 0,23 m.
(2) Mounting: 2 screws M3 x 6 mm + washers
(3) O-Ring

type	prefix option	catalogue number	weight (1)
01	L	LG202A514	0,183
		LS202A515	0,063
		LS202A516	0,073

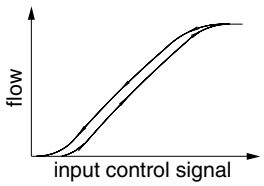
(1) Including leads, length 0,23 m.

PROPORTIONAL SOLENOID VALVE
POSIFLOW
direct operated
1/8

NC 

FEATURES

- *Variable flow, proportional to the control signal*
- *Valves do not require a minimum operating pressure*
- *Valves can be mounted in any position*
- *The solenoid valves satisfy all relevant EC directives*



GENERAL

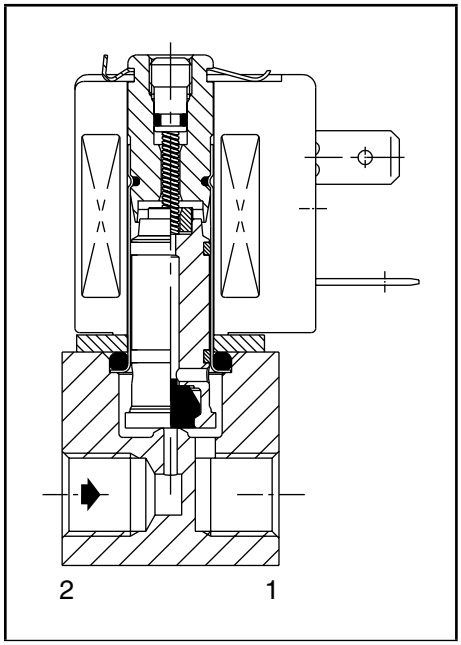
Differential pressure See «SPECIFICATIONS» [1 bar =100 kPa]
Maximum viscosity 50 cSt (mm²/s)

fluids (∗)	temperature range (TS)	seal materials (∗)
air, inert gas, water, oil	0°C to + 50°C	FPM (fluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(∗) Ensure that the compatibility of the fluids in contact with the materials is verified

	Brass body	Stainless steel body
Body	Brass	AISI 303
Core tube	Stainless steel	Stainless steel
Core and plugnut	Stainless steel	Stainless steel
Springs	Stainless steel	Stainless steel
Riderring	PTFE	PTFE
Seat	Brass	Stainless steel
Seals	FPM	FPM
Disc	FPM	FPM
Breaker piece	Stainless steel	Stainless steel



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 6-8 mm)
Connector specification DIN 43650, 11 mm, industry standard B
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V (Other voltages on request)

prefix option	operating current	power ratings				operator ambient temperature range (TS) (2)	replacement coil	type (1)
		inrush ~	holding ~		hot/cold =		=	
	(mA)	(VA)	(VA)	(W)	(W)	(C°)	24 V DC	
SC	100 - 450	-	-	-	8,6 / 6,3	0 to + 40	-	01

Voltage regulation 0 - 24 V DC
24 V DC pulse width modulated (400 Hz)

Flow regulation characteristics (2) Hysteresis < 5%; Repeatability < 1% ; Sensitivity < 1%

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)					power coil (W)	catalogue number		options		
				min.	max. (PS)									
					vacuum	air (∗)	water (∗)	oil (∗)		brass	stainless steel	EPDM	PTFE	
G	(mm)	(m³/h)	(l/min)				=	=	=	(=)				
NC - Normally closed														
1/8	1,2	0,05	0,7	0	1	8	5	5	6,3	**SCG202A201V**	**SCG202A205V**	**E**	**T**	**-**
	1,6	0,07	1,1	0	1	6	4	4	6,3	**SCG202A202V**	**SCG202A206V**	**E**	**T**	**-**
	2,4	0,13	2,2	0	1	4	3	3	6,3	**SCG202A203V**	**SCG202A207V**	**E**	**T**	**-**
	3,2	0,18	2,9	0	1	2,5	2,5	2,5	6,3	**SCG202A204V**	**SCG202A208V**	**E**	**T**	**-**

(1) Refer to the dimensional drawings on the following page.
(2) Percentage of max. value with 24 V DC, P.W.M. 400 Hz, supply at constant differential pressure.

OPTIONS

- Valves can also be supplied with NBR (nitrile), EPDM (ethylene propylene) and PTFE seals and discs
- Explosionproof enclosures for use in zones 1/21-2/22, categories 2-3 to ATEX Directive 94/9/EC, on request
- Electrical enclosures according to “NEMA” standards are available
- Mounting brackets
- Digital control unit (see page 145)
  Features:
  - analog input control signals: 0 - 10 V DC or 4 - 20 mA
  - coil current (= flow rate) adjustable to required control signals
  - switch-off function at less than 2% of the maximum control function
  - adjustable ramp control
  - adjustable frequency
  - output current independent of coil resistance and supply voltage variations
  - housed in: a box with spade plug connector according to ISO 4400 / IP65
- Other pipe connections are available on request

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Solenoid valves have 2 mounting holes in body
- Threaded pipe connection is standard: G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

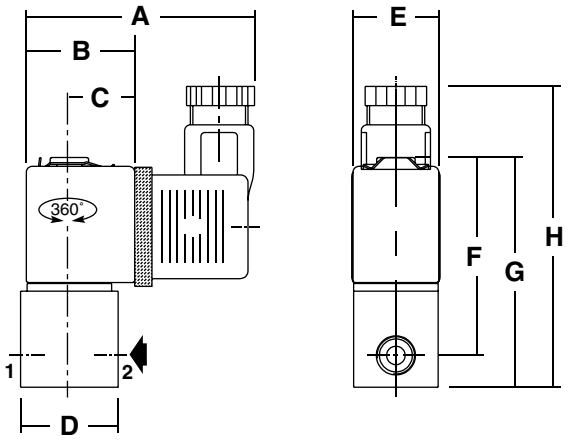
ORDERING EXAMPLES:

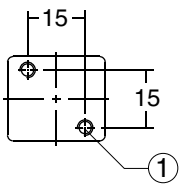
SC G 202 **A** 201 **V** 24V / DC
SC G 202 **A** 205 **E** 24V / DC

prefix
pipe thread
basic number
voltage
suffix

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix “SC” Solenoid
Epoxy moulded
IEC 335 / DIN 43650
IP65



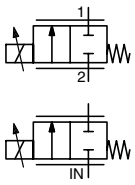


type	prefix option	A	B	C	D	E	F	G	H	X	weight (1)
01	SC	59	28	17	25	22	52	60	78	-	0,2

(1) including coil and connector.

PROPORTIONAL SOLENOID VALVES
POSIFLOW
direct operated
1/4 - 3/8

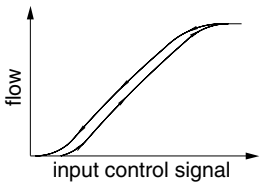
NC



2/2
Series
202

FEATURES

- *Variable flow, proportional to the input control signal*
- *Valve do not require a minimum operating pressure*
- *Valves can be mounted in any position*
- *ASCO solenoid valves satisfy all relevant EC directives*



GENERAL

Differential pressure See "SPECIFICATIONS" [1 bar =100 kPa]
Maximum viscosity 21 cSt (mm²/s)

fluids (✳)	temperature range (TS) (2)	seal materials (✳)
air, inert gas, water, oil	- 10°C to + 90°C	FPM (fluoroelastomer)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

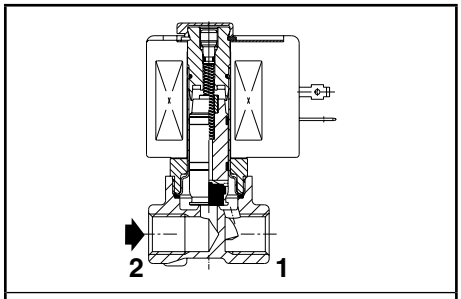
	Brass body	Stainless steel body
Body	Brass	AISI 303 SS
Core tube	Stainless steel	Stainless steel
Core and plugnut	Stainless steel	Stainless steel
Springs	Stainless steel	Stainless steel
Riderring	PTFE	PTFE
Seat	Brass	Stainless steel
Seal, disc	FPM	FPM
Breaker piece	Stainless steel	Stainless steel

ELECTRICAL CHARACTERISTICS

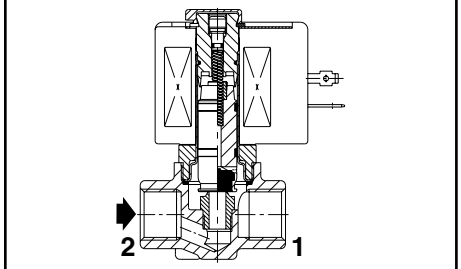
Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm)
Connector specification ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=) : 24V (other voltages on request)

prefix option	operating current	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature ranges (TS) (2)	replacement coil =	type (1)
	(mA)	(VA)	(VA)	(W)	(W)	(C°)	24 V DC	
SC	100 - 500	-	-	-	11 / 8	-10 to + 75	400429-040	01

Voltage regulation 0 - 24 V DC
24 V DC pulse width modulated (300 Hz)
Flow regulation characteristics (3) Hysteresis < 5 % ; Repeatability < 3 % ;
Sensitivity < 2 %



1/4 (brass body)



3/8 (brass body)

SPECIFICATIONS

pipe size		orifice size	flow coefficient kv		operating pressure differential (bar) min.	max. (PS) vacuum	air, water, oil (✳)	power coil (W)	catalogue number brass (=) air / inert gas	brass (=) liquids	stainless steel (=) air / inert gas	stainless steel (=) liquids	options EPDM	CR	PTFE
		(mm)	(m³/h)	(l/min)		=	=	=							
NC - Normally closed															
1/4	G	1,2	0,05	0,8	0	1	16	8	SCG202A001V	SCG202A051V	-	-	E	J	T
	NPT								-	-	SCB202A011V	SCB202A061V	E	J	T
	G	2,4	0,12	2	0	1	8	8	SCG202A002V	SCG202A052V	-	-	E	J	T
	NPT								-	-	SCB202A012V	SCB202A062V	E	J	T
	G	3,2	0,24	4,0	0	1	4	8	SCG202A003V	SCG202A053V		-	E	J	T
	NPT									-	SCB202A013V	SCB202A063V	E	J	T
	G	4,0	0,42	7,0	0	1	2,5	8	SCG202A004V	SCG202A054V		-	E	J	T
	NPT									-	SCB202A014V	SCB202A064V	E	J	T
	G	5,6	0,72	12,0	0	1	1,4	8	SCG202A006V	SCG202A056V		-	E	J	T
	NPT									-	SCB202A016V	SCB202A066V	E	J	T
	G	7,1	0,90	15,0	0	1	1	8	SCG202A007V	SCG202A057V		-	E	J	T
	NPT									-	SCB202A017V	SCB202A067V	E	J	T
3/8	Rp	3,2	0,24	4,0	0	1	4	8	SCE202A023V	SCE202A073V	-	-	E	J	T
	NPT								-	-	SCB202A033V	SCB202A083V	E	J	T
	Rp	4,0	0,42	7,0	0	1	2,5	8	SCE202A024V	SCE202A074V	-	-	E	J	T
	NPT								-	-	SCB202A034V	SCB202A084V	E	J	T
	Rp	5,6	0,72	12,0	0	1	1,4	8	SCE202A026V	SCE202A076V	-	-	E	J	T
	NPT								-	-	SCB202A036V	SCB202A086V	E	J	T
	Rp	7,1	0,90	15,0	0	1	1	8	SCE202A027V	SCE202A077V	-	-	E	J	T
	NPT								-	-	SCB202A037V	SCB202A087V	E	J	T

(1) Refer to the dimensional drawings on the following page.
(2) Damage may occur when liquids solidify above the specified minimum temperature.
(3) Percentage of max. value with 24 V DC, P.W.M. 300 Hz, supply at constant ç P.

OPTIONS

- Valves can also be supplied with NBR (nitrile), EPDM (ethylene-propylene), CR (chloroprene / neoprene) and PTFE seals and discs
- Waterproof enclosure with embedded screw terminal coil according to protection class IP67, CEE-10
- Explosionproof enclosures for use in zones 1/21-2/22, categories 2-3 to ATEX Directive 94/9/EC, on request
- Electrical enclosures according to “NEMA” standards are available
- Mounting brackets
- Digital control unit (see page 145)
  Features:
  - input control signals, analog: 0 - 10 V DC or 4 - 20 mA
  - adjustable coil current
  - switch-off function at less than 2% of the maximum control function
  - adjustable ramp control
  - Adjustable frequency
  - output current independent of coil resistance and supply voltage variations
  - housed in: a box with spade plug connector according to ISO 4400 / IP65
- Other pipe connections are available on request

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation
- Brass and NPT 3/8 stainless steel solenoid valves have 2 mounting holes in body
- NPT 1/4 stainless steel valves are standard supplied with mounting brackets
- Threaded pipe connection is standard: E = Rp (ISO 7/1) ; G = G (ISO 228/1) ; B = NPT (ANSI 1.20.3)
- Installation/maintenance instructions are included with each valve

ORDERING EXAMPLES:

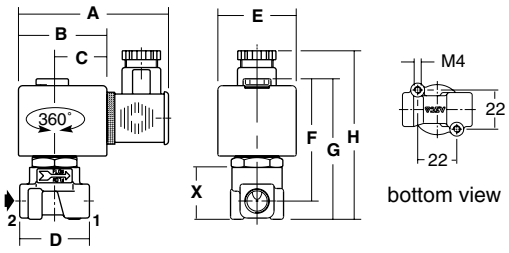
SC	G	202 **A** 001	**V**	24V / DC
SC	B	202 **A** 011	**V**	24V / DC

prefix
pipe thread
basic number
voltage
suffix

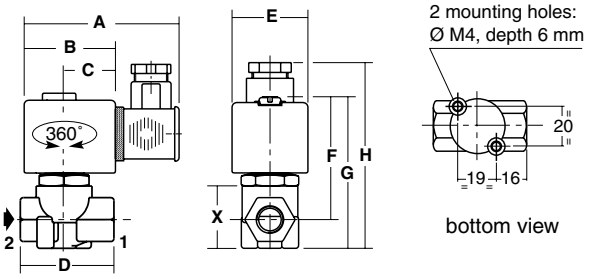
DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" solenoid
Epoxy moulded
IEC 335 / ISO 4400
IP65

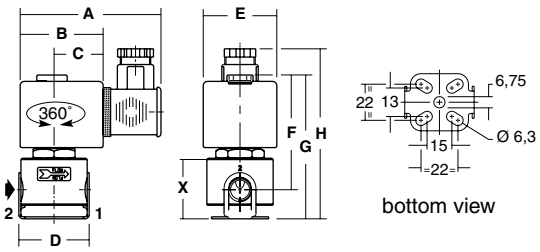
SCG202A001V/002V/003V/004V/006V/007V
SCB202A051V/052V/053V/054V/056V/057V



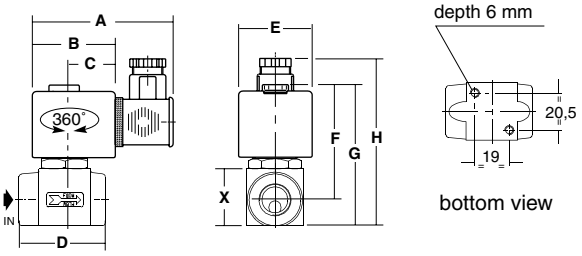
SCE202A023V/024V/026V/027V
SCE202A073V/074V/076V/077V



SCG202A011V/012V/013V/014V/016V/017V
SCB202A061V/062V/063V/064V/066V/067V



SCB202A033V/034V/036V/037V
SCB202A083V/084V/086V/087V

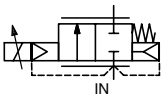


type	prefix option	catalogue number	A	B	C	D	E	F	G	H	X	weight (1)
01	SC	SCG202A001V/002V/003V/004V/006V/007V/051V/052V/053V/054V/056V/057V	85	50	30	40	45	68	79	95	30	0,50
		SCG202A011V/012V/013V/014V/016V/017V/061V/062V/063V/064V/066V/067V	80	50	30	42	45	60	79	95	37	0,60
		SCE202A023V/024V/026V/027V/073V/074V/076V/077V	80	50	30	48	45	68	82	97	32	0,50
		SCB202A033V/034V/036V/037V/083V/084V/086V/087V	80	50	30	51	45	68	81	97	31	0,65

(1) Including coil and connector.

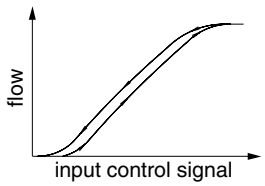
All leaflets are available on: **www.asconumatics.eu**

PROPORTIONAL SOLENOID VALVES
POSIFLOW
pilot operated
3/8 - 1/2

NC 

FEATURES

- *Open loop proportional valves for automatic flow control of water and other non-corrosive liquids*
- *Special valve design to reduce pressure surges to a minimum, preventing waterhammer and ensuring noise-free closing*
- *ASCO solenoid valves satisfy all relevant EC directives*



GENERAL

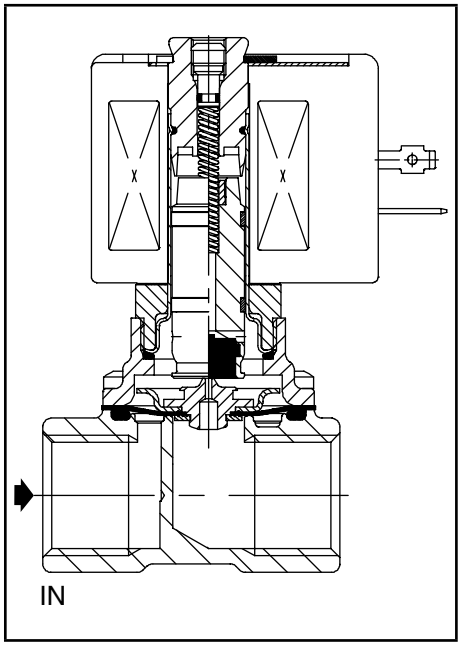
Differential pressure See "SPECIFICATIONS" [1 bar =100 kPa]
Maximum viscosity 40 cSt (mm²/s)

fluids (✳)	temperature range (TS) (1)	seal materials (✳)
water, oil	- 10°C to + 90°C	NBR (nitrile)

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Body Brass
Core tube Stainless steel
Core and plugnut Stainless steel
Springs Stainless steel
Riderring PTFE
Seals, diaphragm NBR
Disc FPM
Breaker piece Stainless steel



ELECTRICAL CHARACTERISTICS

Coil insulation class F
Connector Spade plug (cable Ø 6-10 mm)
Connector specification ISO 4400 / EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection Moulded IP65 (EN 60529)
Standard voltages DC (=): 24V (other voltages on request)

prefix option	operating current	power ratings inrush ~	holding ~		hot/cold =	operator ambient temperature ranges (TS) (2)	replacement coil =	type (1)
	(mA)	(VA)	(VA)	(W)	(W)	(C°)	24 V DC	
SC	100 - 500	-	-	-	11 / 8	-20 to + 75	400429-040	01

Voltage regulation 0 - 24 V DC
24 V DC pulse width modulated (300 Hz)

Flow regulation characteristics (3) Hysteresis < 7,5 % ; Repeatability < 3 % ;
Sensitivity < 2 %

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar) min.	max. (PS) water (✳)	max. (PS) oil (✳)	power coil (W)	catalogue number	options FPM		
	(mm)	(m³/h)	(l/min)		=	=	=	(=)			
NC - Normally closed											
3/8	12,5	2,1	35	0,3	10	10	8	**SCG203B001**	V	-	-
1/2	12,5	2,1	35	0,3	10	10	8	**SCG203B002**	V	-	-

(1) Refer to the dimensional drawings on the following page.
(2) Damage may occur when liquids solidify above the specified minimum temperature.
(3) Percentage of max. value with 24 V DC, P.W.M. 300 Hz, supply at constant ç P.

OPTIONS

- Valves can also be supplied with FPM (fluoroelastomer) seals and discs
- Waterproof enclosure with embedded screw terminal coil according to protection class IP67, CEE-10
- Explosionproof enclosures for use in zones 1/21-2/22, categories 2-3 to ATEX Directive 94/9/EC, on request
- Electrical enclosures according to “NEMA” standards are available
- Mounting brackets
- Digital control unit (see page 145)
  Features:
  - input control signals, analog: 0 - 10 V DC or 4 - 20 mA
  - adjustable coil current (= flow rate) at required control signals
  - switch-off function at less than 2% of the maximum control function
  - adjustable ramp control
  - Adjustable frequency
  - output current independent of coil resistance and supply voltage variations
  - housed in: a box with spade plug connector according to ISO 4400 / IP65

INSTALLATION

- The solenoid valves can be mounted in any position without affecting operation. For optimum performance mount solenoid vertical and upright
- Threaded pipe connection is standard: G = G (ISO 228/1)
- Installation/maintenance instructions are included with each valve

SPARE PARTS KITS

catalogue number	spare parts kit no.	
	~	=
SCG203B001/B002	-	**C132856**

(1) Standard prefixes and suffixes also apply to kits
- Not available.

ORDERING EXAMPLES / VALVES:

SC G 203 **B** 001 24V / DC
SC G 203 **B** 002 **V** 24V / DC

prefix
pipe thread
basic number
voltage
suffix

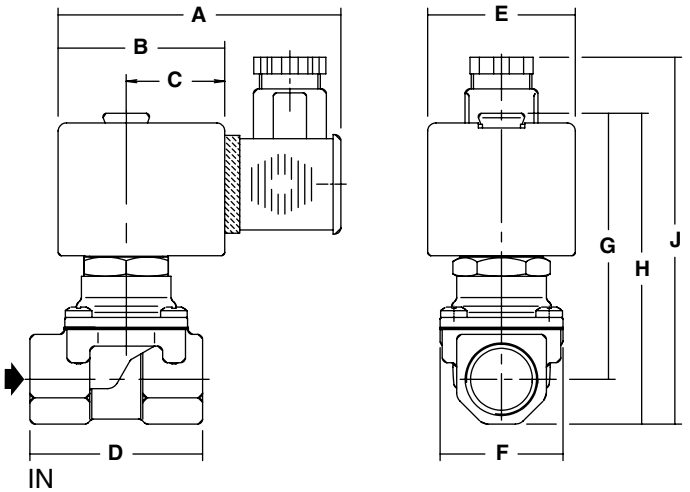
ORDERING EXAMPLES / KITS:

C132856(1)
C132856 **V**

basic number
suffix

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01
Prefix "SC" solenoid
Epoxy moulded
IEC 335 / ISO 4400
IP65



type	prefix option	code	A	B	C	D	E	F	G	H	J	X	weight (1)
01	SC	SCG203B001	85	50	30	52	45	37	80	94	105	-	0,65
		SCG203B002											0,6

(1) Including coil and connector.

PROPORTIONAL VALVES
SENTRONIC^{LP}
G1/4 tapped body or subbase mounted body
with digital pressure control

3 ports
Series
617

FEATURES

- **SENTRONIC^{LP}** *stands for:*
  - *Low power consumption (3,8 W)*
  - *Digital communication and control*
  - *Display (integrated) with function buttons (option)*
  - *Pilot operated proportional valve*
- *Other functions are valve diagnostics, parameter setting and maintenance.*
- *The valve's outlet pressure can also be adjusted over the integrated display and the function buttons.*
- *RoHS, REACH compliant.*

GENERAL

Fluids	Air or neutral gas filtered at 50 µm, without condensate, lubricated or unlubricated, class 5 according to ISO 8573-1:2010 [7:4:4]
Max. allowable pressure (MAP)	At least 1 bar above the maximum outlet pressure
Pressure range	0-3 bar, 0-6 bar, 0-10 bar
Fluid temperature	0°C to +60°C
Ambient temperature	0°C to +50°C
Flow (Qv at 6 bar)	470 Nl/min
Setpoint	0 - 10 V (Impedance 100 kΘ) 0 - 20 mA / 4 - 20 mA (Impedance 250 Θ)
Hysteresis	1% of span
Linearity	1% of span
Repeatability	1% of span
Minimum setpoint	100 mV (0,2 mA/4,2mA) with shutoff function
Minimum outlet pressure	1% of span
Failsafe behaviour	Pressure hold on loss of power, without control

CONSTRUCTION

Body	Aluminium
Internal parts	POM (polyacetal)
Seals	NBR (nitrile)

ELECTRICAL CHARACTERISTICS

nominal diameter DN (mm)	**stabilised voltage ***	**max. power** (W)	**max. current** (mA)	**insulation class**	**degree of protection**	**electrical connection**
4	24VDC	3,8 W (<1W compensate)	160	H	IP 65	5-pin M12 connector (to be ordered separately)

* Max. ripple: 10 %

SPECIFICATIONS

Ø port	**Ø orifice DN** (mm)	**flow** K_v**-coefficient** (Nm^3/h)	**flow at 6 bar** (Nl/min)
G 1/4	4	0,43	470

Test conditions according to ISO 8778: temperature: 20 °C, relative inlet pressure: 6 bar, relative outlet pressure: 5 bar

CATALOGUE NUMBER

G 617 A C S I O I XXX PP

Thread connection
G = ISO 228
8 = NPT

Product Series
617

Revision letter
A = initial release

Size
0 = Flange + pressure hold (DN4)
4 = G1/4 Inline + pressure hold (DN4)

Setpoint
0 = 0-10V
1 = 0-20mA
2 = 4-20mA
5 = 2 Bit, 4 pressure select [1]

Feedback Type
0 = 0-10V
1 = 0-20mA
2 = 4-20mA

Pressure range / **Max. inlet pressure**
03 = 3 bar / 5 bar
06 = 6 bar / 8 bar
10 = 10 bar / 10 bar

Options
A00 = Standard

Input / Display with operating buttons
0 = Standard n.c. + Display
1 = Standard n.c.
2 = Analog IN + Display
3 = Analog IN
8 = Digital IN + Display
9 = Digital IN

Output
0 = N.C
1 = Digital OUT [2] (Standard)

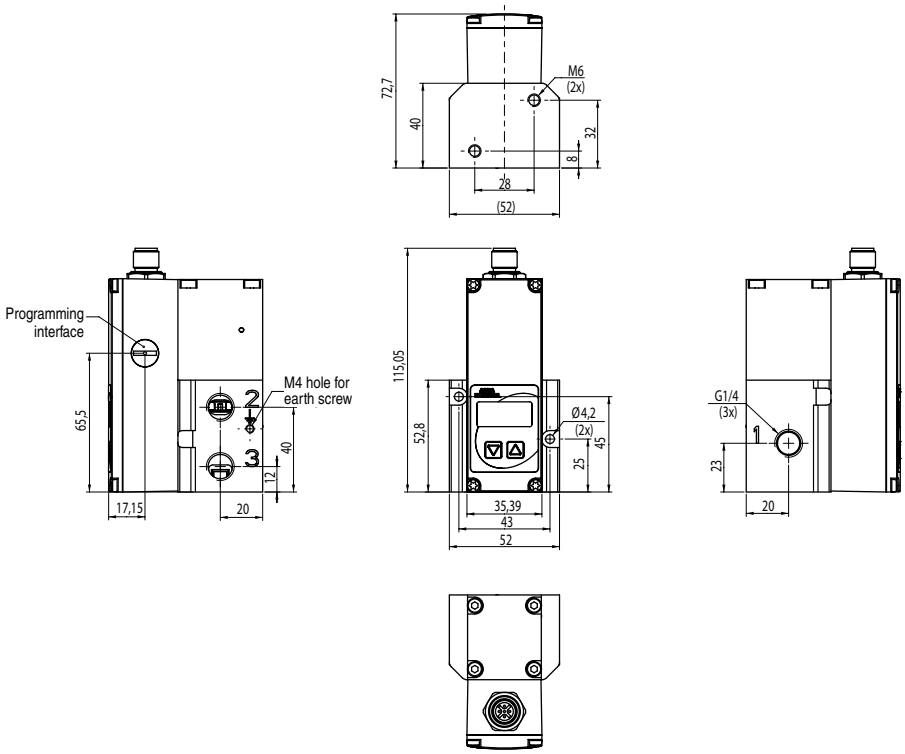
[1]) only Digital IN and no Digital OUT (Output)
[2]) no Digital IN possible

DIMENSIONS (mm), WEIGHT (kg)

Inline version

DN 4

Weight: 0,49 kg

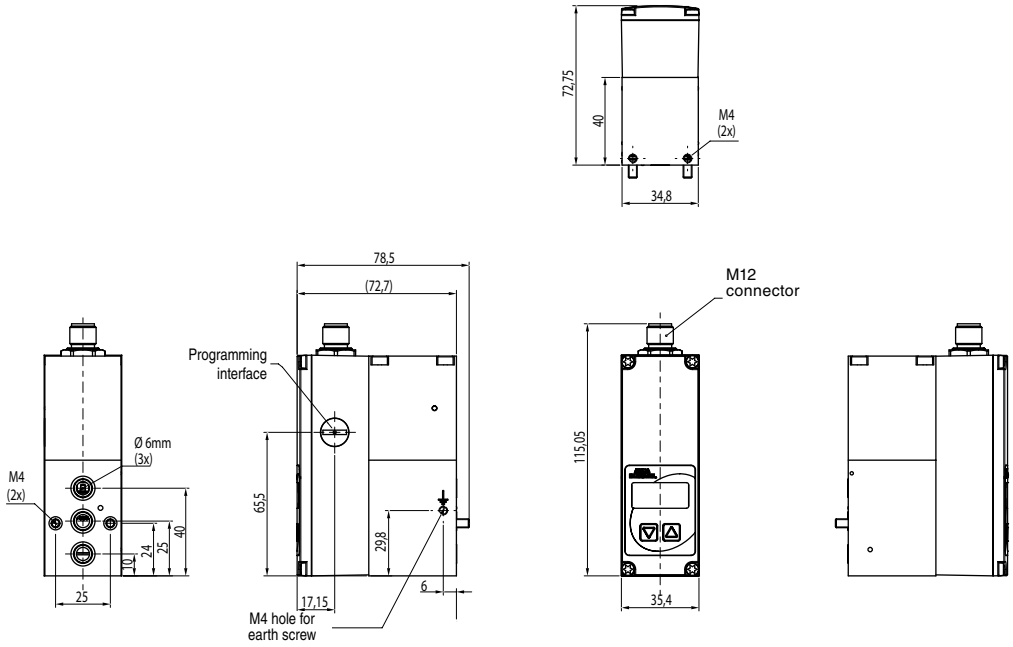


DIMENSIONS (mm), WEIGHT (kg)

Subbase version

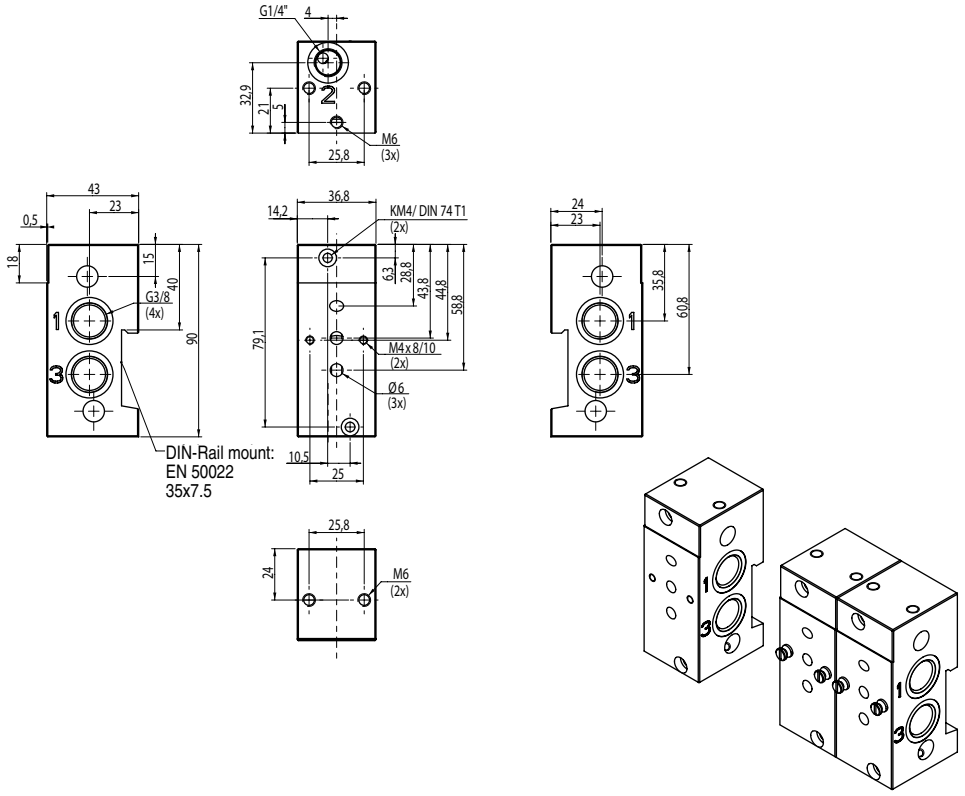
DN 4

Weight: 0,49 kg

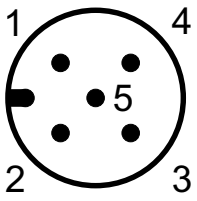


DN 4

Joinable subbase
Weight: 0,3 kg



CONNECTOR PINNING / CABLE WIRING



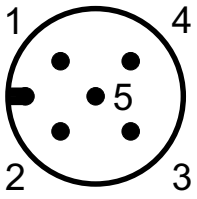
View from soldering side

pin	description	5-wire cable (2m)	6-wire cable (5m, 10m)
1	24V voltage supply	brown	brown
2	Analog setpoint input	white	white
3	Supply ground	blue	green
	Analog ground ❇		yellow
4	Analog output (feedback) [1]	black	pink
5	Digital output (pressure switch)	grey	grey
Body	EMC shield	shield	shield

❇ A 6-wire cable with separate analog ground is used for cable lengths over 2 m to set off the voltage drop for the setpoint.

[1] Analog input when using cascade control

CONNECTOR PINNING / 2BIT - SETPOINT



pin	description
1	24V voltage supply
2	Input signal 1 (LSB)
3	Supply ground
4	Input signal 2 (MSB)
5	unused

ACCESSORIES

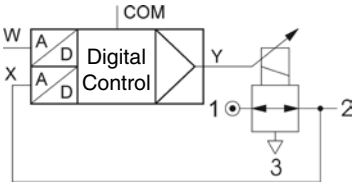
description	catalogue number
Straight M12 female connector, 5 pins, with screw terminals	**88100256**
Right-angle M12 female connector, 5 pins, with screw terminals	**88100725**
Supply cable 2 m, 2 x 0,25 mm², straight connector	**88100726**
Supply cable 2 m, 2 x 0,25 mm², right-angle connector	**88100727**
Supply cable 5 m, 6 x 0,56 mm², straight connector	**88100728**
Supply cable 5 m, 6 x 0,56 mm², right-angle connector	**88100729**
Supply cable 10 m, 6 x 0,56 mm², straight connector	**88100730**
Supply cable 10 m, 6 x 0,56 mm², right-angle connector	**88100731**
Supply cable (2Bit - Setpoint) 3 m, straight connector	**TC0403MMETA04000**
Supply cable (2Bit - Setpoint) 5 m, straight connector	**TC0405MMETA04000**
Supply cable (2Bit - Setpoint) 3 m, right-angle connector	**TD0403MMETA04000**
Supply cable (2Bit - Setpoint) 5 m, right-angle connector	**TD0405MMETA04000**
RS 232 cable converter; 2m cable with 9-pin Sub-D (plug connector)	**88100732**
USB interface, 2m cable	**N50930300100000**
Joinable subbases for 617 DN4 with pressure supply G 3/8"	**N50781800000000**

FEATURES

SENTRONIC^{PLUS} is a highly dynamical 3-way proportional valve with digital control.
SENTRONIC^{PLUS} stands for:

- Digital communication and control
- Direct operated valve
- Dynamic behaviour (high speed)

A special feature of the **SENTRONIC^{PLUS}** is its *DaS* software supplied for optimum adjustment over PC and viewing of setpoint and feedback signals. Other functions are valve diagnostics, parameter setting and maintenance.



GENERAL

Fluids	Air or neutral gases, filtered at 50 µm, condensate-free, lubricated or unlubricated
Ports	G1/8 - G1/4 - G1/2 - G1
Max. allowable pressure	See table below
Pressure range	See table below
Fluid temperature	0...60 °C
Ambient temperature	0...60 °C
Setpoint - analog	0 - 10 V (impedance 100 KΩ) 0 - 20 mA/4 - 20 mA (impedance 250 Ω)
Hysteresis	0,5 % of span
Linearity / pressure measurement	± 0,5 % of span
Repeatability	± 0,5 % of span

EXPLOSION SAFETY

Safety code	Ⓔx II 2D Ex tb IIIC T135 °C Db Ⓔx II 3G Ex nA IIC T4 Gc, 0 I Ta I +50 °C
EC type examination certificate no.:	IBExU07ATEX1173

CONSTRUCTION

	Direct operated poppet valve
Body	See table below
Internal parts	Stainless steel and brass
Seals	FPM and NBR

ELECTRICAL CHARACTERISTICS

nominal diameter DN	stabilised voltage *	max. power (W)	max. current (mA)	insulation class	degree of protection	electrical connection
3	24 V = 24 V = +/-10%	12	500	F	IP65	5-pin M12 connector or 7-pin DIN connector
6		24 [2)]	1000 [2)]			
12		34	1400			
20		44	1800			

* Max. ripple: 10 %

SPECIFICATIONS

pipe size	orifice size (mm)	flow coefficient Kv (Nm^3/h)	flow at 6 bar (l/min - ANR)
G 1/8	3	0,18	210
G 1/4	6	0,60	700
G 1/2	12	1,20	1400
G 1	20	4,80	5600

CATALOGUE NUMBER 6 1 4 3 5 7 B A S I D P P

B: CONTROL PANEL
D = M12 with display - non-explosionproof
E = M12 without display - explosionproof (ATEX)
F = DIN connector, 7-pin, with display - non-explosionproof
G = DIN connector, 7-pin without display - non-explosionproof

A: VERSION (ports), body

0 = DN6	(G 1/4), Alu	7 = DN3	(G 1/8), Brass
1 = DN12	(G 1/2), Alu	8 = DN6	(G 1/4), Brass
2 = DN20	(G 1), Alu	9 = DN3	(NPT 1/8), Brass
4 = DN6	(NPT 1/4"), Alu	A = DN6	(NPT 1/4"), Brass
5 = DN12	(NPT 1/2"), Alu	C = DN6	(G 1/4), St. steel
6 = DN20	(NPT 1"), Alu	H = DN6	(G 1/4), Brass[2)]

S: SETPOINT
0 = 0 ... 10 Volt
1 = 0 ... 20 mA
2 = 4 ... 20 mA

I: FEEDBACK
1 = Feedback output 0 ... 10 Volt
2 = Feedback output 0 ... 20 mA
3 = Feedback output 4 ... 20 mA
4 = Feedback input 0 ... 10 Volt
5 = Feedback input 0 ... 20 mA
6 = Feedback input 4 ... 20 mA

PP: PRESSURE RANGE

Relative pressure	Max. allowable pressure (bar)	Vacuum (relative)
40 = 0 - 100 mbar	2	V1 = 0 ... -1 bar shut-off valve (vacuum at port 3)
50 = 0 - 500 mbar	2	
60 = 0 - 1 bar	2	
02 = 0 - 2 bar	3	V2 = 0 ... -1 bar bypass version
03 = 0 - 3 bar	8	
05 = 0 - 5 bar	8	V3 = 0 ... -1 bar shut-off valve (vacuum at port 1)
06 = 0 - 6 bar	12	
10 = 0 - 10 bar	12	
12 = 0 - 12 bar	14	
16 = 0 - 16 bar[1)]	18	
20 = 0 - 20 bar[1)]	22	
3H = 0 - 30 bar[2)]	40	
5H = 0 - 50 bar[2)]	60	

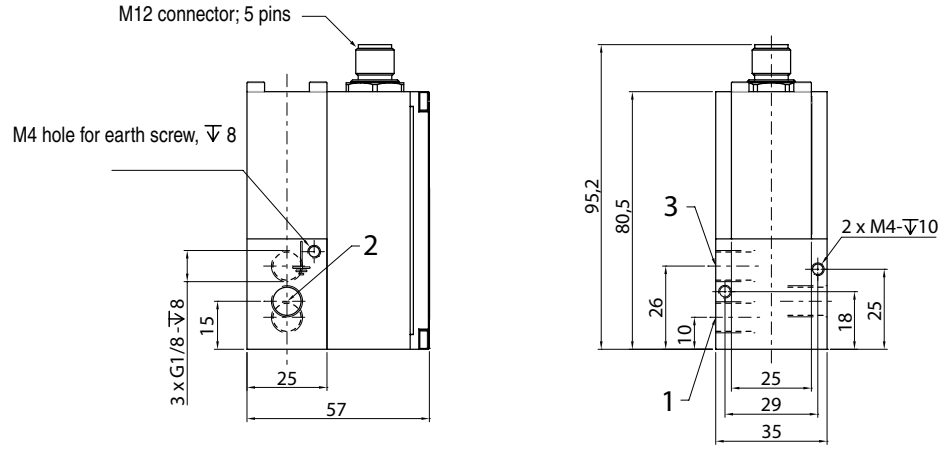
D: DIGITAL OUTPUT
1 = Pressure switch output PNP ± 5 %

Notes:
[1)] Only for DN3 and DN 6
[2)] Only for DN6, brass / 1,8 A 44 W
Other versions available on request.

DIMENSIONS (mm)**, WEIGHT** (kg)

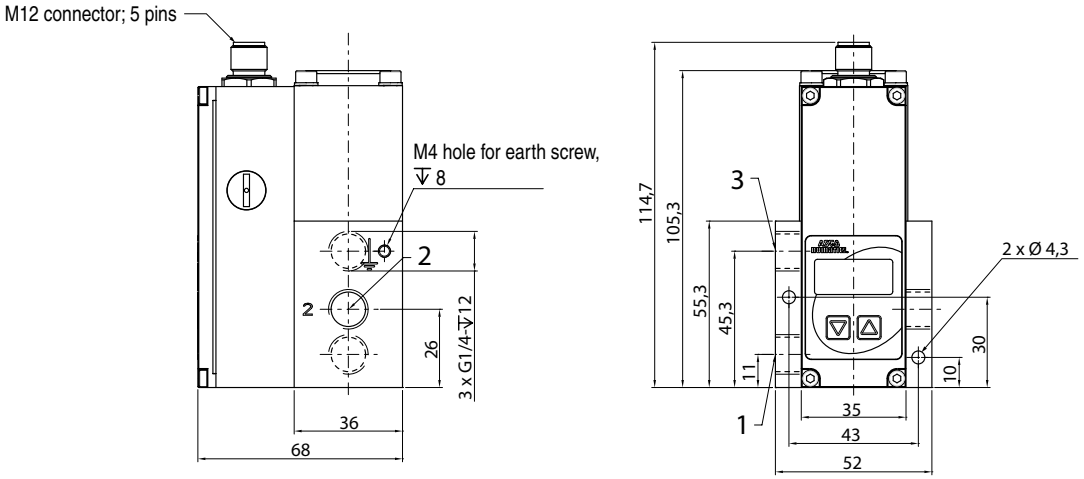
G 1/8

Weight: 0,550 kg



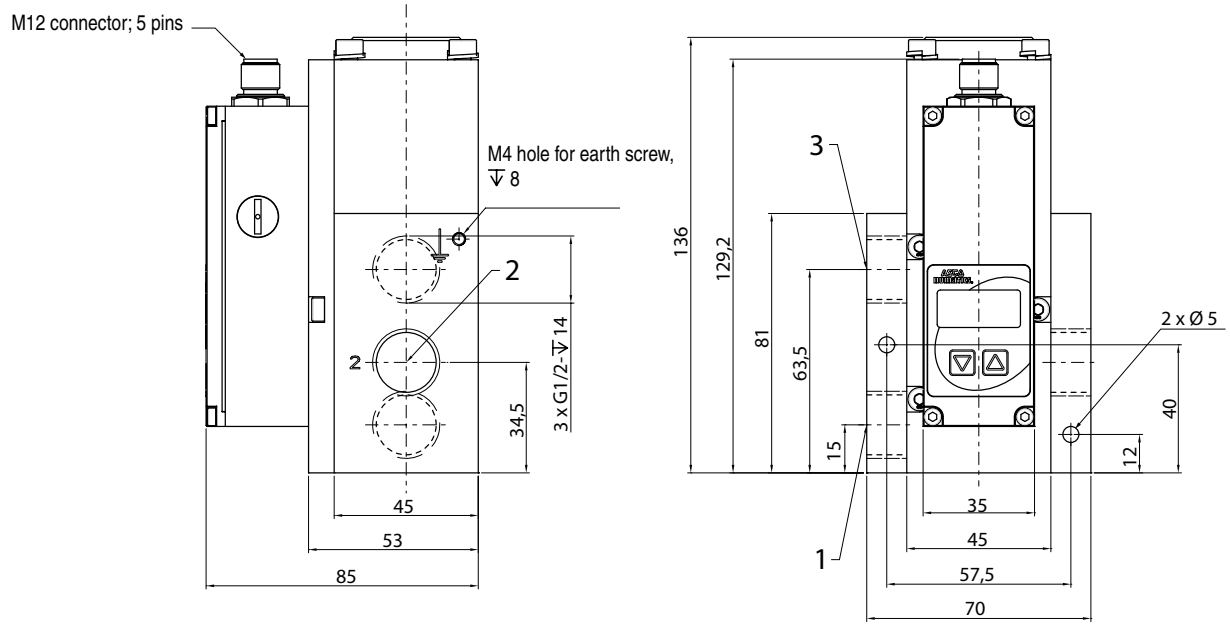
G 1/4

Weight: 0,850 kg aluminium / 1,540 kg brass



G 1/2

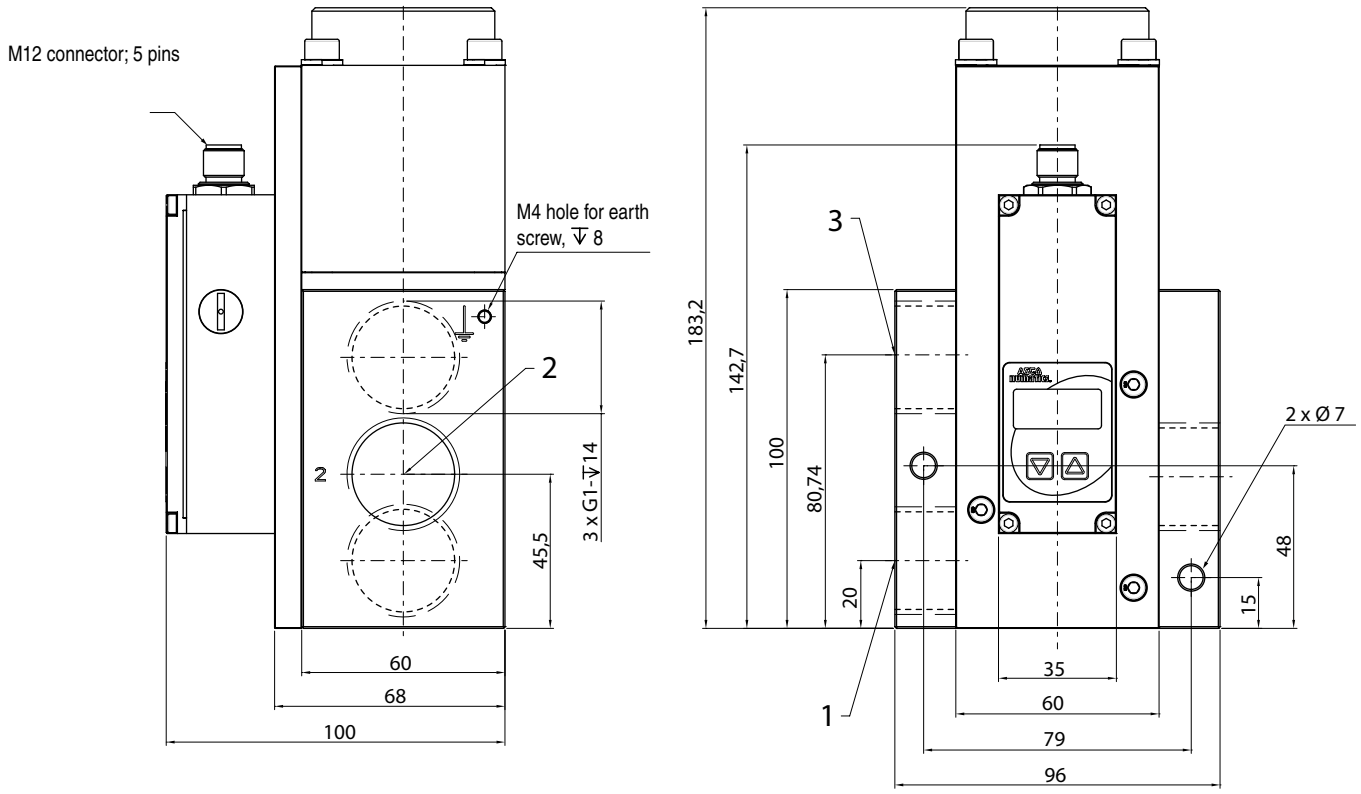
Weight: 1,650 kg



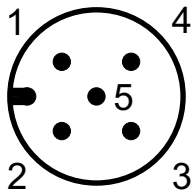
DIMENSIONS (mm)**, WEIGHT** (kg)

G 1

Weight: 3,400 kg



CONNECTOR PINNING / CABLE WIRING



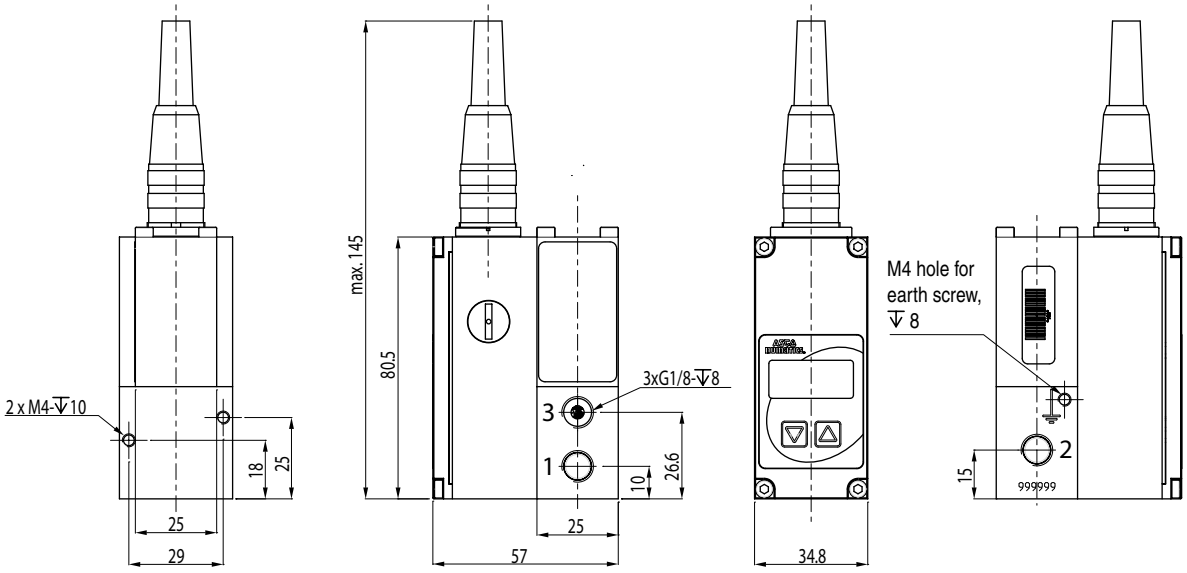
Pin	Description	5-wire cable (2 m)	6-wire cable (5 m, 10 m)
1	24 V voltage supply	brown	brown
2	Analog setpoint input	white	white
3	Supply ground	blue	green
	Analog ground ❊	-	yellow
4	Analog output (Feedback)	black	pink
5	Digital output (Pressure switch)	grey	grey
Body	EMC screen	shield	shield

❊) A 6-wire cable with separate analog ground is used for cable lengths over 2 m to set off the voltage drop for the setpoint.

DIMENSIONS (mm)**, WEIGHT** (kg)

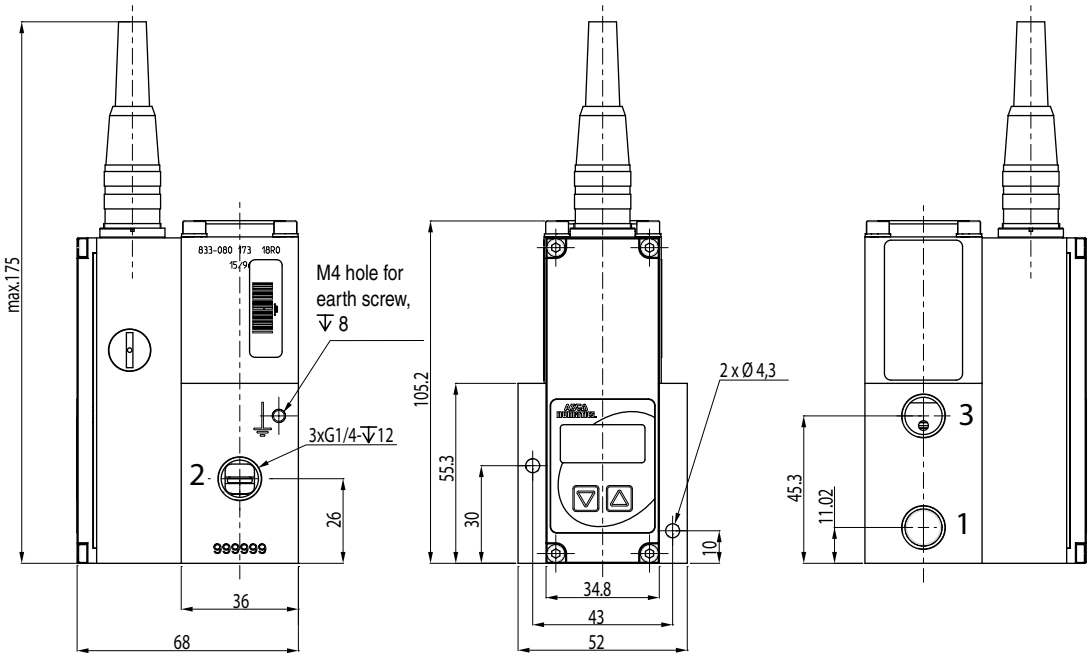
G 1/8

Weight: 0,550 kg



G 1/4

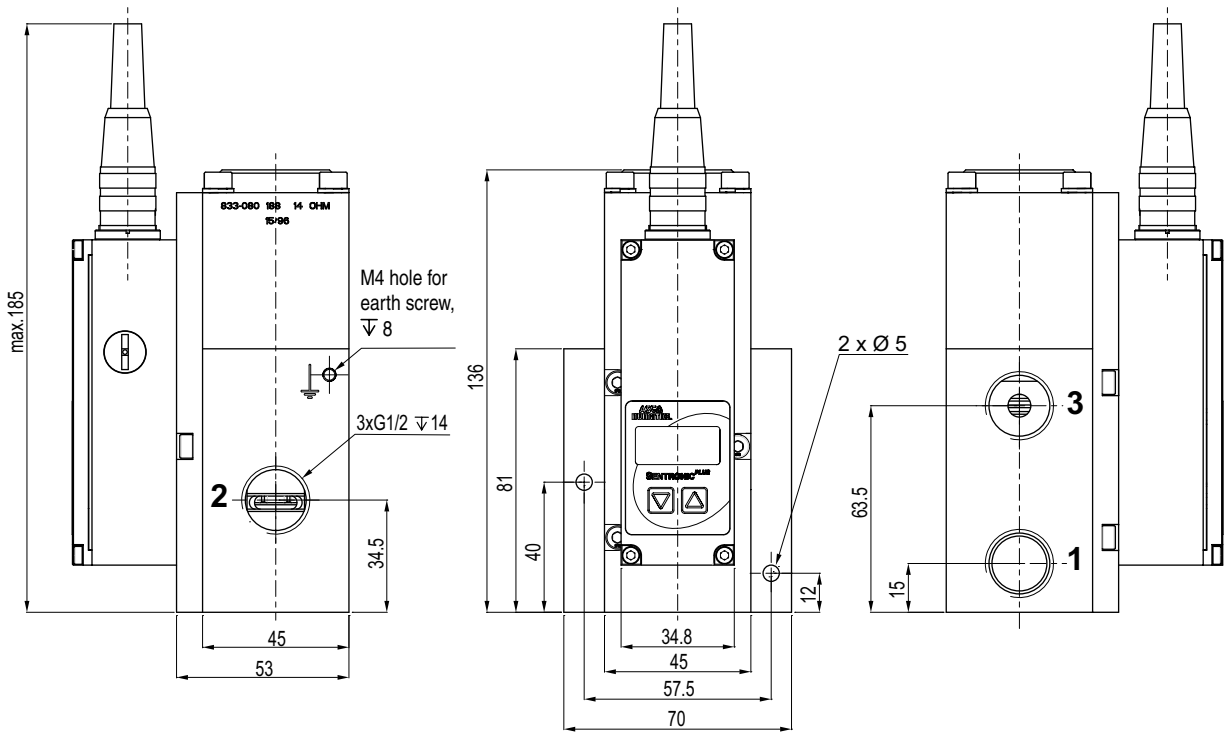
Weight: 0,850 kg aluminium / 1,540 kg brass



DIMENSIONS (mm)**, WEIGHT** (kg)

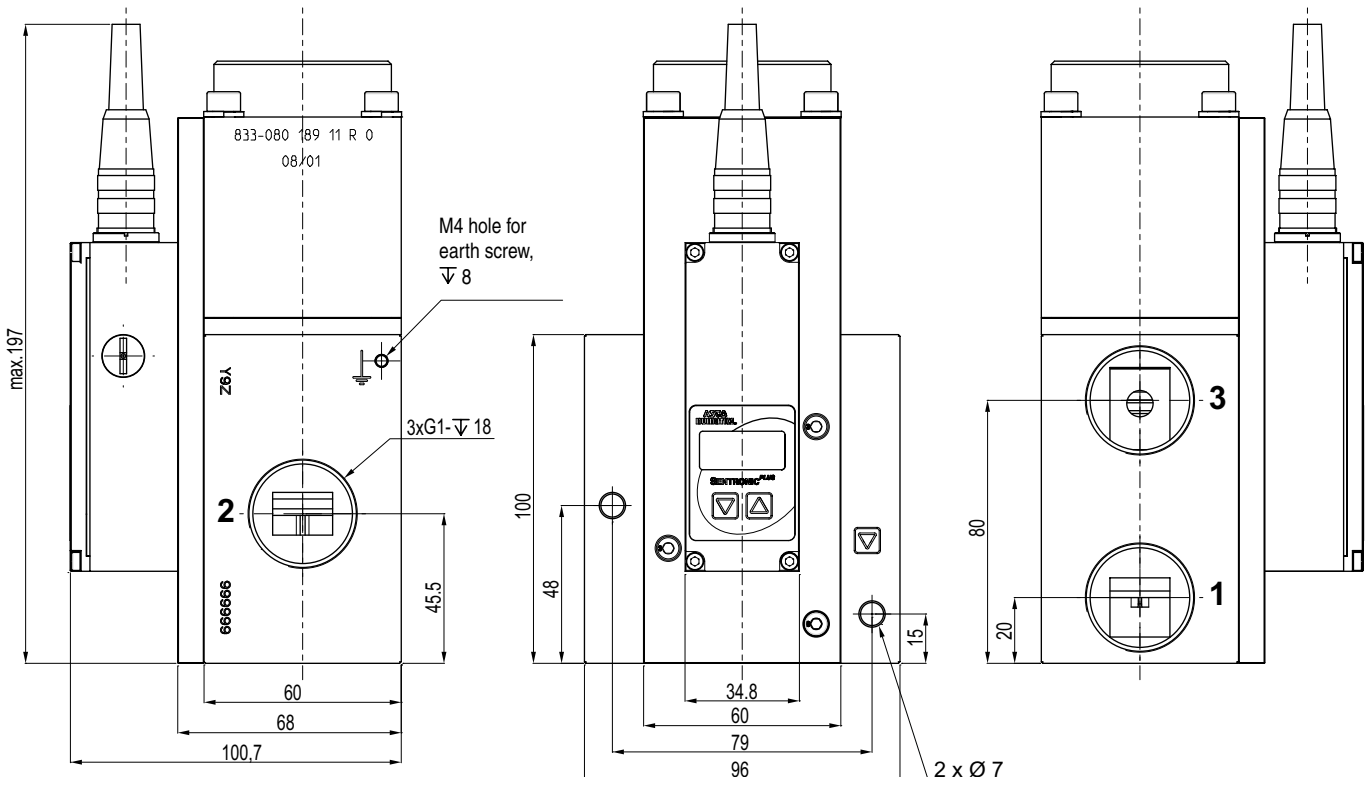
G 1/2

Weight: 1,650 kg



G 1

Weight: 3,400 kg



ACCESSORIES

description	catalogue number
Straight M12 female connector, 5 pins, with screw terminals	**88100256**
Right-angle M12 female connector, 5 pins, with screw terminals	**88100725**
Supply cable 2 m; 5x0,25 mm^2 ; straight connector	**88100726**
Supply cable 2 m; 5x0,25 mm^2 ; right-angle connector	**88100727**
Supply cable 5 m; 6x0,50 mm^2 ; straight connector	**88100728**
Supply cable 5 m; 6x0,50 mm^2 ; right-angle connector	**88100729**
Supply cable 10 m; 6x0,50 mm^2 ; straight connector	**88100730**
Supply cable 10 m; 6x0,50 mm^2 ; right-angle connector	**88100731**
RS 232 cable converter; 2 m cable with 9-pin Sub-D (plug connector)	**88100732**
RS 232 cable converter; 2 m cable with 9-pin Sub-D (screw connector)	**88100970**
DaS Light: Data Acquisition Software for **SENTRONIC^{PLUS}** - basic parameters - CD-ROM	**99100110**
DaS Expert: Data Acquisition Software for **SENTRONIC^{PLUS}** - full parameters - CD-ROM	**99100111**

PROPORTIONAL VALVES FLOWTRONIC^{D}

with control loop for fast flow control
tapped body, 1/4 - 3/8 - 1/2

2 ports
Series
607

FEATURES

- *The FLOWTRONIC^{D} consists of a fast, direct-acting 2-port proportional valve, a pressure sensor unit and digital control electronics*
- *Especially designed for applications placing extreme dynamic demands on flow control*
- *Control and maintenance of constant and even flow, irrespective of outside influences*
- *Precise measurement of flow with two sensors*
- *Adaptable to different applications due to the use of digital control electronics that can be configured by PC over a USB interface*
- *Auto-tune function and ASCO FlowCom PC software provide for quick and easy start-up*
- *Diagnosis over integrated LEDs or the ASCO FlowCom PC software*

GENERAL

Fluid	Air or neutral gases, filtered at 50 µm, without condensate, lubricated or not
Minimum allowable pressure	4 bar
Maximum allowable pressure (MAP)	8 bar
Control range	5 - 2000 l/min (ANR), consult us for other ranges
Fluid temperature	0°C to +50°C
Ambient temperature	0°C to +40°C
Setpoint - analog	0 - 10 V (100 kΩ), 0/4 to 20 mA (resistance 250 Θ)
Feedback - analog	0 - 10 V, 0/4 to 20 mA (max. load 500 Θ)
Flow accuracy	
Hysteresis	± 3%
Linearity	± 3%
Repeatability	± 1,5%
Calibration conditions	
Ambient temperature	22,5°C ±2,5°C
Fluid	Air
Dynamic performance	
Response time	< 200 ms
Other features	Auto-tune, error display by LED

CONSTRUCTION

Body	Aluminium
Internal parts	Aluminium, stainless steel and brass
Seals	NBR (nitrile)

ELECTRICAL CHARACTERISTICS

nominal diameter DN	voltage *	max. power (W)	max. current (mA)	insulation class	degree of protection	electrical connection
2, 3, 5 and 6	24 V = +/-10%	30	1250	H	IP65	- 5 pin M12 connector - USB connection with 4 pin M12 connector
8		44	1800			

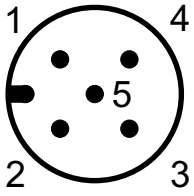
* Max. ripple: 10 %

SPECIFICATIONS

pipe size	DN	flow (1)	max. inlet pressure	catalogue number					
				with display			without display		
				setpoint / output feedback			setpoint / output feedback		
G		(l/min - ANR)	(bar)	0 - 10 V	0 - 20 mA	4 - 20 mA	0 - 10 V	0 - 20 mA	4 - 20 mA
1/4	2	5 - 50	8	60701073	60701081	60701089	60701074	60701082	60701090
	3	10 - 100	8	60701055	60701063	60701071	60701056	60701064	60701072
		12 - 300	8	60701019	60701027	60701035	60701020	60701028	60701036
	5	20 - 500	8	60701001	60701009	60701017	60701002	60701010	60701018
3/8	6	50 - 1000	8	60701037	60701045	60701053	60701038	60701046	60701054
1/2	8	100 - 2000	8	60701091	60701099	60701107	60701092	60701100	60701108

(1) Measurement without flow restriction at the outlet.

CONNECTOR PINNING / CABLE WIRING

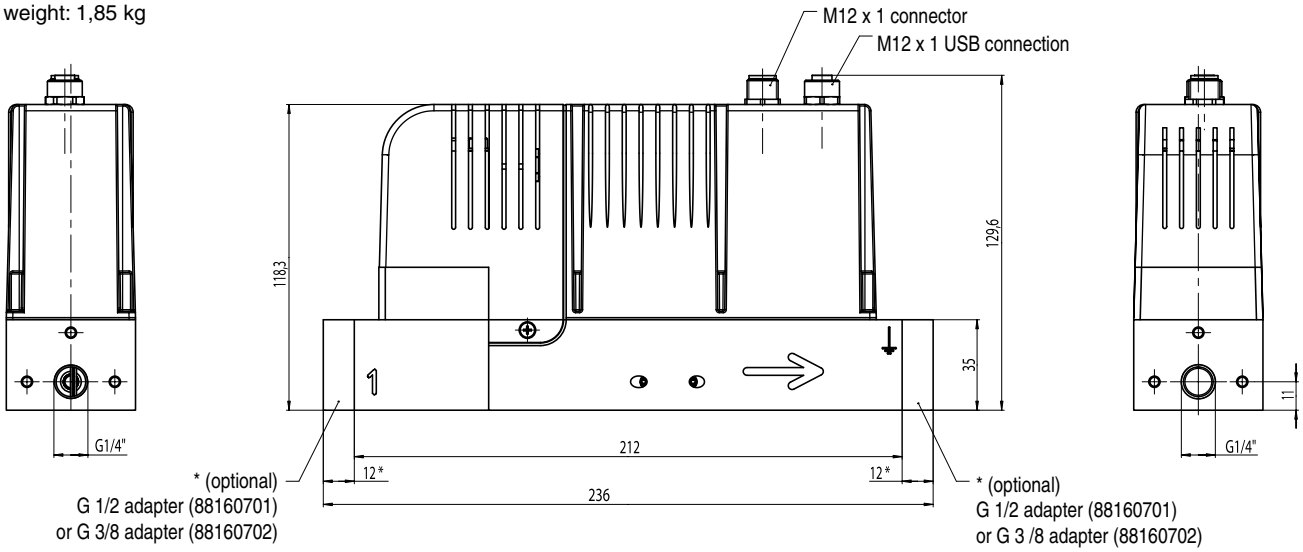


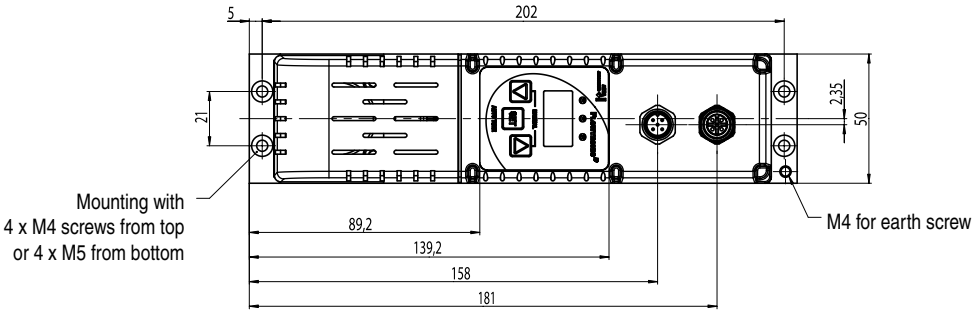
pin	description	5-wire cable (2m)	6-wire cable (5m, 10m)
1	24V voltage supply	brown	brown
2	Analog setpoint input	white	white
3	Supply ground	blue	green
	Analog ground ❇		yellow
4	Analog output (feedback)	black	pink
5	Digital output (pressure switch)	grey	grey
Body	EMC shield	shield	shield

❇) A 6-wire cable with separate analog ground is used for cable lengths over 2 m to set off the voltage drop for the setpoint.

DIMENSIONS (mm), WEIGHT (kg)

weight: 1,85 kg





ACCESSORIES

description	catalogue number
FLOWTRONIC^{D} software "ASCO-FlowCom-Light" - CD-ROM	**88100895**
FLOWTRONIC^{D} software "ASCO-FlowCom-Expert" - CD-ROM	**88100896**
USB cable for connection of FLOWTRONIC^{D} to PC	**88100897**
Straight M12 female connector, 5 pins, with screw terminals	**88100256**
Right-angle M12 female connector, 5 pins, with screw terminals	**88100725**
Supply cable 2 m, 5 x 0,25 mm², straight connector	**88100726**
Supply cable 2 m, 5x0,25 mm², right-angle connector	**88100727**
Supply cable 5 m, 6 x 0,56 mm², straight connector	**88100728**
Supply cable 5 m, 6x0,56 mm², right-angle connector	**88100729**
Supply cable 10 m, 6 x 0,56 mm², straight connector	**88100730**
Supply cable 10 m, 6x0,56 mm², right-angle connector	**88100731**

CONTROL^{D}
CONTROL DEVICE
for proportional solenoid valve control

Series
603

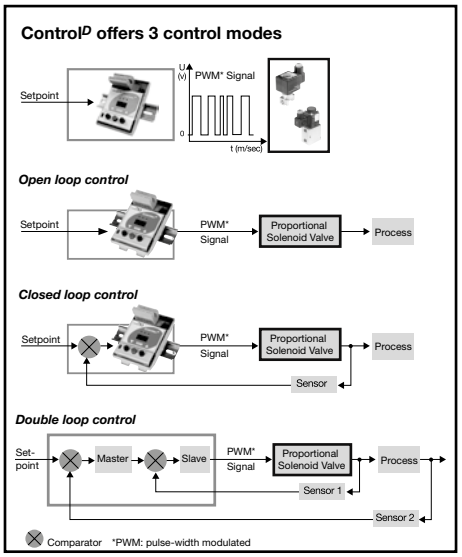
FEATURES
- *Control device for **PWM** (pulse-width modulated) proportional solenoid valve control*
- *Designed for open-loop, closed-loop and **double-loop** (cascaded) control*
- *Suitable for the control of flow, pressure, temperature, force etc.*
- *Integrated display and LEDs*
- *Control parameters adjustable via software (DigiCom, USB interface)*
- *Auto-Adapt function/button for automatic adjustment of the* CONTROL^{D} *control device to the control valve*

A special feature of the CONTROL^{D} is the "ASCO-DigiCom" software supplied for optimum adjustment over PC. Setpoint and feedback values can be viewed at the same time. Other functions are valve diagnostics, parameter setting and maintenance.

GENERAL
Ambient temperature -20°C to +50°C

CONSTRUCTION
Body PA (polyamide)
Degree of protection IP20
Electrical connection Pluggable terminal block (0,08 - 1,5 mm²)
Mounting DIN-EN 50022 rail

ELECTRICAL CHARACTERISTICS
Supply voltage (U_N) 24 V DC ±10 %, max. ripple 10 %
or 12 V DC +15 % -5 %, max. ripple 10 %
Max. current of proportional solenoid valve 0,2 A / 2 A
Setpoint input 0 - 10 V DC, 0 - 20 mA, 4 - 20 mA
Sensor input 0 - 10 V DC, 0 - 20 mA, 4 - 20 mA
Feedback output 0 - 10 V, 0 / 4 - 20 mA
Ramp ON/OFF
adjustable between 0,1 and 20 seconds
Adjustable switching frequency 20 to 2000 Hz



SPECIFICATIONS

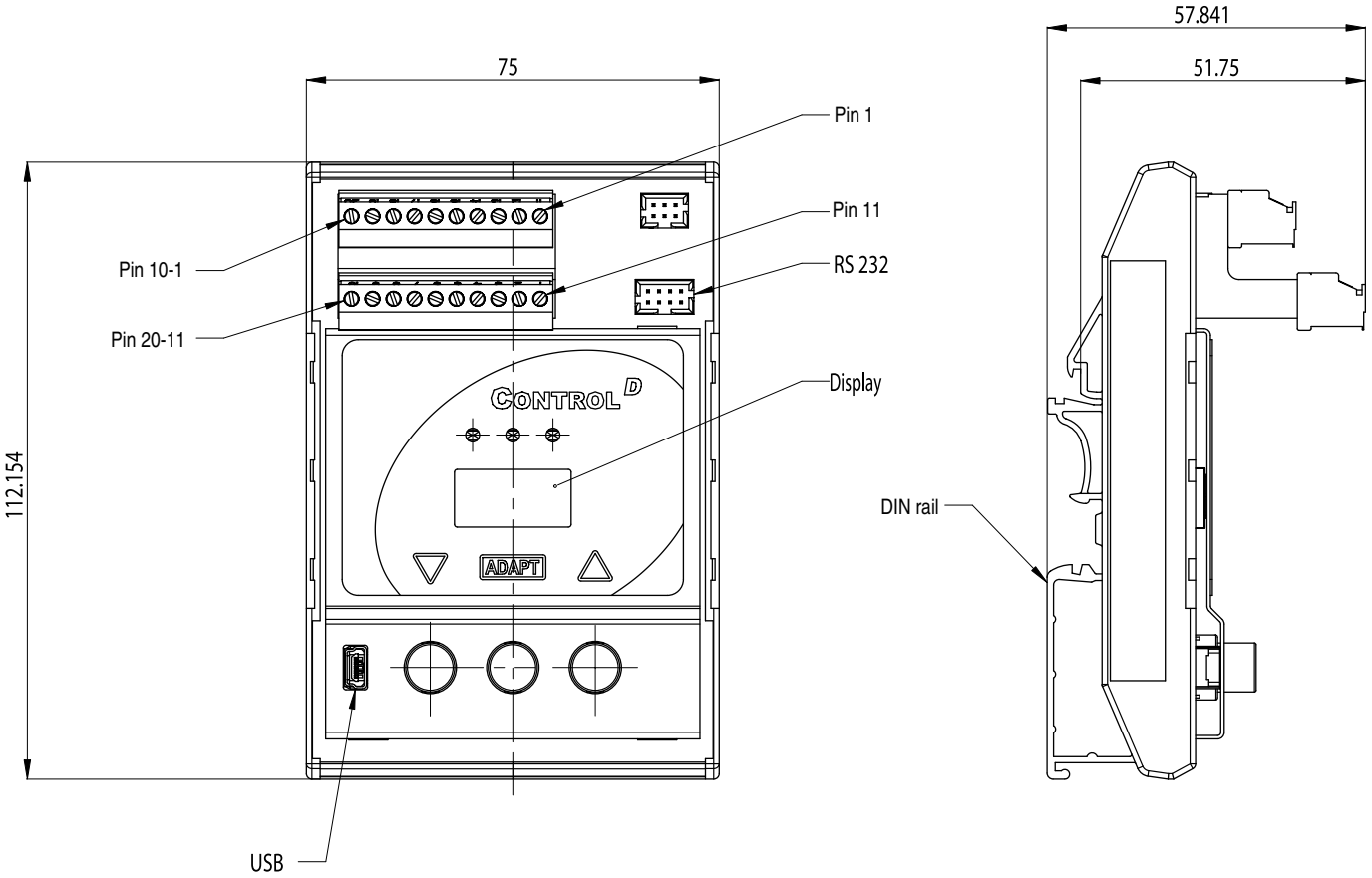
description	catalogue number
CONTROL^{D} control device - 12 V DC / 2 A	**60300117**
CONTROL^{D} control device - 24 V DC / 2 A	**60300118**
CONTROL^{D} control device - 24 V DC / 200 mA	**60300119**

PROPORTIONAL VALVES SUITABLE FOR CONTROL APPLICATIONS

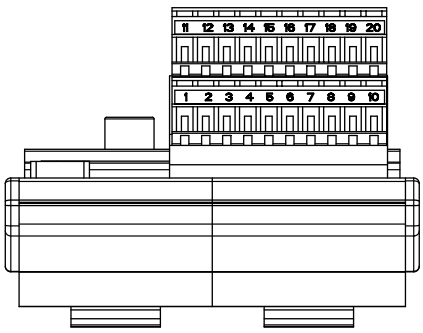
description	series	illustration	catalogue pages
3-port proportional valve for pressure control	602		see P308 in the "Pneumatic Components" catalogue
Posiflow / Preciflow proportional solenoid valves, Flapper proportional	202-203 068		See the "Solenoid and Pressure Operated Valves" and the "Analytical and Medical Technology" catalogues

DIMENSIONS (mm)**, WEIGHT** (kg)

weight: 0,153 kg



CONNECTOR PINNING



pin	description	pin	description
1	V DC IN/ + supply	11	Setpoint
2	GND IN/ ground	12	GND setpoint
3	Protective earth PE	13	Digital input
4	Frequency input	14	GND Digital input
5	Sensor supply voltage +	15	Valve / coil connection
6	Analog input 1	16	GND valve
7	GND sensor supply voltage	17	Digital output
8	Sensor supply voltage +	18	GND Digital output
9	Analog input 2	19	GND Analog output
10	GND sensor supply voltage	20	Analog output

ACCESSORIES

description	catalogue number
"ASCO-DigiCom" CONTROL^{D} software on CD-ROM (supplied with the controller)	**88100893**
USB cable for CONTROL^{D} to PC connection (to be ordered separately)	**88100894**

DIGITAL CONTROL UNIT

for proportional solenoid valves

Series **908**

FEATURES

- *Converts analog input control signals to coil current of a proportional solenoid valve by means of pulse width modulation*
- *LED-Display integrated in the connector*
- *Adjustable UP/DOWN ramp control*
- *Output coil current independent of coil resistance (temperature) and supply voltage variations*
- *The electronic circuit is integrated in a standard housing according to DIN EN 175301-803, form A*
- *Parameter setting via PC interface and programming adapter or, optionally, via the switches integrated in the connector*

GENERAL

Nominal voltage 12/24 V DC
Maximum current 1,2 A / 2,5 A

CONSTRUCTION

Housing PA
Cover PA
Screw Zinc plated steel
Seals NBR

ELECTRICAL CHARACTERISTICS

Connector M12, 5 pins
Connector specification DIN EN 175301-803, form A
Electrical safety IEC 335
Electrical enclosure protection IP65 (EN 60529)
Supply voltage 12V ... 30 V DC (incl. ripple)

max. full load current (I_{FL})	input control signal		ambient temperature range
	U_c =	I_c	
(mA)	(V)	(mA)	(C°)
1200/2400	0 - 10	4 - 20	-20 to +65

Ramp time Selectable ON/OFF, adjustable from 50 ms to 5 s, UP/DOWN
Adjustable switch frequency 60 - 1500 Hz

SPECIFICATIONS

catalogue number: proportional valves for digital control unit	type (1)	setpoint	catalogue number	
			control unit	adapter
202A001V to 202A087V 203B001V and 203B002V 60200001, 60200002, 60200004	**01**	0 - 10 V	**X90850164500100**	**-**
		4 - 20 mA	**X90850164500200**	
202A201V to 202A208V 202A513V	**02**	0 - 10 V	**X90850164500100** +	**833-064154**
		4 - 20 mA	**X90850164500200**	

(1) Refer to the dimensional drawings on the following page.

PROPORTIONAL VALVES SUITABLE FOR CONTROL APPLICATIONS

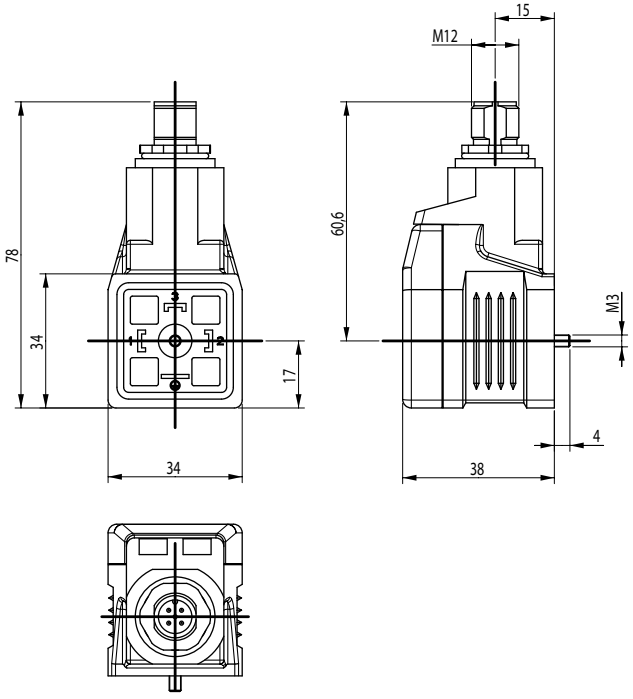
description	series	illustration	catalogue page
3-port proportional valve for pressure control	602		see P308 in our "Pneumatic Components" catalogue
Posiflow / Preciflow proportional solenoid valves, Flapper proportional	202, 203 068		See our "Proportional Technology" catalogue at: www.asconumatics.eu

INSTALLATION

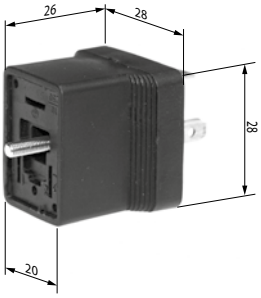
- The control unit can be mounted in any position without affecting operation

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01: CONTROL UNIT
0,075 kg



TYPE 02: ADAPTER
from Form A to Form B



PROGRAMMING ADAPTER

INPUT AND OUTPUT SIGNALS

Pin	Supply
1	Voltage supply (see "Electrical Characteristics")
3	Analog ground 0 V (GND)
	Analog signals
2 4	Setpoint input (differential input) The range 0...100 % corresponds to an input voltage of 0...10 V or an input current of 4...20 mA (depending on version used).
	Communication
5	LIN Bus connection The parameters for the device can be set via this connection and our programming adapter.

ACCESSORIES

description	catalogue number
Straight M12 female connector, 5 pins, with screw terminals	**88100256**
Right-angle M12 female connector, 5 pins, with screw terminals	**88100725**
Supply cable 2 m, 2 x 0,25 mm², straight connector	**88100726**
Supply cable 2 m, 2 x 0,25 mm², right-angle connector	**88100727**
Supply cable 5 m, 6 x 0,56 mm², straight connector	**88100728**
Supply cable 5 m, 6 x 0,56 mm², right-angle connector	**88100729**
Supply cable 10 m, 6 x 0,56 mm², straight connector	**88100730**
Supply cable 10 m, 6 x 0,56 mm², right-angle connector	**88100731**
Adapter DIN EN 175301-803 from Form A to Form B for Type 02	**833-064154**
Programming adapter	**X90850164500300**

CONNECTORS

EN 175301-803, industry standard form B (11 mm)
ISO 4400 / EN 175301-803, form A (18 mm)
sizes 22 and 30

Series **881**

FEATURES

- *Spade connector sizes 22 and 30 to fit standardised three-pin moulded coils:*
  - size 22, EN 175301-803, industry standard form B (11 mm), for coil types CM5, CM22, C22A, EMX and BMX
  - size 30, ISO 4400 / EN 175301-803 form A (18 mm), for coil types CM6, CMXX, CM12, CM25, C25A, CM30, CM40, ANX, AMX, JMX, FNX and FMX
- *The connectors are available in three versions: standard rotatable version with or without integrated visual LED indicator and electrical protection, or version with non-rotatable 3-core moulded-in cable, 2 m long*
- *The standard connector size 30 is provided with a removable lid allowing access to the wiring for easy checking of power supply without unplugging the connector and without interrupting operation of the solenoid valve*

GENERAL

Connector specification	
size 22 (11 mm)	EN 175301-803 industry standard form B
size 30 (18 mm)	ISO 4400 / EN 175301-803, form A
Max. operating temperature	-40°C to +80°C (-40°C to +125°C [1] with silicone seal) [version with moulded-in cable -5°C to +70°C]

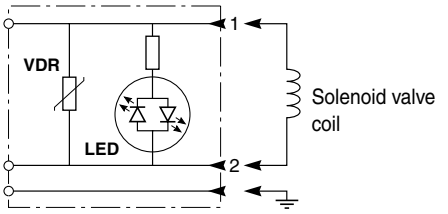
CONSTRUCTION

Standard version	PA (polyamide), glass-fibre reinforced
Enclosure with LED and protection	PA
Enclosure with PVC cable	PA (polyamide), glass-fibre reinforced
Seals	NBR [option for size 30: VMQ (silicone)]

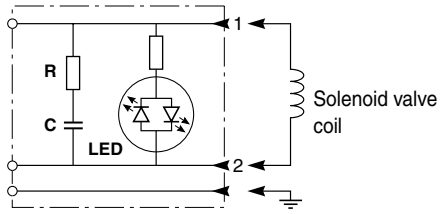
ELECTRICAL CHARACTERISTICS

	Size 22	**Size 30**
Number of contacts	2 + common earth	2 + common earth
Distance between contacts	**11 mm**	**18 mm**
Contact resistance	≤ 4 m Ω	≤ 4 m Ω
Connector	Spade plug	Spade plug
Electrical safety	IEC 335	IEC 335
Electrical enclosure protection	IP65 (EN 60529)	IP65 (EN 60529)
Number of wires (with cable)	3	3

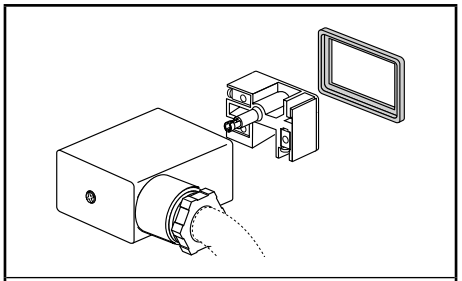
LED indicator and electrical protection diagrams



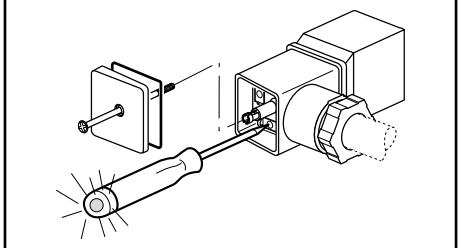
connector size 22



connector size 30



rotatable connector size 22



standard rotatable connector size 30 with power supply control

VDR Varistor absorbing the self-inductance of the coil.
RC RC circuit absorbing the self-inductance of the coil.
LED Green light-emitting diode, bidirectional, signalling the presence of voltage across the coil terminals.

SPECIFICATIONS

description	cable length	cable O.D.		wire cross-section	max. voltage	type	catalogue number		
		size 22	size 30	(mm^2)	(V)		size 22 NBR	size 30 NBR	size 30 VMQ [1]
Rotatable connector									
standard, without LED indicator	-	6-8 mm	6-10 mm	1,5	250	01-02	**88122404**	**88122602**	**88122625**
with integrated LED indicator and electrical protection	-	6-8 mm	8-10 mm	1,5	12	01-02	**-**	**88122611**	**-**
					24		**88122405**	**88122603**	**-**
					48		**88122406**	**88122604**	**-**
					115		**88122407**	**88122605**	**-**
					230		**88122410**	**88122608**	**-**
Non-rotatable connector with cable									
without LED indicator	2 m	-		1,5	250	03-04	**88122413**	**88122612**	**-**

[1] For use within class H temperature limits.

INSTALLATION

- The connectors can be mounted in any position without affecting operation

ORDERING EXAMPLES:

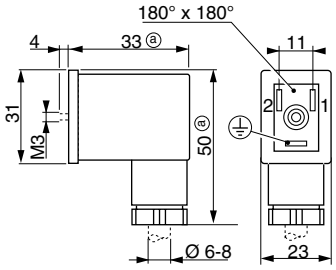
88122404
88122602
basic number

DIMENSIONS (mm), WEIGHT (kg)

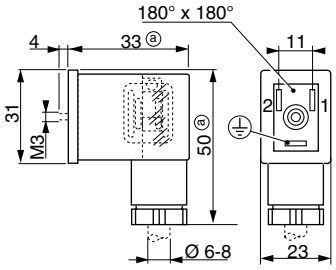
TYPE 01

Size 22 (11 mm)
EN 175301-803 industry standard form B
IP65

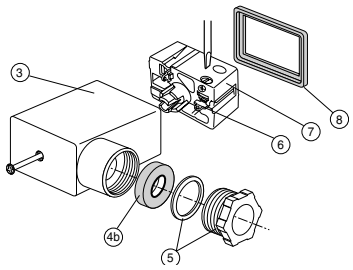
88122404



88122405/406/407/410



88122404/405/406/407/410

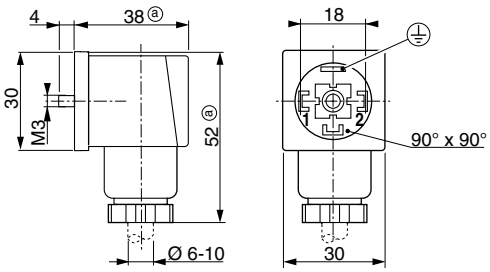


ⓐ Max. dimension.

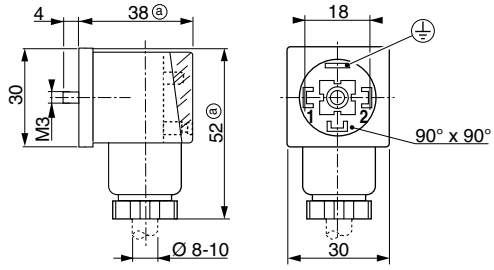
TYPE 02

Size 30 (18 mm)
ISO 4400 / EN 175301-803, form A
IP65

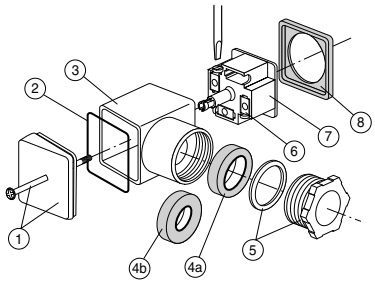
88122602/625



88122611/603/604/605/608



88122602/625

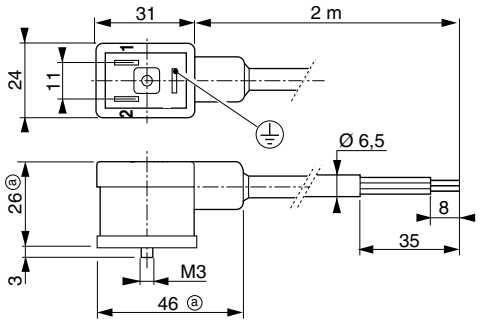


ⓐ Max. dimension.

TYPE 03

Size 22, flying leads (11 mm)
EN 175301-803 industry standard form B
IP65
(non-rotatable terminal holder)

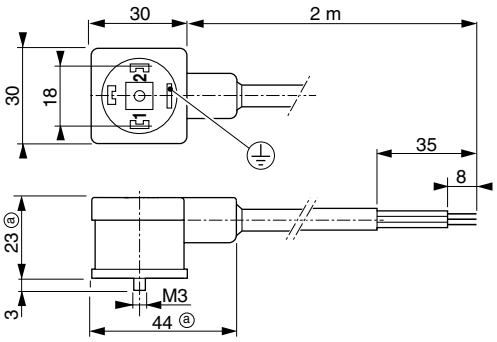
88122413



TYPE 04

Size 30, flying leads (18 mm)
ISO 4400 / EN 175301-803, form A
IP65
(non-rotatable terminal holder)

88122612



ⓐ Max. dimension.

① Fastening screw / cover
② Cover seal
③ Enclosure
④ **88122602/625:**
2 seals
for cable dia. 8 to 10 mm (4a)
or cable dia. 6 to 8 mm (4b)
88122611/603/604/605/608:
1 seal for cable dia. 8 to 10 mm (4a)
88122404/405/406/407/410:
1 seal for cable dia. 6 to 8 mm (4b)
⑤ Stuffing box washer and nut
⑥ Cable connection terminal
⑦ Terminal holder
⑧ Connector seal

type	L	weight (1)	
	(m)	without LED indicator	with LED indicator
01	-	0,025	0,025
02	-	0,030	0,032
03	2	0,150	-
04	2	0,155	-

(1) Including seals and screws.

sizes 03 and 04	
brown wire	terminal 1 (+)
blue wire	terminal 2 (-)
green/yellow wire	earth

CONNECTORS

EN 175301-803, industry standard form C (9,4 mm)
EN 175301-803, form C (8 mm)
size 15

Series **881**

FEATURES

- *Spade connector size 15 to fit standardised three-pin moulded coils:*
  - EN 175301-803, industry standard form C (9,4 mm), for coil type CM15 (series 202), DMX and series 302, 630, 519, 520, 521 and 578 (MEGA)
  - EN 175301-803, form C (8 mm), for series 302, 630 and 202
- *The connectors are available in three versions: standard rotatable version, or version with non-rotatable 3-core moulded-in cable, 2 m or 5 m long, with or without integrated visual LED indicator and electrical protection*

GENERAL

Connector specification	
size 15, 9,4 mm pin spacing	EN 175301-803, industry standard form C
size 15, 8 mm pin spacing	EN 175301-803, form C
Max. operating temperature	-25°C to +60°C [version with moulded-in cable -25°C to +60°C]

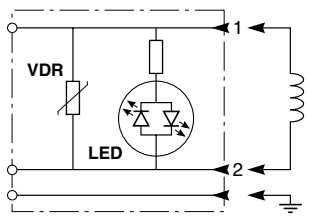
CONSTRUCTION

Standard version	PA (polyamide), glass-fibre reinforced
Enclosure with LED and protection	PA or PP
Enclosure with PVC cable	PP (polypropylene), glass-fibre reinforced
Seals	NBR

ELECTRICAL CHARACTERISTICS

	Size 15	**Size 15**
Number of contacts	2 + common earth (1)	2 + common earth
Distance between contacts	**9,4 mm**	**8 mm**
Contact resistance	≤ 4 m Ω	≤ 4 m Ω
Connector	Spade plug	Spade plug
Electrical safety	IEC 335	IEC 335
Electrical enclosure protection	IP65 (EN 60529)	IP65 (EN 60529)
Number of wires (with cable)	3	3

LED indicator and electrical protection diagrams

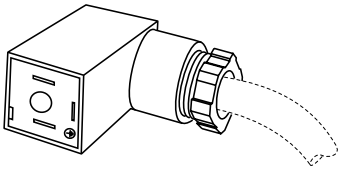


Solenoid valve coil

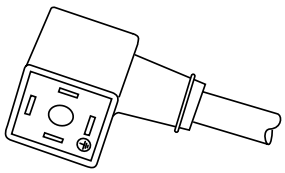
connector

VDR Varistor absorbing the self-inductance of the coil.

LED Green light-emitting diode, bidirectional, signalling the presence of voltage across the coil terminals.



rotatable connector 9,4 mm or 8 mm



non-rotatable connector with cable

SPECIFICATIONS

description	cable length	cable O.D.	wire cross-section (mm²)	max. voltage (V)	type	catalogue number size 15 9,4 mm	catalogue number size 15 8 mm
Rotatable connector							
standard, without LED indicator	-	4-6 mm	0,6	250 V	01-02	**88143581**	**88130211**
Non-rotatable connector with cable							
without LED indicator	2 m	-	0,6	250 V	03	**88143567**	(2)
with integrated LED indicator and electrical protection	2 m	-	0,6	24 V	04	**88143580**	**-**
	5 m					**88143593**	**-**

(1) Version with 3 pins + earth, see our catalogue Fluid Automation Pneumatic Components, page P575.
(2) Contact us

OPTIONS

- Connectors with cable, 5 m long, contact us

INSTALLATION

- The connectors can be mounted in any position without affecting operation

ORDERING EXAMPLES:

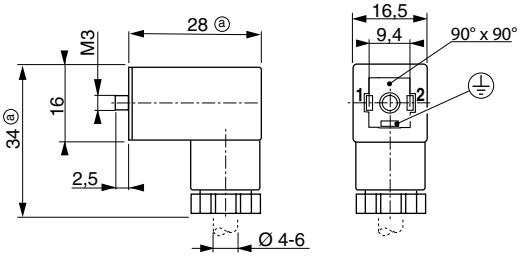
88143581
88130211
basic number

DIMENSIONS (mm), WEIGHT (kg)

TYPE 01

Size 15, 9,4 mm
EN 175301-803, industry standard form C
IP65

88143581

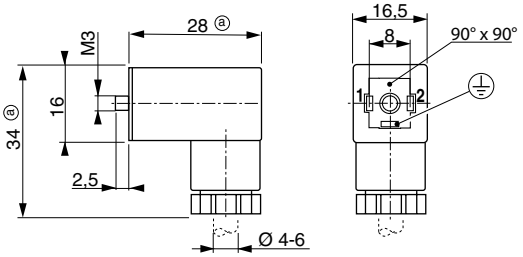


ⓐ Max. dimension.

TYPE 02

Size 15, 8 mm
EN 175301-803, form C
IP65

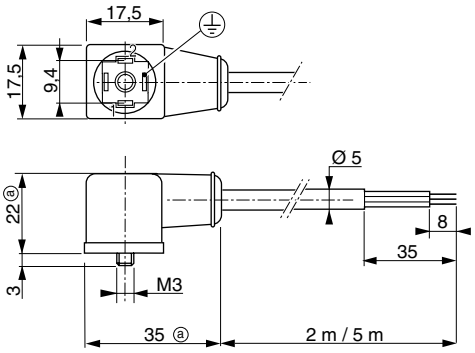
88130211



TYPE 03

Size 15, flying leads, without LED indicator
EN 175301-803, industry standard form C (9,4 mm)
IP65
(non-rotatable terminal holder)

88143567

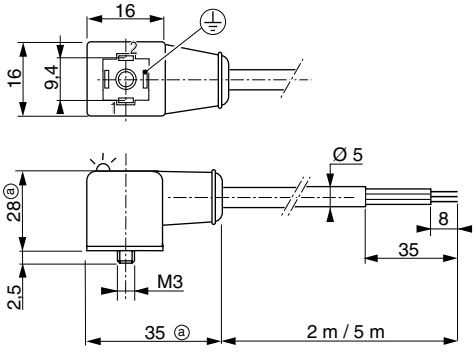


ⓐ Max. dimension.

TYPE 04

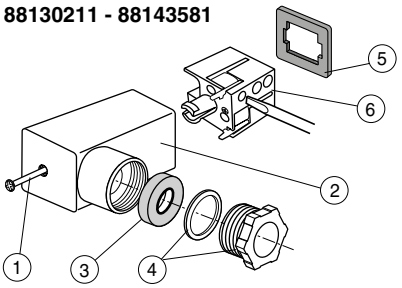
Size 15, flying leads, with LED indicator
EN 175301-803, industry standard form C (9,4 mm)
IP65
(non-rotatable terminal holder)

88143580/593



ⓐ Max. dimension.

88130211 - 88143581



① Fastening screw
② Enclosure
③ Seal for cable dia. 4 to 6 mm
④ Stuffing box washer and nut
⑤ Connector seal
⑥ Terminal holder
⑦ Cable connection terminal

type	L (m)	weight (1) without LED indicator	weight (1) with LED indicator
01 - 02	-	0,015	-
03	2	0,100	-
04	2	-	0,100
	5	-	0,220

(1) Including seals and screws.

sizes 03 and 04	
brown wire	terminal 1 (+)
blue wire	terminal 2 (-)
green/yellow wire	earth

POWER-SAVE CONNECTORS

Industry standard form B (11 mm)
ISO 4400 / EN 175301-803, form A,
sizes 22 and 30

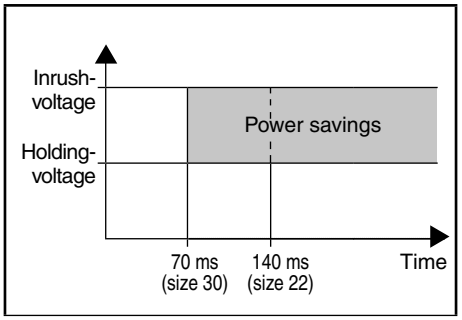
Series
881

FEATURES

- *The main advantages of a connector with voltage reduction are:*
  - Power savings (lower current consumption)
  - Low heat development in the solenoid valve

GENERAL

Once a DC-type solenoid valve is activated, only the holding current, which corresponds to 50% of the inrush voltage, is necessary to keep the valve in position. The power-save connector switches to holding voltage after approx. 70 ms (size 30) or 140 ms (size 22). The holding power is thereby reduced to a quarter of the inrush power. During power reduction, the valve's coil is piloted via PMW voltage pulses.



CONSTRUCTION

Enclosure PA (Polyamide)

ELECTRICAL CHARACTERISTICS

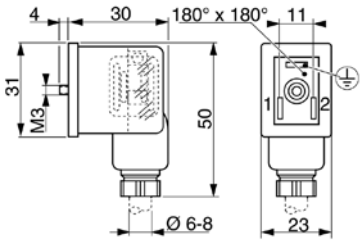
	Size 22	**Size 30**
Input voltage	12/24 V DC ± 10%	10 to 30 V DC
Ouput voltage	12 V DC ± 10%	6 to 30 V DC
Power rating	Max. 12 W	Max. 30 W
Connector	Spade plug	Spade plug
Electrical safety	Industry standard, form B	ISO 4400/EN 175301-803, form A
Number of contacts	2+1 common earth	2+1 common earth
Electrical enclosure protection	IP65	IP65
Cable diameter	6 - 8 mm	6 - 8 mm
LED green	Solenoid valve actuation	Solenoid valve actuation
LED red	-	Overcurrent or overvoltage
Voltage reduction	After 140 ms	After 70 ms
PWM frequency	7 KHz	50 KHz

SPECIFICATIONS

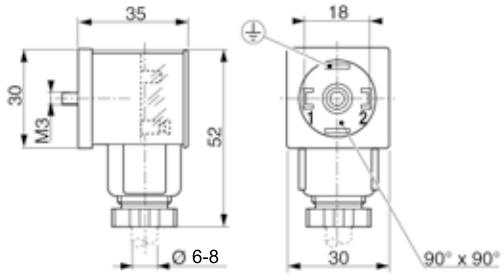
description	size	input voltage	catalogue number
Power-save connector with voltage reduction	22	24 V DC ± 10%	**88100934**
		12 V DC ± 10%	**88100944**
	30	10 to 30 V DC	**88100945**

DIMENSIONS (mm), WEIGHT (kg)

SIZE 22



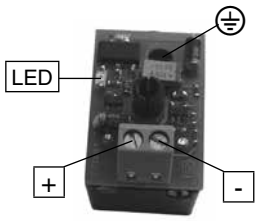
SIZE 30



weight	
size 22	size 30
0,025	0,033

ELECTRICAL CONNECTION

SIZE 22



Screw terminals: up to 1 mm² cable

\+ = Pilot voltage + (12 V/24 V)

\- = Pilot voltage - (GND)

⏚ = Earth terminal, straight through

① = Valve voltage +

② = Valve voltage -

③ = Earth terminal (PE)

SIZE 30

LED green (solenoid valve actuation)

LED red (overcurrent or overtemperature)

Screw terminals: up to 1 mm² cable

\+ = Pilot voltage + (10-30V)

\- = Pilot voltage - (GND)

⏚ = Earth terminal (PE)

① = Valve voltage +

② = Valve voltage -

③ = Earth terminal (PE)

PRODUCT INFORMATION

Solenoid valves, function, terminology and construction types

SOLENOID VALVES

A solenoid valve is a combination of two functional units:

1. A solenoid operator essentially consisting of a coil, core, core tube, shading coil and spring(s).
2. A valve body containing orifices in which a disc, diaphragm or piston etc. is positioned according to the type of technology used.

The valve is opened or closed by movement of the magnetic core which is drawn into a solenoid when the coil is energised.

SOLENOID VALVE TERMINOLOGY (Fig. 1)

Coil
Electrical part of the valve consisting of a spool wound with insulated copper wire creating a magnetic flux when energised. The coil is held in place on the tube with a retaining clip.

Core
Soft-magnetic plugnut moved by magnetic forces (flux generated by the coil).

Core spring
Spring which keeps the core in fixed position when the coil is de-energised.

Core tube
Stainless steel tube closed at one end, installed to improve the magnetic flux of the solenoid coil upon energisation.

Cover
Cover mounted on the valve body and incorporating a number of orifices.

Diaphragm
Seal-tight diaphragm isolating the fluid from the control system.

Disc, valve disc
Sealing material on the core or disc-holder which shuts off the seat orifice.

Manual operator
Manual operation of the lever to open or close the orifices.

Manual operator spring
Drawback spring ensuring return of the pulse control device to its initial position

Orifices
Orifices for fluid transit.

Plugnut
Stationary core pressed in the closed end of the core tube, installed to improve the magnetic flux of the solenoid coil upon energisation.

Retainer clip
Clip anchoring the coil to the yoke.

Rocker
Moving part serving to open and close the orifices for the passage of fluid.

Seating or valve seat
Specially formed border of the main valve.

Solenoid enclosure
Metal housing around the coil for electrical and mechanical protection, as well as protection against ingress of water or dust.

Valve body
Main part of the valve with all ports and main seats.

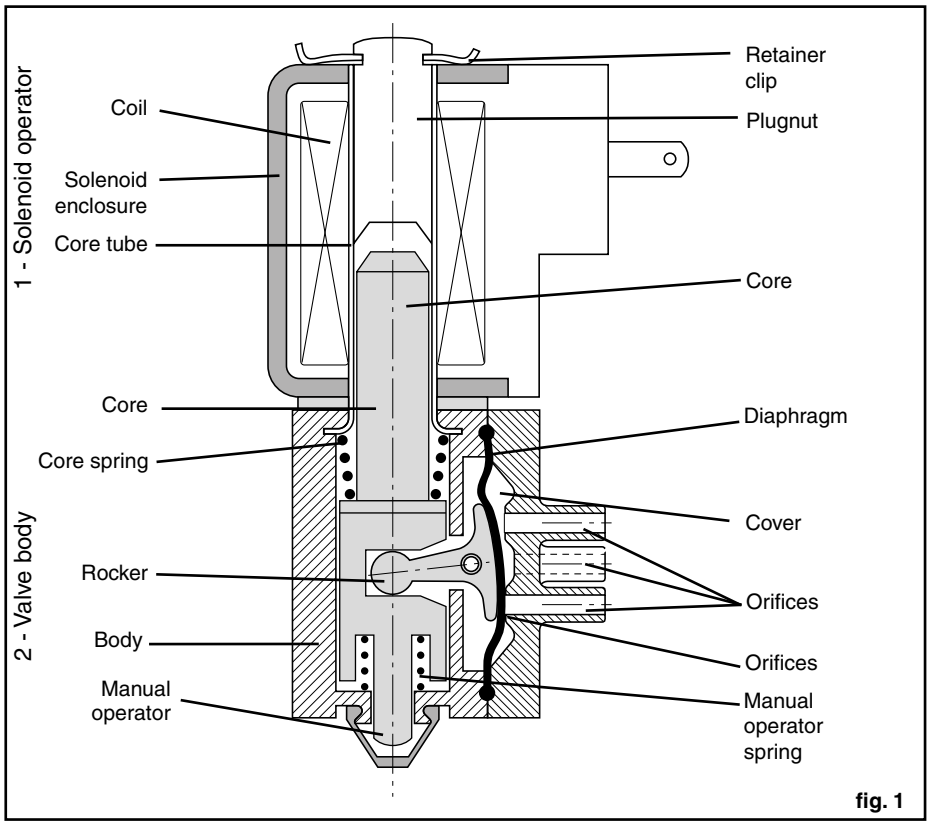


fig. 1

TYPES OF SOLENOID VALVES

2/2-3/2 solenoid valves with fluid isolation

- Diaphragm **(Fig. 2)**:

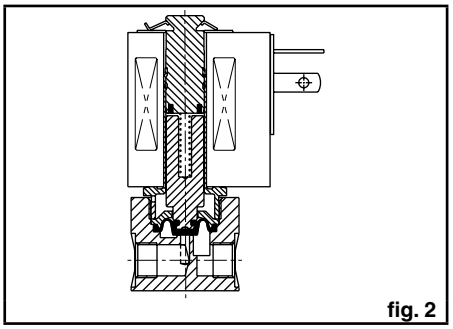


fig. 2

Diaphragm type solenoid valves are compact, and have a very extended service life and a very small internal volume. They are ideal for handling agressive fluids. The valve body is in stainless steel or plastic (PVDF/PP), with a diaphragm in VMQ (silicone), FPM or PTFE. Low power coil. Screwed connections.
Serie 282

- Rocker **(Fig. 3)**:

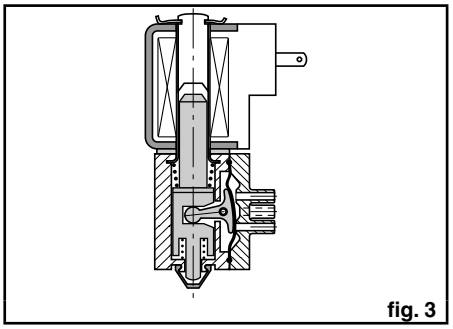


fig. 3

Rocker type solenoid valves are compact, and designed to incorporate a hermetic seal between fluid and control system. These valves are ideal for handling aggressive fluids, or where a maximum level of fluid purity is required. Low power coil and fast response times. Screwed or splined connections.
Series 110/360

- Lever **(Fig. 4)**:

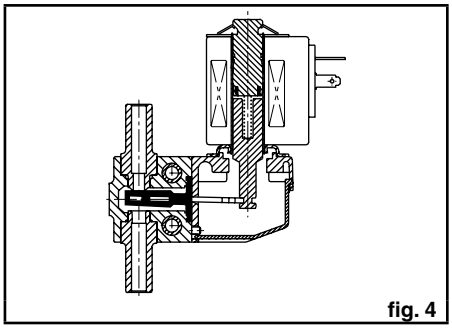


fig. 4

Lever type solenoid valves are designed for high differential pressures and flow rates. Heat dissipation for the electromagnetic part is optimised by separating the control system from the valve itself. These valves are ideally suited for high ambient temperatures. Screwed or spigot connections.
Series 283/383

- Bellows **(Fig. 5)**:

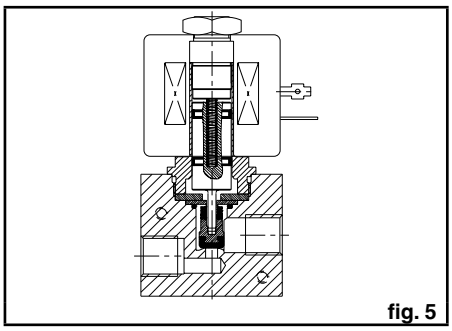


fig. 5

Bellows solenoid valves ensure exceptional operating reliability under severe service conditions and extended life service. A body in PEEK or stainless steel, bellows in PTFE and disc in FFPM make these valves suitable for handling highly corrosive fluids at substantial flow rates. Screwed connections.
Series 296/396

- Tube pinch **(Fig. 6)**:

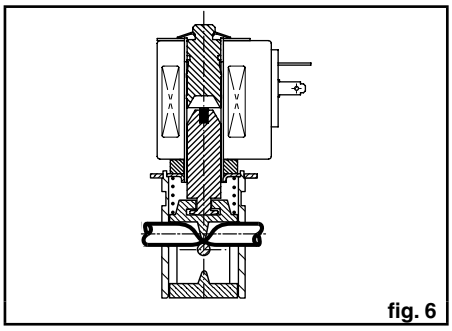


fig. 6

Tube pinch type solenoid valves provide full bore flow (no internal volume) and extended service life. This is achieved by means of the pinch device, designed specially to operate smoothly with a balanced load. No pollution is possible, and operation of the valve is silent. Bidirectional fluid flow.
Series 284/384

Direct operated 2/2 solenoid valves
The core is mechanically connected to the disc and opens or closes the orifice, depending on whether the solenoid coil is energised or de-energised.

Core-disc valve construction (**Fig. 7**).
Operation is not dependent upon line pressure or rate of flow (zero or maximum rated pressure). These valves are generally available in 2/2 NC/NO and 3/2 NC/NO/U versions.
NC – Normally closed:
NO = Normally open
U = Universal

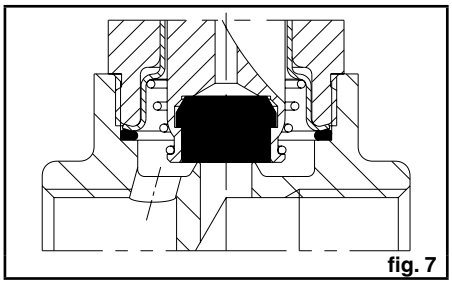


fig. 7

• PRESSURES

Maximum operating pressure differential – MOPD (PS)

The maximum operating pressure differential (DP) is the pressure the solenoid operator has to overcome to open (NC function) or close (NO function) a solenoid valve.
The maximum operating pressure differential refers to the maximum difference in pressure between the inlet and outlet.
If the pressure at the outlet is zero, the supply pressure is to be regarded as the maximum operating pressure differential. In this case, in order to prevent coil burnout, the pressure at the inlet must not exceed the maximum operating pressure differential specified for each valve.
The maximum operating pressure differential may vary according to the fluid or type of power used (AC valves usually have higher pressure ratings than DC valves).

Minimum operating pressure differential

Minimum operating pressure differential (bar) is that which is required to open the valve and keep it open. The valve will start to close below the minimum operating differential pressure.

Maximum allowable pressure
(according to EN 764)

The maximum allowable pressure is the maximum line or system pressure to which the valve may be subjected in normal service and at a given temperature, generally, ambient temperature, without causing damage .

• TEMPERATURES

Normal ambient temperature

The normal ambient temperature is assumed to be in accordance with standard conditions as specified in ISO 554
ambient temperature : 20°C
ambient pressure : 1013 mbar
relative humidity : 65%

Maximum ambient temperature (TS)

The maximum ambient temperature is based on test conditions to determine safe limits for coil insulation. The temperature is determined under continuously energized conditions and with maximum fluid temperatures (as listed) existing in the valve.

Minimum ambient temperature

The minimum ambient temperature of a valve is greatly affected by application and construction.
Damage may occur when liquids solidify above the specified minimum temperature. Be sure to observe minimum and maximum limits.

Maximum fluid temperature (TS)

The maximum fluid temperature listed is valid for an ambient temperature of 20°C and 100% RD (Relative Duty Time).

• VISCOSITY

Viscosity is the resistance of a fluid to flow, due to internal friction. Viscosity affects the flow rate of a valve considerably and the flow factor is reduced when viscous fluids are to pass the valve.
There are two types of viscosity:
a) dynamic viscosity, expressed in Pa.s (Pascal seconds) or Poises
b) kinematic viscosity, which is the ratio between dynamic viscosity and density of the fluid

Kinematic viscosity is expressed in mm^2/s or cStokes; in this catalogue only kinematic viscosity is considered.

PRODUCT INFORMATION

rubbers, plastics and metals

ASCO™

- **RUBBERS:**

CR (chloroprene)

Principally used in refrigeration systems (Freon 22) as an external seal. Neoprene is also utilized for oxygen service. Suitable for alcohol, mild acids, water, air, ammonia, argon gas and other gases.
It has a temperature range of -20°C to +90°C.

CSM (chlorosulfonated polyethylene)

Used to handle strong oxidizing fluids, edible liquids, many chemicals, etc. Not recommended for aromatic or chlorinated hydrocarbons. It has a temperature range of -40°C to +120°C.
Hypalon® is an example for CSM, it is part of the family of elastomers.
(Hypalon® is a registered trademark of Dupont Performance Elastomers)

EPDM (ethylene-propylene)

Suitable for temperatures somewhat above the NBR range (i.e. excellent for phosphate ester type fluids and poor on petroleum base types), except ethylene-propylene has a somewhat higher temperature range than NBR. On this basis, ethylene-propylene has served to replace the formerly used NBR. Useful as "O" ring gaskets on steam valves due to low compression set. Ethylene-propylene is generally suitable for most photographic solutions as well as numerous chemical solutions.
Ethylene-propylene is selected for applications which have a wider temperature range than the NBR temperature range, such as handling hot water and steam. Ethylene-propylene has an extremely wide range of fluid compatibility but has the distinct disadvantage that it cannot be used with petroleum-based fluids or fluids so contaminated (such as lubricated air). It has a temperature range of -20°C to +180°C.

FFPM (perfluoroelastomer)

Elastomer used in the manufacture of joints and seals, combining resistance to aggressive chemical environments, swelling and high temperatures. Particularly suitable for pharmaceutical applications requiring extreme conditions of cleanliness.
Kalrez® is an example for FFPM, it is part of the family of elastomers.
(Kalrez® is a registered trademark of Dupont Performance Elastomers)

FPM (fluoroelastomer)

Suitable for temperatures somewhat above the NBR range. Excellent resistance to many petroleum oils, gasoline, dry-cleaning fluids and jet fuels. Not good for ketones, halogenated hydrocarbons and freons.
FPM is a fluorocarbon elastomer which was primarily developed for handling hydrocarbons such as jet fuels, gasolines, solvent, etc., which normally caused detrimental swelling to NBR. FPM has a high temperature range similar to ethylene-propylene but has the advantage of being somewhat more resistant to "dry heat". FPM has a rather wide range of chemical compatibility. It has a temperature range of -40°C to +190°C.
Viton® is an example for FPM, it is part of the family of elastomers.
(Viton® is a registered trademark of Dupont Performance Elastomers)

FVMQ (fluorosilicone)

A silicone with a trifluoropropyl group on each siloxane unit. Good resistance to heat and most solvents. Good low temperature characteristics.

NBR (nitrile)

Standard compound for service in petroleum oils, air, water, mild acids, acetylene, kerosene, lime solutions, liquified petroleum gases and turpentines. Not recommended for highly aromatic gasolines or acids.
NBR is commonly referred to as a nitrile rubber and is standard synthetic elastomer for accomplishing resilient-type seating or sealing in most values. It has excellent compatibility for most air, water and light oil applications. It has a temperature range of -20°C to +90°C.
Buna® is an example for NBR, it is part of the family of elastomers.
(Buna® is a registered trademark of DuPont de Nemours and Company or its affiliates)

SBR (styrene butadiene)

Polymer use in the manufacture of seals. Good resistance to swelling in acids, non-organic and organic bases, alcohols and water.

UR (urethane)

Used for water, air at normal ambient temperatures, alcohol, non-aromatic compounds, ether, edible fats and oils and hydraulic fluids. Its principal asset is high strength, excellent abrasion resistance. It is not recommended for ketones and strong oxidizing agents. It has a temperature range of -30°C to +40°C.

VMQ (silicone)

Known as the only elastomer which, under certain conditions, can be utilized for both high and low temperature, which is its principal use. Also handles hydrogen peroxide and some acids. Not good for steam; poor disc life. Fluorosilicone compounds are noted to have better fuel resistance.

Note:
Temperature limitations for elastomers are somewhat dependent on their specific functional usage in a valve.
Obviously, a diaphragm which stiffens at low temperature is objectionable while an "O" ring gasket of similar material which stiffens at low temperature may still be performing its sealing function.
Generally, temperatures down to -20°C can be considered tolerable and special elastomers such as silicone and low temperature NBR must be selected for use below this temperature.
These elastomers can extend the lower limit to approximately minus 40°C (-40°C) depending on specific usage. The upper limit for elastomers is generally around +100°C, except FPM, EPDM and VMQ which can, on specific applications, be utilized up to +190°C.
PTFE (see following page) is a commonly used gasket or disc material not considered an elastomer. This unique chemical-resistant material can be used from -270°C to +250°C with proper design limitations.

- **PLASTICS:**

PA (polyamide)

A polyamide resin known to be very durable and also resistant to many chemicals. A heat resistant type polyamide is always used in ASCO Numatics valves.

PARA (polyarylamide)

Aromatic polyamide in which at least one monomer contains a benzene ring, giving it improved mechanical, thermal and chemical resistance.
IXEF® is an example for polyarylamide, it is part of the family of thermoplastics.
(Ixef® is a registered trademark of Solvay S.A.)

PC (polycarbonate)

Good with polar solvents, salt solutions and water applications. Not recommended for non-polar solvents. A polycarbonate type thermoplastic known for having high impact strength and good resistance to inorganic acids and aliphatic hydrocarbons. Not suitable for use with air containing phosphate esters (found in synthetic oils).

PE (polyethylene)
A family of plastics varying from low melting point to high heat distortion temperature; and from flexible to rigid. Although somewhat soft, they offer good electrical, chemical and moisture resistance and physical properties.

PEEK (polyetheretherketone)

High performance thermoplastic with exceptional resistance to a wide range of chemical environments including at high temperatures.

PEI (polyetherimide)

This resin has good heat deflection characteristics. Good chemical resistance to non-oxidizing acids and polar solvents. Questionable usage on alkaline solutions. Ultem® is an example for PEI, it is part of the family of plastics.
(Ultem® is a registered trademark of General Electric Company)

POM (polyacetal or polyoxymethylene)

Acetal resin type thermoplastics are extremely rigid but not brittle. They provide good toughness, tensile strength, stiffness and long life. They are odourless, tasteless, non-toxic and resistant to most solvents.
Delrin® is an example for polyacetal, it is part of the family of plastics.
(Delrin® is a registered trademark of DuPont de Nemours and Company or its affiliates)

PP (polypropylene)

A thermoplastic known to have excellent resistance to inorganic salts, mineral acids and gases. It offers good resistance to photographic solutions and is one of the few plastics that has the ability to withstand steam sterilization.

PPS (polyphenylene sulfide)

This resin has outstanding chemical resistance and no known solvents below 200°C. It has low friction, good wear resistance and high tensile strength.
Ryton® is an example for PPS, it is part of the family of plastics.
(Ryton® is a registered trademark of Chevron Philips Chemical Company)

PSU (polysulfone)

Known as one of the most heat resistant of the thermoplastics. It has excellent chemical resistance when used for inorganic acids, alkalies and aliphatic hydrocarbons.

PTFE (polytetrafluoroethylene)

A fluorcarbon resin known to be suitable for disc material where all other synthetic materials have failed. Teflon® is not easily fabricated and is known to have objectionable "cold flow" characteristics.
Teflon® is an example for PTFE, it is part of the family of plastics.
(Teflon® is a registered trademark of DuPont de Nemours and Company or its affiliates)

PTFE Reinforced

PTFE reinforced is a form of PTFE having fillers which have been added for improved mechanical properties. PTFE and TPFE with fillers are considered more of a plastic than a resilient-type material. They are virtually unattacked by any fluid. Their temperature usage ranges from discs for cryogenic valves to discs for steam valves. The "cold flow" characteristics may contribute to leakage particularly on gases. They have a temperature range of -270°C to +250°C. Rulon® is an example for reinforced PTFE, it is part of the family of plastics.
(Rulon® is a registered trademark of Saint Gobain Performance Plastics Corporation)

PUR (polyurethane)

Polyurethane is a multipurpose, robust product. It has good adhesion to a variety of substrates, providing resistance to humidity and impact strength.

PVC (polyvinyl chloride)

Known for its chemical inertness but has somewhat less temperature resistance than most other plastics. PVC has excellent resistance to strong alkalies, mineral acids, salts and many chemicals corrosive to conventional materials.

PVDF (polyvinylidene fluoride)

Polymer resistant to atmospheric agents and the majority of chemical products at ambient temperature. High purity PVDF compounds are particularly recommended for medical applications.

TPE (thermoplastic polyester elastomer)

Used in some diaphragm applications. HYT elastomers show high strength in tension, compression and flex. They are superior to polyurethane rubbers in load-bearing capacity.
Hytrel® (HYT) is an example for a polyester elastomer, it is part of the family of plastics.
(Hytrel® is a registered trademark of DuPont)

- **METALS:**

Ag (silver)

Shading coil material for stainless steel valves.

Al (aluminum)

Shading coil material for special fluids or for making washers, etc. Die cast aluminum is generally used for bodies for low pressure gas valves and can only be used with "water free" systems. It can be noted that die cast aluminum is successfully used in oil and gasoline applications.

Cu (copper)

Primarily used for shading coil.

CU Sn (bronze)

Casting bronze is used for body forging. Good sealing and casting properties, resistant to abrasion.

Cu Zn Pb (brass)

Forging brass is used in our body forgings. Forging brass has a composition of 59% copper, 2% lead and 39% zinc.

Fe Cr Ni (stainless steel AISI 303 or 304)

One of the most widely used steels containing 18% chromium and 8% nickel. Used for valve bodies, springs and internal parts. Known as stainless steel type 303 or 304.

Fe Cr Ni Mo (stainless steel AISI 316)

Alloy containing approx 17 % chromium, 12% nickel and 2 % molybdenum. Highly corrosion resistant.

Fe Cr Ni Mo (stainless AISI 316L)

Alloy containing 16 to 18% chromium, 11 to 14% nickel and 2,5 to 3% molybdenum. Valve bodies made from this material provide excellent resistance to particularly aggressive fluids.

Ni Fe (nickel iron)

Core material for low temperature fluids (below -100°C) particularly for "long stroke" solenoids.

Pb (lead)

Gaskets - sometimes - lead-clad copper gaskets.

Zamak

Zinc alloy containing approx. 4% aluminium, 0,04% magnesium and 1% copper. Used, for example, for the bodies of air treatment equipment .

PRODUCT INFORMATION
Chemical resistance guide

GENERAL

Our valves are available to control most acids, alcohol, bases, solvents and corrosive gases and liquids. Modified or special designs are sometimes required depending upon the fluid and application.

Corrosion occurs either as a chemical or electro-chemical reaction. Therefore, consideration must be given to both the galvanic and electromotive force series, as well as to pressure, temperature and other factors that might be involved in the application.
This guide provides information on most common corrosive and non-corrosive, unmixed gases and liquids.

Mixtures of different fluids and their temperatures are not included in this table. It's the user's responsibility to ensure the chemical and physical compatibility of the body and other materials with the fluids used.
For applications where abnormal conditions exist and for other types of valves, operations and fluids, contact us with full details of the operating conditions.

fluids ↑ = **Excellent** → = **Acceptable** ↘ = **Not recommended** ↓ = **Do not use** - = **No data available**	**body materials**													**other materials in contact with fluid**									
	steel	stainless steel AISI 303/304	stainless steel AISI 316	stainless steel AISI 316L	aluminium	bronze	cast iron	brass	PA	PEEK	PPS	Silver	Copper	CR	EPDM	FFPM	FPM	NBR	UR	PET	POM	PTFE	TPE
Acetaldehyde	↘	↑	↑	↑	→	↑	↑	↓	→	↑	→	↑	↓	↘	↑	↑	↓	↓	↓	↘	↑	↑	→
Acetic acid	↘	→	→	→	↘	↘	↘	↓	→	↑	↑	↑	↘	↘	→	↑	→	→	↓	→	↓	↑	↓
Acetic anhydride	↘	→	→	→	→	↘	↘	↓	↘	↑	↑	↑	↘	→	→	↑	↓	↘	↓	→	↓	↑	↓
Acetone	↑	↑	↑	↑	↑	↑	↑	↑	↘	↑	↑	↑	↑	↘	↑	↑	↓	↓	↓	↓	→	↑	↓
Acetonitrile	→	↑	↑	↑	↑	-	↑	-	-	↑	-	-	-	↑	→	↑	↓	↘	↓	→	-	↑	→
Acetophenone	-	↑	↑	↑	→	-	↑	↑	↑	-	→	-	-	↓	↑	↑	↓	↓	↓	→	-	↑	-
Acetyl chloride	↑	→	↑	↑	↓	↑	→	→	↘	-	↑	-	↑	↓	↘	↑	↑	↓	↓	↓	↓	↑	↓
Acetylene	↑	↑	↑	↑	↑	↘	↑	→	↘	↑	↘	↓	↓	↘	↑	↑	↓	→	↓	↓	↑	↑	↑
Air (lubricated)	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	-	↑	↘	↑	↑	↑	↑	↑	↑	↑	↑
Air (unlubricated, dry)	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	-	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Alcohol ethyl (ethanol)	↑	↑	↑	↑	→	↑	↑	↓	↑	-	-	↑	→	↑	↑	↑	→	↑	↓	↑	↑	↑	↑
Alcohol methyl (methanol)	↑	↑	↑	↑	→	↑	↑	↓	↑	-	↑	↑	→	↑	↑	↑	↓	↑	↓	↑	↑	↑	↑
Aluminium sulfate	↘	→	↑	↑	↑	↘	↓	↘	↘	↑	↑	→	→	↑	↑	↑	↑	→	↓	↑	↑	↑	→
Ammonia, anhydrous	↑	↑	↑	↑	↘	→	→	↘	↘	↑	↘	↘	↓	↑	↑	→	↓	→	↓	↘	↘	↑	↘
Ammonia, aqueous	↑	→	↑	↑	↓	↘	→	↓	↘	-	↘	↘	↘	→	↑	→	→	↘	↓	↑	↓	↑	-
Ammonia, water	↑	→	↑	↑	↓	↘	→	↓	↘	-	↘	↘	↘	→	↑	-	→	↘	↓	↑	↓	↑	-
Ammonium hydroxyde	↘	→	→	→	↘	↘	↘	↓	↘	↑	→	↓	↓	→	↑	→	→	↘	↓	↑	→	↑	→
Amyl acetate	↘	→	→	→	→	↑	↘	→	↑	↑	↑	-	↑	↓	↑	↑	↓	↓	↓	→	↓	↑	↘
Aniline	↘	→	↑	↑	↘	↘	→	→	↘	↑	→	↑	↓	↓	→	↑	→	↓	↓	↑	↑	↑	↘
Argon	↑	↑	↑	↑	↑	→	→	↑	↑	↑	↑	↑	↘	↓	↑	↑	↑	↘	↑	-	-	↑	↑
Barium chloride	↘	→	↑	↑	↓	↑	↘	↑	↘	↑	↑	-	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
Barium hydroxide	↘	→	↑	↑	↓	↘	↘	→	↘	-	↑	↑	↓	↑	↑	↑	↑	↑	→	↑	↓	↑	→
Benzaldehyde	↑	↑	↑	↑	↑	↑	↑	→	→	↑	→	↓	→	↓	→	↑	↓	↓	↓	↓	↑	↑	→
Benzene pure	→	↑	↑	↑	→	↑	→	→	↘	↑	→	↑	→	↓	↓	↑	↑	↓	↓	→	↑	↑	→
Benzene sulfonic acid	→	↑	↑	↑	↓	→	↓	→	↘	↓	→	↑	↘	→	↘	↑	↑	↘	↓	→	↘	↑	→
Borax	→	↑	↑	↑	↘	↑	↑	→	↘	↑	↑	-	→	→	↑	↑	↑	→	↑	↑	↑	↑	↑
Bromine	↘	↓	↘	↘	↓	↓	↓	-	↘	↓	↓	→	↘	↓	↓	↑	↑	↓	↓	→	↓	↑	↓
Butadiene	↑	↑	↑	↑	↑	↑	↑	↑	↘	-	↑	-	↘	→	↘	↑	↑	↓	↓	↓	↑	↑	↓
Butane	↘	↑	↑	↑	→	→	→	↑	↑	↑	↑	-	↘	↑	↓	↑	↑	↑	↘	→	↑	↑	→
Butanol (aqueous, butyl alcohol)	↑	↑	↑	↑	→	↑	→	↑	↑	-	↑	→	→	↑	→	↑	↑	↑	↓	→	↑	↑	→
Butylene	↘	↑	↑	↑	↑	→	↑	↘	↑	-	↑	-	↓	↘	↓	↑	↑	→	↓	→	↑	↑	→
Butyl acetate	↑	↑	↑	↑	↑	↑	↑	→	↑	↑	↑	→	↑	↓	→	↑	↓	↓	↓	→	→	↑	↘
Butylamine	↑	↑	↑	↑	↑	→	↑	-	↑	-	↓	-	-	↓	↓	↑	↓	↓	↓	→	↓	↑	↓
Butyl ether	↑	↑	↑	↑	↑	-	↑	-	↓	↑	↑	-	-	↘	↘	↑	↓	→	→	↓	↓	↑	↓
Calcium chloride	↘	→	→	→	↓	→	↓	-	↘	↑	↑	↑	→	↑	↑	↑	↑	↑	↑	↑	↓	↑	↑
Calcium sulfate	→	→	↑	↑	→	→	↑	↓	↘	↑	↑	↑	→	↑	↑	↑	↑	↑	↑	↑	↓	↑	-
Carbon dioxide (wet/dry)	↑	↑	↑	↑	↑	→	↑	↓	↑	-	↑	↑	↑	→	→	↑	↑	↑	↑	↑	↑	↑	↘
Carbon tetrachloride	↑	↘	↘	↘	↓	↑	↓	↑	↘	↑	→	→	↘	↓	↓	↑	↑	↘	↓	→	↑	↑	↓
Caustic soda	→	↑	↑	↑	↓	→	→	→	↑	↑	→	-	-	→	↑	↑	→	↘	→	-	↑	↑	→
Cellosolve	↑	→	↑	↑	→	-	→	↑	↑	-	↑	-	-	↓	→	↑	↘	↓	↓	↑	↑	↑	↓

Please note that the chemical resistance may be influenced by many factors, such as temperature, concentration, etc.
This data is for information only.

fluids ↑ = Excellent → = Acceptable ↘ = Not recommended ↓ = Do not use - = No data available	body materials													other materials in contact with fluid									
	steel	stainless steel AISI 303/304	stainless steel AISI 316	stainless steel AISI 316L	aluminium	bronze	cast iron	brass	PA	PEEK	PPS	Silver	Copper	CR	EPDM	FFPM	FPM	NBR	UR	PET	POM	PTFE	TPE
Chlorobenzene	→	→	↑	↑	↓	↑	↘	↑	↘	↑	↑	→	→	↓	↓	↑	↑	↓	↓	→	↓	↑	↓
Chloroform	↘	↑	↑	↑	↓	↑	↘	→	↑	↑	→	↑	→	↓	↓	↑	↑	↓	↓	↓	↑	↑	↘
Chlorosulfonic acid	↘	↘	↘	↘	↓	↘	↓	→	↘	↘	↓	-	↓	↓	↓	↑	↘	↓	↓	↘	↓	↑	↓
Chlorine (wet)	↘	↘	→	→	↓	→	↘	↓	↘	↓	↓	-	-	↓	↘	→	↑	↓	↓	↓	↓	↑	↓
Chromic acid (25%)	↘	↘	↑	↑	↘	↘	↓	↓	↘	↘	↓	↓	↓	↓	↑	↑	↑	↓	↓	→	↓	↑	↓
Chromic acid, concentrated	↘	↘	↘	↘	↓	↘	↓	↓	→	↘	↓	-	↓	↓	↘	↑	↑	↓	↓	→	↓	↑	↓
City gas	-	↑	↑	↑	-	-	-	↑	-	-	-	-	↓	→	↓	↑	↑	↑	→	-	-	↑	-
Coffee	↘	↑	↑	↑	↑	↑	↘	-	↑	-	-	-	↑	↑	↑	↑	↑	↑	↓	↑	↑	↑	-
Coke oven gas	↑	↑	↑	↑	-	→	↑	↘	-	-	-	↑	↑	↘	↓	↑	↑	↘	↓	-	-	↑	-
Detergent	→	↑	↑	↑	↑	↑	→	→	↑	-	↑	-	-	→	↑	↑	↑	↑	↓	↑	↑	↑	→
Diesel fuel	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	↑	↑	↑	→	↓	↑	↑	↑	↘	→	↑	↑	→
Dimethyl formamide	→	↑	↑	↑	↑	→	→	↘	↑	↑	→	-	↑	↓	→	↑	↘	→	↓	↑	↘	↑	→
Dimethyl phtalate	↑	↑	↑	↑	↑	-	↑	↑	↑	-	↑	-	-	↓	→	↑	→	↓	-	↑	-	↑	↑
Ethylene chloride	↑	→	↑	↑	→	↑	↘	→	↑	↑	→	↑	↘	↓	↘	↑	→	↓	↓	↘	↑	↑	↘
Ethylene diamine	→	→	↑	↑	↑	→	↑	↓	→	-	→	-	↓	↑	↑	→	↓	↑	↓	↑	↑	↑	-
Ethylene dichloride	↑	→	→	→	→	↑	↑	↑	↑	→	→	↑	→	↓	↘	↑	→	↓	↓	↓	↑	↑	↘
Ethylene glycol	→	→	↑	↑	→	↑	→	→	↑	↑	↑	↑	→	↑	↑	↑	↑	↑	→	↑	→	↑	↑
Ethylene oxide	→	↑	↑	↑	↓	↑	↘	↑	↘	-	↓	↘	↓	↓	↘	↑	↓	↓	↓	↘	↑	↑	↑
Ferric chloride	↓	↓	↘	↘	↓	↘	↓	↓	↑	→	↑	→	↓	→	↑	↑	↑	↑	↑	↑	→	↑	↑
Ferrous chloride	↓	↓	↘	↘	↓	↘	↓	↓	↘	↑	↑	→	↘	→	↑	↑	↑	↑	-	↑	→	↑	↑
Formaldehyde	→	↘	↑	↑	→	↑	↓	→	↑	→	↘	↑	→	→	↑	↑	→	→	↓	↑	↑	↑	→
Formic acid	↘	→	↑	↑	↓	↘	↓	→	↘	→	↑	-	↓	↑	↑	↑	↘	↘	↓	↑	↓	↑	→
Freon 11	→	↑	↑	↑	↘	↑	→	→	↘	↑	↑	↑	↑	↓	↓	→	↑	→	↓	↑	↑	↑	↑
Freon F-12	→	↑	↑	↑	↑	↑	→	→	↘	↑	↑	↑	↑	↑	→	-	→	→	↑	↑	↑	↑	↑
Freon 22	→	↑	↑	↑	↓	-	↓	↑	↑	↑	↑	↑	→	→	→	↑	→	↓	↓	↓	↑	↑	↓
Freon T WD602	→	↑	↑	↑	↓	-	-	↑	↑	-	↑	-	↑	→	→	→	↑	→	↑	-	-	↑	-
Fuel oil	↑	↑	↑	↑	↑	↑	→	→	↑	-	↑	↑	↘	→	↓	↑	↑	↑	↘	↑	→	↑	→
Fuel oil #6	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	↘	↓	↓	↑	↑	→	→	-	↓	↑	↑
Fuel ASTM Ref Fuel A	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	↘	→	↓	-	↑	↑	↑	-	↓	↑	↑
Fuel ASTM Ref Fuel B	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	↘	↓	↓	-	↑	↑	→	-	↓	↑	↑
Fuel ASTM Ref Fuel C	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	↘	↓	↓	-	↑	→	↓	-	↓	↑	↑
Fuel ASTM #1 Oil	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	-	↑	↓	-	↑	↑	↑	-	↓	↑	↑
Fuel ASTM #2 Oil	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	-	→	↓	-	↑	↑	→	-	↓	↑	↑
Fuel ASTM #3 Oil	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	-	↘	↓	-	↑	↑	→	-	↓	↑	↑
Fuel ASTM #4-5 Oil	↑	↑	↑	↑	↘	↑	↑	↑	↑	-	↑	-	-	↓	↓	-	↑	→	↓	-	↓	↑	↑
Furan	-	↑	↑	↑	↑	-	↑	-	-	-	↑	-	-	↓	↓	↑	↘	↓	-	↘	↓	↑	-
Furfural	↑	↑	↑	↑	↑	↑	↑	→	→	-	↑	→	→	↓	→	↑	↓	↓	↘	↓	→	↑	→
Gasoline (petrol)	↑	↑	↑	↑	-	↑	↑	↑	↑	↑	↑	↑	↘	→	↓	↑	↑	↑	→	↓	↑	-	↑
Gasoline 100 octane	-	↑	↑	↑	-	-	-	↘	↑	-	↑	-	-	→	↓	-	↑	↑	→	↓	↑	↑	↑
Glycogenic acid	↘	↑	↑	↑	-	→	↘	-	→	-	↑	-	-	-	→	-	-	↘	→	↑	↑	↑	-
Glycol	↑	↑	↑	↑	-	↑	↑	-	-	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	-	↑	↑	-
Helium	↑	↑	↑	↑	↑	↑	↑	↑	→	↑	↑	-	-	↑	↑	↑	↑	↑	↑	↑	↑	↑	-
Heptane	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	↓	↑	↑	↑	→	-	↑	↑	→
Hydraulic fluids	→	↑	↑	↑	↑	↑	↑	↑	↑	-	↑	-	-	↓	→	↑	↑	↓	↓	↓	→	↑	↑
Hydraulic oil	↑	↑	↑	↑	↑	↑	↑	↑	↘	-	↑	↑	↑	→	↓	↑	↑	↓	↑	↓	→	↑	↑
Hydrofluoric acid (50%)	↓	↓	↘	↘	↓	↘	↓	↘	↓	↓	↘	→	↓	→	↑	↑	→	↘	↓	→	↓	↑	↓
Hydrogen gas	↑	↑	↑	↑	↓	↑	↑	↑	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	↑	↑
Hydrogen peroxide (30%)	↘	→	→	→	→	↘	↓	↓	↘	↑	→	↓	↓	↓	→	↑	↑	↓	-	↑	↓	↑	↓
Hydrogen sulfide (dry hot)	↘	↘	↑	↑	↘	↘	↘	↘	↘	↑	→	↓	↓	→	↑	↑	↓	↓	→	↑	↑	↑	↑
Isobutylene	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	↘	-	-	↓	↓	↑	↑	↘	↘	-	-	↑	-
Jet fuels (JP1 through 5)	↑	↑	↑	↑	↑	↑	↑	↓	↘	-	↑	-	-	↘	↓	↑	↑	↑	→	→	↑	↑	-
Jet fuels (JP 6)	↑	↑	↑	↑	-	↑	↑	↓	-	-	-	-	↑	↓	↓	↑	↑	↑	↓	↓	↑	↑	-
Kerosene (kerosine)	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	→	↓	↑	↑	↑	→	→	↑	↑	↑
Lactic acid	↘	↑	↑	↑	↘	↘	↓	↓	↘	↑	↑	→	↘	→	→	↑	↑	↘	-	↑	↑	↑	↓
Liquid natural gas (LNG)	-	↑	↑	↑	↑	-	-	↑	-	-	-	-	-	-	-	-	-	-	-	-	-	↑	-
Liquid oxygen (LOX)	↓	↓	↓	↓	↓	↓	↓	↑	↓	-	↓	-	-	↓	↓	→	↓	↓	↓	-	-	↑	-

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fluids ↑ = **Excellent** → = **Acceptable** ↘ = **Not recommended** ↓ = **Do not use** - = **No data available**	**body materials**													**other materials in contact with fluid**									
	steel	**stainless steel AISI 303/304**	**stainless steel AISI 316**	**stainless steel AISI 316L**	**aluminium**	**bronze**	**cast iron**	**brass**	**PA**	**PEEK**	**PPS**	**Silver**	**Copper**	**CR**	**EPDM**	**FFPM**	**FPM**	**NBR**	**UR**	**PET**	**POM**	**PTFE**	**TPE**
Liquid petroleum gas (LPG)	-	↑	↑	↑	↘	-	-	-	→	-	-	↑	↑	→	↓	↑	↑	↑	↑	↓	→	↑	→
Lubricating oils, di-ester	↑	↑	↑	↑	-	↑	↑	-	→	-	↑	↑	↑	↘	↓	↑	↑	→	→	-	-	↑	↓
Lubricating oils, petroleum base	↑	↑	↑	↑	↑	-	↑	↑	-	-	-	-	→	→	↓	↑	↑	→	→	↘	↑	↑	↑
Lubricating oils, SAE 10, 20, 30, 40	↑	↑	↑	↑	↑	-	↑	↑	-	-	-	-	-	→	↓	↑	↑	↑	→	↘	↑	↑	↑
Magnesium acetate	↑	↑	↑	↑	↓	↘	↘	→	→	-	↑	-	-	-	↑	-	↓	↓	-	↑	-	↑	-
Magnesium hydroxide	↑	↑	↑	↑	↓	↘	→	→	→	↑	↑	↘	↘	→	↑	↑	↑	→	↘	↑	↑	↑	→
Methane	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	↓	↑	↑	↑	↘	→	↑	↑	→
Methyl ether ketone (MEK)	↑	↑	↑	↑	↑	↑	↑	↓	→	↘	→	↑	↑	↓	↑	↑	↓	↓	↓	↘	→	↑	→
Mineral oil	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	↑	↑	→	→	↓	↑	↑	↑	↑	→	↑	↑	↑
Morpholine	→	→	→	→	↑	→	→	-	→	-	→	-	-	↓	↓	↑	↓	↓	-	-	-	↑	-
Naphta	↑	↑	↑	↑	↑	↑	→	↘	↑	-	→	↑	→	↘	↓	↑	↑	↘	↘	↘	↑	↑	↑
Natural gas	→	↑	↑	↑	↑	↑	→	→	↑	↑	↑	↑	→	↑	↓	↑	↑	↑	→	↑	↑	↑	→
Nitric acid (10%)	↘	↑	↑	↑	↓	↘	↓	↓	↘	↑	↘	-	↓	→	→	↑	↑	↓	↘	↑	↘	↑	→
Nitric acid, concentrated	↓	↑	↑	↑	↓	↓	↓	↓	↓	↘	↓	-	↓	↓	↓	→	↑	↓	↓	↓	↘	↑	↓
Nitro benzene	↑	→	↑	↑	↘	→	↘	-	↘	↑	→	↑	↘	↓	↓	↑	→	↓	↓	→	→	↑	↓
Nitro methane	→	↑	↑	↑	↑	→	→	-	→	-	→	-	↑	↘	→	↑	↓	↓	↓	↘	↑	↑	↓
Nitrogen	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
Nitro propane	-	↑	↑	↑	↑	-	↑	-	-	-	-	-	-	↓	→	↑	↓	↓	↓	-	-	↑	-
Octane	-	-	↑	↑	-	-	-	-	-	-	-	-	-	↓	↓	↑	↑	↑	↓	↓	-	↑	-
Octane carboxylic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	↑	↓	-	-	↑	-
Octanol	-	-	↑	↑	-	-	-	-	-	-	-	-	-	→	↑	-	↑	→	↓	-	-	↑	-
Oleic acid	↘	→	↑	↑	↑	→	→	↘	↑	-	-	↑	↘	→	↘	↑	→	→	→	↑	↑	↑	↑
Olive oil	↑	→	↑	↑	↑	↑	↑	→	→	-	↑	-	-	→	→	↑	↑	↑	↑	↑	↑	↑	-
Oxygen, cold	→	→	→	→	→	→	-	↑	-	-	-	-	→	↑	↑	↑	↑	→	↑	-	-	↑	-
Oxygen 121 - 204°C (250 - 400 °F)	-	-	-	-	-	-	-	-	↓	-	↓	-	-	↓	↓	↑	↓	↓	↓	-	-	↑	-
Oxygen, gas	↑	↑	↑	↑	-	↑	↑	↑	→	-	↓	→	↑	→	↑	-	↑	↓	↑	-	-	↑	-
Ozone (dry)	↑	↑	↑	↑	→	↑	↑	↑	↘	↘	↘	→	↓	↘	↑	↑	↘	↓	↑	↓	↓	-	↘
Palm oil	↘	↑	↑	↑	↑	↘	↑	-	-	-	-	-	↑	↘	-	-	↑	↑	→	-	↑	↑	-
Palmic acid	↘	→	↑	↑	→	↘	↘	↘	↑	-	→	-	→	→	→	↑	↑	↑	↑	-	-	↑	-
Paraffin	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	-	-	→	→	↓	↑	↑	↑	→	↑	↑	↑	-
Pentane	-	→	↑	↑	↑	-	→	↓	→	-	-	↑	→	↑	↓	↑	↑	↑	↓	-	↑	↑	-
Pentanol	-	-	-	-	-	-	-	-	-	-	-	-	-	↑	↑	-	→	→	↓	-	-	↑	-
Perchloroethylene (“Perk”)	→	↑	↑	↑	↓	→	→	-	↘	↑	↓	↑	→	↓	↓	↑	↑	↓	↓	↓	↑	↑	↓
Petrol	→	↑	↑	↑	→	↑	→	↘	↑	↑	↑	-	-	→	↓	↑	↑	↑	→	↑	↑	↑	-
Petroleum benzine	↑	↑	↑	↑	↘	-	↑	→	→	-	↑	-	-	→	↓	-	↑	↑	→	-	-	↑	-
Petroleum ether	→	↑	↑	↑	→	-	→	↑	↑	↑	↑	-	-	→	↓	↑	↑	↑	→	↑	↑	↑	-
Petroleum naphtha	↑	↑	↑	↑	↘	↑	-	-	→	-	-	-	-	→	↓	-	↑	↑	→	-	→	↑	-
Petroleum oil above 121°C (250°F)	↑	↑	↑	↑	↘	↑	-	-	→	-	-	-	-	↓	↓	↑	→	↑	↓	-	→	↑	-
Petroleum oil below 121°C (250°F)	↑	↑	↑	↑	↘	↑	-	-	→	-	-	↑	↑	→	↓	↑	→	↑	→	-	→	↑	-
Phenol	→	→	→	→	→	→	↓	→	↘	→	↑	↑	→	↓	↓	↑	↑	↓	↓	↘	↑	↑	↓
Phenilic acid	-	-	-	-	-	→	-	↓	-	-	-	-	-	↓	↓	-	→	↓	↓	-	-	↑	-
Phosphoric acid 10%	→	→	→	→	↓	→	↓	↓	↘	↑	↑	→	↓	→	↑	↑	↑	↑	↑	↑	↓	↑	-
Phosphoric acid, concentrated	↘	↓	↓	↓	↓	↘	↓	↓	↓	↘	↑	→	↓	↓	→	↑	↑	↓	↑	↑	↓	↑	↓
Pine oil	-	↑	↑	↑	↑	↑	→	→	↑	↑	→	-	-	↓	↓	↑	↑	→	-	-	↑	↑	↓
Poly propylene glycol	↑	↑	↑	↑	↑	↑	→	↑	→	-	↑	-	-	↓	↑	↑	↑	↑	-	↑	↓	↑	-
Potassium acetate	-	→	→	→	↓	-	↑	-	-	-	-	↑	→	→	↑	↑	↓	→	↓	↑	↑	↑	-
Potassium bicarbonate	↑	→	→	→	↓	→	↘	-	→	-	-	-	↓	↑	-	↑	↑	↑	-	-	↘	↑	-
Potassium carbonate	↑	→	↑	↑	↓	→	↑	→	→	↑	↑	-	-	↑	↑	↑	↑	↑	-	-	-	↑	-
Potassium chloride	↘	↘	↘	↘	→	↑	→	↓	→	↑	↑	↓	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓
Potassium hydroxide (50%)	→	↑	↑	↑	↓	↘	↘	↓	↘	↑	→	→	↘	→	→	↑	↘	↘	→	↑	↑	↑	↑
Potassium nitrate	→	↘	↑	↑	↑	↑	→	→	→	↑	↑	↘	→	↑	↑	↑	↑	↑	↑	↑	→	↑	-
Potassium phosphate	→	→	→	→	↓	-	↓	→	→	↑	-	-	-	↑	↑	↑	↑	→	-	-	-	↑	-
Potassium sulfate	↑	→	↑	↑	↓	→	↓	→	→	↑	↑	→	→	↑	↑	↑	↑	↑	↑	-	-	↑	-
Propane	↑	↑	↑	↑	↑	↑	→	→	→	↑	↑	-	↑	↘	↓	↑	↑	↑	↘	↓	↑	↑	→
Propanol	↑	↑	↑	↑	-	-	↑	↑	→	↑	↑	-	-	↑	↑	-	↓	↓	↓	-	-	↑	-
Propylene	↑	↑	↑	↑	↑	-	↑	↑	-	-	-	↑	↑	↓	↓	↑	↑	↓	↓	↑	↑	↑	-

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	steel	**stainless steel AISI 303/304**	**stainless steel AISI 316**	**stainless steel AISI 316L**	**aluminium**	**bronze**	**cast iron**	**brass**	**PA**	**PEEK**	**PPS**	**Silver**	**Copper**	**CR**	**EPDM**	**FFPM**	**FPM**	**NBR**	**UR**	**PET**	**POM**	**PTFE**	**TPE**
Propylene chloride	-	→	↑	↑	↓	-	↑	-	-	-	-	-	-	↓	↓	↑	→	↓	↓	-	-	↑	-
Pydraul 10E, 29ELT	-	↑	↑	↑	-	-	↑	-	-	-	-	↑	→	↓	→	↑	↑	↓	↓	-	-	↑	-
Pyridine	↑	→	↑	↑	→	→	→	↘	↑	↑	↑	-	↘	↓	→	↑	↓	↓	↓	↘	→	↑	↘
Saccharose	→	↑	↑	↑	-	-	↑	↑	-	-	→	-	→	↑	↑	-	↑	↑	↓	-	-	↑	-
SAE oils	-	-	-	-	-	-	-	-	-	-	-	-	→	→	↓	-	↑	↑	↑	-	-	↑	-
Salt water	-	↘	↘	↘	↓	↑	↓	↓	↑	-	↑	-	→	↑	↑	↑	↑	↑	↓	↑	↑	↑	-
Soda	→	↑	↑	↑	↓	→	→	→	↑	-	↑	↑	→	→	↑	↑	→	↘	→	-	↑	↑	→
Sodium carbonate	↑	→	↑	↑	↘	↑	→	→	→	-	↑	↑	→	↑	↑	↑	↑	↑	-	↑	↑	↑	→
Sodium chloride	↘	↘	→	→	↘	↑	→	↘	→	↑	↘	→	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Sodium hydroxide (caustic soda)	↑	→	↑	↑	↓	↑	↘	↓	↑	↑	→	↑	↘	→	↑	↑	→	↘	→	↑	↑	↑	↓
Sodium hypochlorite	↘	↘	↘	↘	↓	↘	↓	↘	↘	↑	↘	→	↓	↘	→	↑	↑	↘	↓	→	↓	↑	↘
Sour natural gas	-	-	→	→	-	-	-	-	-	-	-	-	-	-	↓	↑	↓	↓	↓	-	-	↑	-
Steam to 107°C (225°F)	↑	↑	↑	↑	↓	↑	↑	↑	↘	-	→	→	→	↘	↑	↑	↓	↘	↓	-	-	↑	-
Steam 107 - 148°C (225 - 300°F)	↑	↑	↑	↑	↓	↑	↑	↑	↘	-	→	-	-	↓	↑	↑	↓	↓	↓	-	-	↑	-
Steam over 148°C (300°F)	↑	↑	↑	↑	↓	↑	↘	↑	↘	-	→	-	-	↓	↘	↑	↓	↓	↓	-	-	↑	-
Stoddard solvent	↑	↑	↑	↑	↑	↑	↑	-	↑	-	↘	-	↑	↘	↓	↑	↑	↑	↑	↑	↑	↑	↘
Sulphur dioxide, liquid	↑	→	↑	↑	↓	→	↓	↘	↘	↘	↑	↘	↘	→	↑	↑	↑	↓	-	↑	↓	↑	↓
Sulphuric acid, concentrated	↘	→	→	→	↓	↘	↓	↓	↘	↓	→	↓	↓	↓	→	↑	↑	↓	↓	↘	↓	↑	↘
Tetrachloroethylene	↑	↑	↑	↑	↓	-	↑	→	↘	-	→	↑	↑	↓	↓	↑	↑	↓	↓	↓	↑	↑	-
Tetrahydrofuran	↑	↑	↑	↑	→	↑	-	-	↑	↑	↘	-	-	↓	→	↑	↓	↓	↘	↘	↓	↑	→
Toluene	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	↑	↑	↓	↓	↑	↑	↘	↓	-	↘	↑	↘
Tri chloro ethylene	→	→	→	→	→	→	→	↑	↘	↑	→	-	↘	↓	↓	↑	↑	↘	↓	↘	→	↑	↓
Tri chloro acetic acid	↘	↓	↘	↘	↓	-	↓	↘	↘	-	↑	-	↓	↘	→	↑	↘	→	↓	→	↓	↑	↓
Turpentine	↑	→	↑	↑	↑	↑	→	↘	→	-	↑	↑	→	↓	↓	↑	↑	↑	↓	→	↑	↑	→
Vaseline	↑	↑	↑	↑	-	-	↑	↑	↑	-	↑	-	-	→	↓	-	↑	↑	↑	-	-	↑	-
Vegetable oils	↑	↑	↑	↑	↑	↑	→	→	↑	-	-	-	-	↓	→	↑	↑	↑	-	↑	↑	↑	-
Vinegar	↘	↑	↑	↑	↓	↘	↘	↘	↑	-	↑	↑	→	→	↑	↑	↑	↘	↓	↑	→	↑	↘
Water	-	↑	↑	↑	-	-	-	-	-	-	-	-	-	→	↑	↑	→	↑	↘	-	-	↑	↑
Water, acid mine	↘	→	↑	↑	↓	↘	↓	↘	↑	-	↑	-	↓	↑	↑	-	↑	→	-	↑	↑	↑	↑
Water, deionized	↘	↑	↑	↑	↑	→	↘	↑	↓	-	↑	-	→	↑	↑	→	↑	→	-	-	→	↑	↑
Water, distilled lab	↘	→	↑	↑	→	↑	↘	→	→	↑	↑	↑	↘	↘	↑	-	↑	↑	↑	↑	→	↑	↑
Water, drinking	-	↑	↑	↑	↑	-	-	↓	↑	-	-	-	-	→	↑	-	↑	↑	↓	-	-	↑	↑
Water, fresh	↑	↑	↑	↑	→	↑	→	↑	↑	-	↑	↑	→	→	↑	-	↑	↑	↑	↑	↑	↑	↑
Water, heavy	-	-	-	-	-	-	-	-	↑	-	↑	-	-	→	↑	↑	↑	↑	↓	↑	↑	↑	↑
Water, sea/river	↘	→	→	↑	→	→	↘	↘	→	↑	↑	↑	→	→	↑	-	↑	→	↑	↑	↑	↑	↑
Water glass	↑	↑	↑	↑	-	-	↑	→	↑	-	↑	-	→	↑	↑	-	↑	↑	↘	↑	↑	↑	↑
Waterproofing salt	-	↘	↘	↘	→	↑	↓	→	↑	-	↑	-	-	→	-	-	-	→	↘	↑	↑	↑	↑
Xenon	↘	↑	↑	↑	↑	-	↘	↑	↑	↑	↑	-	-	↑	↑	↑	↑	↑	↑	↑	-	↑	-
Xylene	↑	→	→	→	↑	↑	→	→	→	↑	→	↑	↑	↓	↓	↑	↑	↓	↓	→	↑	↑	→
Zinc chloride	↓	↘	↘	↘	↓	↘	↓	↓	↑	↑	↑	→	↓	↑	↑	↑	↑	↑	↑	↑	↓	↑	↑

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ENGINEERING INFORMATION

Conversion tables

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

	cm^2	m^2	sq.inch	sq.foot	sq.yard
1 cm^2	1	1.10^{-4}	0,155	$1,0764.10^{-3}$	$1,196.10^{-4}$
1 m^2	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 m^2 = 10^{-6} km = 10^{-4} ha = 10^{2} dm^2 = 10^{6} mm

DENSITY

	kg/ltr	kg/m^3	pound / cubic foot	pound / gallon	
				Imperial	US
1 kg/ltr	1	1000	62,43	10,022	8,345
1 kg/m^3	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 (dm^3)	m^3	cubic inch	cubic foot	gallons	
					US	Imperial
1 l	1	1.10^{-3}	61,024	0,03531	0,2642	0,220
1 m^3	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	m^3/kg	cubic foot / pound
1 ltr/kg	1	0,001	0,01602
1 m^3/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 1 $\frac{cm}{s^2}$; 1 kg = 1 kg x g
1 Poundal = 1 Pound x g

PRESSURE

	1 bar = 10^5 N / m^2	1 at = 1 Kp / cm^2	poundal / sq ft	poundal / sq in = Psi	1 atm = 760 Torr = 760 mm Hg (0°C)	Hg column (0°C)		H_2O column (WC) (4°C)	
						mm Hg = Torr	in Hg	m H_2O	ft H_2O
1 Pa = 1 N/m^2	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
1 mm 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 $\frac{N}{m^2}$ = Pa (Pascal) = 10 $\frac{dyn}{cm^2}$

1 $\frac{kp}{m^2}$ = 10^{-4} $\frac{kp}{cm^2}$ = 1 mm WC (at 4°C)

WORK, ENERGY, HEAT CONTENT

	1 kcal	1 kp m	Btu (British thermal unit)	ft poundal	1 kWh	Horsepower hour (hph)		ton-day of refrigeration	1 Joule = 1 Nm = Ws
						metrical 75 kp m h / s	imperial 550 ft.lb h / s		
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 kW = 1 kJ/s	Horsepower hour (HP) metrical 75 kp m/s	Horsepower hour (HP) imperial 550 ft lb/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									
Br u r	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

ς**h**	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

ς**s**	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

FORMULAS FOR TEMPERATURE CALCULATION

T celsius = $\frac{5}{9}$ (Tf - 32)

Tc = temperature Celsius

T fahrenheit = $\frac{9}{5}$ (Tc + 32)

Tf = temperature Fahrenheit

T kelvin = Tc + 273

Tk = temperature Kelvin

TEMPERATURES

Common temperatures in degrees Kelvin and corresponding Celsius and Fahrenheit equivalents

Kelvin (K)	Celsius (°C)	Fahrenheit (°F)
0	- 273	- 459
17	- 256	- 429
33	- 240	- 400
49	- 224	- 371
65	- 208	- 342
81	- 192	- 314
97	- 176	- 285
113	- 160	- 256
129	- 144	- 227
145	- 128	- 198
161	- 112	- 170
177	- 96	- 141
193	- 80	- 112
209	- 64	- 83
225	- 48	- 54
241	- 32	- 26
257	- 16	- 3

Kelvin (K)	Celsius (°C)	Fahrenheit (°F)
273	0	32
289	16	61
305	32	90
321	48	118
337	64	147
353	80	176
369	96	205
385	112	234
401	128	262
417	144	291
433	160	320
449	176	349
465	192	378
481	208	406
497	224	435
513	240	464
529	256	493

(ORIFICE) SIZES

Common valve ORIFICE sizes and equivalents im mm

inches	mm
3/64 (,0469)	1,19
1/16 (,0625)	1,59
5/64 (,0781)	1,98
3/32 (,0937)	2,38
1/8 (,1250)	3,18
5/32 (,1562)	3,97
11/64 (,1719)	4,37
3/16 (,1875)	4,76
7/32 (,2187)	5,55
1/4 (,2500)	6,35
9/32 (,2812)	7,14
5/16 (,3125)	7,94

inches	mm
7/17 (,4375)	11,11
1/2 (,5000)	12,70
5/8 (,6250)	15,88
11/16 (,6875)	17,46
3/4 (,7500)	19,05
1 (1,000)	25,40
1 1/8 (1,250)	28,58
1 1/4 (1,2500)	31,75
1 1/2 (1,5000)	38,10
1 3/4 (1,7500)	44,45
2 (2,0000)	50,80
3 (3,0000)	76,20

VALVES FOR ANALYTICAL AND MEDICAL TECHNOLOGY

www.asconumatics.eu

ASCO Numatics GmbH
Otto-Hahn-Str. 7-11 • 75248 Ölbronn-Dürrn • Germany
Phone: +49 7237 / 996-0 • Fax: +49 7237 / 996-1
E-Mail: asconumatics-de@emerson.com

DP 14209-EN, 10/2015, 500, Koha