Explosion Proof 4/3 Proportional Control Valve, Screw-in Cartridge design

SD2P2X-B4

7/8-14 UNF • Q_{max} 25 l/min (7 GPM) • p_{max} 250 bar (3600 PSI)

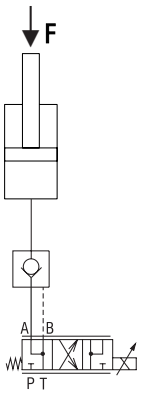
Technical Features

- 4/3-screw-in cartridge proportional directional control valve, spool type, with 7/8-14 UNF connection thread
- Maximum operating pressure 250 bar (P, A, B ports) and 100 bar (T port)
- Certification of solenoid coil ATEX (Directive 2014/34/EU) and IECEx, valid for mines and environments with potentially explosive atmospheres consisting of gases or dust
- Coil certification "FM APPROVED" valid for USA and Canada
- Coil protection by flameproof enclosure "d" / "t" (for dust)
- Robust design resistant to mechanical damage
- Protection against static discharge by grounding the valve surface
- Valves applicable for temperature classes T4 (135 °C) depending on maximum ambient temperature
- Easily interchangeable direction of power cable entry (axial/radial) into the coil
- Optional coil supply voltage (12 / 24 V DC)
- The valve is zinc coated for 520 h corrosion protection in NSS acc. to ISO 9227 and as protection against ignition spark in the event of mechanical impact

Product Description

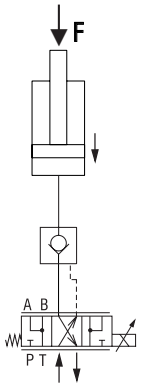
Screw-in cartridge proportional directional control valve, spool type, with special channel opening timing. It combines the opening of pilot operated check valve at the beginning of the device function with the control of the volumetric flow in the appliance branch proportional to the electrical command signal. The valve can be used for a single-acting appliance where backward movement is provided by the load. For a double-acting appliance, two valves must be used (for branches A, B). The valve is certified for use in potentially explosive atmospheres of gases, vapors, dusts and flammable particles with a high protection level EPL = b.
A suitable electronic control unit (not included) should be used to control the valve, which must meet the required protection level or be located outside the explosive atmosphere.

A



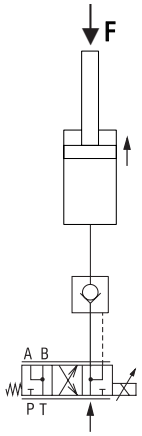
The piston lowering is blocked by closed pilot operated check valve.

B



The pilot operated check valve is opened by pressure fluid in B channel
and the cylinder is relieved to the tank via A channel – the piston moves downwards by acting load F;
the lowering speed can be smoothly regulated by flow throttling on the spool adge.

C



The pilot operated check valve remains open by fluid pressure in B channel.
The pressure fluid is simultaneously led to the cylinder
and the piston moves upwards. The lifting speed can be smoothly regulated.

Use of the valve in potentially explosive atmospheres

12 V / 24 V DC	Zones	Type of protection – flameproof enclosure
Ex I M2 Ex db I Mb	Category Mb	"d" (EN /IEC 60079-1)
Ex II 2G Ex db IIB+H2 T4 Gb	Zones 1, 2	"d" (EN /IEC 60079-1)
Ex II 2D Ex tb IIIC T135°C Db	Zones 21, 22	"t" (EN/IEC 60079-31)

NEC 500 (USA), Annex J (Canada)
Class I Division 1 Group B, C, D T4 Class II / III Division 1 Group E, F, G T4

NEC 505, 506 (USA)
CL I Zone 1, AEx db IIB+H2, T4 Gb
Zone 21, AEx tb IIIC T135°C Db

CEC Section 18 (Canada)
Ex db IIB+H2 T4 Gb
Ex tb IIIC T135°C Db

Technical Data

Valve size / Cartridge cavity			7/8-14 UNF-2A / B4 (C-10-4)	
Flow [Δp = 10 bar (145 PSI)]		l/min (GPM)	5 (1.3)	25 (6.6)
Max. operating pressure		bar (PSI)	250 (3630)	
Max. proof pressure in T channel		bar (PSI)	100 (1450) T channel should stay without pressure for the correct function	
Fluid temperature range (NBR)		°C (°F)	-30 ... +70 (-22 ... +158)	
Ambient temperature range		°C (°F)	-30 ... +60 (-22 ... +140)	
Weight		kg (lbs)	2.17 (4.78)	
Technical Data - Explosion proof solenoid				
Available nominal voltages U_N		V DC	12	24
Available nominal input power		W	18	
Supply voltage fluctuations			U_N ± 10 %	
Enclosure type acc. to EN 60529			IP66 / IP68*	
Test procedure IP68: Pressure 1 m under water, test duration 24 h. The indicated IP protection level is only achieved if the cable is properly mounted.				
Limit current		A	1.37	0.65
Rated resistance at 20 °C (68 °F)		Ω	7.7	32.3
		Datasheet	Type	
General information		GI_0060	Products and operating conditions	
Operating instructions		15324		
Valve bodies	In-line mounted	SB_0018	SB-B4*	
	Sandwich mounted	SB-04(06)_0028	SB-*B4*	
Cavity details / Form tools		SMT_0019	SMT-B4*	
Spare parts		SP_8010		

Ordering Code

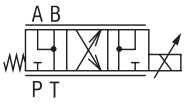
SD2P2X - B4 / H [ ] - [ ] - [ ] [ ] B4 [ ] [ ] - B [ ]

Explosion proof
4/3 proportional directional control valve, Screw-in Cartridge design

Valve cavity
7/8-14 UNF (C-10-4)

Model
High performance

Model / Symbol



3Y13

Nominal flow rate P → A at Δp = 10 bar (1450 PSI)
5 l/min (1.3 GPM) **5**
25 l/min (6.6 GPM) **25**

Nominal supply voltage / limit current (I_G)
12 V DC / 1.32 A **12**
24 V DC / 0.64 A **24**

Certifications of valve
No designation ATEX, IECEx, UKCA, FM APPROVED

Surface treatment
520 h salt spray test (ISO 9227)

Seals
No designation NBR

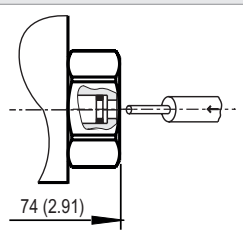
Manual override
No designation standard

Temperature class - solenoid nominal input power
Class T4 - 18 W

Threaded adapter with thread
M M20x1.5
NPT ½ NPT ANSI

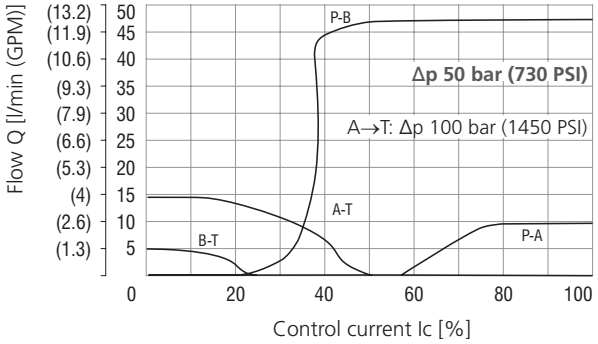
Manual Override measured in millimeters (in)

Bez označení - standardní

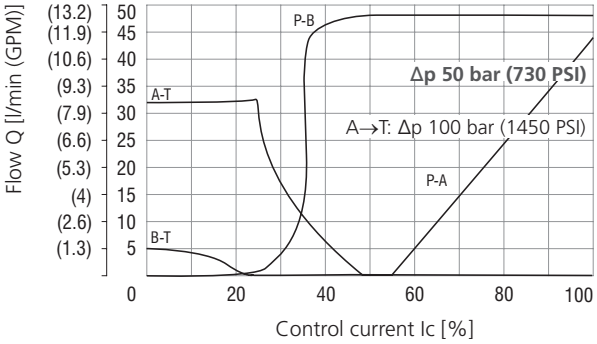


In case of solenoid malfunction or power failure, the spool of the valve can be shifted by manual override as long as the pressure in port T does not exceed 25 bar (363 PSI).
For alternative manual overrides contact our technical support.

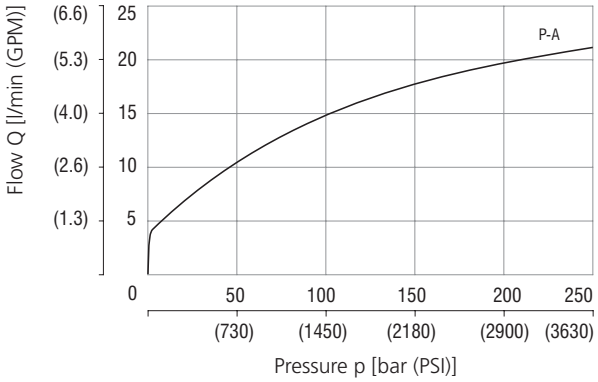
Timing control limit SD2P-B4/H3Y13-5



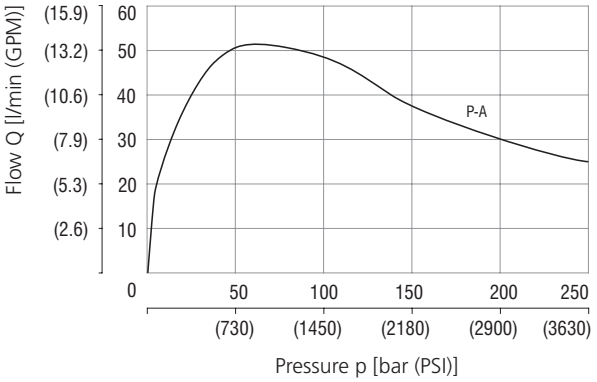
Timing control limit SD2P-B4/H3Y13-25



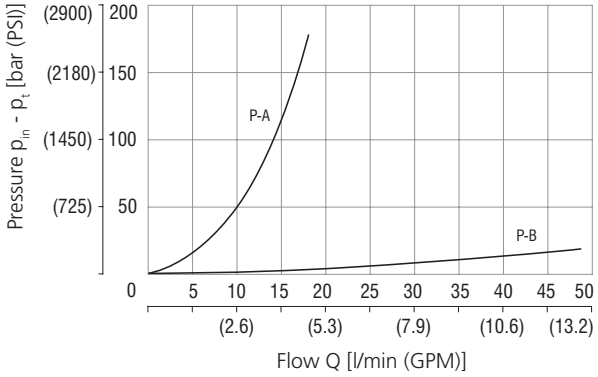
Operating limits SD2P-B4/H3Y13-5



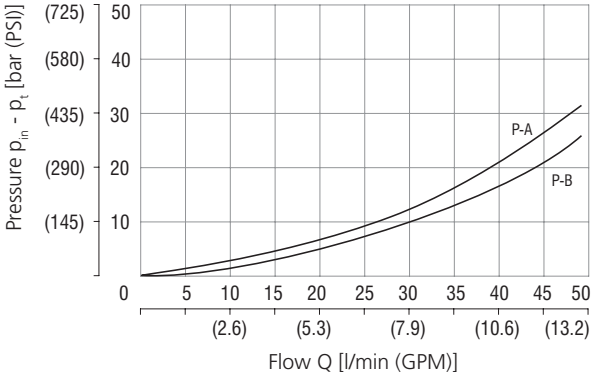
Operating limits SD2P-B4/H3Y13-25



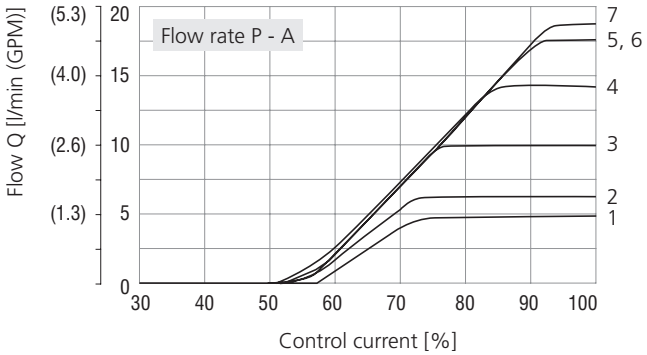
Pressure drop SD2P-B4/H3Y13-5



Pressure drop SD2P-B4/H3Y13-25

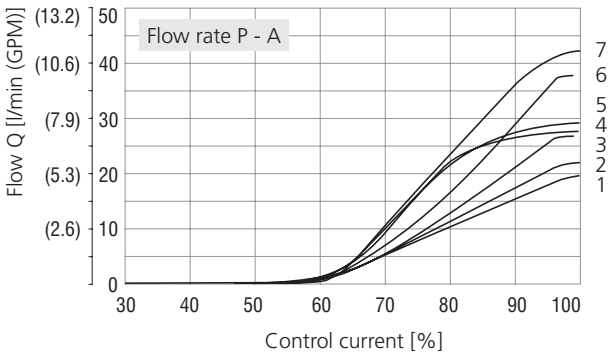


Flow characteristic SD2P-B4/H3Y13-5



1	Δp 10 bar (145 PSI)	5	p_{in} 150 bar (2180 PSI)
2	p_{in} 20 bar (290 PSI)	6	p_{in} 250 bar (3630 PSI)
3	p_{in} 50 bar (725 PSI)	7	p_{in} 200 bar (2900 PSI)
4	p_{in} 100 bar (1450 PSI)		

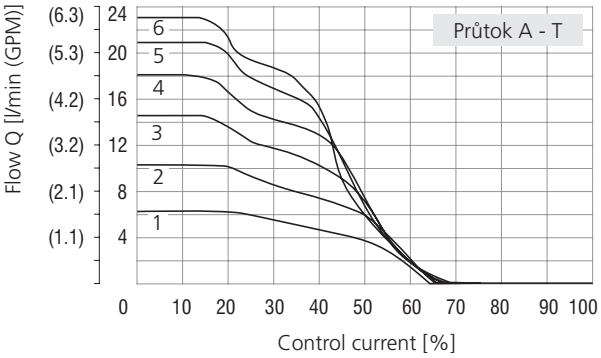
Flow characteristic SD2P-B4/H3Y13-25



1	p_{in} 250 bar (3630 PSI)	5	p_{in} 150 bar (2180 PSI)
2	p_{in} 200 bar (2900 PSI)	6	p_{in} 100 bar (1450 PSI)
3	p_{in} 20 bar (290 PSI)	7	p_{in} 50 bar (725 PSI)
4	Δp 10 bar (145 PSI)		

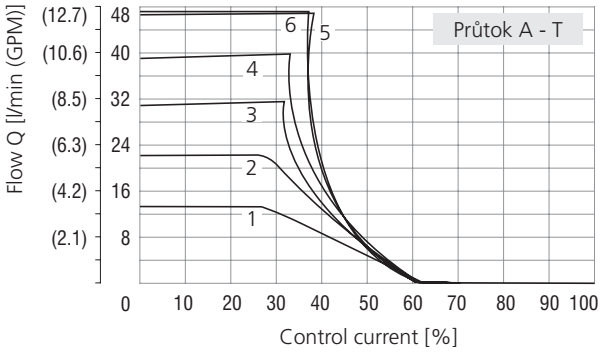
Characteristics measured at ν = 32 mm²/s (156 SUS)

Flow characteristic SD2P-B4/H3Y13-5



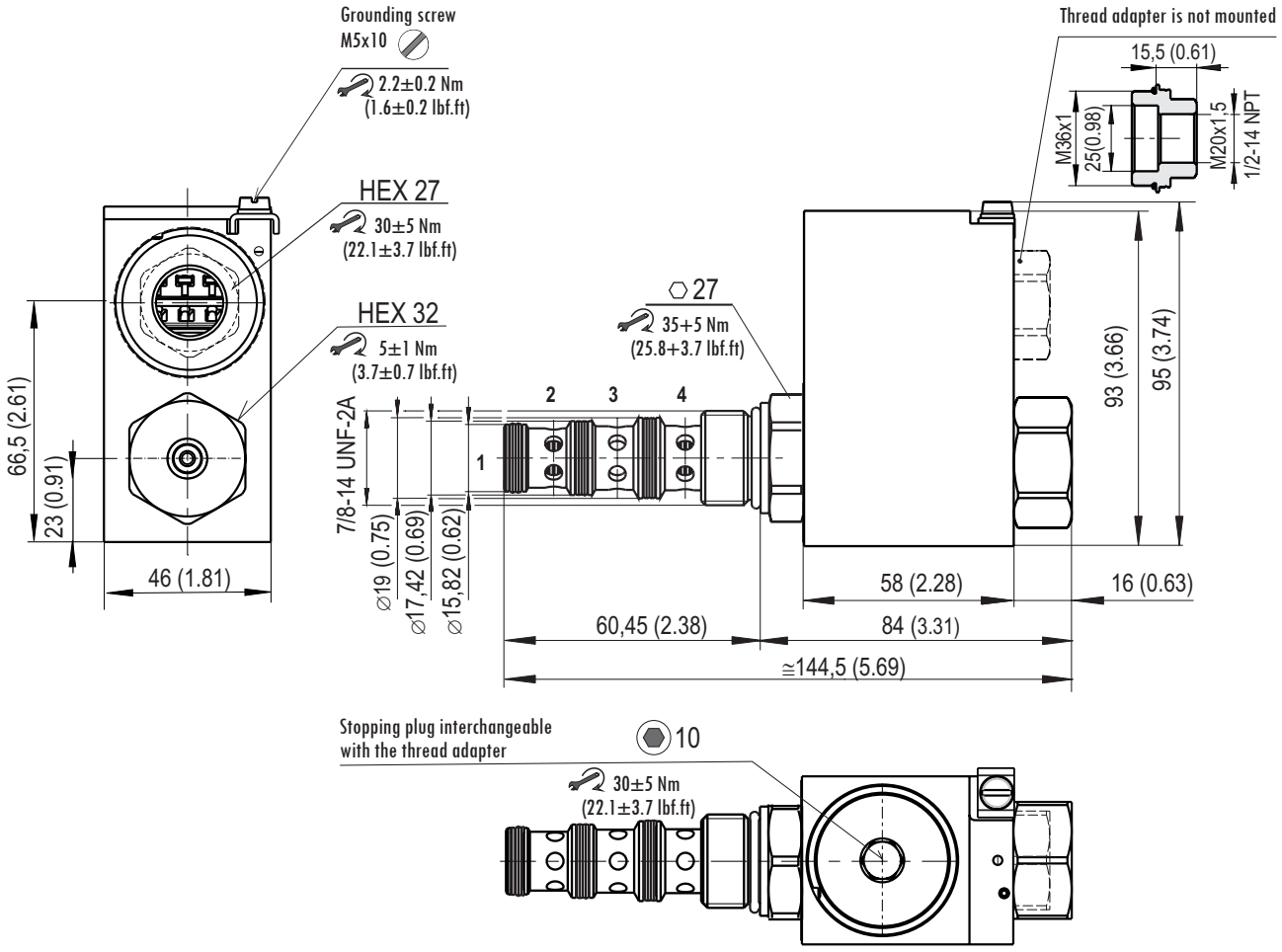
1	p_{in} 20 bar (290 PSI)	4	p_{in} 150 bar (2180 PSI)
2	p_{in} 50 bar (725 PSI)	5	p_{in} 200 bar (2900 PSI)
3	p_{in} 100 bar (1450 PSI)	6	p_{in} 250 bar (3630 PSI)

Flow characteristic SD2P-B4/H3Y13-25



1	p_{in} 20 bar (290 PSI)	4	p_{in} 150 bar (2180 PSI)
2	p_{in} 50 bar (725 PSI)	5	p_{in} 200 bar (2900 PSI)
3	p_{in} 100 bar (1450 PSI)	6	p_{in} 250 bar (3630 PSI)

Dimensions in millimeters (in)

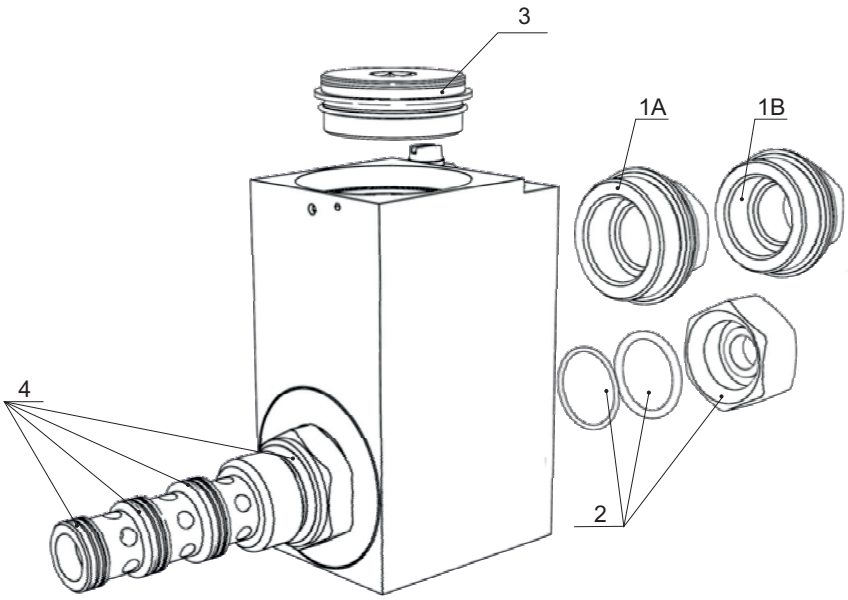


Ordering

The access to the terminal is covered by a steel plug with a seal, mounted on the upper surface of the coil casing. A second hole in the casing is provided for a thread adapter with an optional M20x1.5 (M key) or ½ NPT ANSI (NPT key) thread. The thread adapter with a seal is included because the design of the coil casing allows the axial input of the power cable to be easily changed to vertical by interchanging the plug and thread adapter.

SPARE PARTS

Position		Component name	Description	Ordering number
1A		Thread adapter with the thread M20x1.5	Set with the sealing ring 36x2 VQM (silicone)	44915100
1B		Thread adapter with the tapered thread ½ NPT ANSI	Set with the sealing ring 36x2 VQM (silicone)	44915000
2	Set	Coil nut	Nut	44915200
		Sealing ring actuating system-coil	O-ring 22x1.5 VMQ 50 (silicone)	
		Nut sealing	O-ring 21.89x2.62 VMQ 70 (silicone)	
3		Stopping plug	Set with the sealing ring 36x2 VQM (silicone)	44923800
4	Set	Bush sealing	SP-SK-B4-N O-ring 19.4 x 2.1 NBR Dualseal 16.65 x 19.05 x 3.1 PU Dualseal 15.07 x 17.47 x 3.1 PU Dualseal 13.47 x 15.87 x 3.1 PU	18960800



Information for customers

› Before installing the product, please read the Product Instructions for Use, which is available in full on the manufacturer's website (www.argo-hytos.com) near the data sheet. Please also pay attention to the chapter describing the target user group, their professional qualifications and medical fitness to install, use and repair the product.

› The product may only be used in the zones indicated, otherwise there is a risk of initiating an explosion

Area of application

Equipment - group I – MINES	**Equipment - group II (IIG) - GAS**		**Equipment - group III (IID) - DUST**	
Category M1 – **NO**	Zone 0 - **NO**		Zone 20 - **NO**	
Category M2 (the device remains switched off)	Zone 1 Zone 2	IIA (propane) IIB (ethylene) + H2	Zone 21 Zone 22	IIIA (combustible particles) IIIB (non-conductive dust) IIIC (conductive dust)

Note: The valve may be used in potentially explosive hydrogen atmospheres belonging to Group IIC. However, it cannot be used for other Group IIC gases, e.g. acetylene

› For use in the temperature class, the maximum ambient temperature (see technical data table) must be observed for a given coil input (18 W), the maximum temperature of the working fluid 70 °C and the nominal voltage of the coil supply.

› The user must ensure free heat dissipation from the valve surface. The surface must not be covered, exposed to a heat source or direct sunlight. When mounting the valves in groups, observe the minimum distances specified in the Instructions for Use.

› Use a certified cable and a cable gland with protection "d" to prevent the penetration of hot gases into the surrounding environment when an explosion is initiated in the interior of the flameproof enclosure. The insulation must match the temperature class.

› It is forbidden to install, dismantle or repair the product in an explosive atmosphere. Repairs to the product shall be carried out by the manufacturer, except for repairs permitted by the user under the conditions specified in the Instructions for Use.

› Attention! The surface of the coil and the valve heats up during operation.There is a risk of skin burns if touched.