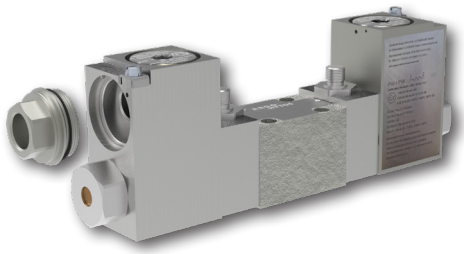
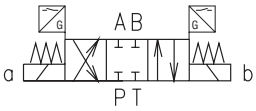
ARGO HYTOS
A Voith Company

Explosion Proof, 4/2 and 4/3, Directional Control Valve - Spool Position Monitoring

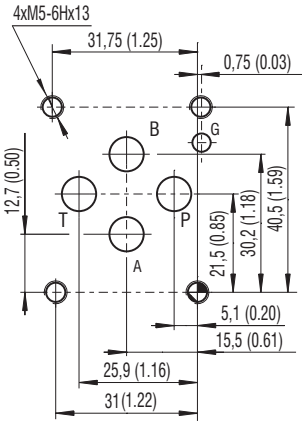
RPE2X3-06*S6

Size 06 (D03) • Q_{max} 60 l/min (16 GPM) • p_{max} 350 bar (5100 PSI)





ISO 4401-03-02-0-05



Ports P, A, B, T - max. ∅7.5 mm (0.29 in)

Technical Features

- Hydraulic, spool-type directional control valve with cast iron body and connection pattern according to ISO 4401 and DIN 24340 (CETOP 03)
- Maximum operating pressure 350 bar (P, A, B ports) / 210 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), T5 (100 °C) and T6 (85 °C) depending on the coil input power and maximum ambient temperature
- Inductive contactless spool position sensor with protection type "i"
- Easily interchangeable direction of power cable entry (axial/radial) into the coil
- Optional coil supply voltage, spool type and type of manual override
- 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

Directl-acting, spool-type directional control valve operated by solenoids. The valve is designed to control the direction of movement of the appliance output component (direction of piston feed in the cylinder, direction of rotation of the hydraulic motor shaft) or its stop. The valve is certified for use in potentially explosive atmospheres of gases, vapors, dust and flammable particles with a high level of protection EPL = b. The spool position sensing is intended for hazardous machinery control systems.

Use of the valve in potentially explosive atmospheres

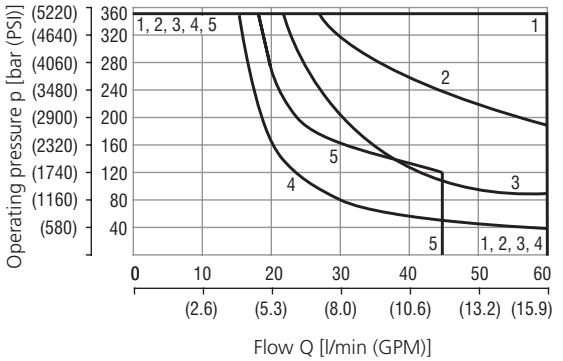
12 V / 24 V / 48 V / 110 V DC 110 V / 230 V AC 50 / 60 Hz	Zones	Type of protection – flameproof enclosure
Ex I M2 Ex db I Mb	Category Mb	"d" (EN /IEC 60079-1)
Ex II 2G Ex db IIB+H2 T6, T5, T4 Gb	Zones 1, 2	"d" (EN /IEC 60079-1)
Ex II 2D Ex tb IIIC T85°C, T100°C, T135°C Db	Zones 21, 22	"t" (EN/IEC 60079-31)

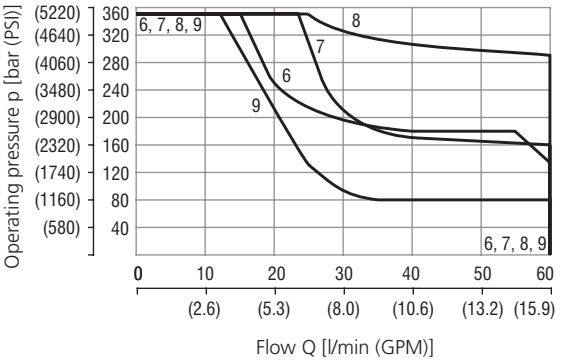
NEC 500 (USA), Annex J (Canada)	NEC 505, 506 (USA)	CEC Section 18 (Canada)
Class I Division 1 Group B, C, D T6...T4 Class II / III Division 1 Group E, F, G T6...T4	CL I Zone 1, AEx db IIB+H2, T6...T4 Gb	Ex db IIB+H2 T6...T4 Gb
	Zone 21, AEx tb IIIC T85°C...T135°C Db	Ex tb IIIC T85°C...T135°C Db

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

Operating limits (p-Q)

Ambient temperature 70 °C (158 °F), Voltage U_n -10 % (24 V DC), Power P_n 10 W





1	R30, X30, J15*
2	Z11
3	Y11, N11, V41
4	H11, B71
5	C11
6	2H11, 2H51
7	2C51
8	3M21
9	2A51

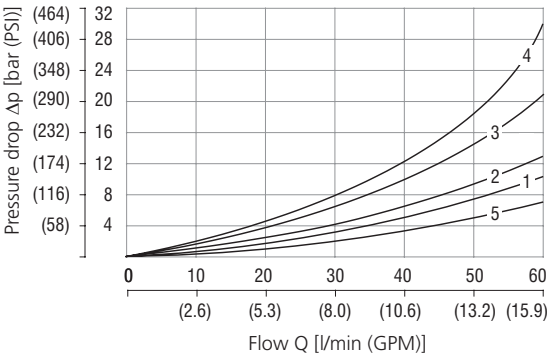
Operating limits of other than shown versions consult with our technical department. *Spool J15 is available only with Coil B4 (18 W).

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

Pressure drop related to flow rate (Δp-Q)

	P→A	P→B	A→T	B→T	P→T		P→A	P→B	A→T	B→T	P→T
Z11, J15*	1	1	2	2		Y11	1	1	1	1	
C11	3	3	3	4	2	R30	1	1	2	2	
H11	1	1	1	2	2	X30	1	1	2	2	
B71	1			1		2C51	3			4	2
2A51	1	1				2H11	1	1	1	2	2
2H51		1	2			3M21	1	5	1	1	

*Spool J15 available only with solenoid B4 (18 W).



Ordering Code

RPE2X3-06 [ ] [ ] / [ ] [ ] [ ] [ ] [ ] **S6 - B** [ ]

Explosion proof,4/2 and 4/3, directional control valve

Valve size

Number of spool positions
two positions **2**
three positions **3**

Spool symbols
see the table "Spool Symbols"

Rated supply voltage of solenoids
DC voltage (I_N of coil 10 W)
12 V DC / 0.75 A **01200**
24 V DC / 0.39 A **02400**
48 V DC / 0.19 A **04800**
110 V DC / 0.086 A **11000**
AC voltage 50/60 Hz (I_N of coil 10 W)
110 V AC / 0.084 A **11050**
230 V AC / 0.046 A **23050**

- Mounting bolts M5x45 DIN 912 10.9 nor studs must be ordered separately. Tightening torque 8.9+1 Nm (6.56+0.7 lbf.ft).

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

Temperature class - solenoid nominal input power
A6 Class T4, T5, T6 - 10 W
B4 Class T4 - 18 W*

*Coil B4 (18 W) available only in combination with spool **J15**

Manual override
No designation standard
N7 detent assembly
N9 without manual override

Seals
No designation NBR

Spool position monitoring
350 bar (5080 PSI)

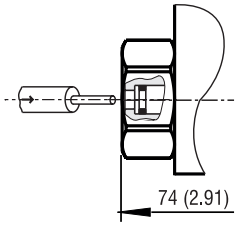
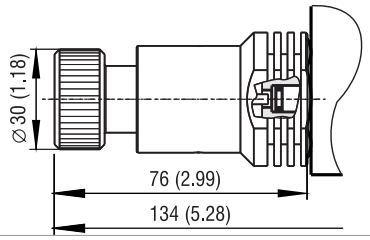
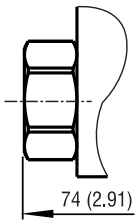
Surface treatment
520 h salt spray test (ISO 9227)

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

Technical Data

Valve size			06 (D03)	
Max. flow		l/min (GPM)	60 (15.9)	
Max. operating pressure at ports P, A, B		bar (PSI)	350 (5080)	
Max. operating pressure at ports T		bar (PSI)	210 (3050)	
Pressure drop		bar (PSI)	see Δp-Q characteristics	
Fluid temperature range (NBR)		°C (°F)	-30 ... +70 (-22 ... +158)	
Max. switching frequency		1/h	15 000	
Switching time ON at ν=32 mm²/s (156 SUS)		ms	AC: 30 ... 40	DC: 30 ... 50
Switching time OFF at ν=32 mm²/s (156 SUS)		ms	AC: 30 ... 70	DC: 10 ... 50
Weight	valve with 1 solenoid and 1 sensor	kg (lbs)	2.99 (6.59)	
	valve with 2 solenoids and 2 sensors		4.92 (10.85)	
Technical Data - Explosion proof Solenoid				
Voltage type			AC 50/60 Hz	DC
Available nominal voltages U_N		V	110, 230	12, 24, 48, 110
Available nominal input power		W	10, 18	
Supply voltage fluctuations			U_N ± 10%	
Duty cycle			100 % ED	
Enclosure type of the Solenoid 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.				
Ambient temperature range		°C (°F)		
Temperature class / Nominal input power	T4-10 W / 18 W		-25 ... +70 / 60 (-13 ... +158 / 140)	
	T5-10 W		-25 ... +55 (-13 ... +131)	
	T6-10 W		-25 ... +40 (-13 ... +104)	
		Datasheet	Type	
General information		GI_0060	products and operating conditions	
Operating instructions		15311		
Mounting surface		SMT_0019	Size 06	
Subplates		DP*_0002		
Spare parts		SP_8010		

Manual Override measured at millimeters (in)

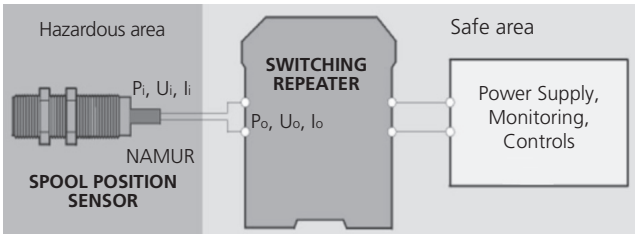
No designation - standard	N7 - detent assembly	N9 - without manual override
		

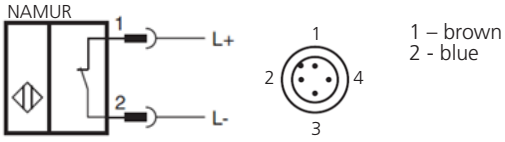
In case of solenoid malfunction or power failure, the valve spool can be shifted by manual override under the condition that the pressure in the back line does not exceed 25 bar (363 PSI).

Spool Position Sensor S6 (NC)

The S6 position sensor is a certified inductive sensor for use in explosive atmospheres with type of protection „ia" (the device is not capable of generating initiation sparks due to the low voltage). The sensor may only be powered by a power supply circuit with an intrinsically safe separating element, which separates the sensor in an explosive atmosphere from other electrical parts located in a safe area. The electrical parameters of the sensor depend on the separating element used, see the User's Manual_RPE2X3-06*S6_15311. and the User's Manual for the NJ1,5-18GM-N-D-V1 sensor, document of the manufacturer PEPPERL + FUCHS.
The range of use of the sensor covers the range of use of the valve.

Technical Data of the Sensor		
Max. operating pressure	bar (PSI)	350 (5080)
Electrical power connector		M12x1; 4 PIN
Available nominal voltages U_N	V	8.2
Ambient temperature	°C	-25 ... +85
Electrical protection of sensor		IP66 / IP67
Switching frequency	Hz	0 ... 400

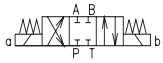
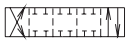
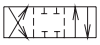
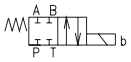
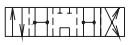
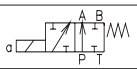
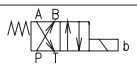
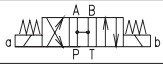
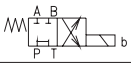
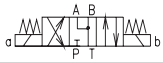
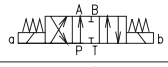
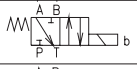
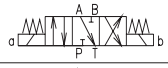
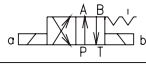
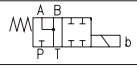
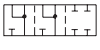
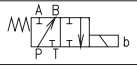




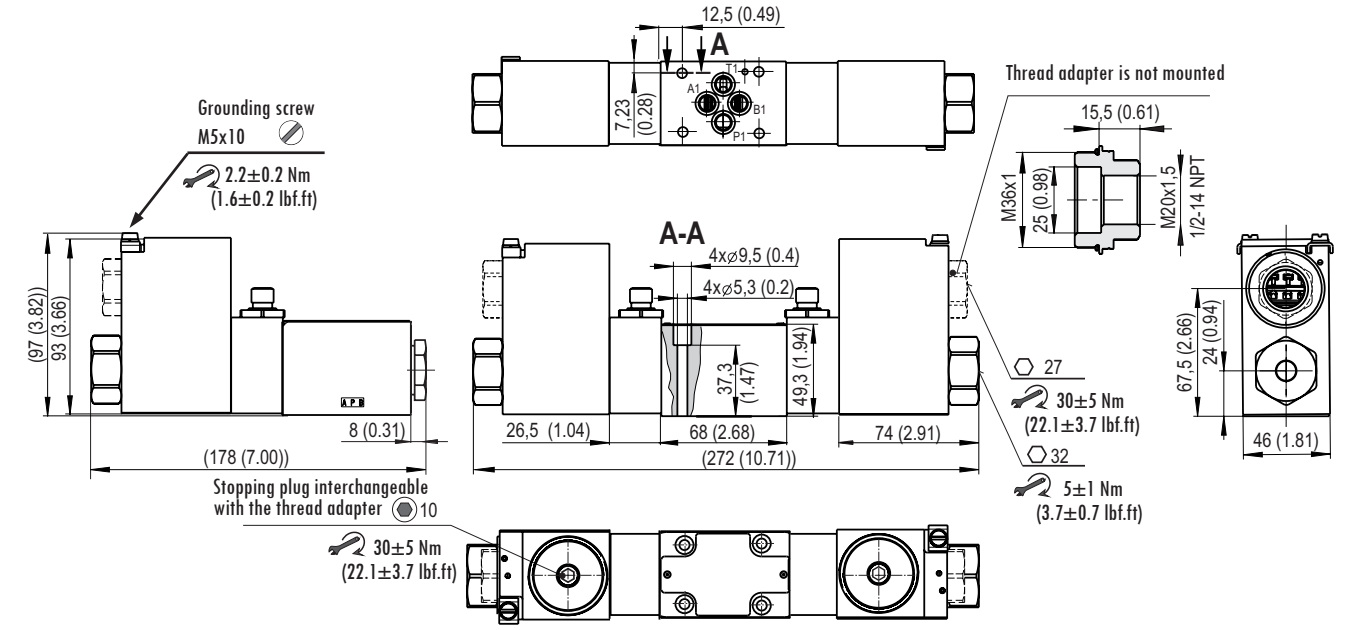
NOTE: In the basic position, the core is located under the coil of the NC sensor, which means that the sensor is in operation, the contacts are opened. After the coil is activated, the spool is moved away from the activated coil and the sensor switches on.

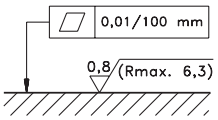
Solenoid coil		Spool position	Position sensor at the solenoid	
a	b		a	b
0	0	Basic position (middle)	0	0
1	0	End position right →	1	0
0	1	← End position left	0	1
1 = solenoid in operation			1 = contacts closed	

Spool Symbols

Type	Symbol	Interposition	Type	Symbol	Interposition	Type	Symbol	Interposition
Z11			R30			Z11		
C11			A51			X30		
H11			Y51			C11		
Y11			C51			H11		
M21			H51			N11		
N41			X51			B71		
J15			Y13			V41		

Dimensions in millimeters (in)





Required surface quality of the counterpart

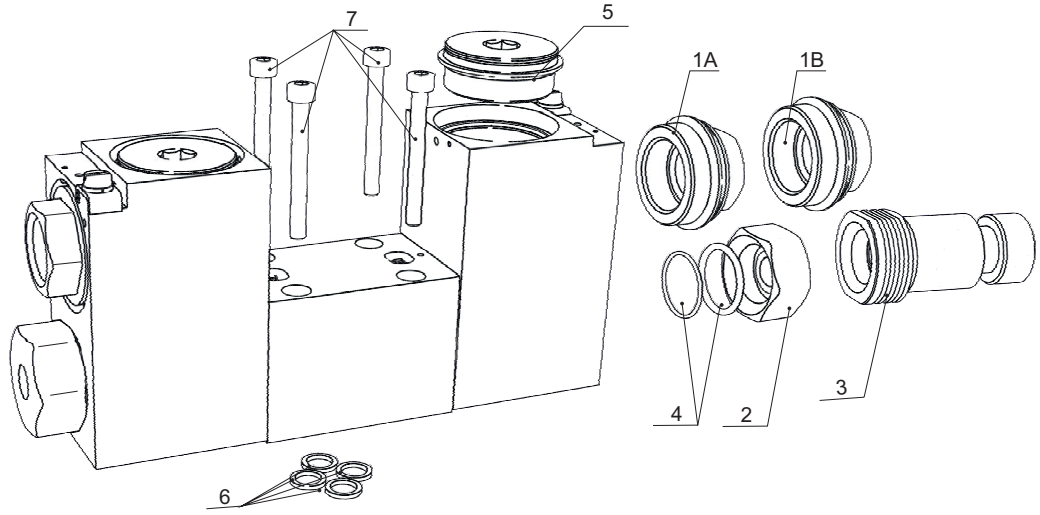
Mounting screws 8.9+1 Nm (7+0.7 lbf.ft)
M5x45 DIN 912-10.9 4

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		Coil nut	Nut	44915200
4	Set	Sealing ring actuating system-coil	O-ring 22x1.5 VMQ 50 (silicone)	
		Nut sealing	O-ring 21.89x2.62 VMQ 70 (silicone)	
3		Coil nut with manual override N7	Nut	45904200
4	Set	Sealing ring actuating system-coil	O-ring 22x1.5 VMQ 50 (silicone)	
		Nut sealing	O-ring 21.89x2.62 VMQ 70 (silicone)	
5		Stopping plug	Set with the sealing ring 36x2 VQM (silicone)	44923800
6		Set of seals	4x Square ring 9.25x1.68 NBR	15845200
7	Set	Valve mounting screws	4x M5x45 DIN 912 10.9	15845100



› 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)	Zone 21 Zone 22	IIIA (combustible particles)
		IIB (ethylene) + H2		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 the coil input (10/18 W), the maximum working fluid temperature of 70 °C and the nominal coil supply voltage. The 18 W coil valve may only be used in temperature class T4 (135 °C).

› 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 gets hot during operation. There is a risk of skin burns if touched.