



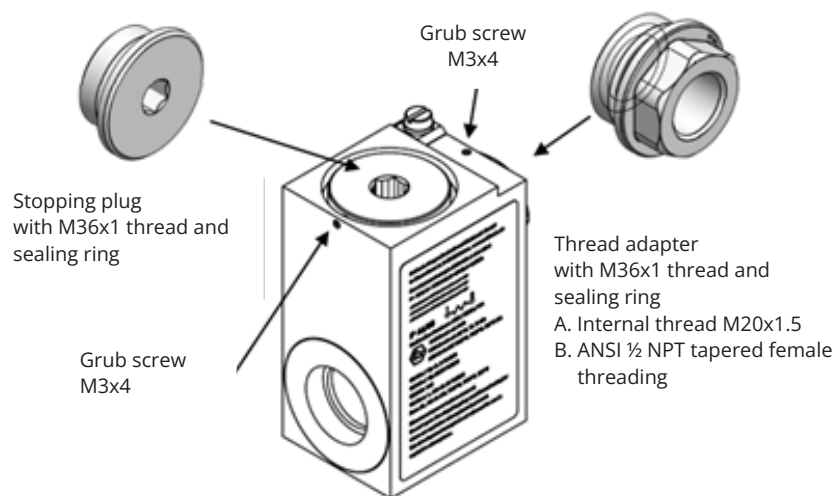
# NEW PRODUCT LINE OF EX-VALVES WITH A 2.0 COIL

Say hello to innovation! The new Ex-Valves 2.0 series brings solid enclosure coils, transforming safety measures in explosive environments. With compact design, flexible cable connections and impressive hydraulic power, these valves are a game-changer across industries. Let us explore the future of safety tech!

The fundamental difference in the new series of valves for potential explosive atmospheres lies in the method used to protect the electromagnetic coil. While the original series has the coil protected by potting compound (protection method "m" according to EN 60079-18), the new series has the coil protected by a solid enclosure (protection method "d" according to EN 60079-1 for gases and "t" according to EN 60079-31 for dust). In the event of an explosion inside the coil's enclosure, the protection principle relies on adequately cooling the hot gases by passing them through narrow and long gaps between the enclosure components to reduce the temperature to a level where an explosion cannot be initiated in the surrounding environment. The protection provided by a solid enclosure is preferred for use in mines due to its high resistance to mechanical impact. Direct-acting valves exhibit high hydraulic performance despite the reduced electrical power input of the coils, thanks to the specified maximum surface temperature.

## YOUR ADVANTAGES

- FM Approved
- Worldwide Certifications (IECEx, ATEX, Ex, NEC500/505, more ...)
- Extended life-time up to 10 million cycles
- Optimized robust design
- Simplified electrical installation
- Variety of different CETOP and Cartridge types



## ELECTRICAL COIL CONNECTIONS

The design of the coil housing allows for easy alteration of the direction of the power cable connection. Changing from a horizontal to a vertical orientation can be accomplished through a simple replacement of the closure plug and threaded reducer. The threaded reducer for cable gland installation is optional and is available with threads M20x1.5 or 1/2 NPT. Both the plug and reducer are equipped with silicone rubber sealing and their positions are secured against loosening (e.g., due to vibrations) by tightening the adjusting screws radially. It's important to note that the cable gland and cable, as separately certified Ex-components, are not included in the valve's delivery.

## PROTECTION OF NON-ELECTRICAL PARTS

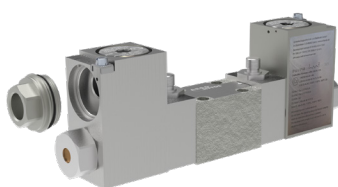
To prevent the accumulation of electrostatic charge and the initiation of electrical sparks, the valve is protected by a grounding conductor that connects to the grounding screw on the surface of the coil. The valve's surface is also safeguarded against corrosion with a zinc-nickel (Zn-Ni) coating, which has been tested for climatic resistance with 520 hours in NSS according to ISO 9227. This protective layer simultaneously prevents the creation of initiating sparks when a falling object (e.g., tools) impacts the valve's surface. The moving components of the hydraulic section and the control system of the electromagnetic coil do not produce mechanical sparks as they move over short distances at low speeds in a space filled with working fluid and sealed off from the surrounding atmosphere. In general, the non-electrical parts are protected by a safe design "c" according to ČSN EN ISO 80079-37.

## USE IN TEMPERATURE CLASSES

The basic coil, typically used, has a power rating of 10 W. If the maximum temperature of the working fluid (70 °C) and the maximum ambient temperature for the specified temperature class are not exceeded, valves with a 10 W coil can be used in temperature classes T4 (135 °C), T5 (100 °C), and T6 (85 °C). Coils with higher power ratings of 18 W are used to ensure proper operation in proportional valves and distributors with pulse control and position retention. The 18 W coil emits more heat loss and can, therefore, only be used in the T4 class.

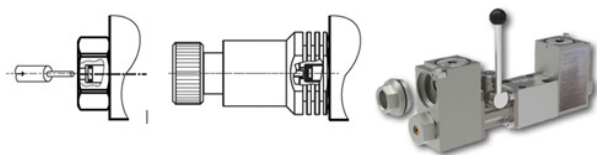
Temperature class	Max. surface temperature	Ambient temperature range	
		Coil 10 W	Coil 18 W
T4	85 °C	-30...+70 °C	-30...+60 °C
T5	100 °C	-30...+55 °C	
T6	135 °C	-30...+40 °C	

## POSITION SENSOR FOR THE SPOOL MONITORING



The directional valve RPE2X3-06\*S6 is equipped with inductive position sensors of the working spool. Such valves are used in hazardous equipment where feedback is necessary to ensure safe operation. The sensor is intrinsically safe (protection "i" according to ČSN EN 60079-25). Safe power supply for the sensor and signal transmission must be provided by an appropriate isolating element.

## MANUAL VALVE CONTROL



Valves can be equipped with manual emergency control, which allows for the repositioning of the slide gate or cone in the event of an electromagnetic failure or a power outage. This is necessary in some applications to achieve a safe position of the controlled mechanism or connected load. The use of emergency control is limited to a maximum pressure of 25 bar in the control system. There are two design options for manual emergency control. In the first type, an anchor is moved using a pin sealed inside the control system plug and a suitable pin, while the second type uses a special nut with a built-in mechanism that allows position retention. The electromagnetically controlled distributor with an integrated manual control lever mechanism allows manual valve control up to a pressure of 100 bar in the "T" channel. The toggle mechanism has no impact on the valve's function when electromagnetic control is in use. All manual controls are safe. Sealing between moving and non-moving parts prevents the entry of contaminants, such as sand particles, and thus the generation of mechanical ignition sparks.

## PROPORTIONAL VALVES



In the portfolio, there are four families of proportional valves. We offer directional – flow and pressure control valves CETOP as well as cartridges. Suitable electronic control units should be used for their smooth operation (not included with the valve). The control unit must have certified protection for the specific environment or must be located outside of the explosive atmosphere. The proportional valves are certified for a wide range of applications.

## EQUIPMENT GROUP I - MINES

Valves with a protection level EPL = Mb can be used for equipment in Group M2, which is shut down in the event of a mine gas outbreak.

## EQUIPMENT GROUP II - GASES

Valves with a protection level EPL = Gb can be used in Zone 1 and 2 for gas groups IIA, IIB, and also for hydrogen from group IIC.

## EQUIPMENT GROUP III - DUST

Valves with a protection level EPL = Db can be used in Zone 21 and 22 for all types of dust IIIA, IIIB, and IIIC.

## AREAS OF APPLICATION - CERTIFICATION

Group I - Mines	Group II - Gases		Group III - Dust	
Category M1 - not applicable	Zone 0 - not applicable		Zone 20 - not applicable	
Category M2 (device remains off)	Zone 1 Zone 2	Zone 2 IIA (propane)	Zone 21 Zone 22	IIIA (flammable particles)
		IIB (ethylene) + H2 (hydrogen)		IIIB (non-conductive dust)
		IIIC (acetylene) - not applicable		IIIC (conductive dust)

## CERTIFICATION

The complete certification of the coil was conducted by FM APPROVALS. The use of the protection method with a solid enclosure ("d") allowed the valves to be certified not only for the European Union (according to ATEX Directive 2014/34/EU), the United Kingdom (UKCA), and IECEx but also for the United States and Canada.



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	Class 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



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

Symbol	Type Code Data Sheet	Size	Flow/Pressure GPM (l/min) / PSI (bar)	Key Shot
	4/2 and 4/3, Directional Control Valve, Solenoid Operated			RPE2X3-06*S6
	RPE2X3-06 HA 5310	D03 (Size 06)	16 (60) / 5100 (350)	
	Spool Position Monitoring			
	RPE2X3-06*S6 HA 5311	D03 (Size 06)	16 (60) / 5100 (350)	
	with Auxiliary Lever Override			
	RPER2X3-06 HA 5312	D03 (Size 06)	16 (60) / 5100 (350)	
	4/2 and 4/3 Directional Control Valve, Pilot Operated			RNE2XH5-16
	RNE2XH1-10 HA 5316	D05 (Size 10)	40 (150) / up to 6100 (420)	
	RNE2XH5-16 HA 5318	D07 (Size 16)	80 (300) / up to 6100 (420)	
	RNE2XH4-25 HA 5317	D08 (Size 25)	160 (600) / up to 6100 (420)	
	2/2, 3/2, 4/2 SIC Directional Control Valve, Spool Type			SD2E2X-B2
	SD2E2X-B2 HA 5321	SAE10/2 (7/8-14 UNF)	12 (45) / 5100 (350)	
	SD2E2X-B3 HA 5322	SAE10/3 (7/8-14 UNF)	16 (60) / 5100 (350)	
	SD2E2X-B4 HA 5323	SAE10/4 (7/8-14 UNF)	13 (50) / 5100 (350)	
	2/2 SIC Directional Control Valve, Poppet Type, Pilot Operated			SD3E2X-C2
	SD3E2X-B2 HA 5325	SAE10/2 (7/8-14 UNF)	20 (75) / 6100 (420)	
	SD3E2X-C2*2O2(2L2) HA 5326	SAE12/2 (1-1/16-12 UN)	40 (150) / 5100 (350)	
	SD3E2X-C2*S5(S6) HA 5327	SAE12/2 (1-1/16-12 UN)	40 (150) / 5100 (350)	
	2/2, 3/2 SIC Directional Control Valve, Poppet Type, Direct Acting			SD1E2X-A3
	SD1E2X-A2 HA 5319	SAE8/2 (3/4-16 UNF)	8 (30) / 5100 (350)	
	SD1E2X-A3 HA 5320	SAE8/3 (3/4-16 UNF)	11 (40) / 5100 (350)	
	4/3 SIC Proportional Directional Control Valve			PRM2X2-06
	SD2P2X-B4 HA 5186	SAE10/4 (7/8-14 UNF)	7 (25) / 3630 (250)	
	Proportional Directional Control Valve			
	PRM2X2-06 HA 5183	D03 (Size 06)	7.4 (28) / 5100 (350)	
	Proportional Directional Control Valve, Pilot Operated			
	PRM2X8-06 HA 5185	D03 (Size 06)	37 (140) / 5100 (350)	
	SIC Proportional Pressure Control Valve, Reducing - Relieving, Direct-Acting			
	PVRM2X3-103 HA 5184	M24x1.5	11 (40) / 1300 ( 90)	

## CONCLUSION

The newly launched protection with a flameproof enclosure d(t) expands the range of applications for these valves. The new Ex-coil is compact, makes it easy to change the direction of the power cable feed and offers high resistance to mechanical damage. These valves meet a high degree of protection (EPL = b) and are suitable

for use in various industries, including mining, the chemical and petrochemical industries as well as in dusty operations in lime, cement and milling facilities. Despite the reduced power consumption of the electromagnetic coils, the valves exhibit high hydraulic performance.