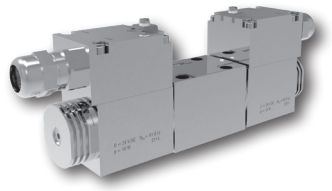
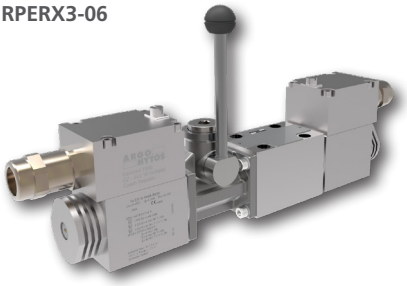
RPEX3-06, RPERX3-06, RPEX3-06*S6, PRMX2-06, PRMX8-06, SD1EX-A2, SD1EX-A3, SD2EX-B2, SD2EX-B3, SD2EX-B4, SD3EX-B2, SD2PX-B4, PVRMX3-103

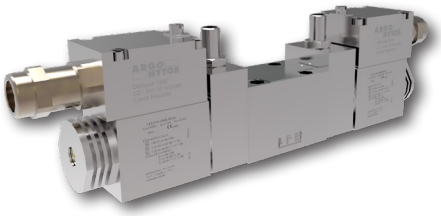
RPEX3-06, PRMX2-06, PRMX8-06



RPERX3-06

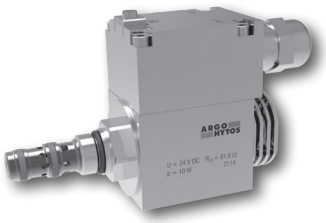


RPEX3-06*S6



SD1EX-A2

SD1EX-A3



SD2EX-B2, SD3EX-B2

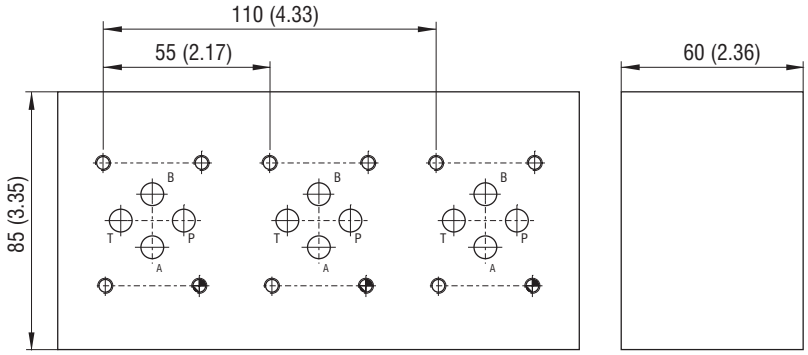
Content:

Valve Installation - Dimensions in millimeters (inches)

The minimum dimensions of the manifold must not be below the defined volume.
Heat conductivity of the subplate ≥ 38 W/mK (EN-GJS-500-7)

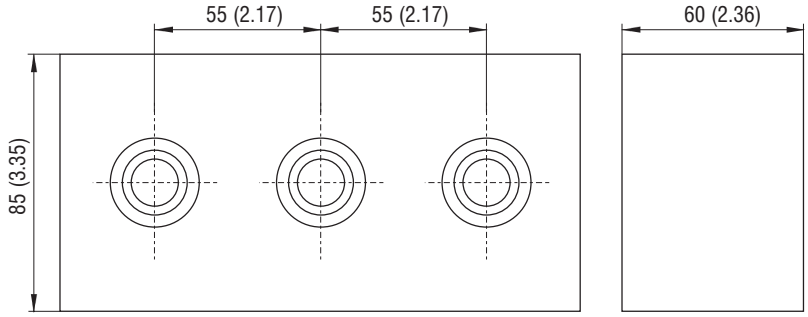
RPEX3-06 Single valve - min. subplate volume 116 cm³
min. subplate dimensions: 80 x 58 x 25 (3.15 x 2.28 x 0.98)

RPEX3-06 Parallel assembly



SD*EX- Single valve - min. housing volume 144 cm³**
min. housing dimensions: 60 x 60 x 40 (2.36 x 2.36 x 1.57)

SD*EX- Screw-in cartridges - parallel assembly**



Protection against mechanical damage
The valve must be protected against damage by falling objects with a suitable cover or a suitable location on the machine or device.

Mechanical Part of the Valve

Marking Ⓔx II 2GD Ex h IIB T4...T6 IIIC T135 °C, T100 °C, T85 °C
Ⓔx I M2 Ex h

ATEX/IECEx Classification

The valves equipped with a explosion-proof single stroke solenoid are available with the following certifications and protection modes:

	Certificate No.: EPS14ATEX1744 X	Certificate No.: IECEx EPS14.0064 X
AC	Ⓔx I M2 Ex mb I Mb	Ex mb I Mb
	Ⓔx II 2G Ex mb IIB T4, T5, T6 Gb	Ex mb IIB T4, T5, T6 Gb
	Ⓔx II 2D Ex mb IIIC T135 °C, T100 °C, T85 °C Db	Ex mb IIIC T135 °C, T100 °C, T85 °C Db
DC	Ⓔx I M2 Ex e mb I Mb	Ex e mb I Mb
	Ⓔx II 2G Ex e mb IIB T4, T5, T6 Gb	Ex e mb IIB T4, T5, T6 Gb
	Ⓔx II 2D Ex tb IIIC T135 °C, T100 °C, T85 °C Db	Ex tb IIIC T135 °C, T100 °C, T85 °C Db

SD2EX-B3

Electrical Part of the Valve

Registry-No. of above authority: 0408
Declaration of conformity: K 19 / 2014

CE 0408

Document: B 32 / 2014
Data as of: 03.06.2014

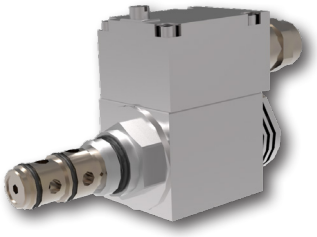
SD2EX-B4, SD2PX-B4

1. Introduction

The solenoid was designed, manufactured, and tested in compliance with the standards and regulations generally applicable within the European Union. On leaving the factory, the solenoid's safety-related conditions were tested and proven to be faultless.
The operator must read and observe the notes and warnings provided with these operating instructions to maintain this status and to ensure safe operation.
The solenoid must only be installed and wired by a qualified technician, who is familiar with and works according to the generally accepted engineering standards and the latest legal regulations and standards of explosion protection.

Surface treatment - Solenoid is zinc-coated with surface protection acc. to ISO 9227 (520 h salt spray).

PVRMX3-103



2. Usage

This solenoid is assigned to Group II, Category 2 of the ATEX directive and to Group I, Category M2 for mining applications.
This device can be used in areas where explosion hazard occurs through:
- gas/air mixtures, vapours or mists of flammable materials
  according to classes IIA and IIB acc. ATEX and IECEx.
- flammable dust/air mixtures
  according to classes IIIA, IIIB and IIIC.

This device may be used in the following explosion hazard areas outside mining:
Zone 1, Zone 2, Zone 21 and Zone 22.

The maximum ambient temperatures are as follows:

Temperature class
T6 or rather T 80 °C (176 °F): Tamb= -30 °C (-22 °F) up to +45 °C (113 °F) and coil power P_n=10 W
T5 or rather T 95 °C (203 °F): Tamb= -30 °C (-22 °F) up to +55 °C (131 °F) and coil power P_n=10 W
T4 or rather T130 °C (266 °F): Tamb= -30 °C (-22 °F) up to +70 °C (158 °F) and coil power P_n=10 W
T4 or rather T130 °C (266 °F): Tamb= -30 °C (-22 °F) up to +60 °C (140 °F) and coil power P_n=18 W

For 110 V DC, 110 V AC and 230 V AC coils:
The valve coil is not intended for direct connection to an electrical distribution network. Interference filtering up to 30 MHz and surge protection must be provided by the manufacturer of the device on which the valve is installed.

3. Solenoid Ordering Code

EX22-46/ □ □ □ - □ - □

Explosion-proof solenoid, inner diameter 22 mm

Housing size

DC voltage connection box + Cable gland	12 V DC	**01200**
	24 V DC	**02400**
	48 V DC	**04800**
	110 V DC	**11000**
AC voltage 50/60 Hz fix installed cable	110 V AC	**11050**
	230 V AC	**23050**

A 10 W
B 18 W

Solenoid nominal power

T4 for 10 W, 18 W
T6 for 10 W only

Temperature class

No designation no cable (only for DC)
3M cable 3 m
8M cable 8 m

Cable length

B zinc-coated (ZnNi), ISO 9227 (520 h)

Surface treatmen

Solenoid Codes	Ordering No.	Solenoid Codes	Ordering No.	Solenoid Codes	Ordering No.
EX22-46/01200AT4-B	32754300	EX22-460/1200BT4-B	32755000	EX22-46/23050AT4-3M-B	32756000
EX22-46/01200AT6-B	32754400	EX22-46/02400BT4-B	32755300	EX22-46/23050AT4-8M-B	32756100
EX22-46/02400AT4-B	32041400	EX22-46/04800BT4-B	32755400	EX22-46/23050AT6-3M-B	32756200
EX22-46/02400AT6-B	32754500	EX22-46/11000BT4-B	32755500	EX22-46/23050AT6-8M-B	32756300
EX22-46/04800AT4-B	32754600	EX22-46/11050AT4-3M-B	32755600	EX22-46/11050BT4-3M-B	32756400
EX22-46/04800AT6-B	32754700	EX22-46/11050AT4-8M-B	32755700	EX22-46/11050BT4-8M-B	32756500
EX22-46/11000AT4-B	32754800	EX22-46/11050AT6-3M-B	32755800	EX22-46/23050BT4-3M-B	32756600
EX22-46/11000AT6-B	32754900	EX22-46/11050AT6-8M-B	32755900	EX22-46/23050BT4-8M-B	32756700

4. Electrical Data - Version A and B

- Rated voltage: U_n [V DC] ±10 % max.
- Supply voltage: U_n [V DC or V AC] for electronics
- Ripple voltage: ±15 %
- Resistance: R_{20} [Ω] ±5 % at 20 [°C]
- Working duty: S1 (100 % ED) in mounted state with valve

Table 2: Voltage versions A and B

Type	Voltage	Resistance	Nominal current	Limiting current	Protection concept	Power
	U_n	R_{20}	I_n	I_G		P_n
	[VDC]	[Ω]	[A]	[A]		[W]
xx EX18 046A A012	12	16.1	0.75	0.65	Diode (36V)	8.9
xx EX18 046A A024	24	61.8	0.39	0.34	Diode (36V)	9.3
xx EX18 046A A048	48	252.4	0.19	0.16	Diode (75V)	9.1
xx EX18 046A A110	110	1171.5	0.094	0.08	Diode (180V)	10.3
xx EX18 046B A012	12	7.7	1.56	1.37	Diode (36V)	18.8
xx EX18 046B A024	24	32.3	0.74	0.65	Diode (36V)	17.8
xx EX18 046B A048	48	125.7	0.38	0.33	Diode (75V)	18.3
xx EX18 046B A110	110	655.6	0.17	0.15	Diode (180V)	18.5
	[VAC] 50/60 Hz					
xx EX18 046A B110	110	894.1	0.112	0.095	Bridge rectifier	11.2
xx EX18 046A B230	230	3987	0.052	0.044	Bridge rectifier	10.7
xx EX18 046B B110	110	524.4	0.19	0.167	Bridge rectifier	19.1
xx EX18 046B B230	230	2251.4	0.092	0.08	Bridge rectifier	19

*Limiting curent (I_G) - current at the highest temperature.

5. Initial Installation

- The ambient temperature range shall not exceed the temperatures given in chapter 2. The maximum temperature of the medium (generally hydraulic fluid) shall not exceed 70 °C (158 °F).
- It is the user's duty to ensure free and unhindered heat emission during operation. This means that the solenoid shall neither be covered nor stored immediately adjacent to heat sources (e.g. fan heaters) during operation.
- The solenoid shall not be subjected to direct sunlight during operation.

6. Installation - Installation, Mounting, Demounting

- Using the V DC type for temperature class T4 requires a cable with an operating temperature limit of at least +105 °C (221 °F), e.g. LAPP FD Robust. T5 and T6 require a cable with an operating temperature limit of at least +90 °C (194 °F). The fastening torque on the cable gland depends of the used cable and is to be determined by the installing user.
- When installing the V DC solenoid, the fastening torque of the screws shall be [4 Nm (2.95 lbf.ft)] and for the BARTEC connection box [0.4 Nm (0.30 lbf.ft)].
- When installing the V DC solenoid, an appropriate cable shoe of size M3 with a crosssectional area of 0.75 mm² with an operating temperature limit of at least +105 °C (221 °F) is to be used.
- The user has to safeguard each solenoid with a fuse: $I_p \leq 3xI_G$, with trigger characteristic "slow blow". (I_G values see Operating Instructions - Table 2). The breaking capacity of the fuse link has to be stronger than the maximum short circuit current at the user's operating area.
- EX-secured components must be used during mounting in case the fuse and/or the interface are within the EX-range.
- The solenoid may be connected to ground via the purpose-built ground clamp on the connector casing.
- The EX-solenoid shall only be operated with a valve body according to the instructions in chapter 12.
- The coil must not be activated alone – a connection to the valve body is required!
- The single parts needed for assembly are listed in chapter 13.

7. Specification

- Coils and plug cavity with watertight encapsulation. Temperature class of coil "F" [155 °C (311 °F)]
- Protection type IAW DIN VDE 0470, EN 60529 and/or IEC 529, device: IP 65
- Surface protection (casing) acc. DIN 50979 Fe//Zn8-12//Cn//T0
- Max. temperature of the operating medium (generally hydraulic fluid): 70 °C (158 °F)
- Max. ambient temperature: see chapter 2!

8. Suppressor - Connection Diagrams

Figure 1 - Bidirectional voltage limiter – diodes:

U_z = 36 V, bipolar for U_n = 12 und 24 V DC
U_z = 75 V, bipolar for U_n = 48 V DC
U_z = 180 V, bipolar for U_n = 110 V DC

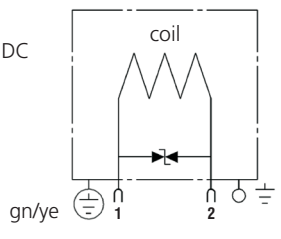
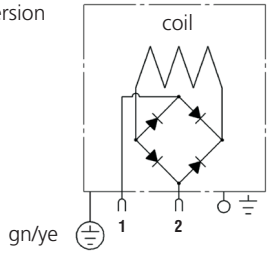


Figure 2 - Bridge rectifier for AC version



9. Maintenance, Service, Troubleshooting

› The solenoid generally requires almost no maintenance. All electrical connections shall be checked regularly for possible damages (visual check).
› The surface of the device shall be checked regularly for dust deposits, which should be cleaned off.
› Do not try to open or to repair the device. If any trouble occurs, please contact the manufacturer.

10. Standards and Regulations

› Directive 2014/34/EU of the European Parliament and the European Council (ATEX 95)
› DIN VDE 0580
› EN 60529
› EN 60079-0:2012, EN 60079-7:2007, EN 60079-18:2009, EN 60079-31:2009
› IEC 60079-0:2011, IEC 60079-7:2006, IEC 60079-18:2009, IEC 60079-31:2008

11. Safety Notice - Please Read Carefully!

› In case the solenoid shows any signs of a defect, malfunctioning or external damage. (including corrosion), the device must immediately be taken out of operation.
› Any deposits on the surface of the device shall not obstruct heat emission.
› To maintain legibility of the data plate, the solenoid must not be coated.

Caution:

› Always disconnect the solenoid from the power supply before any maintenance or other work on it.
› Always exchange the complete solenoid. Do not try to repair the solenoid.
› Under no circumstances shall any changes be made to the solenoid or the connecting cable.
› Never operate the solenoid when disconnected from the valve body.
› Demount the solenoid only in secure areas (not in EX-areas). If this is not possible, the solenoid must cool off for at least 10 minutes.

Any warranty claims are denied in case the regulations in this operating manual are not observed!

12. Grouping of Single Solenoids and Valves

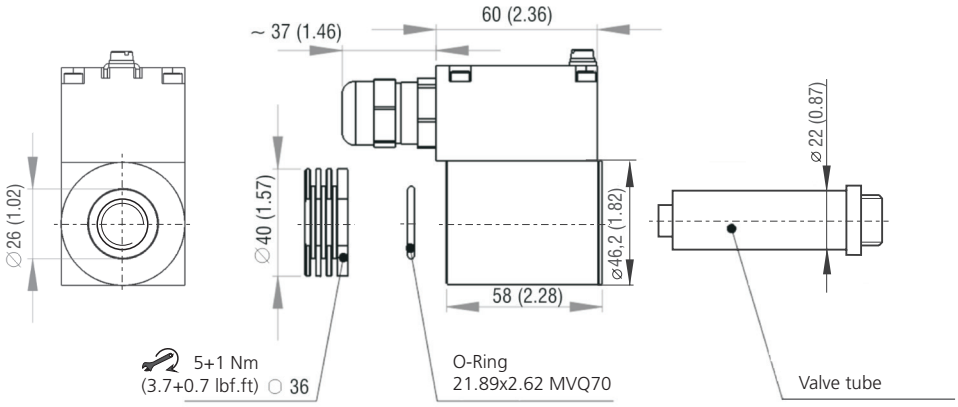
General

› A single solenoid must only be operated with a valve body within at least a minimum volume described in "Valve Installation".

Instructions – Please Read Carefully!

› If two solenoids per valve body are installed (RPEX3-06), they have to be mounted on opposite sides.
› The user has to ensure only one solenoid per valve body is actuated at a time. Simultaneous activation of solenoids at one and the same valve body is forbidden. The user has to fulfil this requirement by proper electrical connections.

13. Dimensions in millimeters (inches)



14. Transport and Storage / Service and Maintenance

› The valves are wrapped in polyethylene bags (vacuum packed) and fitted with paper labels bearing the product number, name and manufacturing order.
› The valves should be stored in boxes and protected against weather influences that may cause corrosion.

› Except for the replacement of the external gasket, any other repairs of the valve are prohibited. They may be carried out at the manufacturer's only.

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