



The solenoid winding & booster circuit is hermetically sealed & fitted in an Exd housing. The circuit draws a small current which gets boosted and is stored in a capacitor. When sufficient energy to pull the plunger is stored in the capacitor, a sensor triggers, allowing current to the winding. This results in the movement of the plunger. When the plunger is moved, current charging the capacitor is cut off and the same is fed to the winding which is sufficient to keep the plunger in the energised position.

INSTALLATION

Ensure that :

⚠The solenoid valve is properly installed in desired position ensuring that water / process fluid cannot enter the coil provided (a) the coil cover is properly fitted & cable gland is of good quality fitted using correct engineering practice.

⚠Using IS Solenoid Valve alone does not certify installation for Intrinsic Safe. It is necessary to connect power supply to the solenoid from an approved and certified power source.

- For Cable length refer Page-2 and Data Sheet of Barrier and Cable refer Page-3.
- Select approved and Ex certified cable gland matching to the cable entry provided on the solenoid and the diameter of the cable.

Code (DD)	Cable Entry (DD)	Identification Mark on Solenoid
62, 62-CO	3/4" ET (F)	-
63, 63-CO	1/2" NPT (F)	N
64, 64-CO	M20 x 1.5 (F)	M

FOR ATEX ADD SUFFIX "01" e.g. 62-01, 62-01-CO

- The solenoid is suitable for Zone 0 installation.
- The wiring, cable gland fixing etc. should meet local regulations and also following sound engineering practice.
- Provide earthing to the solenoid if needed by local authorities. Earthing Terminals are provided inside termination area as well as outside on the solenoid housing.
- The cable ends are properly fixed by tightening terminal screws provided in the termination area.
- The cover of the solenoid should be fully tightened with rubber gasket in its usual place.
- Product certified for Group IIC and can be used for Group IIA, IIB also.
- Temperature Class T6 approved solenoid can be installed in any of the temperature class.

⚠The solenoid is provided with test leads which are to be removed before final installation.

⚠The solenoid is polarity sensitive. Please ensure that the leads are connected correctly.

⚠Refer name plate for details of ATEX/EX protection coding / temperature Class for selection and use before putting into service.



CAUTION

- As the solenoid has inbuilt circuit, the response ON time of the Valve will be higher than the valve with Exd / Weatherproof Solenoid.
- Response ON time of the solenoid valve depends on the voltage and current available to the solenoid, based on the Barrier, Cable, Cable length used, it may vary from 1.5 sec. To 10 sec. However, the response ON time for a given installation shall not vary much.
- **It is recommended not to use this solenoid for applications where response ON time of the valve is important. For such an application it is recommended to use the solenoid valve with Low Power Intrinsically Safe Solenoid.**

- Response OFF time of the valve does not change as compared to valve with Weather / Explosionproof solenoid.
- As only one pulse is available to pull the plunger and hence supply to the solenoid should be applied only when the solenoid is properly fitted on the valve.
- Tighten Terminal Box cover properly with rubber gasket in its usual place.
- Cable gland of good quality is properly fitted using correct engineering practice ensuring that rain water / other fluid does not enter in the solenoid.
- Cable gland threads are properly matched to that provided in the solenoid cable entry.
- Excessive tightening of the nut can damage the solenoid.
- The diametrical clearance between the cover and the bore in the housing should not be more than 0.2mm. Verify this in case if the cover is damaged.

OPERATION

- ⚠**Connect the solenoid to certified source meeting output parameter as indicated in Table-1.
- Plunger may hunt between 12.5V to 8V.

REMOVING / REPLACING THE SOLENOID

- If needed, this solenoid can be fitted on all valve except listed hereunder having Dia. 14mm core tube for converting the same to Intrinsically Safe / Low Power Solenoid.

⚠Not suitable to operate 30309, 30318, 30316 type valves.

- It is advisable to switch off the electrical supply before opening cover.
- Remove cable from terminal and then cable gland from the solenoid.
- Ensure that the new solenoid has same voltage, current rating, cable entry, insulation, temperature class, special version etc. Check label contents completely.
- Remove solenoid by opening nut (Part No. 37).
- Fix new solenoid and tighten the nut till solenoid just stops rotating.
- The solenoid is polarity sensitive. Take care while connecting cable leads.

CHECKING OF THE SOLENOID

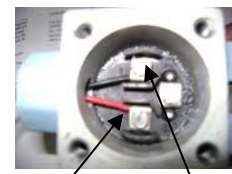
- Mega Ohms insulation between winding and solenoid housing should be more than 100 mega Ohms at 500V DC.
- If possible, conduct High voltage test between winding and the housing at 1500 V for AC for 1 minute and trip current sensitivity @ 25 mA.
- Check the soundness of the O Ring and Gasket fitted on the cover. It should not have any crack or deformity due to ageing.
- In a safe area, check the operation of the Solenoid Valve with the Low Power IS Solenoid, by applying 14VDC to the solenoid. Also check its operation applying 24VDC.

APPROVAL

ATEX	CMRI	CCOE	DGMS	BIS
✓	✓	✓	Applied for	✓



DD Cable Entry Identification



Positive Negative Wiring Diagram



TECHNICAL DATA

DUTY CYCLE

100% ED (Continuous Duty)

INSULATING CLASS, EPOXY, WINDING WIRE

EPOXY CLASS F/H, WIRE CLASS 'H' (180°C)

AMBIENT TEMPERATURE

UPTO -40°C to 70°C

MOUNTING POSITION

ANY

**LIMITING SAFETY VALUES OF THE
INTRINSICALLY SAFE COIL WITH CIRCUIT**

TABLE - 1

	Group IIC	Group IIA, IIB
Open Circuit Voltage	32V	32V
Short Circuit Current	80 mA	200 mA

- WATTAGE : P / 1.2 W
- INDUCTANCE : 0 (Not measurable)
- CAPACITANCE : 40 pf @ 1 kHz

OPERATING PARAMETER

- VOLTAGE : 14V DC to 32V DC
- MIN. OPERATING CURRENT: 23 mA
- MIN. OPERATING VOLTAGE : 14V DC
- MINIMUM WATTAGE : ≤ 0.28 W
- PLUNGER DROP OUT : 5 mA, 8V

MAXIMUM PERMISSIBLE CABLE LENGTH

ASSUMPTION

1) **SOURCE (Barrier/Zenner) : MTL3021 (for Exia IIC T6)**

U_A	L_a	C_a
≤ 28V	≤ 4.2 mH	≤ 130 nF

2) **CABLE : 0.75mm² FR+HR 105°C Single Core Unsheathed Copper Cable for Voltage of 1100 Volts AC**

R'	C'	L'
(26x2) 52 Ω / km	0.4 nF / km	1.25 mH / km

3) **SOLENOID** : ROTEX – IS Coil with Circuit Type 62 / 63 / 64 for Aluminium Construction Gr. II Cat 1.
62-CO / 63-CO / 64-CO for SS Construction for Gr.I M1.

Refer Technical Data of the Solenoid as above.

4) **The solenoid valve is to be installed in IIC area.**

a) **Cable length Limited by Capacitance,**

Find Following :

Equip-ment	Parameter	Source of Data	Value	
Barrier	Maximum allowable Capacitance	Product data sheet / Certificate	130 nF	C_a
Cable	Capacitance	Manufacturer's Data Sheet	0.4 nF/km	C'
Solenoid	Capacitance	Data sheet/ Certificate	0.04 nF	C_c

Maximum permissible cable length limited by capacitance

$$= S_c = \frac{C_a - C_c}{C'} \times 130 = \frac{130 - 0.04}{0.4} = 324.9 \text{ km}$$

b) **Cable length Limited by Inductance,**

Find Following :

Equip-ment	Parameter	Source of Data	Value	
Barrier	Maximum allowable Inductance	Certificate & Data Sheet	4.2 mH	L_a
Cable	Inductance	Data Sheet	1.25 mH/km	L'
Solenoid	Inductance	Certificate & Data Sheet	0	L_c

Maximum permissible cable length limited by Inductance

$$= S_L = \frac{L_a - L_c}{L'} \times 4.2 = \frac{4.2 - 0}{1.25} = 3.36 \text{ km}$$

c) **Cable length Limited by Resistance,**

Find Following :

Equip-ment	Parameter	Source of Data	Value	
Barrier	Output voltage @ Min, Op. Current	Data Sheet	17.5V @ 19.5 mA	V_a
Cable	Resis-tance / km	Data Sheet	52 Ω / km	R'
Solenoid	Min. Op. Current	Data Sheet	19.5 mA	I_c
	Min. Op. Voltage	Data Sheet	14 V	V_L

Allowable voltage drop across cable

$$= V' = V_a - V_L = 17.5 - 14 = 3.5 \text{ V}$$

Maximum allowable resistance of the cable

$$= R_c = \frac{V'}{I_c} = \frac{3.5}{0.0195} = 175$$

Maximum permissible cable length limited by resistance

$$= S_R = \frac{R_c}{R'} = \frac{175}{52} = 3.37 \text{ km}$$

Select Minimum of S_c, S_L, S_R i.e. = 3.36 km limitation due to inductance.

➔ **REPLACE DATA OF SOURCE & CABLE, AT THE RELEVANT PLACES TO CALCULATE MAXIMUM PERMISSIBLE CAB LELENGTH FOR YOUR APPLICATION.**



MANUFACTURER	MODEL	MAXIMUM PERMISSIBLE LENGTH OF THE CABLE PAIR in metre				
		WITH 0.5 sq mm cable (39 Ohms / km)	WITH 0.75 sq mm cable (26 Ohms / km)	WITH 1 sq mm cable (19.5 Ohms / km)	WITH 1.5 sq mm cable (13.3 Ohms / km)	WITH 2.5 sq mm cable (7.98 Ohms / km)
MTL	MTL3021	2450	3700	4900	7200	12050
	MTL3022	4450	6650	8900	13050	21750
	MTL4021	2150	3250	4350	6400	10650
	MTL4021S	2150	3250	4350	6400	10650
	MTL4023	2950	4450	5950	8700	14550
	MTL4024	2150	3250	4350	6400	10650
	MTL4025	1650	2500	3300	4850	8150
	MTL5021	2400	3600	4850	7100	11850
	MTL5022	3000	4550	6050	8900	14900
	MTL5023	2400	3600	4850	7100	11850
	MTL5024	2400	3600	4850	7100	11850
	MTL5025	1200	1800	2400	3550	5950
PEPPERL & FUCHS	KFD2-SD-Ex1.48	1900	2850	3800	5550	9300
	KFD2-SD-Ex1.48.90A	1900	2850	3800	5550	9300
	KFD2-SL-Ex1.48	1850	2800	3750	5550	9250
	KFD2-SL-Ex1.48.90A	1900	2850	3800	5550	9300
	KFD2-VD-Ex1.1560	650	950	1300	1900	3200
	KFD2-VD-Ex1.1835	2600	3900	5250	7700	12850
	KFD2-SL2-Ex1	3050	4600	6150	9050	15100
	KFD2-SL2-Ex1.B	3050	4600	6150	9050	15100
	KFD2-SL2-Ex1.LK	2750	4150	5500	8100	13500
	KFD2-SL2-Ex2	3050	4600	6100	9000	15000
	KFD2-SL2-Ex2.B	3050	4600	6100	9000	15000
	KSD2-BO-Ex	3200	4800	6400	9450	15750
	KSD2-BO-Ex2.2	3200	4800	6400	9400	15750
STAHL	9475/12-04-11	200	350	450	700	1200
	9475/12-04-21	2500	3750	5000	7350	12300
	9475/22-04-21	2500	3750	5000	7350	12300
	9475/12-04-31	1650	2500	3350	4900	8200
	9475/12-08-51	150	200	300	450	750
	9475/22-08-51	150	200	300	450	750
	9475/12-08-61	2300	3450	4650	6800	11350
	9475/22-08-61	2300	3450	4650	6800	11350
TURCK	MK72-S09-Ex/24VDC	4250	6400	8500	12500	20850
	MK72-S12-Ex/24VDC	950	1450	1950	2850	4800
	MK72-S13-Ex/24VDC	1300	1950	2600	3850	6400
	MK72-S14-Ex/24VDC	1300	1950	2600	3850	6400
	MK72-S15-Ex/24VDC	1300	1950	2600	3850	6400
	MK72-S16-Ex/24VDC	1300	1950	2600	3850	6400
	MK72-S17-Ex/24VDC	350	550	750	1150	1900
	MK72-S18-Ex/24VDC	2350	3550	4700	6900	11550
	MK72-S19-Ex/24VDC	6550	9850	13100	19250	32100
	MK72-S20-Ex/24VDC	6550	9850	13100	19250	32100
	MK72-S21-Ex/24VDC	6550	9850	13100	19250	32100
MK72-S22-Ex/24VDC	7850	11800	15750	23100	38550	