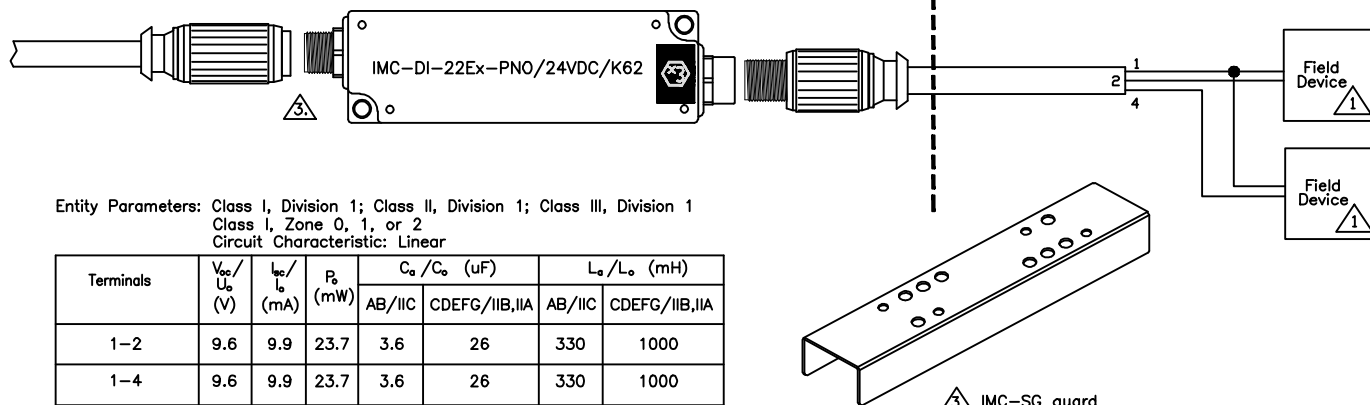
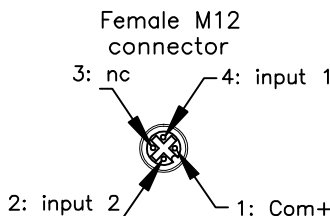
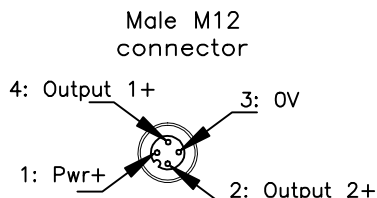


# Discrete Input Devices with Intrinsically Safe Field Circuits

NON-HAZARDOUS LOCATION, or  
Class I, Div. 2, Groups A,B,C,D,  $\Delta$

HAZARDOUS (CLASSIFIED) LOCATION  
Class I, Div. 1, Groups A,B,C,D;  
Class II, Div. 1, Groups E,F,G;  
Class III, Div. 1  
or  
Class I, Zone 0, Group IIC, IIB, or IIA



Entity Parameters: Class I, Division 1; Class II, Division 1; Class III, Division 1  
Class I, Zone 0, 1, or 2  
Circuit Characteristic: Linear

Terminals	$V_{oc}/U_c$ (V)	$I_{sc}/I_c$ (mA)	$P_o$ (mW)	$C_a/C_o$ (uF)		$L_a/L_o$ (mH)	
				AB/IIC	CDEFG/IIB,IIA	AB/IIC	CDEFG/IIB,IIA
1-2	9.6	9.9	23.7	3.6	26	330	1000
1-4	9.6	9.9	23.7	3.6	26	330	1000



Associated Apparatus, Nonhazardous or Class I, Div 2  
Grps A, B, C, D hazardous locations; [AEx ia] IIC,  
[Ex ia] IIC, providing intrinsically safe circuits for  
use in hazardous locations Cl I, Div 1, Grps A, B, C, D;  
Cl II, Div 1, Grps E, F, G; Cl III, Div 1; Cl I, Zone 0,  
Group IIC when installed per Turck control drawing IS-1.309.  
-25°C < T<sub>a</sub> < +70°C U<sub>m</sub> = 250V Temp Code T5

## Notes:

- Selected intrinsically safe equipment must be third party approved with correct entity parameters meeting the relations shown in Table 1, or simple apparatus.
- Multiple circuits extending from the same piece of Associated Apparatus equipment must be installed in separate cables or in one cable having suitable insulation. Refer to Instrument Society of America Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
- When installed in a Class I, Division 2 location, the IMC-DI-22Ex-PNO/24VDC/K62 must be protected by a Turck IMC-SG guard when the circuit is live.  
WARNING: Explosion hazard. Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations.
- A simple apparatus is defined as an electrical component or combination of components of simple construction with well-defined electrical parameters that does not generate more than 1.5V, 100mA, and 25mW, or a passive component that does not dissipate more than 1.3W and is compatible with the intrinsic safety of the circuit in which it is used.
- Capacitance and inductance of the field wiring from the intrinsically safe equipment to the barrier should be calculated and should be included in the system calculations as shown in Table 1. Cable capacitance ( $C_c$ ) plus intrinsically safe equipment capacitance ( $C_i$ ) must be less than the marked capacitance ( $C_a$ ) shown on any barrier used. The same applies for inductance ( $L_c$ ,  $L_i$  and  $L_a$ , respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used:  $C_c = 60$  pF/ft,  $L_c = 0.2$  uH/ft.  
Circuits may contain up to 1% of the  $L_a$  or  $L_o$  value and the full  $C_a$  or  $C_o$  value or 1% of the  $C_a$  or  $C_o$  value and the full  $L_a$  or  $L_o$  value.  
Alternatively, where circuits contain inductance and capacitance values that are both greater than 1% of  $C_a$  or  $C_o$  and  $L_a$  or  $L_o$ , each of the values of capacitance and inductance must be limited to 50% of the  $C_a$  or  $C_o$  and  $L_a$  or  $L_o$  values.

Table 1

I.S. Equipment	Barrier
$V_{max} \geq$	$V_{oc}$ (or $V_t$ )
$I_{max} \geq$	$I_{sc}$ (or $I_t$ )
$C_i + C_c \geq$	$C_a$
$L_i + L_c \geq$	$L_a$
$U_i \geq$	$U_o$
$I_i \geq$	$I_o$
$C_i + C_{cable} \leq$	$C_o$
$L_i + L_{cable} \leq$	$L_o$
$P_i \geq$	$P_o$

If  $P_o$  of the barrier is not known, it may be calculated using the formula  $P_o = (V_{oc} * I_{sc})/4$

- Barriers must be installed in accordance with barrier manufacturer's control drawing and Article 504 of the National Electrical Code, ANSI/NFPA 70, for installation in the United States.
- Control equipment must not use or generate more than 250V rms or dc with respect to earth.
- WARNING: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
- WARNING: Substitution of components may impair intrinsic safety.

Drawing No.:

IS-1.309

**TURCK**

3000 Campus Drive  
Plymouth, MN 55441  
Phone: (763) 553-7300

Title: Control Drawing for UL Listed  
IMC-DI-22Ex-PNO/24VDC/K62 with  
I/S (Entity) Field Circuits

Scale: NONE

Sheet 1 of 1

Rev	Description	Drft	Date
E	Correct P <sub>o</sub> value	BVL	1/11/13
D	Standard update evaluation	BVL	11/2/12
C	Correct pin-out in Entity tables	BVL	12/10/08
B	Remove Zone reference	BVL	7/25/08