

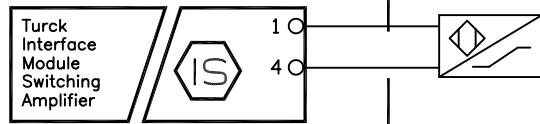
FM Approved Isolator Barriers

Discrete Input Devices with Intrinsically Safe Field Circuits

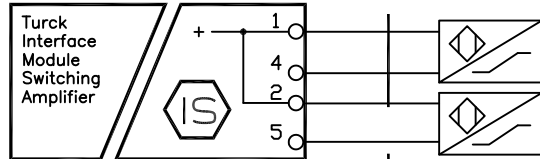


NON-HAZARDOUS LOCATION, OR
Class I, Division 2, Groups A,B,C or D

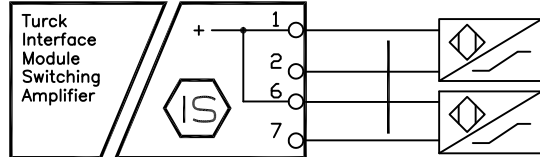
HAZARDOUS (CLASSIFIED) LOCATION
Class I, Div. 1, Group A, B, C or D;
Class II, Div. 1, Group E, F or G;
Class III, Div. 1; or
Class I, Zone 0, 1 or 2, Group IIC, IIB or IIA



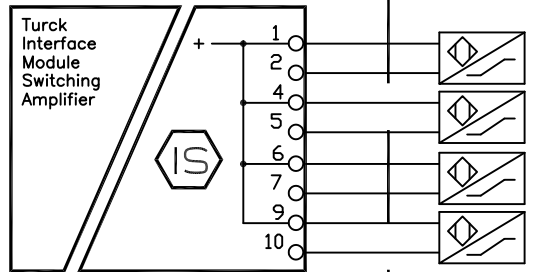
IM1 - a Ex - b
a = 12, or 121
b = R, T, or MT



IM1 - 22Ex - b c
IM12 - 22Ex - b c
b = R, T, or MT
c = /24VDC or blank



IM1 - 231Ex - R



IM1 - d Ex - e
d = 44 or 451
e = R or T

Entity Parameters: Class I, Division 1; Class II, Division 1; Class III, Division 1
Circuit Characteristic: Linear

Model	Terminals	V _{oc} (V)	I _{sc} (mA)	P _o (mW)	C _a (uF) AB/CE/DFG	L _o (mH) AB/CE/DFG
IM1-12Ex-	1-4	9.6	11	27	3.6/26.0/210	250/922/1H
IM1-121Ex-						
IM1-22Ex-	1-4, 2-5	9.6	11	27	3.6/26.0/210	250/922/1H
IM12-22Ex-						
IM1-44Ex-	1-2, 4-5, 6-7, 9-10	11.5	12.8	37	1.6/11.2/46.0	222/781/1H
IM1-451Ex-						
IM1-231Ex-R	1-2, 6-7	11.5	12.8	37	1.6/11.2/46.0	222/781/1H

Model	Terminals	V _t (V)	I _t (mA)	P _o (mW)	C _a (uF) AB/CE/DFG	L _o (mH) AB/CE/DFG
IM1-22Ex-	1-2-4-5	9.6	22	54	3.6/26.0/210	67/246/579
IM12-22Ex-						
IM1-44Ex-	1-2-4-5-6-7-9-10	11.5	51	147	1.6/11.2/46.0	12.5/49.0/108
IM1-451Ex-						
IM1-231Ex-R	1-2-6-7	11.5	25.2	74	1.6/11.2/46.0	xxx/xxx/xxx

Entity Parameters: Class I, Zone 0, 1, or 2
Circuit Characteristic: Linear

Model	Terminals	U _o (V)	I _o (mA)	P _o (mW)	C _o (uF) IIC/IIB/IIA	L _o (mH) IIC/IIB/IIA
IM1-12Ex-	1-4	9.6	11	26	3.76/11.3/30.1	282/981/1H
IM1-121Ex-						
IM1-22Ex-	1-4, 2-5	9.6	11	26	3.76/11.3/30.1	282/981/1H
IM12-22Ex-						
IM1-22Ex-	1-2-4-5	9.6	22	54	3.6/26.0/210	67/246/579
IM12-22Ex-						
IM1-44Ex-	1-2, 4-5, 6-7, 9-10	11.5	12.8	37	1.6/11.2/46.0	222/781/1H
IM1-451Ex-						
IM1-44Ex-	1-2-4-5-6-7-9-10	11.5	51	147	1.6/11.2/46.0	12.5/49.0/108
IM1-451Ex-						
IM1-231Ex-R	1-2, 6-7	11.5	12.8	37	1.6/11.2/46.0	222/781/1H
IM1-231Ex-R	1-2-6-7	11.5	25.2	74	1.6/11.2/46.0	xxx/xxx/xxx

Notes:

- The symbol designates third party approved with correct entity parameters meeting the relations shown in Table 1.
 - For US jurisdictions - Any FM approved intrinsically safe apparatus with Entity Concept parameters, or any simple apparatus.
 - For Canadian jurisdictions - Any Canadian certified intrinsically safe apparatus with Entity Concept parameters, or any simple apparatus.

The Entity concept allows interconnection of intrinsically safe apparatus and associated apparatus not specifically examined in such combination as a system when the conditions above are met.

$$V_{max} \geq V_{oc} \text{ or } V_t \quad I_{max} \geq I_{sc} \text{ or } I_t \quad U_i \geq U_o \quad I_i \geq I_o \quad P_i \geq P_o$$

$$C_i + C_{cable} \leq C_a \quad L_i + L_{cable} \leq L_a \quad C_i + C_{cable} \leq C_o \quad L_i + L_{cable} \leq L_o$$

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.

- When the field device is a contact closure and line monitoring is enabled, the connection should be made as shown below for proper performance.

IM1 models with line monitoring enabled R1 should be 1kΩ to 2.2kΩ, R2 should be 10kΩ to 22kΩ. IM12 models
- Wiring methods must be in accordance with:
 - For US jurisdictions - the National Electrical Code, ANSI/NFPA 70, Article 504 (for Division installations) or Article 505 (for Zone applications), and ANSI/ISA RP12.06.01.
 - For Canadian jurisdictions - the Canadian Electrical Code, CSA 22.1, Appendix F.

- Associated apparatus must not be connected to any device that uses or generates in excess of 250Vrms.
- If the electrical parameters of the cable are unknown, the following default values may be used:
 - Capacitance - 60pF/foot,
 - Inductance - 0.2uH/foot

Drawing No: IS-1.101	TURCK 3000 Campus Drive Plymouth, MN 55441 Phone: (763) 553-7300
Title: Control Drawing for IM1-...Ex- and IM12-...Ex- Isolator Barriers with I/S (Entity) Field Circuits	
Scale: None	Scale 1 of 1

Rev	Description	Drft	Date
D	Correct terminal numbers in IM1(12)-22Ex- diagram	BVL	7/15/13
C	Add IM1-22Ex-R/24VDC and IM12-22Ex-R/24VDC	BVL	8/11/11
B	Add IM1-231Ex-R	BVL	1/29/10
A	Release	BVL	11/16/05