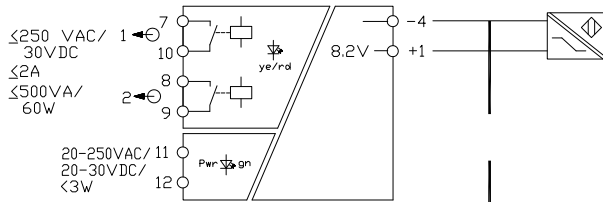


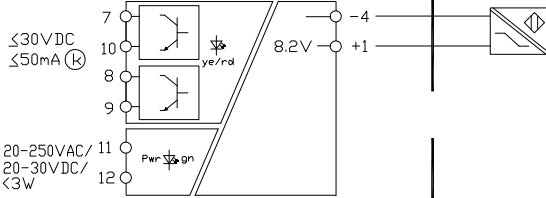
Discrete Input Devices with Intrinsically Safe Field Circuits

NON-HAZARDOUS LOCATION



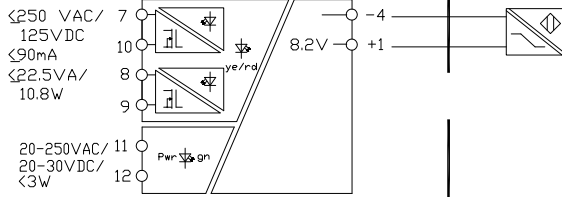
IM1-12Ex-R
IM1-121Ex-R

(Output 2 on IM1-121Ex-R is a fault output)

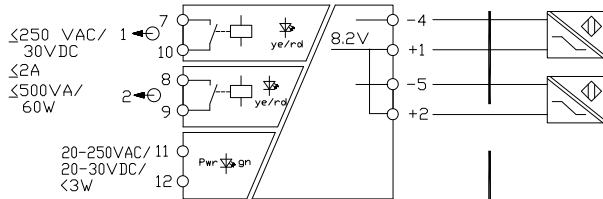


IM1-12Ex-T
IM1-121Ex-T

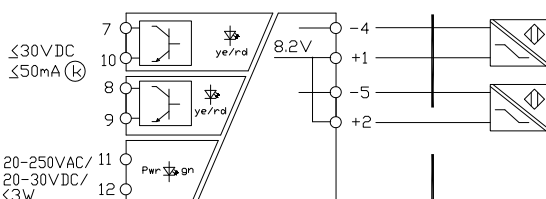
(Output 2 on IM1-121Ex-R is a fault output)



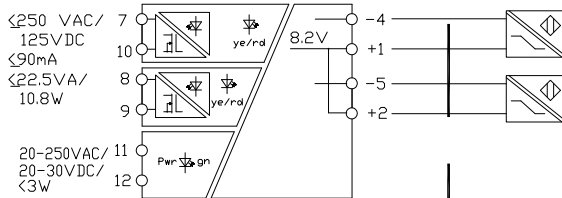
IM1-12Ex-MT



IM1-22Ex-R
IM1-22Ex-T



IM1-22Ex-T



IM1-22Ex-MT

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, 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

Model	Terminals	V_{oc}/U_o (V)	I_{sc}/I_o (mA)	P_o (mW)	C_o/C_o (uF)		L_o/L_o (mH)	
					AB/IIC	CDEFG/IIB,IIA	AB/IIC	CDEFG/IIB,IIA
IM1-12Ex-R, IM1-12Ex-MT, IM1-12Ex-T, IM1-121Ex-R, IM1-121Ex-T	1-4	9.6	11	26	1.1	5.2	1	2
					0.83	3.8	5	10
IM1-22Ex-R, IM1-22Ex-MT, IM12-22Ex-R	1-4, 2-5				0.74	3.4	10	20

P_o of the barrier is calculated using the formula $P_o = (V_{oc} * I_{sc})/4$

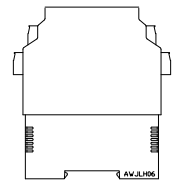
IM1-1.., IM1-2.., and IM12-2.. models



Associated Equipment
Nonhazardous Locations, providing intrinsically safe circuits for use in hazardous locations CI I, Div 1, Grps A,B,C,D; CI II, Div 1, Grps E,F,G; CI III, Div 1; [AEx ia] IIC or [Ex ia] IIC; when installed per Turck control drawing IS-1.301.
-25°C < T_a < +60°C



Terminal Identification



Date Code Location

Drawing No.:

IS-1.301

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

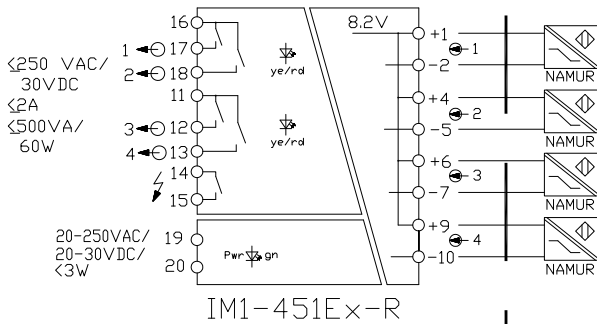
Title: Control Drawing for UL Listed
IM1-..Ex-, and IM12-..Ex-, Isolator Barriers
with I/S (Entity) Field Circuits

Scale: NONE

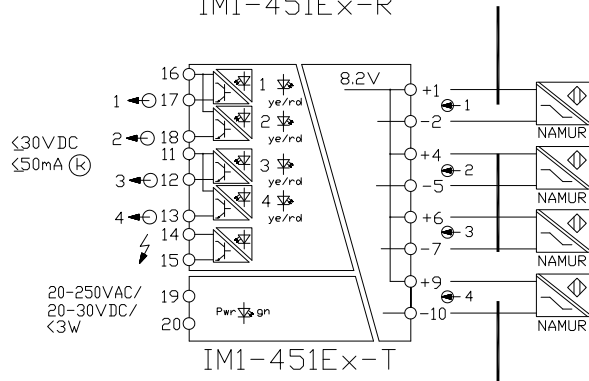
Sheet 1 of 2

Rev	Description	Drft	Date
D	Add C/US for IM1-1.., IM1-2.., and IM12-2..	BVL	4/28/15
C	Standard update evaluation	BVL	11/2/12
B	Remove Obsolete Models	BVL	5/25/10
A	Release	BVL	6/6/07

NON-HAZARDOUS LOCATION



IM1-451Ex-R



IM1-451Ex-T

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, 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

Model 	Terminals	V_o/U_o (V)	I_o/I_o (mA)	P_o (mW)	C_o/C_o (uF)		L_o/L_o (mH)	
					AB/IIC	CDEFG/IIB,IIA	AB/IIC	CDEFG/IIB,IIA
IM1-451Ex-R	1-2, 4-5, 6-7, 9-10	11.3	13	36	0.84	4	1	2
IM1-451Ex-T					0.62	2.8	5	10
					0.55	2.5	10	20

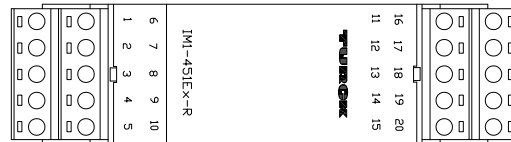
P_o of the barrier is calculated using the formula $P_o = (V_{oc} * I_{sc})/4$

IM1-4.. models

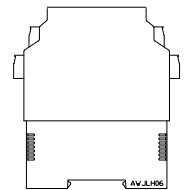


Associated Apparatus, Nonhazardous Locations, providing intrinsically safe circuits for use in hazardous locations Cl I, Div 1, Grps A,B,C,D; Cl II, Div 1, Grps E,F,G; Cl III, Div 1; [AEx ia] IIC; when installed per Turck control drawing IS-1.301.

-25°C < T_a < +60°C



Terminal Identification



Date Code Location

Notes:

- The symbol designates third party approved equipment 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.
- 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:
 $C_c = 60 \text{ pF/ft}$, $L_c = 0.2 \text{ uH/ft}$.
- WARNING: EXPLOSION HAZARD** – Do not connect/disconnect while circuit is live unless area is known to be nonhazardous.
AVERTISSEMENT: RISQUE D'EXPLOSION – Ne pas connecter/deconnecter lorsque le circuit est sous tension sauf si la zone est connue pour etre non dangereux.
- WARNING: EXPLOSION HAZARD** – Substitution of components may impair intrinsic safety.
AVERTISSEMENT: RISQUE D'EXPLOSION – La substitution de composants peut compromettre la securite intrinseque.
- 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, or
– The Canadian Electrical Code, CSA 22.1 for installation in Canada
- 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.
- Environmental conditions:
– -25°C to +60°C
– Altitude ≤ 2000 meters
– Maximum relative humidity 92.5% non-condensing
– Pollution degree 2
- Barriers must on 35 mm DIN rail or may be surface mounted by extending their surface mount 'feet' as shown.

10. Symbology:



SPST Relay output



Optically isolated MOSFET output



A discrete control circuit meeting the interoperability requirements of IEC 60947-5-6



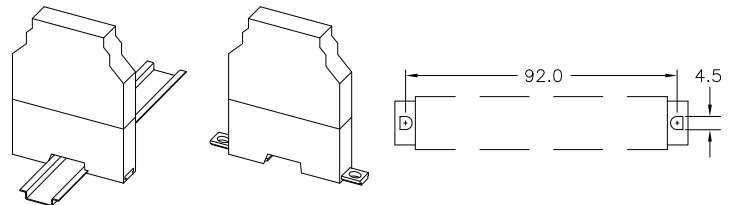
Potential free transistor output



Optically isolated potential free transistor output



Fault output



D Add C/US for IM1.., IM1-2.., and IM12-2.. BVL 4/28/15 Drawing No.: IS-1.301

Rev Description Drft Date Scale: None Sheet 2 of 2