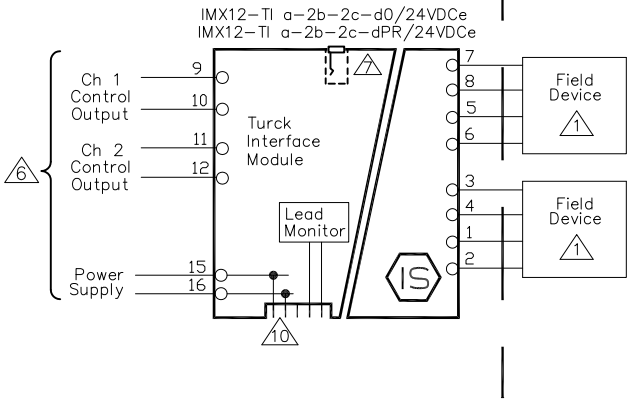
Temperature Transmitters with Intrinsically Safe Field Circuits

NON–HAZARDOUS LOCATION
or
Class I, Div. 2, Group A, B, C or D
or
Class I, Zone 2, Group IIC

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

Model 1	Terminals	V_{oc}/U_o (V)	I_{sc}/I_o (mA)	R (Ω)	P_o (mW)	C_a/C_o (uF)		L_a/L_o (mH)	
						AB/IIC	CDEFG/IIB,IIA	AB/IIC	CDEFG/IIB,IIA
IMX12–TI 02–2TCURTDR–2.–./..	1–2–3–4	5.0	2.8	1817	3.5	3.4	18	1.7	1.7
	5–6–7–8	5.0	2.8	1817	3.5	2.9 2.7	13 12	4.7 9.7	9.7 19.7
IMX12–TI 01–2RTDR–2.–./..	1–2–3–4	5.0	2.4	2093	3	3.4	18	1.7	1.7
	5–6–7–8	5.0	2.4	2093	3	2.9 2.7	13 12	4.7 9.7	9.7 19.7

P_o is calculated using the formula $P = (U_o * I_o)/4 = (5.0V * 2.8mA)/4 = 3.5mW$
or $P_o = (U_o * I_o)/4 = (5.0V * 2.4mA)/4 = 3mW$

a = Function 01 (RTD), 02 (TC+RTD, millivolt), or 03 (TC, millivolt)
b = Input type TC (thermocouple), RTD (resistance temp. detector), U (voltage), or R (resistor)
c = Output type I (current)
d = Extra function C (programming port), or blank
e = Connection /CC (cage clamp terminals), or blank (screw clamp terminals)

For Models Without Relay Output

Associated Apparatus, non–hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx nA [ia] IIC, Ex nA [ia] IIC, providing intrinsically safe circuits for use in hazardous locations Cl I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1, and Zone 0 Group IIC when installed in accordance with Turck control drawing IS–1.319.
$-25°C < T_a < +70°C$ $U_m = 253V$ Temp Code T4

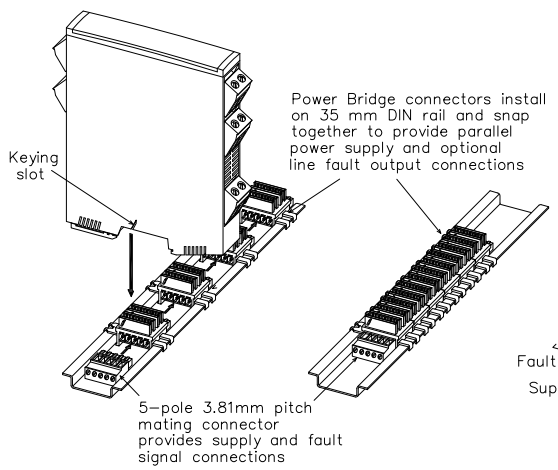
Notes:

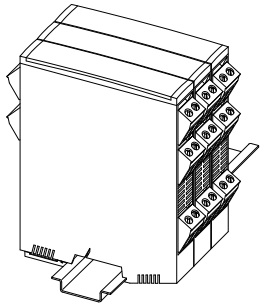
1. Selected intrinsically safe equipment must be third party approved with correct entity parameters meeting the relations shown in Table 1, or simple apparatus.
2. Multiple circuits extending from the same piece of Associated Apparatus equipment must be installed in separate cables or in one cable having suitable insulation. Refer to International Society of Automation Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
3. 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 compatable with the intrinsic safety of the circuit in which it is used.
4. 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 (Cc) plus intrinsically safe equipment capacitance (Ci) must be less than the marked capacitance (Ca) shown on any barrier used. The same applies for inductance (Lc, Li and La, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Cc = 60 pF/ft, Lc = 0.2 uH/ft.

Table 1

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

5. The 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.
6. Control equipment must not use or generate more than 253V rms or dc.
7. Optional programing port (Extra function 'C') must not be used, connected, or disconnected in the Division 2 or Zone 2 hazardous location.
8. WARNING: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
9. WARNING: Substitution of components may impair intrinsic safety.
10. Connections: IMX12–TI ..–..–..–PR/... devices may be connected to "Power Bridge" connectors installed on 35 mm DIN rail or attached directly to the DIN rail.
    IMX12–TI ..–..–..–0/... devices must be attached directly to the DIN rail.
11. The maximum terminal tightening torque is 0.5 Nm.
12. The barriers must be installed in a Pollution Degree 2 environment.
13. The barriers must be installed in a final enclosure rated IP54 or better.
14. The maximum installation altitude is 2000 meters.
15. Use conductors rated 75°C minimum.





Rev	Description	Drft	Chk	Date
B	Change power connection description	BVL		2/12/18
A	Release	BVL		4/18/17

Drawing No.: IS–1.319

TURCK
3000 Campus Drive
Plmouth, MN 55441
www.Turck.com

Title: Control Drawing for UL Listed
IMX12–TI0.–..–..–../.. Temperature Input
Isolated Barriers with I/S (Entity) Field Circuits

Scale: NONE

Sheet 1 of 1

CERTIFICATE OF COMPLIANCE

Certificate Number	E230865
Report Reference	E230865-20150731
Date	2022-May-19
Issued to:	Hans Turck GmbH & Co. KG Witzlebenstrasse 7 Muelheim an der Ruhr 45472 DE
This is to certify that representative samples of	PROCESS CONTROL EQUIPMENT FOR USE IN HAZARDOUS LOCATIONS See Addendum Page for Product Designation(s). Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	See Addendum Page for Standards
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	E230865
Report Reference	E230865-20150731
Date	2022-May-19

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx ec [ia] IIC.

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex ec [ia] IIC X.

Analog Signal Isolator, cat. nos. IMX12-AO01-; followed by 1I-1I- or 2I-2I-; maybe followed by H; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe outputs for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.318.

Analog Signal Isolator, cat. nos. IMXK12-AO01-1I-1I-H0/24VDC; maybe followed by /CC providing intrinsically safe outputs for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.318.

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx nA [ia] IIC.

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex nA [ia] IIC X.

Solenoid Driver, cat. nos. IMX12-DO; followed by two alpha numeric characters; followed by -1U-1U- or -2U-2U-; followed by two alpha numeric characters; followed by /; followed by five alpha numeric characters; maybe followed by /; maybe followed by two alpha numeric characters providing intrinsically safe outputs for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.314.

Solenoid Driver, cat. nos. IMXK12-DO01-1U-1U-0/24VDC; maybe followed by /CC providing intrinsically safe outputs for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.314.

Temperature transmitters, cat. nos. IMX12-TI02-2TCURTDR-2I-, IMX12-TI01-2RTDR-2I-; all cat. nos. followed by C; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.319.

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Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx nA nC [ia] IIC.

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex nA nC [ia] IIC X.

Temperature transmitters, cat. nos. IMX12-TI02-1TCURTDR-1I1R-; followed by C; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.319.

Open type process control equipment, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx ec nC IIC.

Open type process control equipment, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex ec nC IIC X.

Power Supply Modules for IMX Power Bridge Devices, cat. nos. IMX12-PS02-UI-UIR-PR/24VDC; maybe followed by /CC to be installed in accordance with Turck control drawing No. IS-1.322.

USL - Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx ec [ia] IIC.

CNL - Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex ec [ia] IIC X.

Rotation speed monitor, cat. no. IMX12-FI01-2SF-2I-C; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.320.

Isolating Transducer, cat. nos. IMX12-AI01-2I-2IU-, IMX12-AI01-1I-1IU- and IMX12-AI01-1I-2IU-; all models followed by H; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.317.

Isolating Transducer, cat. nos. IMXK12-AI01-1I-1I-H0/24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.317.

Strain Gauge Interface Module, cat. no. IMX12-SG10-1U-1UI-0/24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.325.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

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Report Reference	E230865-20150731
Date	2022-May-19

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Class I, Zone 2, AEx ec nC [ia] IIC.

Associated Apparatus, non-hazardous locations or Class I, Division 2, Groups A, B, C and D Hazardous Locations, Ex ec nC [ia] IIC X.

Rotation speed monitor, cat. no. IMX12-FI01-1SF-; maybe followed by 1I; followed by 1R-; maybe followed by C; followed by 0 or PR; followed by /24VDC; maybe followed by /CC providing intrinsically safe circuits for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; and Zone 0, Group IIC when installed in accordance with Turck control drawing No. IS-1.320.

Standards:

UL 913, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
UL 60079-0, Explosive atmospheres – Part 0: Equipment – General requirements
UL 60079-7, Explosive atmospheres – Part 7: Equipment Protection by Increased Safety “e”
UL 60079-11, Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i”
UL 121201, 9th Ed., Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 And 2 Hazardous (Classified) Locations
UL 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
CAN/CSA-C22.2 No. 60079-0:15, Explosive atmospheres — Part 0: Equipment — General requirements
CAN/CSA-C22.2 No. 60079-7, Explosive Atmospheres - Part 7: Equipment Protection by Increased Safety "e"
CAN/CSA-C22.2 No. 60079-11:14 , Explosive atmospheres — Part 11: Equipment protection by intrinsic safety “i”
CAN/CSA C22.2 No. 213, Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
CSA C22.2 No. 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

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