



FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
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Member of the FM Global Group

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

IM21-14Ex-CDTRi. Rotational Speed Monitor

AIS / I, II, III / 1 / ABCDEFG – IS-1.115; Entity*;

I / 0 / AEx [ia] / IIC – IS-1.115; Entity*;

NI / I / 2 / ABCD / T5; $-25\text{ °C} \leq T_a \leq +70\text{ °C}$

*For Entity Parameters reference Control Drawing IS-1.115

Special Conditions of Use:

1. Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.

IM33-FSD-Ex/L. Fire and Smoke Detector Repeater

AIS / I, II, III / 1 / ABCDEFG – IS-1.115; Entity*;

I / 0 / AEx [ia] / IIC – IS-1.104; Entity*;

NI / I / 2 / ABCD / T5; $-25\text{ °C} \leq T_a \leq +70\text{ °C}$

For Entity Parameters reference Control Drawing IS-1.104

Special Conditions of Use:

1. Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.

Equipment Ratings:

Associated Apparatus with Intrinsically Safe connections to Class I, II & III, Division 1, Groups A, B, C, D, E, F & G and connection to Class I, Zone 0, Groups IIC, in accordance with the Control Drawing, and Nonincendive for use in Class I, Division 2, Groups A, B, C, and D Hazardous (Classified) Locations



Member of the FM Global Group

FM Approved for:

Turck Inc.
Plymouth, MN



Member of the FM Global Group

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3610	2007
Class 3611	2004
Class 3810	2005

Original Project ID: 3036717

Approval Granted: April 6, 2010

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC

J. E. Marquedant
Group Manager, Electrical

6 April 2010
Date



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CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

IM21-14Ex-CDTRi. Rotational Speed Monitor

AIS / I, II, III / 1 / ABCDEFG – IS-1.115; Entity*;

I / 0 / Ex [ja] / IIC – IS-1.115; Entity*;

NE / I / 2 / ABCD / T5; -25 °C < Ta < +70 °C

*For Entity Parameters reference Control Drawing IS-1.115

Special Conditions of Use:

1. Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.

IM33-FSD-Ex/L. Fire and Smoke Detector Repeater

AIS / I, II, III / 1 / ABCDEFG – IS-1.104; Entity*;

I / 0 / Ex [ja] / IIC – IS-1.104; Entity*;

NI / I / 2 / ABCD / T5; -25 °C < Ta < +70 °C

For Entity Parameters reference Control Drawing IS-1.104

Special Conditions of Use:

1. Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.

Equipment Ratings:

Associated Apparatus with Intrinsically Safe connections to Class I, II & III, Division 1, Groups A, B, C, D, E, F & G and connection to Class I, Zone 0, Groups IIC, in accordance with the Control Drawing, and Nonincendive for use in Class I, Division 2, Groups A, B, C, and D Hazardous (Classified) Locations

FM Approved for:

Turck Inc.
Plymouth, MN



Member of the FM Global Group

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

CSA C22.2 No. 213 1987
CSA C22.2 No. 142 1987

Original Project ID: 3036717C

Approval Granted: April 6, 2010

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC

J.E. Marquardt
Group Manager, Electrical

6 April 2010
Date

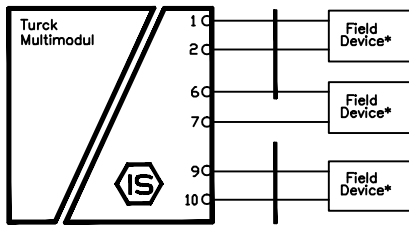
FM Approved Isolator Barriers



Rotational Speed Monitors with Intrinsically Safe Field Circuits

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

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, Group IIC, IIB, or IIA, Zone per Note 3



IM21-14Ex-CDTRI

* The field device may be:

- For US jurisdictions - Any FM approved intrinsically safe apparatus with compatible Entity Concept parameters 1, or any simple apparatus 2.
- For Canadian jurisdictions - Any Canadian certified intrinsically safe apparatus with compatible Entity Concept parameters 1, or any simple apparatus 2.

Entity Parameters: Class I, Division 1; Class II, Division 1; Class III, Division 1

Model	Terminals	V _{oc} (V)	I _{sc} (mA)	P _o (mW)	Output Characteristic	R _i (Ohms)	C _o (uF) AB/CE/DFG	L _o (mH) AB/CE/DFG
IM21-14Ex-CDTRI	1-2,	9.6	10.7	25	linear	900	3.6/26/26	100
	6-7,							
	9-10							

Entity Parameters: Class I, Zone 0, 1, or 2

Model	Terminals	U _o (V)	I _o (mA)	P _o (mW)	Output Characteristic	R _i (Ohms)	C _o (uF) IIC/IIB/IIA	L _o (mH) IIC,IIB,IIA
IM21-14Ex-CDTRI	1-2,	9.6	10.7	25	linear	900	3.6/26/26	100
	6-7,							
	9-10							

Notes:

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

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

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

2. 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.

3. Wiring methods must be in accordance with:

For US jurisdictions - the National Electrical Code, ANSI/NFPA 70, Article 504 (for Division 1 or 2 installations) or Article 505 (for Zone 0, 1 or 2 applications), and ANSI/ISA RP12.06.01.

For Canadian jurisdictions - the Canadian Electrical Code, CSA 22.1, for Division 1 or 2 or Zone 1 or 2 installations.

4. Associated apparatus must not be connected to any device that uses or generates in excess of 250Vrms unless it has been determined that the voltage is adequately isolated from the associated apparatus.

5. If the electrical parameters of the cable are unknown, the following default values may be used:

Capacitance - 60pF/foot
Inductance - 0.2uH/foot

6. WARNING: Substitution of components may impair intrinsic safety. AVERTISSEMENT: La substitution de composants peut compromettre la securite intrinseque.

Drawing No.:

IS-1.115

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

Title: Control Drawing for IM21-14Ex-CDTRI
Rotational Speed monitors with I/S
(Entity) Field Circuits

A	Release	BVL	4/2/10
Rev	Description	Drft	Date

Scale: NONE

Sheet 1 of 1