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# CERTIFICATE OF COMPLIANCE

## HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

**IMC-DI-22EX-PNO/24VDC/K62. Isolation switching amplifier**  
**Part Number: 7560000**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.119  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.119  
 I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.119; IP67  
 I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.119; IP67

**IS Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
 Group IIC, Groups A & B Co (Ca) = 0.76 µF Lo (La) = 5 mH  
 Groups IIB & IIA, Groups C, D, E, F & G Co (Ca) = 4.3 µF Lo (La) = 5 mH

**"ic" Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
 Group IIC Co (Ca) = 1.9 µF Lo (La) = 1 mH  
 Groups IIB & IIA Co (Ca) = 7.4 µF Lo (La) = 5 mH

**NI Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
 Groups A & B Co (Ca) = 1.6 µF Lo (La) = 1 mH  
 Groups C & D Co (Ca) = 6.2 µF Lo (La) = 5 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AIA-11EX-i/24VDC/K62. 2-Wire Loop Isolator**  
**Part Number: 7560001**

NI-AIS / I / 2 / CD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / CDEFG - IS-1.120  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.120  
 I / 2 / AEx nA [ia IIB] / IIB / T5 Ta = -25 °C to 70 °C - IS-1.120; IP67  
 I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.120; IP67

**IS Output Entity Parameters: Terminals 1 – 2**

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 0.53  $\mu$ F  
Co (Ca) = 0.5  $\mu$ F

Lo (La) = 1 mH  
Lo (La) = 5 mH

**"ic" Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
Group IIC

Co (Ca) = 0.14  $\mu$ F  
Co (Ca) = 0.12  $\mu$ F  
Co (Ca) = 1.2  $\mu$ F  
Co (Ca) = 1.2  $\mu$ F

Lo (La) = 1 mH  
Lo (La) = 2 mH  
Lo (La) = 5 mH  
Lo (La) = 10 mH

Groups IIB & IIA

**NI Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
Groups A & B

Co (Ca) = 0.25  $\mu$ F  
Co (Ca) = 0.20  $\mu$ F  
Co (Ca) = 0.82  $\mu$ F  
Co (Ca) = 0.82  $\mu$ F

Lo (La) = 0.1 mH  
Lo (La) = 0.2 mH  
Lo (La) = 5 mH  
Lo (La) = 10 mH

Groups C & D

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DO-11EX/L/K62. Solenoid Driver and Intrinsically Safe Power Supply**

**Part Number: 7560002**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.121

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.121

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.121; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.121; IP67

**IS Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW

Group IIC, Groups A & B

Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 0.29  $\mu$ F  
Co (Ca) = 1.4  $\mu$ F  
Co (Ca) = 1  $\mu$ F

Lo (La) = 0.05 mH  
Lo (La) = 0.5 mH  
Lo (La) = 2 mH

**"ic" Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW

Group IIC

Groups IIB & IIA

Co (Ca) = 0.39  $\mu$ F  
Co (Ca) = 3.1  $\mu$ F  
Co (Ca) = 1.9  $\mu$ F

Lo (La) = 0.5 mH  
Lo (La) = 0.5 mH  
Lo (La) = 2 mH

**NI Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW

Groups A & B

Groups C & D

Co (Ca) = 0.26  $\mu$ F  
Co (Ca) = 2.0  $\mu$ F  
Co (Ca) = 1.5  $\mu$ F

Lo (La) = 0.2 mH  
Lo (La) = 0.5 mH  
Lo (La) = 2 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DI-22EX-PNO/24VDC. Isolation Switching Amplifier**

**Part Number: 7560003**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.122

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.122

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**IS Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW

Group IIC

Groups A & B

Groups IIB & IIA

Groups C, D, E, F & G

Co (Ca) = 0.76  $\mu$ F

Lo (La) = 10 mH

Co (Ca) = 3.4  $\mu$ F

Lo (La) = 20 mH

**"ic" Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW

Group IIC

Groups IIB & IIA

Co (Ca) = 1.4  $\mu$ F

Lo (La) = 5 mH

Co (Ca) = 6.6  $\mu$ F

Lo (La) = 10 mH

**NI Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW

Groups A & B

Groups C & D

Co (Ca) = 1.2  $\mu$ F

Lo (La) = 5 mH

Co (Ca) = 5.5  $\mu$ F

Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AI-11Ex-i/L. Analogue Data Transmitter**

**Part Number: 7560004**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.126

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.126

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.126; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - I IS-1.126; IP67

**Input Entity Parameters:** Terminals 2 – 4

Ui (Vmax) = 27 V, Ii (Imax) = 150 mA, Pi = 1W, Ci = 0, Li = 0

**Output Entity Parameters:** Terminals 2 – 4

Uo (Voc) = 1 V, Io (Isc) = 0, Po = 0

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AO-11EX-i/L. Analogue Data Transmitter**

**Part Number: 7560006**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.123

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.123

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.123; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.123; IP67

**IS Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW

Group IIC, Groups A & B

Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 420 nF

Lo (La) = 2 mH

Co (Ca) = 2.7  $\mu$ F

Lo (La) = 2 mH

**"ic" Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW

Group IIC

Co (Ca) = 510 nF

Lo (La) = 5 mH

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

Groups IIB & IIA

Co (Ca) = 2.9  $\mu$ F

Lo (La) = 10 mH

**NI Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW

Groups A & B

Groups C & D

Co (Ca) = 390 nF

Co (Ca) = 2.4  $\mu$ F

Lo (La) = 5 mH

Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DO-11EX/L. Solenoid Driver and Intrinsically Safe Power Supply**

**Part Number: 7560008**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.124

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.124

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.124; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.124; IP67

**IS Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW

Group IIC, Groups A & B

Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 70 nF

Co (Ca) = 450 nF

Lo (La) = 0.5 mH

Lo (La) = 0.5 mH

**"ic" Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW

Group IIC

Groups IIB & IIA

Co (Ca) = 74 nF

Co (Ca) = 490 nF

Lo (La) = 4 mH

Lo (La) = 20 mH

**NI Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW

Groups A & B

Groups C & D

Co (Ca) = 61 nF

Co (Ca) = 360 nF

Lo (La) = 2 mH

Lo (La) = 20 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AIA-11EX-i/24VDC. 2-Wire Loop Isolator**

**Part Number: 7560009**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / CDEFG - IS-1.125

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.125

I / 2 / AEx nA [ia IIB] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.125; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.125; IP67

**IS Output Entity Parameters:** Terminals 1 – 2

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W

Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 0.53  $\mu$ F

Co (Ca) = 0.5  $\mu$ F

Lo (La) = 1 mH

Lo (La) = 5 mH

**"ic" Output Entity Parameters:** Terminals 1 – 2

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W

Group IIC

Groups IIB & IIA

Co (Ca) = 0.14  $\mu$ F

Co (Ca) = 0.12  $\mu$ F

Co (Ca) = 1.2  $\mu$ F

Lo (La) = 1 mH

Lo (La) = 2 mH

Lo (La) = 5 mH

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**NI Output Entity Parameters: Terminals 1 – 2**

U<sub>o</sub> (Voc) = 22 V, I<sub>o</sub> (Isc) = 64.5 mA, P<sub>o</sub> = 1.2 W  
Groups A & B

Groups C & D

Co (Ca) = 1.2 µF

Lo (La) = 10 mH

Co (Ca) = 0.20 µF

Lo (La) = 0.1 mH

Co (Ca) = 0.25 µF

Lo (La) = 0.2 mH

Co (Ca) = 0.82 µF

Lo (La) = 5 mH

Co (Ca) = 0.82 µF

Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DI-22EX-PNC/24VDC. Isolation Switching Amplifier**

**Part Number: 7560010**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

AIS / I,II,III / 1 / ABCDEFG - IS-1.122

NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67

ANI / I / 1 / ABCD - IS-1.122

I / 2 / AEx nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

I / 2 / AEx nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

**IS Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

U<sub>o</sub> (Voc) = 9.6 V, I<sub>o</sub> (Isc) = 10 mA, P<sub>o</sub> = 24 mW

Group IIC

Groups A & B

Groups IIB & IIA

Groups C, D, E, F & G

Co (Ca) = 0.76 µF

Lo (La) = 10 mH

Co (Ca) = 3.4 µF

Lo (La) = 20 mH

**"ic" Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

U<sub>o</sub> (Voc) = 9.6 V, I<sub>o</sub> (Isc) = 10 mA, P<sub>o</sub> = 24 mW

Group IIC

Groups IIB & IIA

Co (Ca) = 1.4 µF

Lo (La) = 5 mH

Co (Ca) = 6.6 µF

Lo (La) = 10 mH

**NI Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

U<sub>o</sub> (Voc) = 9.6 V, I<sub>o</sub> (Isc) = 10 mA, P<sub>o</sub> = 24 mW

Groups A & B

Groups C & D

Co (Ca) = 1.2 µF

Lo (La) = 5 mH

Co (Ca) = 5.5 µF

Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**Equipment Ratings:**

Associated apparatus for use in Class I, Division 2 Groups A, B, C, and D and Class I Zone 2 Group IIC with Intrinsically Safe connections for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (classified) locations and Intrinsically Safe connections for Group IIC hazardous (classified) locations

**FM Approved for:**

Hans Turck GmbH & Co KG  
Mulheim an der Ruhr, Germany



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	2011
Class 3610	2010
Class 3810	2005
Class 3611	2004
ANSI/ISA-60079-0 (12.00.01)	2009
ANSI/ISA-60079-11 (12.02.01)	2009
ANSI/ISA-60529 (12.02.01)	2004
ANSI/ISA 60079-15 (12.12.02)	2012

Original Project ID: 0003047551

Approval Granted: September 24, 2014

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC

J.E. Marquedant  
Manager, Electrical Systems

24 September 2014

Date



Member of the FM Global Group

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# CERTIFICATE OF COMPLIANCE

## HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

**IMC-DI-22EX-PNO/24VDC/K62. Isolation switching amplifier  
Part Number: 7560000**

NI-AIS / I / 2 / ABCD /T5 Ta = -25 °C to 70 °C; IP67  
AIS / I,II,III / 1 / ABCDEFG - IS-1.119  
NI-ANI / I / 2 / ABCD /T5 Ta = -25 °C to 70 °C; IP67  
ANI / I / 1 / ABCD - IS-1.119  
I / 2 / Ex nA [ia] / IIC /T5 Ta = -25 °C to 70 °C - IS-1.119; IP67  
I / 2 / Ex nA [ic] / IIC /T5 Ta = -25 °C to 70 °C - IS-1.119; IP67

**IS Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
Group IIC, Groups A & B Co (Ca) = 0.76 µF Lo (La) = 5 mH  
Groups IIB & IIA, Groups C, D, E, F & G Co (Ca) = 4.3 µF Lo (La) = 5 mH

**"ic" Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
Group IIC Co (Ca) = 1.9 µF Lo (La) = 1 mH  
Groups IIB & IIA Co (Ca) = 7.4 µF Lo (La) = 5 mH

**NI Output Entity Parameters: Terminals 1 – 2, Terminals 1 - 4**

Uo (Voc) = 9.6 V, Io (Isc) = 19.8 mA, Po = 47.5 mW  
Groups A & B Co (Ca) = 1.6 µF Lo (La) = 1 mH  
Groups C & D Co (Ca) = 6.2 µF Lo (La) = 5 mH

**Special Conditions of Use:**

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AIA-11EX-i/24VDC/K62. 2-Wire Loop Isolator  
Part Number: 7560001**

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

NI-AIS / I / 2 / CD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / CDEFG - IS-1.120  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.120  
 I / 2 / Ex nA [ia IIB] / IIB / T5 Ta = -25 °C to 70 °C - IS-1.120; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.120; IP67

**IS Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Groups IIB & IIA, Groups C, D, E, F & G

	Co (Ca) = 0.53 µF	Lo (La) = 1 mH
	Co (Ca) = 0.5 µF	Lo (La) = 5 mH

**"ic" Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Group IIC

	Co (Ca) = 0.14 µF	Lo (La) = 1 mH
	Co (Ca) = 0.12 µF	Lo (La) = 2 mH
Groups IIB & IIA	Co (Ca) = 1.2 µF	Lo (La) = 5 mH
	Co (Ca) = 1.2 µF	Lo (La) = 10 mH

**NI Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Groups A & B

	Co (Ca) = 0.25 µF	Lo (La) = 0.1 mH
	Co (Ca) = 0.20 µF	Lo (La) = 0.2 mH
Groups C & D	Co (Ca) = 0.82 µF	Lo (La) = 5 mH
	Co (Ca) = 0.82 µF	Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DO-11EX/L/K62. Solenoid Driver and Intrinsically Safe Power Supply  
 Part Number: 7560002**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.121  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.121  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.121; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.121; IP67

**IS Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW  
 Group IIC, Groups A & B

	Co (Ca) = 0.29 µF	Lo (La) = 0.05 mH
Groups IIB & IIA, Groups C, D, E, F & G	Co (Ca) = 1.4 µF	Lo (La) = 0.5 mH
	Co (Ca) = 1 µF	Lo (La) = 2 mH

**"ic" Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW  
 Group IIC

	Co (Ca) = 0.39 µF	Lo (La) = 0.5 mH
Groups IIB & IIA	Co (Ca) = 3.1 µF	Lo (La) = 0.5 mH
	Co (Ca) = 1.9 µF	Lo (La) = 2 mH

**NI Output Entity Parameters: Terminals 1 – 3**

Uo (Voc) = 17.4 V, Io (Isc) = 185.3 mA, Po = 1.076 mW  
 Groups A & B

	Co (Ca) = 0.26 µF	Lo (La) = 0.2 mH
Groups C & D	Co (Ca) = 2.0 µF	Lo (La) = 0.5 mH
	Co (Ca) = 1.5 µF	Lo (La) = 2 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)



**IMC-DI-22EX-PNO/24VDC. Isolation Switching Amplifier**  
**Part Number: 7560003**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.122  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.122  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

**IS Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW  
 Group IIC Co (Ca) = 0.76 µF Lo (La) = 10 mH  
 Groups A & B Co (Ca) = 3.4 µF Lo (La) = 20 mH  
 Groups IIB & IIA  
 Groups C, D, E, F & G

**"ic" Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW  
 Group IIC Co (Ca) = 1.4 µF Lo (La) = 5 mH  
 Groups IIB & IIA Co (Ca) = 6.6 µF Lo (La) = 10 mH

**NI Output Entity Parameters:** Terminals 1 – 4, Terminals 2 - 3

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW  
 Groups A & B Co (Ca) = 1.2 µF Lo (La) = 5 mH  
 Groups C & D Co (Ca) = 5.5 µF Lo (La) = 10 mH

**Special Conditions of Use:**

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AI-11Ex-i/L. Analogue Data Transmitter**  
**Part Number: 7560004**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.126  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.126  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.126; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - I IS-1.126; IP67

**Input Entity Parameters:** Terminals 2 – 4

Ui (Vmax) = 27 V, Ii (Imax) = 150 mA, Pi = 1W, Ci = 0, Li = 0

**Output Entity Parameters:** Terminals 2 – 4

Uo (Voc) = 1 V, Io (Isc) = 0, Po = 0

**Special Conditions of Use:**

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-AO-11EX-i/L. Analogue Data Transmitter**  
**Part Number: 7560006**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.123  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.123  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.123; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.123; IP67

**IS Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW  
 Group IIC, Groups A & B  
 Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 420 nF	Lo (La) = 2 mH
Co (Ca) = 2.7 µF	Lo (La) = 2 mH

**"ic" Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW  
 Group IIC  
 Groups IIB & IIA

Co (Ca) = 510 nF	Lo (La) = 5 mH
Co (Ca) = 2.9 µF	Lo (La) = 10 mH

**NI Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 13.3V, Io (Isc) = 97 mA, Po = 332 mW  
 Groups A & B  
 Groups C & D

Co (Ca) = 390 nF	Lo (La) = 5 mH
Co (Ca) = 2.4 µF	Lo (La) = 10 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DO-11EX/L. Solenoid Driver and Intrinsically Safe Power Supply**  
**Part Number: 7560008**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.124  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.124  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.124; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.124; IP67

**IS Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW  
 Group IIC, Groups A & B  
 Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 70 nF	Lo (La) = 0.5 mH
Co (Ca) = 450 nF	Lo (La) = 0.5 mH

**"ic" Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW  
 Group IIC  
 Groups IIB & IIA

Co (Ca) = 74 nF	Lo (La) = 4 mH
Co (Ca) = 490 nF	Lo (La) = 20 mH

**NI Output Entity Parameters:** Terminals 1 – 3

Uo (Voc) = 27 V, Io (Isc) = 95.3 mA, Po = 674 mW  
 Groups A & B  
 Groups C & D

Co (Ca) = 61 nF	Lo (La) = 2 mH
Co (Ca) = 360 nF	Lo (La) = 20 mH

*Special Conditions of Use:*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**IMC-AIA-11EX-i/24VDC. 2-Wire Loop Isolator**  
**Part Number: 7560009**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / CDEFG - IS-1.125  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.125  
 I / 2 / Ex nA [ia IIB] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.125; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.125; IP67

**IS Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Groups IIB & IIA, Groups C, D, E, F & G

Co (Ca) = 0.53 µF      Lo (La) = 1 mH  
 Co (Ca) = 0.5 µF      Lo (La) = 5 mH

**"ic" Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Group IIC

Co (Ca) = 0.14 µF      Lo (La) = 1 mH  
 Co (Ca) = 0.12 µF      Lo (La) = 2 mH  
 Co (Ca) = 1.2 µF        Lo (La) = 5 mH  
 Co (Ca) = 1.2 µF        Lo (La) = 10 mH

Groups IIB & IIA

**NI Output Entity Parameters: Terminals 1 – 2**

Uo (Voc) = 22 V, Io (Isc) = 64.5 mA, Po = 1.2 W  
 Groups A & B

Co (Ca) = 0.20 µF      Lo (La) = 0.1 mH  
 Co (Ca) = 0.25 µF      Lo (La) = 0.2 mH  
 Co (Ca) = 0.82 µF      Lo (La) = 5 mH  
 Co (Ca) = 0.82 µF      Lo (La) = 10 mH

Groups C & D

**Special Conditions of Use:**

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

**IMC-DI-22EX-PNC/24VDC. Isolation Switching Amplifier**  
**Part Number: 7560010**

NI-AIS / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 AIS / I,II,III / 1 / ABCDEFG - IS-1.122  
 NI-ANI / I / 2 / ABCD / T5 Ta = -25 °C to 70 °C; IP67  
 ANI / I / 1 / ABCD - IS-1.122  
 I / 2 / Ex nA [ia] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67  
 I / 2 / Ex nA [ic] / IIC / T5 Ta = -25 °C to 70 °C - IS-1.122; IP67

**IS Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW  
 Group IIC

Co (Ca) = 0.76 µF      Lo (La) = 10 mH

Groups A & B

Co (Ca) = 3.4 µF        Lo (La) = 20 mH

Groups IIB & IIA

Groups C, D, E, F & G

**"ic" Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW

Group IIC

Co (Ca) = 1.4 µF        Lo (La) = 5 mH

Groups IIB & IIA

Co (Ca) = 6.6 µF        Lo (La) = 10 mH

**NI Output Entity Parameters: Terminals 1 – 4, Terminals 2 - 3**

Uo (Voc) = 9.6 V, Io (Isc) = 10 mA, Po = 24 mW

Groups A & B

Co (Ca) = 1.2 µF        Lo (La) = 5 mH

Groups C & D

Co (Ca) = 5.5 µF        Lo (La) = 10 mH

**Special Conditions of Use:**

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)



*Member of the FM Global Group*

1. The modules shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application, including a tool removable cover.
2. When installed in Division 2 Hazardous (classified) locations, a warning label must be prominently affixed near the unit(s) which warns that the cables must not be removed or inserted unless the area is known to be non-hazardous

### Equipment Ratings:

Associated apparatus for use in Class I, Division 2 Groups A, B, C, and D and Class I Zone 2 Group IIC with Intrinsically Safe connections for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (classified) locations and Intrinsically Safe connections for Group IIC hazardous (classified) locations

### FM Approved for:

Hans Turck GmbH & Co KG  
Mulheim an der Ruhr, Germany



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:

- CAN/CSA-C22.2 No. 157- 2006
- CAN/CSA-C22.2 No. 213- 2008
- CAN/CSA-C22.2 No. 2011
- CAN/CSA-C22.2 No. 2011
- CAN/CSA C22.2 No. 1010 2004
- CAN C22.2 No. 60529 1992 (2006)
- CAN/CSA-C22.2 No. 2012

Original Project ID: 0003047551C

Approval Granted: September 24, 2014

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC

J.E. Marquedant  
Manager, Electrical Systems

24 September 2014

Date

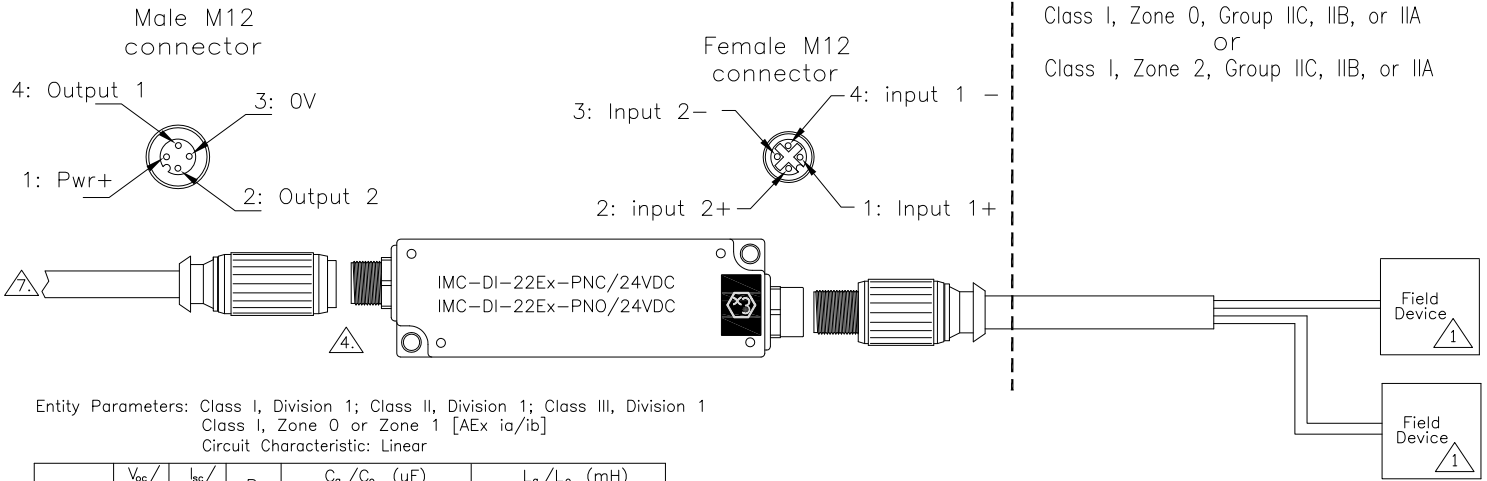
To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

# Discrete Input Devices with Intrinsically Safe Field Circuits



NON-HAZARDOUS LOCATION  
 Class I, Div. 2, Groups A,B,C,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  
 Class I, Div. 2, Groups A,B,C,D;  
 Class I, Zone 0, Group IIC, IIB, or IIA  
 or  
 Class I, Zone 2, Group IIC, IIB, or IIA



Entity Parameters: Class I, Division 1; Class II, Division 1; Class III, Division 1  
 Class I, Zone 0 or Zone 1 [AEx ia/ib]  
 Circuit Characteristic: Linear

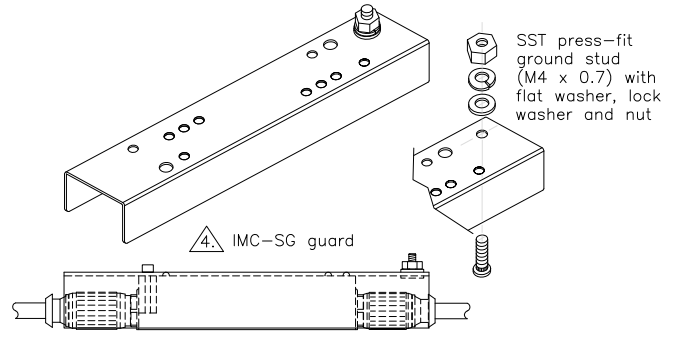
Terminals	V <sub>oc</sub> / U <sub>o</sub> (V)	I <sub>sc</sub> / I <sub>o</sub> (mA)	P <sub>o</sub> (mW)	C <sub>a</sub> /C <sub>o</sub> (uF)		L <sub>a</sub> /L <sub>o</sub> (mH)	
				AB/IIC	CDEFG/IIB,IIA	AB/IIC	CDEFG/IIB,IIA
1-4	9.6	10	24	0.75	3.4	10	20
2-3	9.6	10	24	0.75	3.4	10	20

Class I, Zone 2 [AEx ic]

Terminals	U <sub>o</sub> (V)	I <sub>o</sub> (mA)	P <sub>o</sub> (mW)	C <sub>o</sub> (uF)		L <sub>o</sub> (mH)	
				IIC	IIB,IIA	IIC	IIB,IIA
1-4	9.6	10	24	1.4	6.6	5	10
2-3	9.6	10	24	1.4	6.6	5	10

Nonincendive Field Wiring Parameters Class I, Division 2

Terminals	V <sub>oc</sub> (V)	I <sub>sc</sub> (mA)	P <sub>o</sub> (mW)	C <sub>a</sub> (uF)		L <sub>a</sub> (mH)	
				AB	CD	AB	CD
1-4	9.6	10	24	1.2	5.5	5	10
2-3	9.6	10	24	1.2	5.5	5	10



Notes:

1. FMRC Approved Intrinsically safe apparatus with entity parameters that meet the conditions below, or simple apparatus. The entity concept allows interconnection of intrinsically safe apparatus and associated apparatus not specifically examined in combination as a system when the following conditions are met:

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

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

Where the cable capacitance and inductance are not known, the following values shall be used: C<sub>cable</sub> = 60 pF/ft, L<sub>cable</sub> = 0.2 uH/ft.

- 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.
- 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 or Zone 2/22 location, the IMC-DI-22Ex-PN./24VDC must be protected against any kind of mechanical damage. This can be done using a Turck IMC-SG protective housing.
- When installed in a Class I, division 2 or Zone 2/22 location, the IMC-DI-22Ex-PN./24VDC must be protected against any static charge, e.g. by conductive fastening with connection to protective ground potential.
- 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.

7. 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. AVERTISSEMENT: La substitution de composants peut compromettre la securite intrinseque.

Drawing No.: IS-1.122	<b>TURCK</b> 3000 Campus Drive Plymouth, MN 55441 Phone: (763) 553-7300
Title: Control Drawing for FM Approved IMC-DI-22Ex-PN./24VDC with I/S (Entity) Field Circuits	
Scale: None	Sheet 1 of 1

A	Release	BVL	8/1/14
Rev	Description	Drft	Date