Technical Information

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Canadian Standards Association (CSA) Certified Intrinsically Safe Apparatus, Associated Apparatus, and Equipment with Nonincendive Field Wiring Connections

Foxboro®

by Schneider Electric

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General

This document provides the user with information necessary for the connection of Canadian Standards Association (CSA) approved intrinsically safe apparatus and associated apparatus. Wiring procedures for Foxboro intrinsically safe systems are provided in Foxboro Instructions (MIs) applicable to the systems in question.

CSA Marking Code

The marking codes adopted by CSA for intrinsic safety are:

Exia — means the apparatus is intrinsically safe.

[Exia] — means the associated apparatus provides intrinsically safe circuits.

Intrinsically Safe Apparatus

The term “intrinsically safe” means that any spark or thermal effect that may occur in normal use, or under any conditions of fault likely to occur in practice, is incapable of causing an ignition of the prescribed flammable gas, vapor, or dust. Intrinsically safe apparatus is apparatus that may be installed in a hazardous location, in which all the circuits are intrinsically safe, or that is designed to form part of an intrinsically safe system.

Associated Safe-Location Apparatus

Associated safe-location apparatus is apparatus designed to form part of an intrinsically safe system, in which not all the circuits are intrinsically safe, but which affects the safety of the intrinsically safe system of which it forms a part. Such equipment may not be installed in a hazardous location unless provided with appropriate protection.

CSA Approvals

Table 1 and Table 2 list the SPEC 200 System CSA associated apparatus connected to Foxboro intrinsically safe apparatus.

Table 3 and Table 4 list UIO and MICROSPEC Subsystems associated apparatus connected to Foxboro intrinsically safe apparatus.

Table 5 lists UFM Subsystem associated apparatus connected to Foxboro intrinsically safe apparatus.

Table 6 lists FIO System associated apparatus connected to Foxboro intrinsically safe apparatus, and Table 7 lists Foxboro associated apparatus connected to other manufacturer's intrinsically safe apparatus.

Table 8 lists TankExpert Hydrostatic Gauging and Inventory Management System associated apparatus connected to Foxboro intrinsically safe apparatus.

Table 9 lists Foxboro intrinsically safe apparatus connected to CSA-certified zener barriers (other manufacturer's associated apparatus).

Table 10 lists Foxboro apparatus connected with nonincendive field wiring.

SPEC 200 System

Table 1 and Table 2 list SPEC 200 System input/output cards that are approved by CSA as providing intrinsically safe circuits to the field devices mounted in Class I, Groups A, B, C, and D, Divisions 1 and 2 hazardous locations. The cards must be mounted in a 2ANU–D nest and receive power via a 2AX+DP10–CGB power distribution module (green). The input/ output (I/O) cards must be the –CGB version and operate in one of the approved loops listed in Table 1 and Table 2. Certification is contingent on rack assemblies being wired at specified Foxboro plants.

Table 1. SPEC 200 System Connected to Foxboro Intrinsically Safe Apparatus (see Figure 1)

Associated Apparatus SPEC 200 System Model Number	Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
2AI–C2L–CGB	Input Circuit may connect to:	Nonpowered contacts or switches
2AI–F2F–CGB 2AI–F2V–CGB	Input Circuit may connect to:	E83 Series Vortex Flowmeters 83 Series Vortex Flowmeters (a) (b)
2AI–I2V–CGB 2AI–I3V–CGB 2AS–I2I–CGB (Channel A) 2AS–I3I–CGB (Channel A)	Input Circuit may connect to:	Foxboro/ICT 27 Series Pressure Transmitters 65 Series Indicators (c) 130 Series DMU Transmitter 820 Series Transmitters 834DP Series Transmitters 841, 843, and 847 Series Transmitters 892 Series Converter 1125 Pressure Transducers 1150 Pressure Transducers E83 Series Vortex Flowmeters 83 Series Vortex Flowmeters (a) (b) I/A Series Pressure Transmitter (d) 870 Series Transmitters (e) 870IT Series Electrochemical Transmitters (e)
2AI–I2V–CGB 2AS–I2I–CGB	Input Circuit may connect to: (when associated apparatus is modified per SI 8-00590 only)	65 Series Indicators (c)
2AO–V2I–CGB 2AO–VAI–CGB	Output Circuit may connect to: (when associated apparatus is modified per SI 8-00590 only)	
2AI–N2V–CGB 2AI–P2V–CGB	Input Circuit may connect to:	Nonincendive Resistances Resistance Temperature Detectors (RTDs)
2AI–T2V–CGB	Input Circuit may connect to:	Thermocouples
2AI–W3V–CGB	Input Circuit may connect to:	65 Series Indicators (c) 820 Series Transmitters
2AO–V2I–CGB 2AO–V3I–CGB 2AO–V5I–CGB 2AO–VAI–CGB 2AS–I2I–CGB (Channel B) 2AS–I3I–CGB (Channel B) 2AT–SBU–CGB	Output Circuit may connect to:	65 Series Indicators (c) E69 Series Converters and Positioners
2AT–SBM–CGB	Used with 205S–SBU–CGB	
2AO–L2C–ISR–CGB	May be used to switch any approved intrinsically safe loop	

a. To maintain intrinsic safety in 83 Series Vortex Flowmeters, current loop and pulse output field wiring pairs must be run in separate cables or with separate shields connected to intrinsically safe ground.

b. This Model also intrinsically safe for Class II, Groups E, F, and G, Division 1; Class III, Division 1.

c. 65 Series Indicator (65FS–CBJB, 65PH–JT, 65PV–JG, 65PV–JT or 65PV-JY) may be connected in a loop with other intrinsically safe apparatus listed in the same segment of the table.

d. Communication -I and -D only.

e. 870 Series Transmitters entity parameters based upon connection to 871 Series sensors. Maximum cable length of CSA certified 871EC or 871FT, 100 ft; 871PH, 500 ft.

Figure 1. SPEC 200 System - Loop Diagram (Reference Table 1)

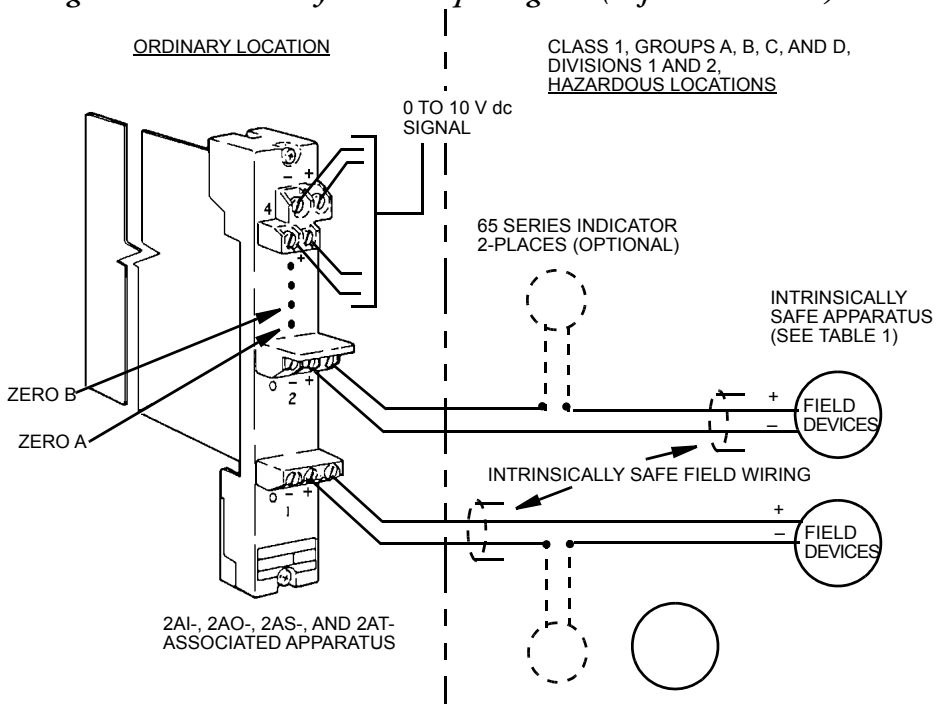
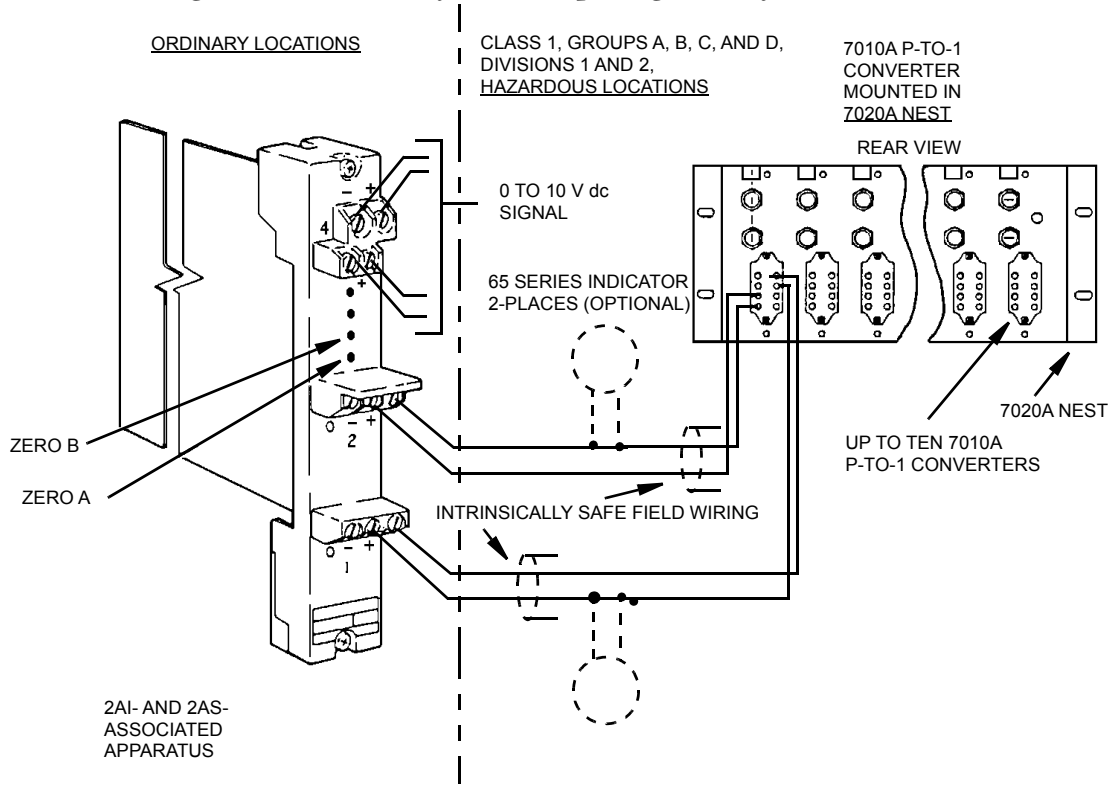


Table 2. SPEC 200 System Connected to Foxboro Intrinsically Safe Apparatus (See Figure 2)

Associated Apparatus SPEC 200 System Model Number	Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
2AI–I2V–CGB 2AI–I3V–CGB 2AS–I2I–CGB (Channel A) 2AS–I3I–CGB (Channel A)	Input Circuit may connect to:	65 Series Indicators (a) 7010A Pneumatic-to-Current Converter

a. 65 Series Indicator (65FS–CBJB, 65PH–JT, 65PV–JG, 65PV–JT, or 65PV-JY) may be connected in a loop with other intrinsically safe apparatus listed in the same segment of the table.

Figure 2. SPEC 200 System - Loop Diagram (Reference Table 2)



UIO and MICROSPEC Subsystems

Table 3 and Table 4 list UIO and MICROSPEC Subsystem input/output cards that are approved by CSA as providing intrinsically safe circuits to the field devices mounted in Class I, Groups A, B, C, and D, Divisions 1 and 2 hazardous locations. The cards must be mounted in a 3ANU–D, K0118AF, G0113DH, or C0159FT nest, and receive power via a 2AX+DP10–CGB power distribution module (green). The nest must be mounted in a nonhazardous area. The I/O cards must be the –CGB version, and operate in one of the approved loops listed in Table 3 and Table 4. Certification is contingent on rack assemblies being wired at specified Foxboro plants.

Table 3. UIO and MICROSPEC Subsystems Connected to Foxboro Intrinsically Safe Apparatus (See Figure 3)

Associated Apparatus UIO and MICROSPEC Subsystems Model Number	Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
3A2–D2I–CGB 3A2–D3I–CGB 3A2–D3IB–CGB 3AD–I3IA–CGB (18 V, 43 mA rating) 3AS–I3I–CGB	Output Circuit may connect to:	65 Series Indicators (a) E69 Series Converters and Positioners
3A2–F2D–CGB 3A2–Q2D–CGB	Input Circuit may connect to:	E83 Series Vortex Flowmeters 83 Series Vortex Flowmeter (b) (c)
3A2–I2D–CGB 3A2–I3D–CGB 3A4–I2DA–CGB (24 V, 62 mA rating) 3AD–I3IA–CGB (24 V, 62 mA rating) 3AS–I2I–CGB 3AS–I3I–CGB	Input Circuit may connect to:	Foxboro/ICT 27 Series Pressure Transmitters 65 Series Indicators (a) 130 Series DMU Transmitters 820 Series Transmitters 834DP Series Transmitters 841, 843, and 847 Series Transmitters 892 Series Converter E83 Series Vortex Flowmeters 83 Series Vortex Flowmeter (b) (c) 870 Series Transmitters (d) I/A Series Pressure Transmitter (e) 870IT Series Electrochemical Transmitters(4)
3A2–M2D–CGB 3A4–M2DA–CGB 3A2–T2D–CGB	Input Circuit may connect to:	Thermocouples
3A2–R2D–CGB	Input Circuit may connect to:	Noninductive Resistances Resistance Temperature Detectors (RTDs)
3C8–C3D–CGB	Input Circuit may connect to:	Nonpowered Contacts or Switches
3C8–D2CS–CGB	May be used to switch any approved intrinsically safe loop	

a. 65 Series Indicator (65FS–CBJB, 65PH–JT, 65PV–JG, 65PV–JT or 65PV-JY) may be connected in a loop with other intrinsically safe apparatus listed in the same segment of the table.

b. To maintain intrinsic safety in 83 Series Vortex Flowmeters, current loop and pulse output field wiring pairs must be run in separate cables or with separate shields connected to intrinsically safe ground.

c. This Model also intrinsically safe for Class II, Groups E, F and G, Division 1; Class III, Division 1.

d. 870 Series Transmitters entity parameters based upon connection to 871 Series sensors. Maximum cable length of CSA certified 871EC or 871FT, 100 ft; 871PH, 500 ft.

e. Communication -I and -D only. See Figure 5 for -T HART communications.

Figure 3. UIO and MICROSPEC Subsystems - Loop Diagram (Reference Table 3)

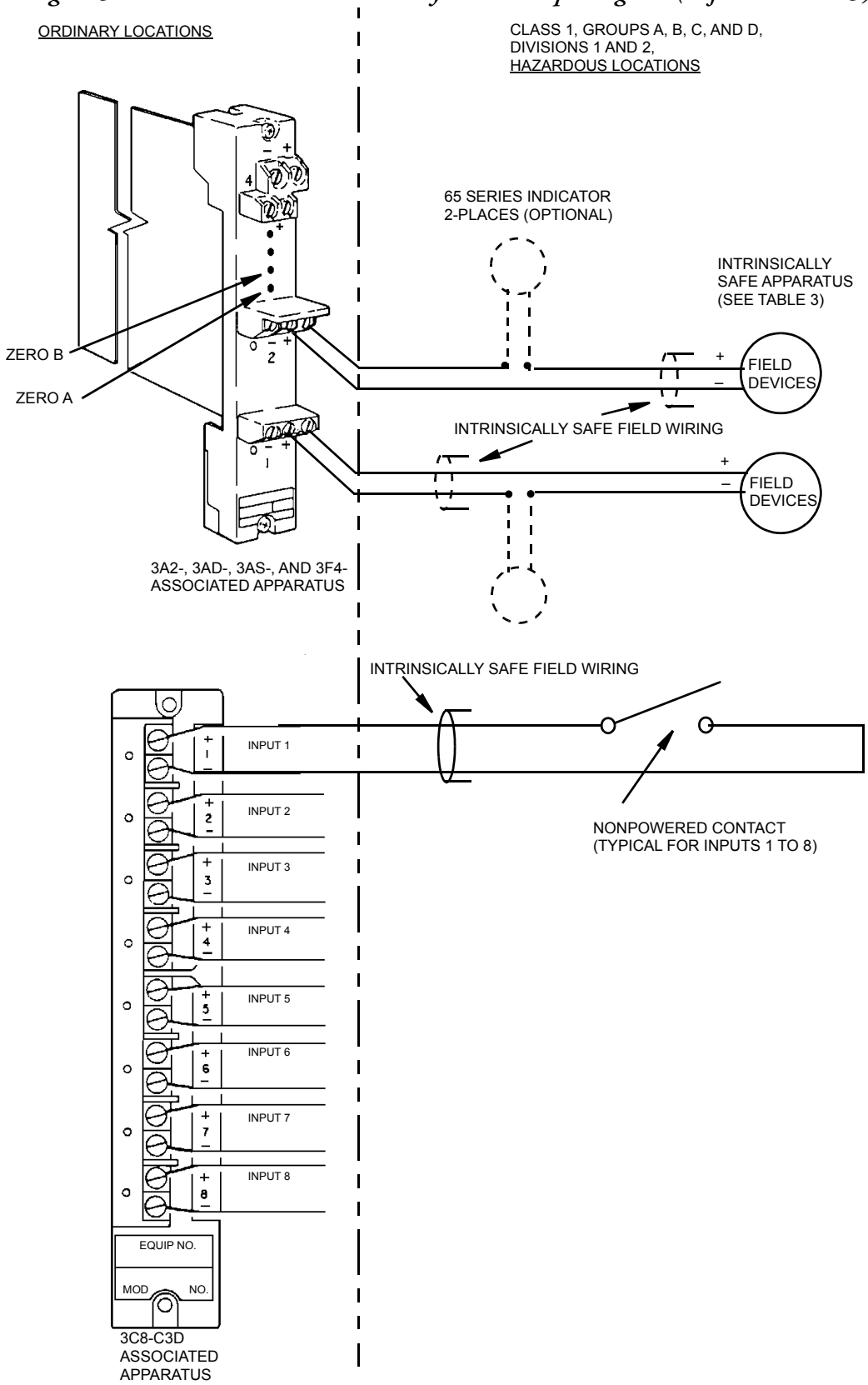


Table 4. UIO and MICROSPEC Subsystems Connected to Foxboro Intrinsically Safe Apparatus (See Figure 4)

Associated Apparatus UIO and MICROSPEC Subsystems Model Number	Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
3A2–I2D–CGB 3A2–I3D–CGB 3A4–I2DA–CGB 3AD–I3IA–CGB 3AS–I3I–CGB	Input Circuit may connect to:	65 Series Indicators (a) 7010A Pneumatic-to-Current Converter
3A2–I2D–CGB 3A2–I3D–CGB	Input Circuit may connect to:	1125 Pressure Transducers 1150 Pressure Transducers

a. 65 Series Indicator (65FS–CBJB, 65PH–JT, 65PV–JG, 65PV–JT or 65PV-JY) may be connected in a loop with other intrinsically safe apparatus listed in the same segment of the table.

Figure 4. UIO and MICROSPEC Subsystems - Loop Diagram (Reference Table 4)

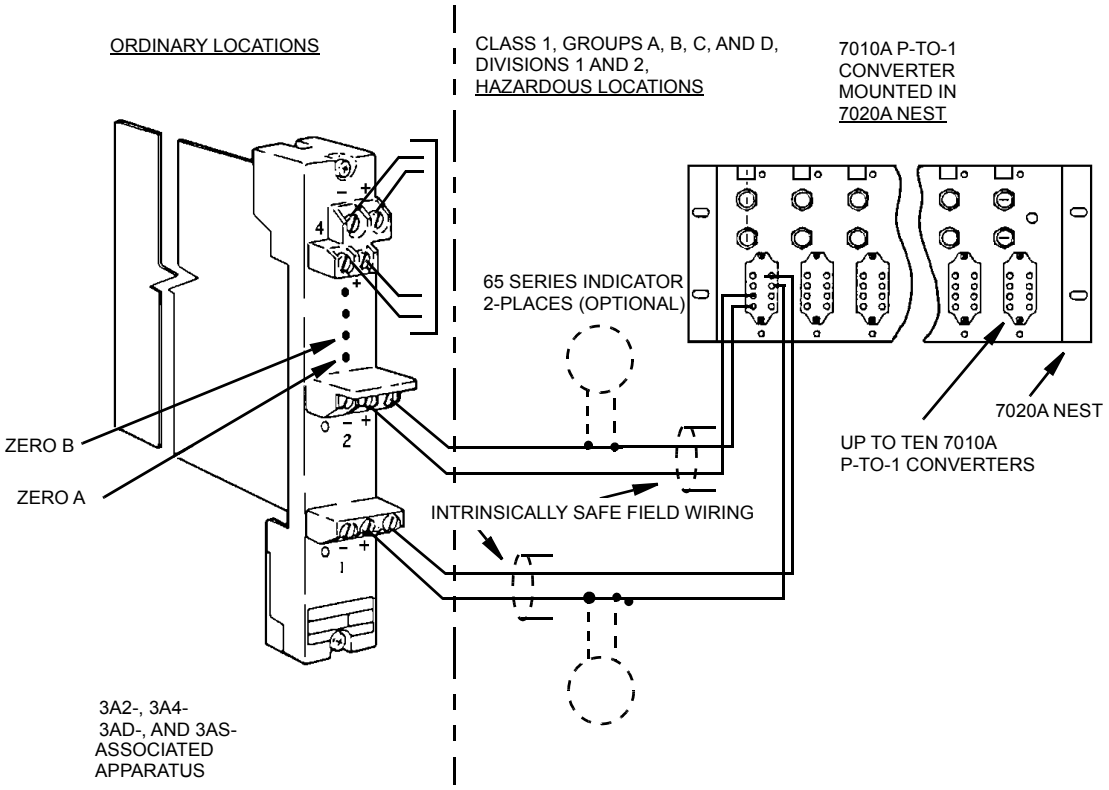
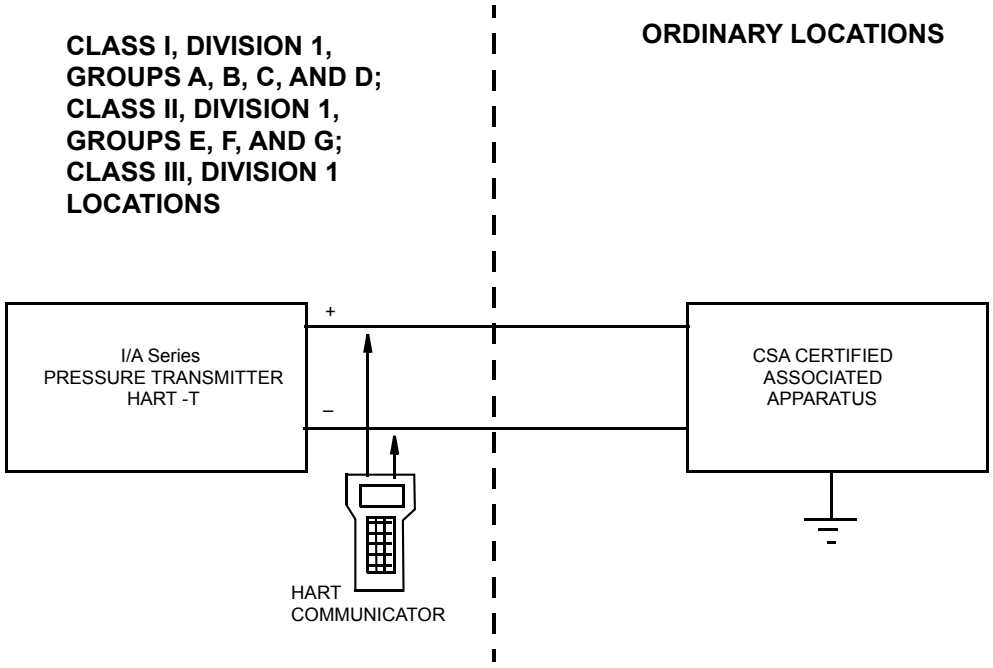


Figure 5. I/A Series System HART Loop Diagram with UIO/UCM



UIO AND MICROSPEC SUBSYSTEMS
ASSOCIATED APPARATUS

MODEL
3A4-12DA-CGB
3A3-12IA-CGB
(TERMINAL GROUP 1)
3AS-12IA-CGB
(TERMINAL GROUP 2)

NOTES:

1. CONTROL ROOM EQUIPMENT SHALL NOT USE OR GENERATE MORE THAN 250 V.

2. OBSERVE ASSOCIATED APPARATUS (BARRIER) AND COMMUNICATION MANUFACTURER'S INSTRUCTIONS WHEN INSTALLING THIS EQUIPMENT.

3. INSTALL IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE (PART I).

UFM Subsystem

The UFM input nest and the UFM cards listed in Table 5 are approved by CSA as providing intrinsically safe circuits to the field devices mounted in Class I, Groups A, B, C, and D, Divisions 1 and 2 hazardous locations. The slave nest (A2054KR) must be mounted in a nonhazardous location and must receive power via the DPX card. If any card in the nest is operating as intrinsically safe, then all cards in the nest must operate as intrinsically safe.

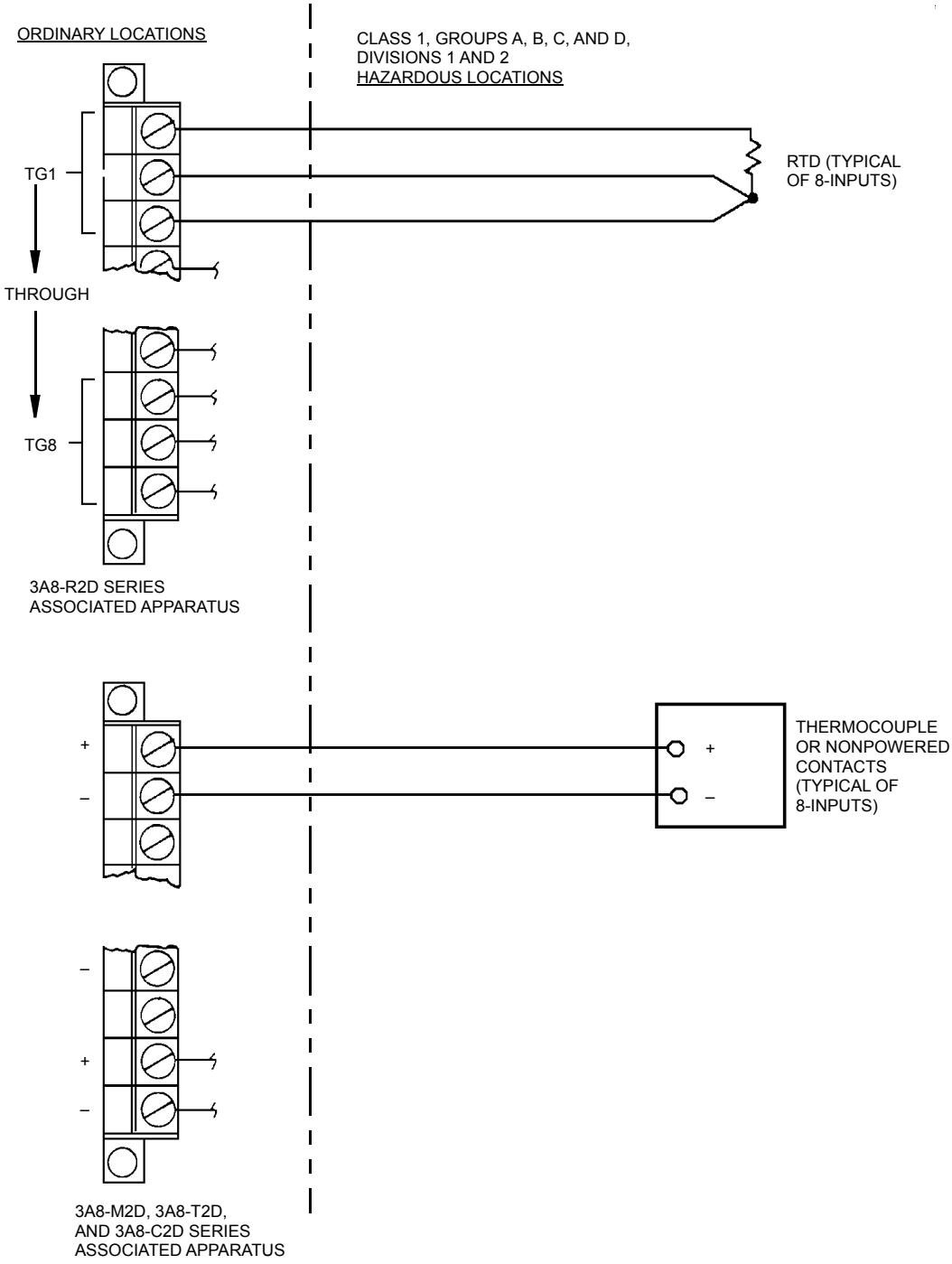
— NOTE

NOTE: The current input card (3A8–I2D1) and voltage input card (3A8–V2D1) are not intrinsically safe and cannot be mounted in a nest containing intrinsically safe cards. This is because both cards must receive their power external from UFM, and there is no means to assure that this power source is intrinsically safe.

Table 5. UFM Subsystem Connected to Foxboro Intrinsically Safe Apparatus (See Figure 6)

Associated Apparatus UFM Subsystem Model Number	Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
3A8–M2D–CGB 3A8–T2D–CGB	Input Circuit may connect to:	Thermocouples
3A8–R2D–CGB	Input Circuit may connect to:	Resistance Temperature Detectors (RTDs)
3D8–C2DL–CGB	Input Circuit may connect to:	Nonpowered Contacts

Figure 6. UFM Subsystem - Loop Diagram (Reference Table 5)



Field Input/Output (FIO) System

Table 6 and Table 7 list FIO system input/output cards that are approved by CSA as providing intrinsically safe circuits to the field devices mounted in Class I, Groups A, B, C, and D, Division 1 and 2 hazardous locations. The cards must be mounted in nest A2048BJ powered by DPXI card A2047VE, or mounted in satellite nest A2047WF powered by voltage monitor A2047WA.

Table 6. Field Input/Output (FIO) System Connected to Foxboro Intrinsically Safe Apparatus (See Figure 7 and Figure 8)

Foxboro Associated Apparatus FIO System		Field Wiring Connection Criteria	Foxboro Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations
Model Number	Rating		
3F4–D2IA	24 V, 62 mA	Output Circuit may connect to:	65 Series Indicators (a) E69 Series Converters and Positioners
3F4–F2DA 3F4–Q2DA	24 V, 69 mA 24 V, 69 mA	Input Circuit may connect to:	E83 Series Vortex Flowmeters 83 Series Vortex Flowmeter (b) (c)
3F4–I2D1A	24 V, 62 mA	Input Circuit may connect to:	Foxboro/ICT 27 Series Pressure Transmitters 65 Series Indicators (one or two) (a) 130 Series DMU transmitters 820 Series Transmitters 834DP Series Transmitters 841, 843, and 847 Series Transmitters 892 Series Converter E83 Series Vortex Flowmeters 83 Series Vortex Flowmeters (b) (c) 870 Series Transmitters (d) I/A Series Pressure Transmitters (e) 870IT Series Electrochemical Transmitters (d)
3F8–C2DCA		Input Circuit may connect to:	Nonpowered Contacts
3F8–T2DA1 3F8–T2DA2 3F8–T2DA3 3F8–T2DA4 3F8–T2DA5 3F8–T2DA6 3F8–T2DA7		Input Circuit may connect to:	Thermocouples
3F8–R2DCA 3F8–R2DNA 3F8–R2DPA1 3F8–R2DPA2 3F8–R2DPA3		Input Circuit may connect to:	Resistance Temperature Detectors (RTDs)

a. 65 Series Indicator (65FS–CBJB, 65PH–JT, 65PV–JG, 65PV–JT or 65PV-JY) may be connected in loop with other intrinsically safe apparatus listed in the same segment of the table.

b. To maintain intrinsic safety in 83 Series Vortex Flowmeters, current loop and pulse output field wiring pairs must be run in separate cables or with separate shields connected to intrinsically safe ground.

c. This Model also intrinsically safe for Class II, Groups E, F and G, Division 1; Class III, Division 1.

d. 870 Series Transmitters entity parameters based upon connection to 871 Series sensors. Maximum cable length of CSA certified 871EC or 871FT, 100 ft; 871PH, 500 ft.

e. Communications -I and -D only.

Figure 7. FIO System - Loop Diagram; RTD, Thermocouple, or Nonpowered Contact Inputs (Reference Table 6)

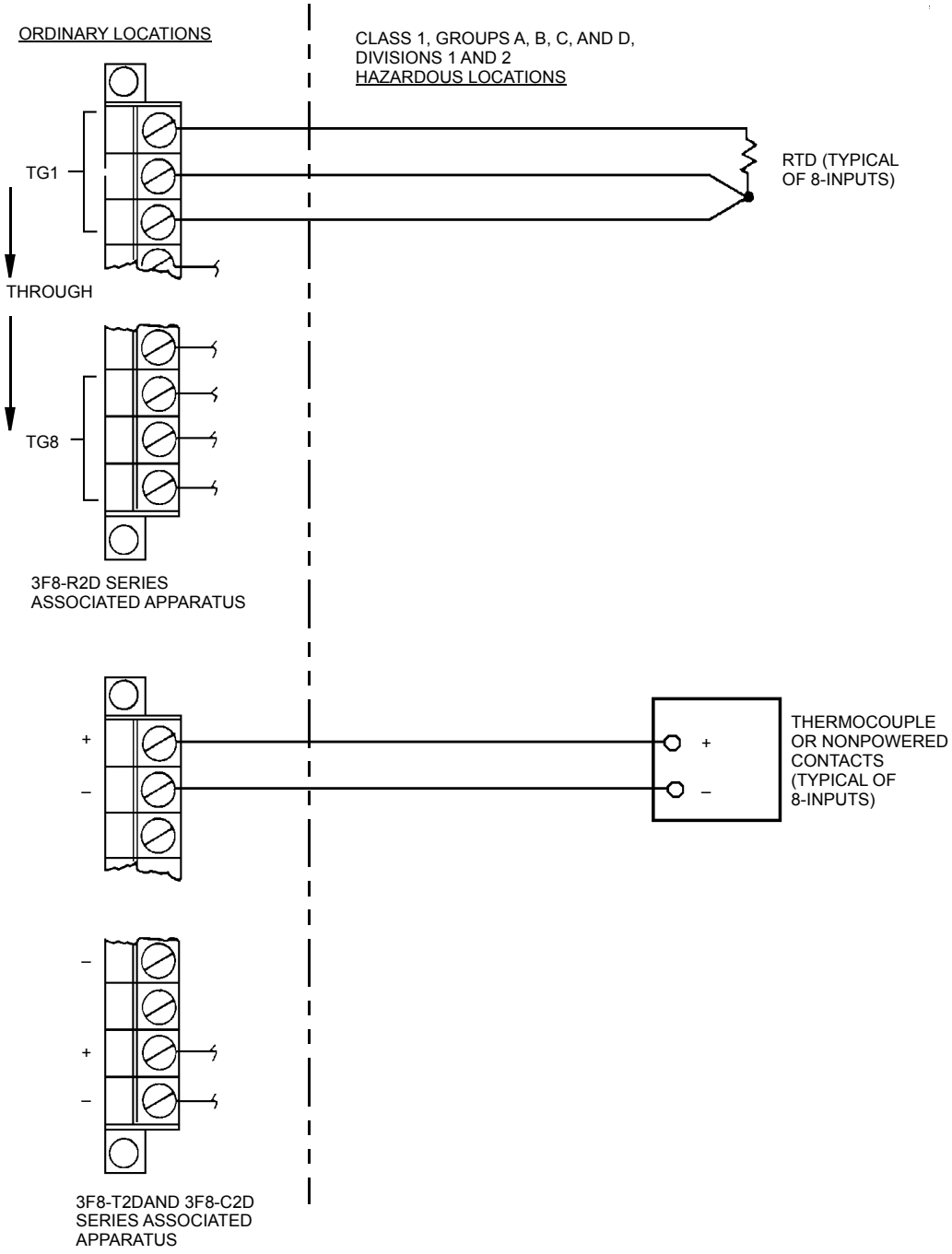


Figure 8. FIO System - Loop Diagram; Intrinsically Safe Apparatus Inputs (Reference Table 6)

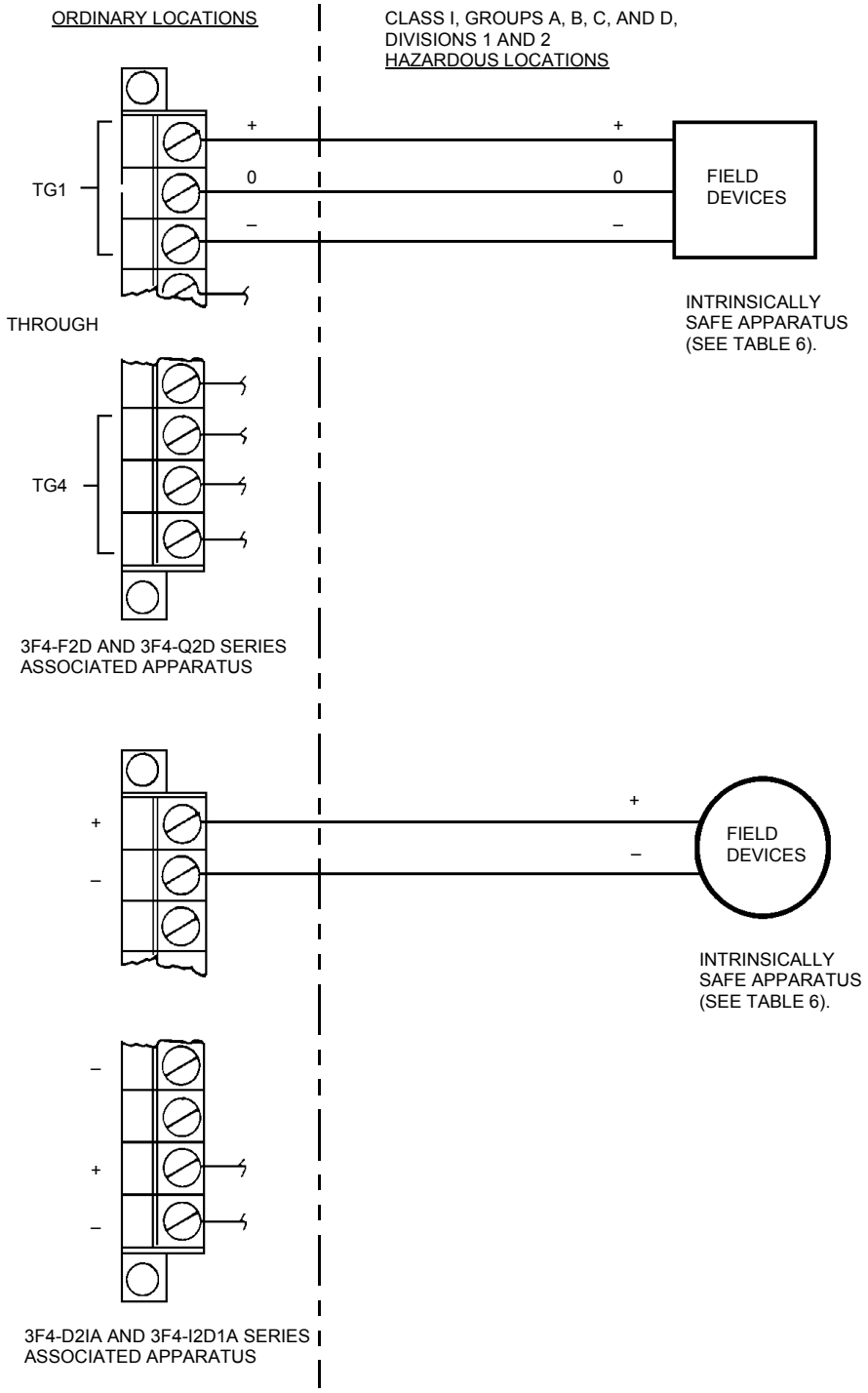


Table 7. Foxboro Associated Apparatus Connected to Other Manufacturer's Intrinsically Safe Apparatus (See Figure 9)

Foxboro Associated Apparatus FIO System		Field Wiring Connection Criteria	Other Manufacturers' Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Divisions 1 and 2 Hazardous (Classified) Locations	
Model Number	Rating		Manufacturer	Description
3F8–D2ZA 3F8–D2WA	22 V, 56 mA 24 V, 67.4 mA	Output Circuit may connect to:	Telektron Type P; RGS Electro-Pneumatics Type EP100–A.	Solenoid Operator. Solenoid must be CSA approved as intrinsically safe.
			ASCO	Solenoid Driver

Figure 9. Typical Loop Diagram for Foxboro 3F8–D2ZA Connected to Telektron Intrinsically Safe Apparatus (Reference Table 7)

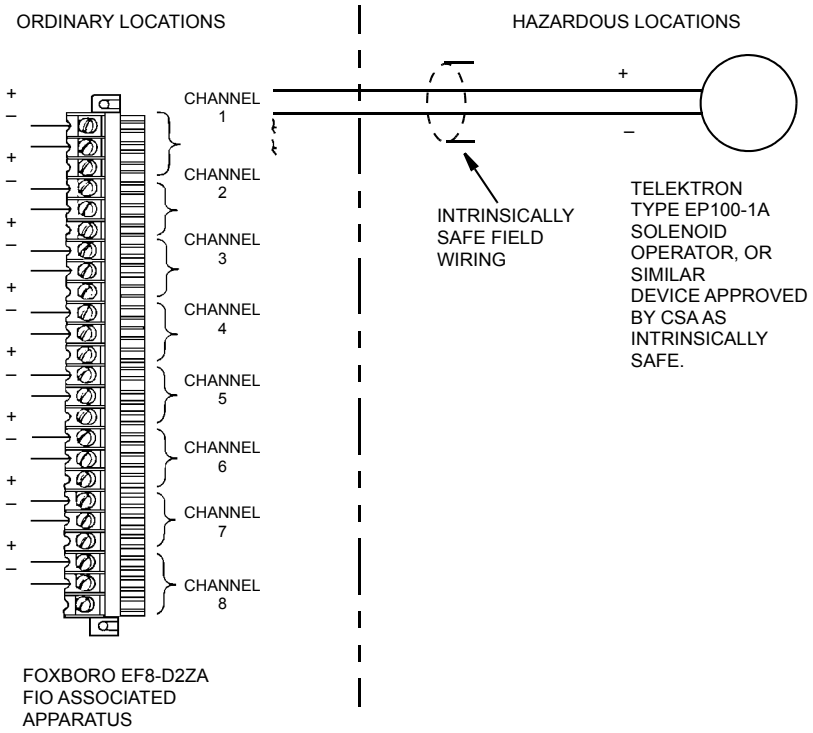
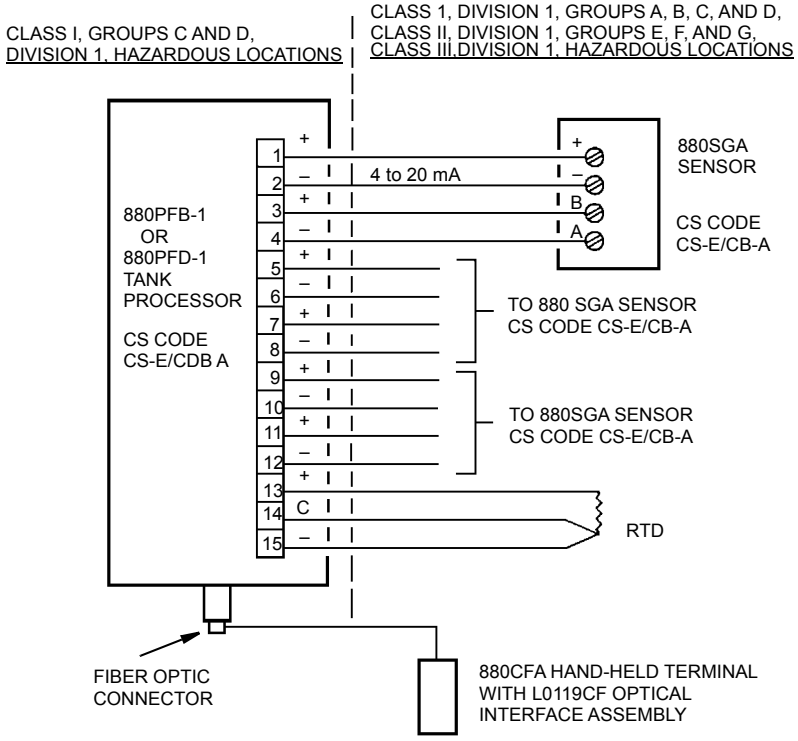


Table 8. TankExpert Hydrostatic Gauging and Inventory Management System (See Figure 10 and Figure 11)

Associated Apparatus TankExpert System		Field Wiring Connection Criteria	Intrinsically Safe Apparatus Located in Class I, Groups A, B, C, and D, Division 1 Hazardous (Classified) Locations
Model Number	CS Code		
880PFB–1 880PFD–1	CS–E/CDB–A CS–E/CDB–A	Input Circuits may connect to:	880SGA Sensor Resistance Temperature Detector (RTD)
880PFB–2(a) 880PFB–3(a) 880PFD–2(a) 880PFD–3(a)	CS–E/CNB–A CS–E/CNB–A CS–E/CNB–A CS–E/CNB–A	Input Circuits may connect to:	880SGA Sensor Resistance Temperature Detector (RTD)

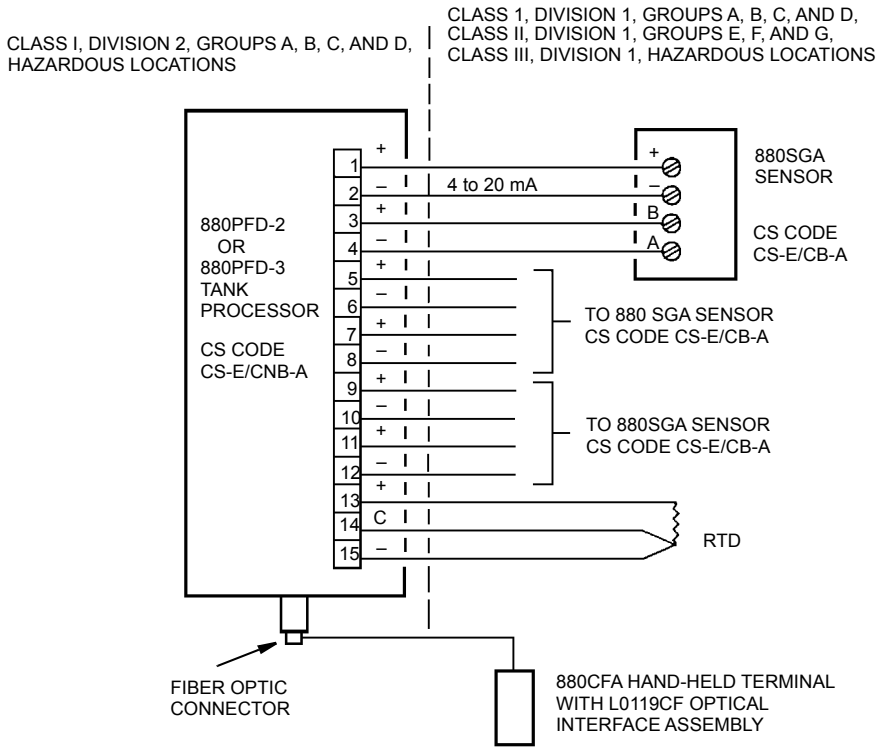
Figure 10. TankExpert Hydrostatic Gauging and Inventory Management System (Division 1) – Loop Diagram (Reference Table 8)



NOTE

CAUTION: Refer to MI 020-057 and MI 020-070 for proper installation instructions for the 880PFB and 880PFD systems, respectively.

Figure 11. TankExpert Hydrostatic Gauging and Inventory Management System (Division 2) –Loop Diagram (Reference Table 8)



CSA Certified Zener Barriers

The instruments listed in Table 9 are approved for the hazardous (classified) locations listed when connected to CSA certified zener barriers having the ratings also listed in Table 9. Note the temperature class associated with each rating.

Table 9. Foxboro Intrinsically Safe Apparatus Connected to CSA Certified Zener Barriers (Other Manufacturer's Associated Apparatus)

CSA Certified Zener Barriers Rated at:			Field Wiring Connection Criteria	Foxboro Intrinsically Safe Apparatus	
V_{max}	R_{min}	Temp. Class		Foxboro Model Number	Hazardous (Classified) Locations
33 V 30 V 28 V 20 V	415 Ω 300 Ω 240 Ω 70 Ω	T4A T4A T4A T4A	Intrinsically Safe Field Wiring Terminals may connect to:	Foxboro/ICT 27 Series Pressure Transmitters 821 Series Transmitters (a) (b) (c) (d) 823DP Series Transmitters (b) (c) (d) 823EP Series Transmitters (a) (c) (d) 823MP Series Transmitters (a) (c) (d) 827DF Series Transmitters (a) (c) (d) 892 Series Converters 1125 Pressure Transducers 1150 Pressure Transducers E69F Series Converters (b) E69P Series Converters E83 Series Vortex Flowmeters (e) 65 Series Indicators (f) 83.-A Series Transmitters (e)	Class I, Groups A, B, C, and D, Division 1 locations.
33 V 30 V 28 V 26.7 V 20 V	415 Ω 300 Ω 240 Ω 200 Ω 70 Ω	T4A T4A T4A T4A T4A	Intrinsically Safe Field Wiring Terminals may connect to:	841AM and 841AX Series Transmitters 841GM and 841GX Series Transmitters 843DP DX EP EX MP MX Series Transmitters 847DF DX EF EX Series Transmitters 892 Series Converters 65 Series Indicators (f) 870 Series Transmitters (g)	Class I, Groups A, B, C, and D, Division 1 locations.
28 V 28 V Diode 28 V 10 V	300 Ω 300 Ω — 300 Ω 50 Ω	T3C T3C Return T3C Return	Intrinsically Safe Field Wiring Terminals may connect to:	130 Series DMU Transmitters 820–D Series Transmitters (h)((i) RTT10 Series Transmitters (h) (i) B0190AM Transmitters (h) (i) (j) 860 Series Transmitters (d) (i) 870IT Series Electrochemical Transmitters (g)	Class I, Groups A, B, C, and D, Division 1 locations.
28 V 28 V Diode	300 Ω 300 Ω —	T3C T3C Return	Intrinsically Safe Field Wiring Terminals may connect to:	83 Series Transmitters (e) (k) (l) I/A Series Pressure Transmitters (m) RTT20 Series Transmitters (h) (i) (l) (n)	Class I, Groups A, B, C, and D, Division 1 locations.
28 V Diode	300 Ω —	T3C Return	Intrinsically Safe Field Wiring Terminals may connect to:	893 Series Transmitters	Class I, Groups A, B, C, and D, Division 1 locations.
20 V	70 Ω	T3C	Intrinsically Safe Field Wiring Terminals May Connect to:	834DP Series Transmitters E69R Series Converters	Class I, Group A, B, C, and D, Division 1 locations.
33 V 28 V 20 V	415 Ω 240 Ω 70 Ω	T3C T3C T3C	Intrinsically Safe Field Wiring Terminals may connect to:	RTT10 Series Transmitters (d) B0190AM Transmitters (d) (j)	Class I, Groups A, B, C, and D, Division 1 locations.

Table 9. Foxboro Intrinsically Safe Apparatus Connected to CSA Certified Zener Barriers (Other Manufacturer's Associated Apparatus) (Continued)

CSA Certified Zener Barriers Rated at:			Field Wiring Connection Criteria	Foxboro Intrinsically Safe Apparatus	
V_{max}	R_{min}	Temp. Class		Foxboro Model Number	Hazardous (Classified) Locations
33 V 30 V 28 V 20 V	185 Ω 130 Ω 115 Ω 68 Ω	T4A T4A T4A T4A	Intrinsically Safe Field Wiring Terminals may connect to:	Foxboro/ICT 27 Series Pressure Transmitters 821 Series Transmitters (a) (b) (c) (d) 823DP Series Transmitters (b) (c) (d) 823EP Series Transmitters (a) (c) (d) 823MP Series Transmitters (a) (c) (d) 827DF Series Transmitters (a) (c) (d) 841AM and 841AX Series Transmitters 841GM and 841GX Series Transmitters 843DP DX EP EX MP MX Series Transmitters 847DF DX EF EX Series Transmitters 892 Series Converters E69F Series Converters (b) E69P Series Converters 65 Series Indicators (f) 870 Series Transmitters (g) 83.-A Series Transmitters (e)	Class I, Groups C and D, Division 1 locations.
33 V 30 V 28 V 20 V	185 Ω 130 Ω 115 Ω 68 Ω	T3C T3C T3C T3C	Intrinsically Safe Field Wiring Terminals may connect to:	RTT10 Series Transmitters (d) B0190AM Transmitters (d) (j)	Class I, Groups C and D, Division 1 locations.
30 V 28 V 20 V	130 Ω 115 Ω 68 Ω	T3C T3C T3C	Intrinsically Safe Field Wiring Terminals may connect to:	834DP Series Transmitters E69R Series Converters E83 Series Vortex Flowmeters (e)	Class I, Groups C and D, Division 1 locations.
33 V	185 Ω	T3A	Intrinsically Safe Field Wiring Terminals may connect to:	E83 Series Vortex Flowmeters (e)	Class I, Groups C and D, Division 1 locations.

a. With or without optional analog output indicator.

b. 4 to 20 mA dc output signal only.

c. Intelligent Transmitters with or without Model HHT Hand-Held Terminal (Configurator); (821AL–D, 821AM–D, 821GM–D, 821GH–D, 823DP–D, 823MP–D, 823EP–D, and 827DF–D).

d. See Figure 12 for loop diagram showing 860, 8□□□ -D, RTT10 or RTT20 Transmitter, Model HHT and CSA-Certified Zener Barriers.

e. See Figure 14 for the Integral and Remote Sensor Versions.

f. 65 Series Indicator (65FS-CBJB, Temp. Code T4; 65PH-JT, 65PV-JG, 65PV-JT, or 65PV-JY, Temp. Code T6) may be connected in a loop with other intrinsically safe apparatus listed in the same segment of the table.

g. 870 Series Transmitters entity parameters based upon connection to 871 Series sensors. Maximum cable length of CSA certified 871EC or 871FT, 100 ft; 871PH, 500 ft.

h. With and without RDM10 Remote Digital Meters, with and without optional J0173KE Meter in 82□□□ –D and a Model HHT Hand-Held Terminal. A maximum of two meters shall be used in a loop.

i. See Figure for loop diagram showing 860, 82□□□ –D, RTT10 or RTT20 Transmitter, RDM10 Meter, Model HHT Hand-Held Terminal, and CSA-Certified Zener Barrier.

j. B0190AM Transmitter to be installed in suitable enclosure as acceptable to CSA.

k. To maintain intrinsic safety in 83 Series Vortex Flowmeters, current loop and pulse output field wiring pairs must be run in separate cables or with separate shields connected to intrinsically safe ground.

l. This Model also intrinsically safe for Class II, Groups E, F and G, Division 1; Class III, Division 1.

m. HART Communicator, Rosemount 275, can be connected to loop in hazardous or ordinary location are for HART -T communications.

n. RTT20 suitable for T6 @ 40°C, T4 @ 85°C ambient.

Figure 12. Loop Diagram Showing 860, 82 □□□–D, RTT10 or RTT20 Transmitter, Model HHT, and CSA-Certified Zener Barriers

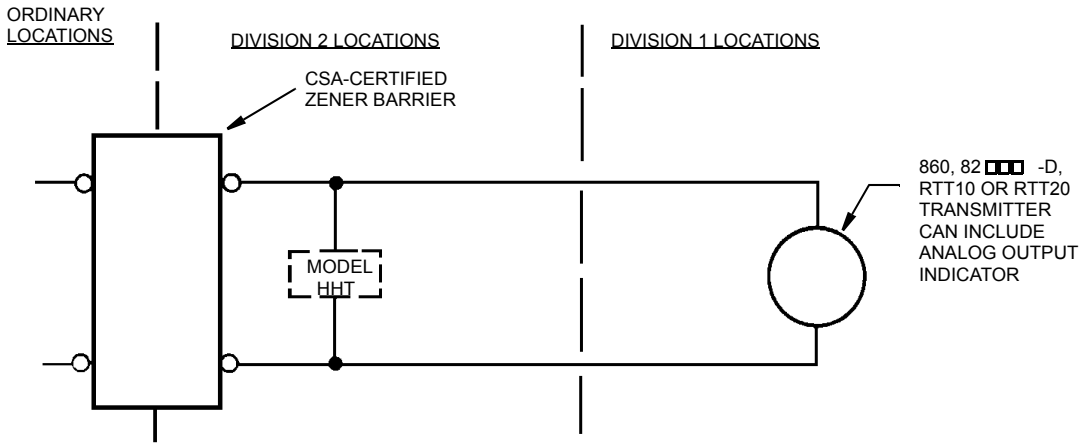


Figure 13. Loop Diagram Showing 860, 82□□□–D, RTT10 or RTT20 Transmitter, Model HHT, RDM10 Remote Digital Meters, and CSA-Certified Zener Barrier

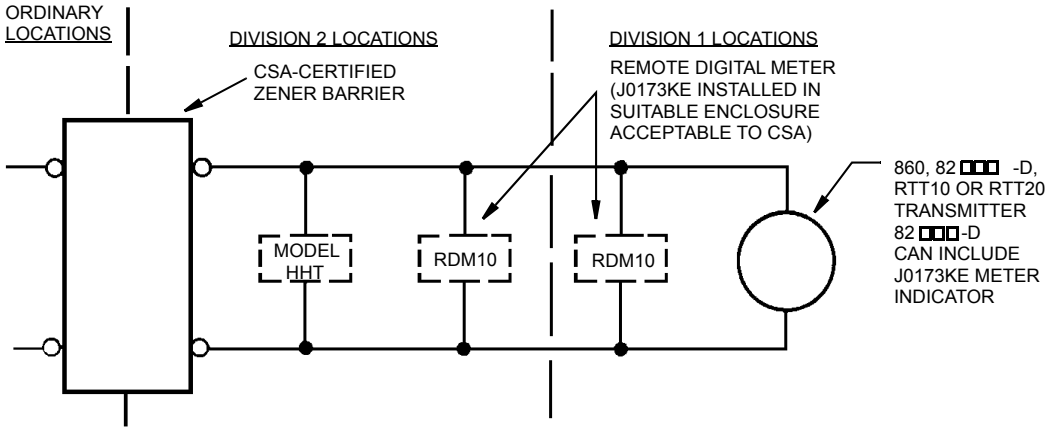
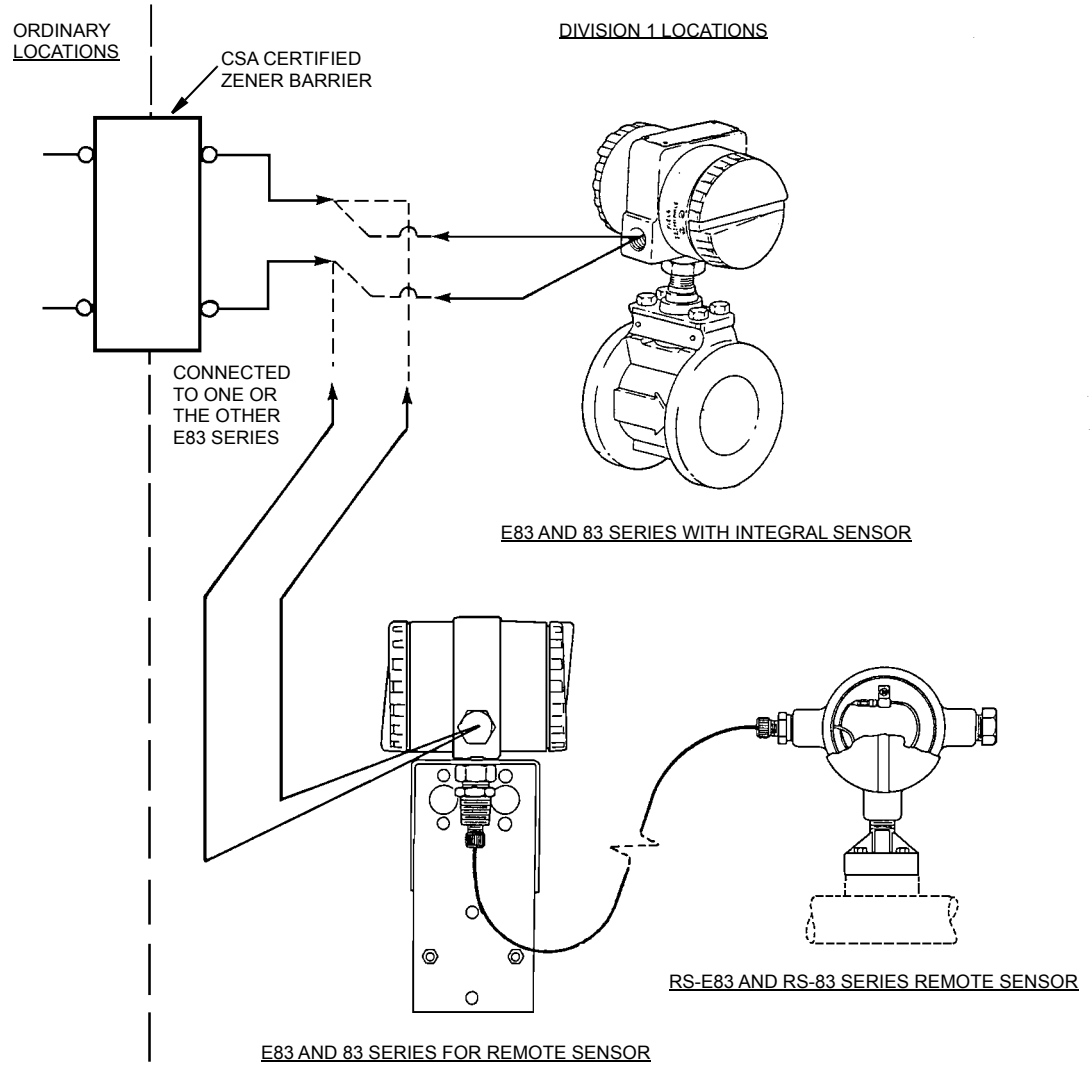


Figure 14. E83 and 83 Series Vortex Flowmeter - Loop Diagram (Reference Table 9)



Nonincendive Circuit Field Wiring Considerations

Table 10. Apparatus Connected with Nonincendive Field Wiring

Ordinary Locations and Class I, Division 2, Groups A,B,C,D Hazardous Locations	Ordinary Locations and Class I, Division 2, Groups A,B,C,D Hazardous Locations
E83SA Flow Transmitter (a) 83S Flow Transmitter (a)	RS-E83SA Sensor (a) RS-83S Sensor (a)
873 Series Electrochemical Analyzer (a) 870 Series Transmitters (a) 870IT Series Electrochemical Transmitters (a)	871 Series Sensor (a)
Ordinary Locations and Class I, Division 2 Groups A,B,C,D Hazardous Locations	Ordinary Locations and Class I, Division 2, Groups C,D Hazardous Locations
FBM04 (a) FBM18 (a)	IMT20 (a) (b)
Ordinary Locations	Class I, Division 2, Groups C,D Hazardous Locations

Table 10. Apparatus Connected with Nonincendive Field Wiring (Continued)

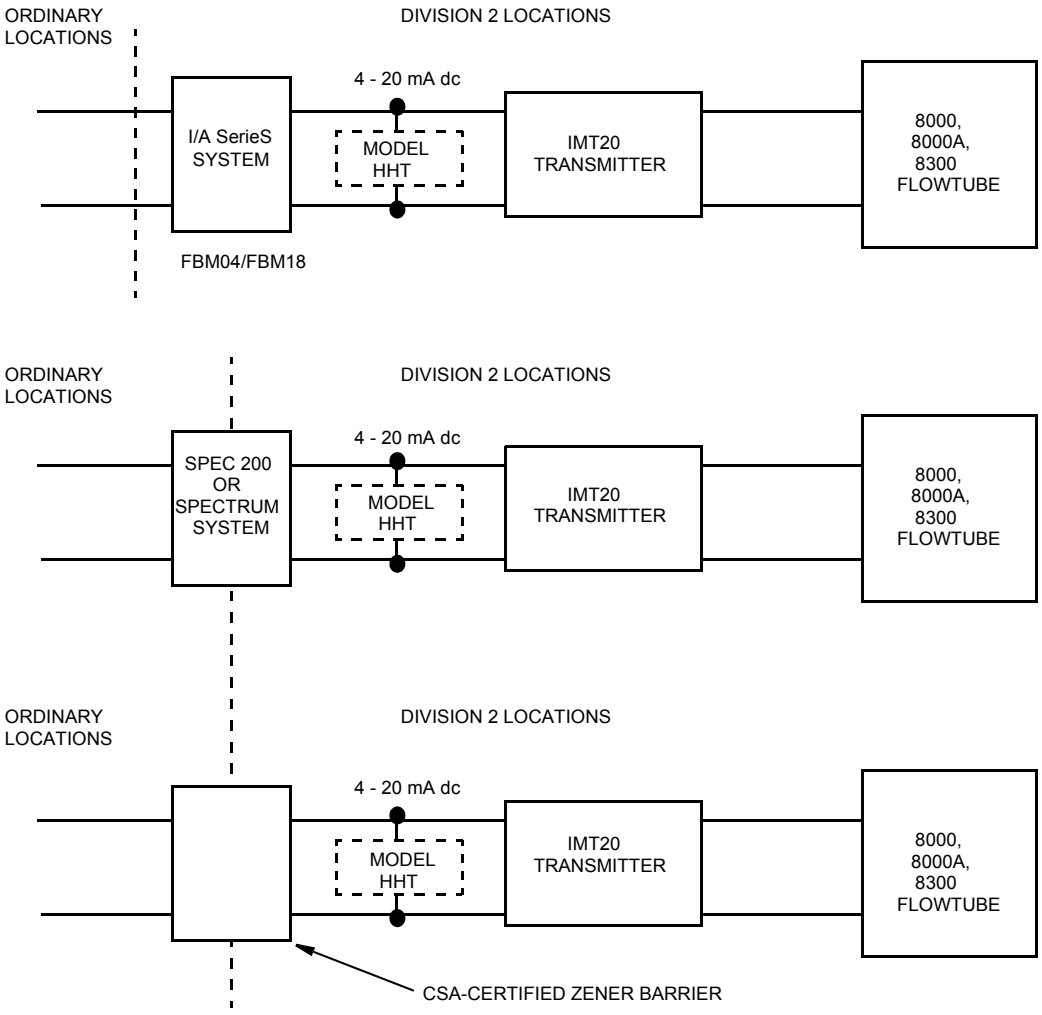
Ordinary Locations and Class I, Division 2, Groups A,B,C,D Hazardous Locations	Ordinary Locations and Class I, Division 2, Groups A,B,C,D Hazardous Locations
2AI–I2V–CGB 2AI–I3V–CGB 2AS–I2I–CGB 2AS–I3I–CGB 3A2–I2D–CGB 3A2–I3D–CGB 3A4–I2DA–CGB 3AS–I2I–CGB 3AS–I3I–CGB 3AD–I3IA–CGB 3F4–I2D1A	IMT20 (a) (b)
CSA Certified Barriers	
28 Volt 300 ohm 28 Volt 300 ohm Diode Return 28 Volt 300 ohm 10 Volt 50 ohm Return	IMT20 (a) (b)

a. **WARNING** -- Explosion Hazard-- Substitution of components may impair suitability for Class I, Division 2. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

ADVERTISSEMENT -- Risque D'explosion -- La substitution de composants peut rendre ce materiel inacceptable pour les emplacements de Classe I, Division 2. Avant de deconnecter l'equipement couper le courant ou s'assurer que l'emplacement est designe non dangereux.

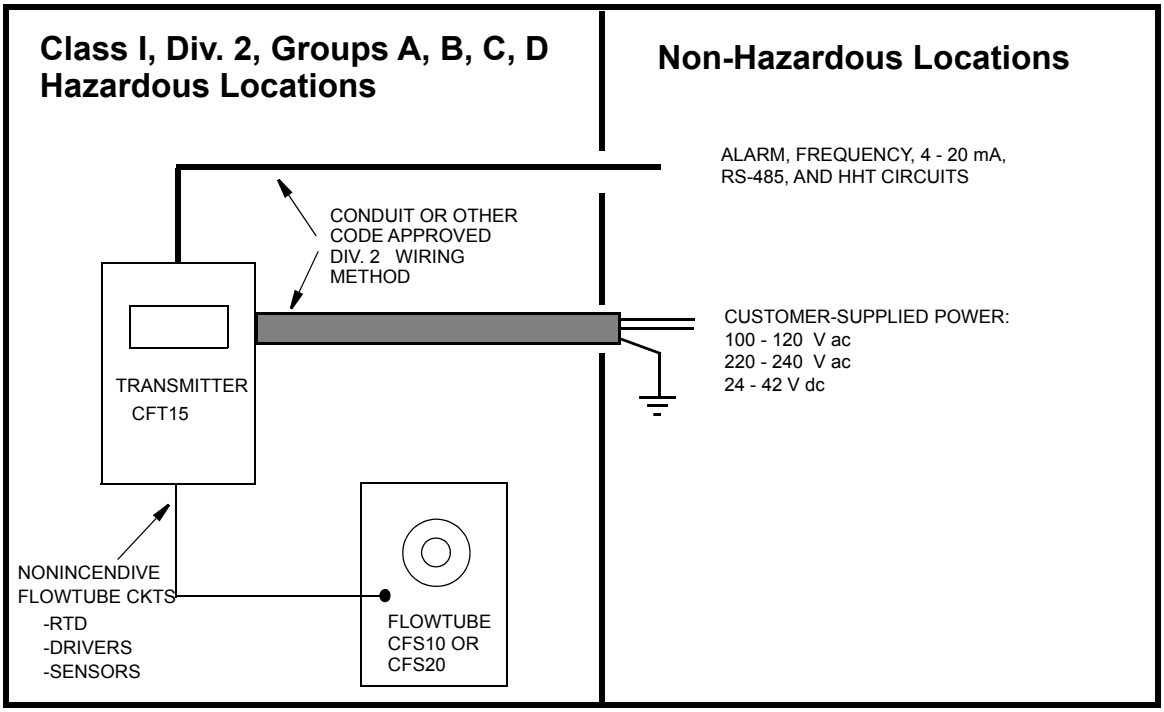
b. Model HHT can be hooked across loop in ordinary or Class I, Division 2 areas (see Figure 15).

Figure 15. IMT20 Series Transmitter - Loop Diagram (Reference Table 10)



I/A Series System Mass Flowmeter Wiring for Division 2 Locations

Figure 16. CNN Loop Diagram



I/A Series System FBMs with CSA Certified I/O Circuits

The Canadian Electrical Code allows nonincendive circuits for use in Class I, Division 2, hazardous locations. CSA does not allow the use of the "entity parameter" concept for field apparatus except for non-energy generating or storing devices such as RTDs, thermocouples, switches and the associated interconnecting wiring. Following are the FBMs that currently have CSA certified I/O circuits:

Table 11. FBMs with CSA Certified I/O Circuits

FBM Type	Voc	Isc	Ca	La
Fieldbus Isolator	5.0 V dc	0.5 A	1000 µF	0.2 mH
FBM02	1.0 V dc	1.0 mA	1000 µF	1000 mH
FBM03	6.0 V dc	1.0 mA	1000 µF	1000 mH
FBM33	6.0 V dc	1.0 mA	1000 µF	1000 mH

NOTE

For the Fieldbus Isolator module, the values of Ca and La are satisfied when Foxboro-specified twinaxial cable (P/N P0170GG or P0170GF) is used to interconnect two Fieldbus Isolator modules. This cable has sufficient inherent series resistance to offset its internal inductance and capacitance at any length.

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