



IMPORTANT

SALES MANUAL LETTER

Read carefully and file

NO. AL-7-1A **Section 7**

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BY: John Holly

SUPERCEDES: June 1, 2005

AGENCY APPROVALS



U.S.A. & Canada

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General Classification		Model Number	Approvals		Ratings			Remarks
			Agency	File No.	Mounting Location	Enclosure	Int. safe sensor or probe/PFM circuit	
Intrinsically Safe system When used with approved probe. See Note 1.	Intrinsically Safe	167-A (1,2)	CSA	LR18690	E	E	E	See Notes 2,14
		900GA336-(01,02,05,06)	UL, c-UL	E164999	A & S	K & M	A & S	See Notes 13,15
		900GA336-(03,04,07,08)	UL, c-UL	E164999	A & S	K & N	A & S	See Notes 13,15
	Associated equipment. See Note 12.	158A-(A,B)(1,2)-(C,D) 1	CSA	LR18690	E	E	B	See Notes 3,14
		158A-(A,B)(1,2)-(A,B) 1	CSA	LR18690	See Note 10	L	B	See Notes 4,9,14
		310-C(2,4)-(A,B)(1-5)	CSA	LR18690	E	E	E	See Notes 8,9,14
		310-(A,B)(2,4)-(A,B)(1-5)	CSA	LR18690	See Note 10	L	E	See Notes 8,9,14
		304B-B(1,2,3)-B5	CSA	LR18690	E	E & L	E	See Notes 8,9,14
		318A-B1	CSA	LR18690	E	E & L	E	See Notes 8,14
		5400A-(A)(1,2)-(A-H)(0-4)	UL	E164999	See Note 10	M	A & S	See Note 16
		5400A-(A)(1,2)-(A-H)(0-4)	c-UL	E164999	See Note 10	M	D & U	See Note 16
		5400A-(B,C)(1,2)-(A-H)(0-4)	UL	E164999	See Note 10	N	A & S	See Note 16
		5400A-(B,C)(1,2)-(A-H)(0-4)	c-UL	E164999	See Note 10	N	D & U	See Note 16
5400A-(D)(1,2)-(A-H)(0-4)	UL	E164999	T & G	T & G	A & S	See Note 16		
5400A-(D)(1,2)-(A-H)(0-4)	c-UL	E164999	J & H	J & H	D & U	See Note 16		
General Location		366-(A,D)(0,1,2,4,7,8)	CSA	LR35674	See Note 10	K & AB		
Explosion-Proof		365-(A,D)(0,1,2,4,7,8)	CSA	LR18728	J	J		
		365-(A,D)(2,4,8)	FM	1N1A6.AE 0R1H7.AE	E	E		
		365A-(A,D,G)(0,2,4,7,8)-(E,H) (E & H suffixes may be omitted)	UL, c-UL	E164999	V	V		
		E365A-(A,D,G)(0,2,4,7,8)-(E,H) (E & H suffixes may be omitted)	UL, c-UL, DEMKO	E164999 05 ATEX 0436069	AD	AD		
		EURO366-(ALL VERSIONS)	INERIS	02 ATEX 0043	AA	AA		
		375A-A(1,2,3)-(A,C,D,E,F) (0,2,3,4)	FM	0Q7A3.AE 0R1H7.AE	D	D		
		443A-(A,B,C,E,F) (1,2,3)-(A or None)	FM	0G1A7.AE	E	E & P		
		445A-(A,B,C,E,F) (1,2,3)-(A or None)	FM	0G1A7.AE	E	E & P		
		566-(A,B)(1,2)	CSA	LR18690	E	E & K		(See 904GC337)
		904GC337 (566 Remote Transducer)	CSA	LR18690	E	E & K		
		I-542-(H,J,K,L,M,N,P,Q)	UL	E30075	Q	Q		
		566-(A,B)(1,2)	FM	2Q3A4.AX	D	D		(See 904GC337)
		904GC337 (566 Remote Transducer)	FM	2Q3A4.AX	R	R & M		
Intrinsically Safe		443A-B(1,2,3)-(A or None)	CSA	LR18728	C			See Note 6
		445A-B(1,2,3)-(A or None)	CSA	LR18728	C			See Note 6
		443A-B(1,2,3)-(A or None)	CSA	LR18728	F			See Note 7
		445A-B(1,2,3)-(A or None)	CSA	LR18728	F			See Note 7
		443A-B(1,2,3)-(A or None)	FM	0H4A4.AX	A	E & P		See Note 6
		445A-B(1,2,3)-(A or None)	FM	0H4A4.AX	A	E & P		See Note 6
		443A-B(1,2,3)-(A or None)	FM	0H4A4.AX	D	E & P		See Note 7
		445A-B(1,2,3)-(A or None)	FM	0H4A4.AX	D	E & P		See Note 7
		571A-(A,B,C,D,E,F)	CSA	093264	W	X		See Note 17
		571A-(A,B,C,D,E,F)	CSA (USA)	093264	W	X		See Note 17
571A-(A,B,C,D,E,F)	LCIE	03 ATEX 6113 X	Z	Y		See Note 17		
For Use in Explosive Atmospheres		RT1010(A1,A2,A3,A1001, A2001,A2002,A3001)	ETL SEMKO	ITS 03ATEX41501X	AC			
Model Number	Declaration Of Conformity						Applicable Mark	
900GA336-(01-08)	EMC Emissions: FCC 47 CFR Part 15 Class B emissions requirements (USA). EN 55011:1991 Group 1 Class B ISM emissions requirements (EU). EMC Immunity: EN 50082-2:1995 EMC heavy industrial generic immunity standard						CE & FCC	
900GA337-(01-04)	EMC Emissions: EN 55011:1989 Group 1 Class B ISM emissions requirements (EMC). EMC Immunity: EN 50082-2:1995 EMC heavy industrial generic immunity standard						CE	

RATINGS

A	Class I, Div. 1, Groups A, B, C & D; Class II, Div. 1, Groups E, F, & G; Class III, Div. 1	R	Class I, Div. 1, Groups B, C & D; Class II, Div. 1, Groups E, F & G; Class III, Div. 1
B	Class I, Div. 1, Groups A, B, C & D; Class II, Div. 1, Groups E, F, & G	S	Class I, Zone 0, Group IIC
C	Class I, Div. 1, Groups A, B, C & D	T	Class I, Div. 1, Group D; Class II, Div. 1, Groups E, F & G Class III
D	Class I, Div. 1, Groups C & D; Class II, Div. 1, Groups E, F & G; Class III, Div. 1	U	Class I, Zone 0, Group IIB
E	Class I, Div. 1, Groups C & D; Class II, Div. 1, Groups E, F & G	V	Class I, Div. 1, Groups B, C & D; Class II, Div. 1, Groups E, F & G; Enclosure 4 or 4X; Class I, Zone 1, AEx d IIB+H T6; Ex d IIB+H IP66
F	Class I, Div. 1, Groups C & D	W	Class I, Div. 1, Groups A, B, C & D; T3C
G	Class I, Zone 1, Group IIA	X	IP68, NEMA 4X
H	Class I, Zone 1, Group IIB	Y	IP68
J	Class I, Div. 1, Groups C & D; Class II, Div. 1, Groups E, F & G; Class III	Z	CE 0081  II 1 G EEx ia IIC T3
K	CSA Enclosure 4 (Watertight) Equivalent to NEMA Type 4	AA	CE 0080  II 2 GD EEx d IIC T6 IP65 T85° C
L	CSA Enclosure 5 (Dust-tight) Similar to NEMA Type 12	AB	CSA Enclosure 12 (Dust-tight) Equivalent to NEMA Type 12
M	NEMA Type 4 Enclosure (Watertight)	AC	CE  II 3 G (-28° C ≤ Ta ≤ +65° C) Maximum Process Temperature 129° C
N	NEMA Type 4X Enclosure (Watertight and Corrosion Resistant)	AD	Class I, Div. 1, Groups B, C & D; Class II, Div. 1, Groups E, F & G; Enclosure 4 or 4X; Class I, Zone 1, AEx d IIB+H T6; Ex d IIB+H IP66 ATEX EEx d IIB+H T6 IP66
P	Indoor/Outdoor Rust Resistant and Sleet/Ice Resistant		
Q	Class I, Group D		

NOTES (As Applicable)

1. CSA requirements state that only insulated probes may be used in Class II, Group E & F areas.
2. Barriers must be connected in accordance with Robertshaw drawing 907GA681.
3. Barriers must be connected in accordance with Robertshaw drawing 907GA518, Fig. 1.
4. Barriers must be connected in accordance with Robertshaw drawing 907GA518, Fig. 2.
6. Barriers must be connected in accordance with Robertshaw drawing 907GA695, Fig. 1 (907-600-695, Fig. 1).
7. Barriers must be connected in accordance with Robertshaw drawing 907GA695, Fig. 2 (907-600-695, Fig. 2).
8. Customer installed barrier not required for intrinsic safety of sensor/probe.
9. Robertshaw conduit outlet (certified for use with 158A & 310) must be mounted on probe.
10. Instrument must be mounted outside of hazardous area.
11. Enclosure and mounting location for remote transducer (sensor) is rated H.
12. Associated equipment is 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 (such as an explosion-proof enclosure).
13. Barrier and/or control unit must be connected in accordance with Robertshaw drawing 907GA811.
14. Approved probes: 702, 728, 729, 736, 738, 739, 740 & 741.
15. Approved probes: 702, 728, 729, 736, 737, 738, 739, 740, 741, 750, 150KB284 & 150KB285.
16. Instrument must be installed in accordance with Robertshaw drawing 907GA826.
17. Barriers must be connected in accordance with Robertshaw drawing 12641.

DRAWING 907GA518 Rev E
(For Model 158A)

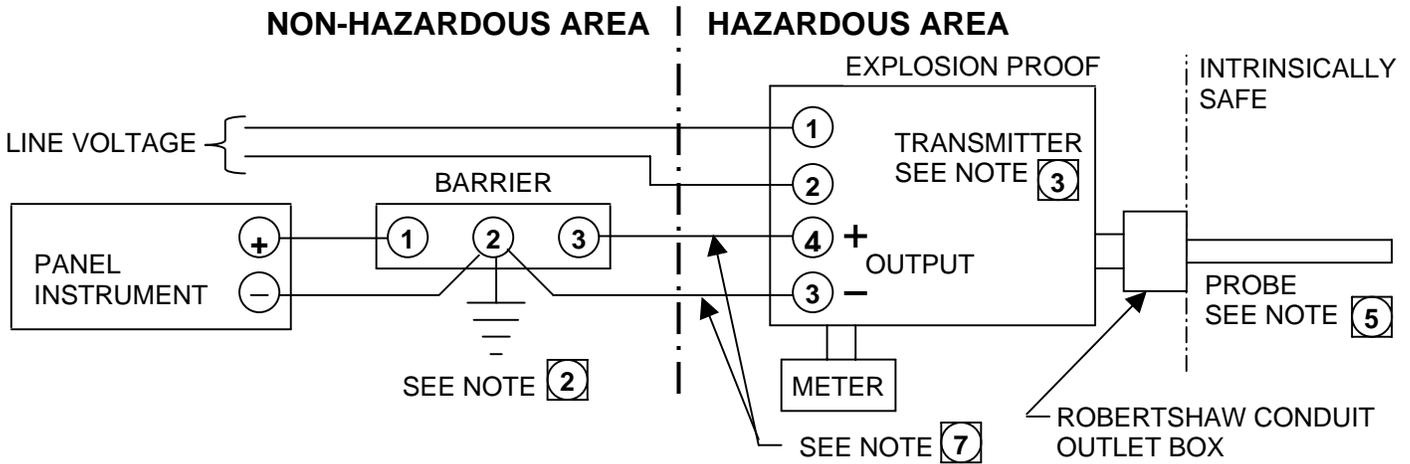


FIGURE 1 - SEE NOTE 1

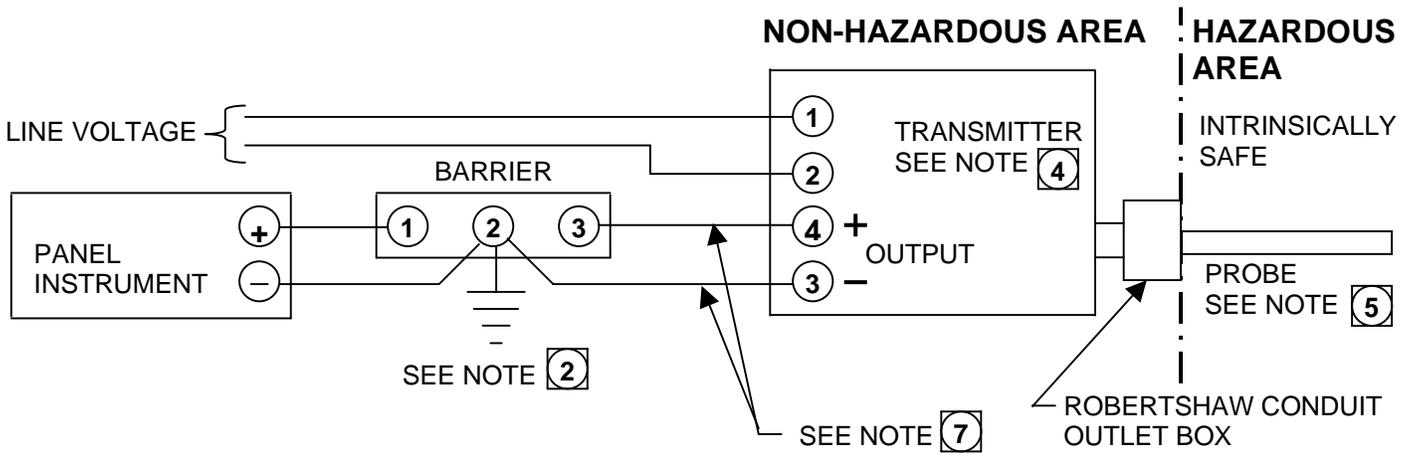


FIGURE 2 - SEE NOTE 1

NOTES:

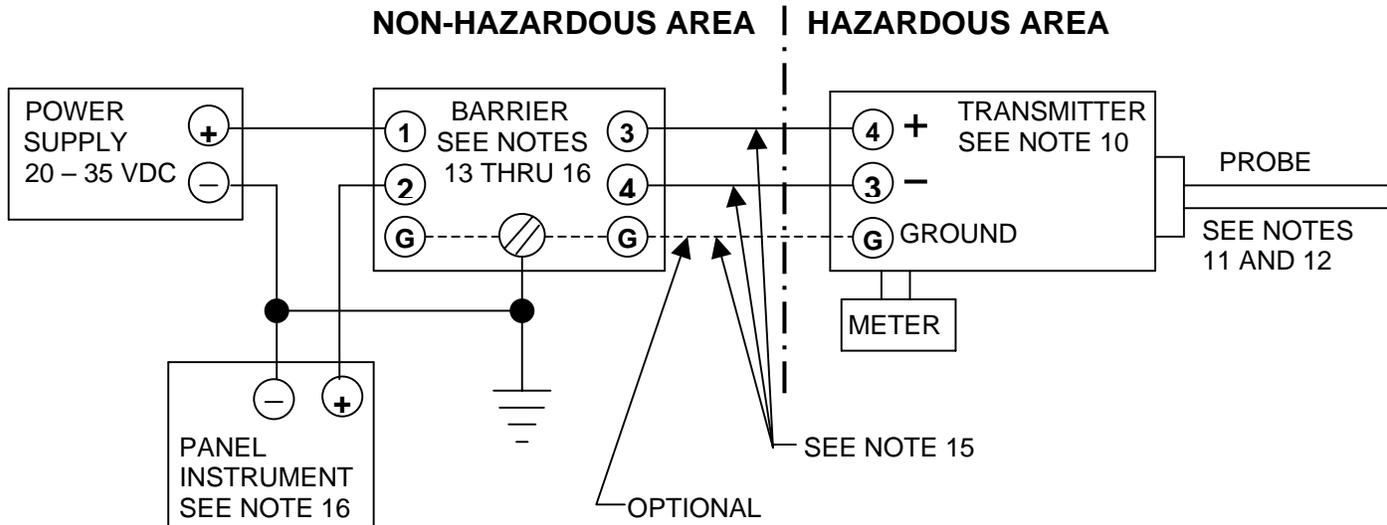
- 1 In Figure 1, the transmitter is CSA Certified for hazardous locations, Class I, Division 1, Groups C & D; Class II, Division 1, Groups E, F & G. The probe is intrinsically safe for Class I, Division 1, Groups A, B, C & D, Class II, Division 1, Groups E, F & G.
- In Figure 2, the transmitter is CSA Certified for Enclosure 5. The probe is intrinsically safe for Class I, Division 1, Groups A, B, C & D, Class II, Division 1, Groups E, F & G.
- 2 R. Stahl Inc., Model 8901/33-293/000/79 or CSA Certified equivalent (28.1V max., 300 ohm min.) positive-potential signal return line barrier with intrinsically safe terminals 2 (ground) and 3. Barrier must be mounted and grounded outside the hazardous area in accordance with the instructions packed with the barrier. Potential to ground must not exceed 250V rms (360V peak).
- 3 Robertshaw Models 158A-(A, B) (1, 2) – (C, D) 1.
- 4 Robertshaw Models 158A-(A, B) (1, 2) – (A, B) 1.
- 5 Robertshaw Model 702, 728, 729, 736, 738, 739, 740 or 741 probe. Insulated probes only may be used in Class II, Group E & F areas.
- 6. 650 ohms maximum total loop resistance, excluding barrier resistance.
- 7 For an intrinsically safe installation, all wiring between the barrier and the transmitter must be installed in rigid metal conduit.

DRAWING 907GA681 Rev G

(For Model 167)

This drawing applicable to instruments employing printed circuit assembly 044KB896-01 Rev S and subsequent.

(Instruments manufactured after May 1998.)



NOTES:

1 thru 8 not applicable.

9. When connected as shown the transmitter and probe are CSA Certified as intrinsically safe for hazardous locations:
 Class I, Division 1, Groups C & D;
 Class II, Division 1, Groups E, F & G.
10. Transmitter is Robertshaw Model 167-A1 (w/o meter) or Model 167-A2 (w/meter).
11. Probe is Robertshaw Model 702, 728, 729, 736, 738, 739, 740 or 741.
12. Insulated probes only may be used in Class II, Group E or F areas.
13. CSA Certified intrinsic safety (isolating type) with output parameters of:
 28V maximum and 267 ohms minimum
 or
 25V maximum and 200 ohms minimum.
14. The barrier must be mounted and grounded outside of the hazardous area in accordance with the instructions packed with the barrier.
15. Safety barrier and its intrinsically safe wiring must be installed in accordance with Article 504 of the NEC ANSI/NFPA 70 or, if applicable, the Canadian Electrical Code.
16. Recommended safety barriers:

MANUFACTURERS	PART NUMBER	MAX LOOP RESISTANCE
R. Stahl Inc.	9001/51-280-110-14	750 ohms
MTL	4041-B	650 ohms
MTL	702+	850 ohms
Pepperl + Fuchs Inc.	KFD2-CR-EX 130 200	1k ohms

17. The example wiring diagram shown is for Stahl 9001/51-280-110-14. For other barriers consult the wiring diagram supplied with the barrier.

DRAWING 907GA695 (907-600-695)

(For Models 443A & 445A)

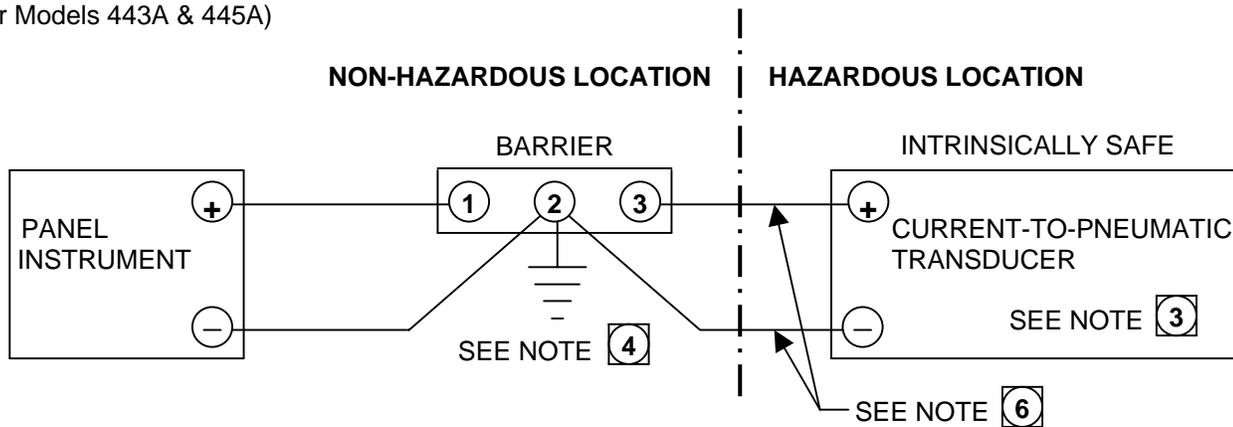


FIGURE 1 - SEE NOTE ①

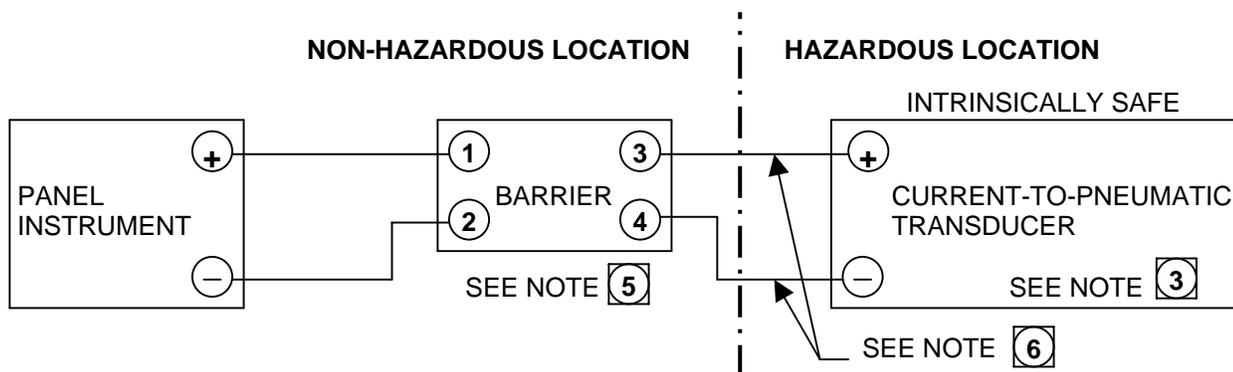


FIGURE 2 - SEE NOTE ②

NOTES:

- ① CSA Certified as Intrinsically Safe for Class I, Division 1, Groups A, B, C & D when connected to an R. Stahl Inc. Model 8901/33-293/000/79 barrier as shown on this drawing.
FM Approved as Intrinsically Safe for Class I, II, III, Division 1, applicable Groups A, B, C, D, E, F & G when connected to an R. Stahl Inc. Model 8901/33-392/000/79 barrier as shown on this drawing.
 - ② CSA Certified as Intrinsically Safe for Class I, Division 1, Groups C & D when connected to a Taylor barrier part number 1130FG21000 or 1135FG21000 as shown on this drawing.
FM Approved as Intrinsically Safe for Class I, II, III, Division 1, applicable Groups C, D, E, F & G when connected to a Taylor barrier part number 1130FG21000 or 1135FG21000 as shown on this drawing.
 - ③ Robertshaw Electro-Pneumatic Relay, Models 443A-B(1, 2, 3), 443A-B1-A, 445A-B(1, 2, 3) and 445A-B1-A.
 - ④ R. Stahl Inc., Model 8901/33-293/000/79 Positive-Potential, DC-Resistive Barrier, 28.1V, 470 ohms, with intrinsically safe terminals 2 (ground) and 3. Barrier must be mounted and grounded outside the hazardous location in accordance with the instructions packed with the barrier. Potential to ground must not exceed 250V rms (360V peak).
 - ⑤ Taylor Instrument Company Model 1130FG21000 Single Barrier, 27.8V, 240 ohms, or Model 1135FG21000 Multiple Barrier, 27.8V, 294 ohms, with intrinsically safe terminals 3 and 4. Barriers must be mounted and grounded outside the hazardous location in accordance with the instructions packed with the barrier. Potential to ground must not exceed 250V rms (360V peak).
 - ⑥ For a CSA Intrinsically safe installation, all wiring between the barrier and the Current-To Pneumatic Transducer must be installed in rigid metal conduit.
7. No revision without prior Factory Mutual Approval.

DRAWING 907GA811 Rev F
(For Model 900GA336)

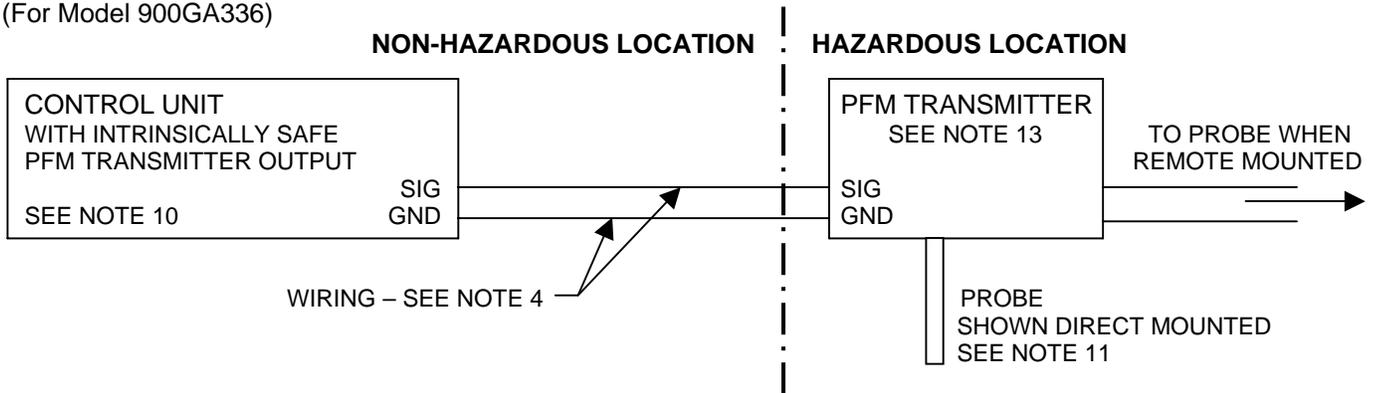


FIGURE 1

WHEN CONNECTED AS SHOWN THE PFM TRANSMITTER AND PROBE ARE INTRINSICALLY SAFE FOR HAZARDOUS LOCATIONS. SEE NOTE 10

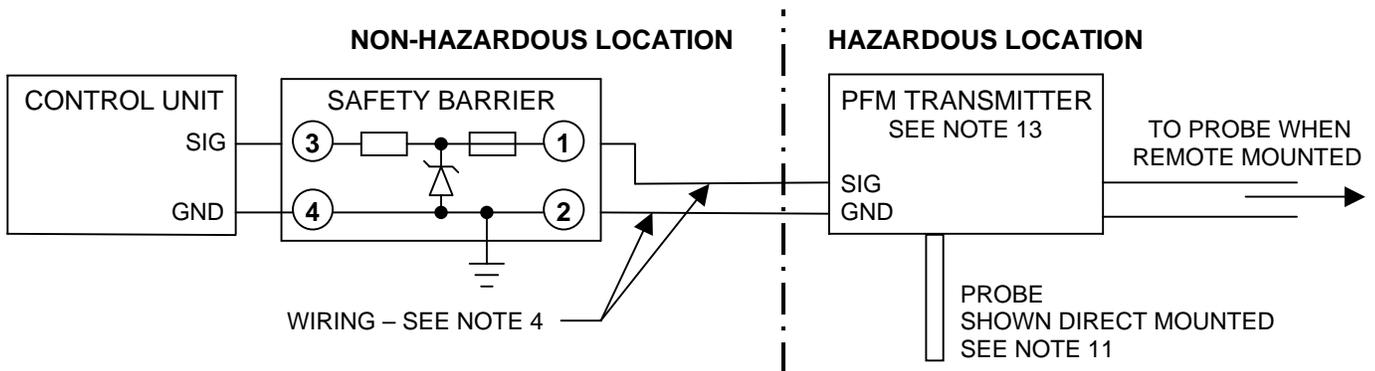


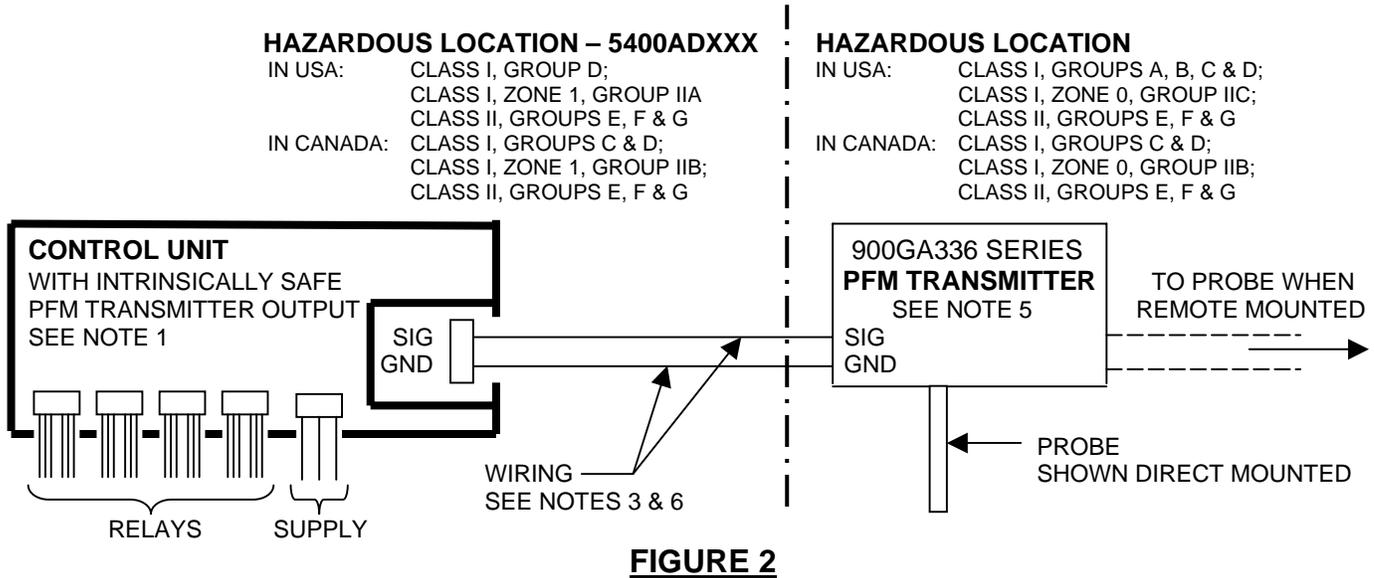
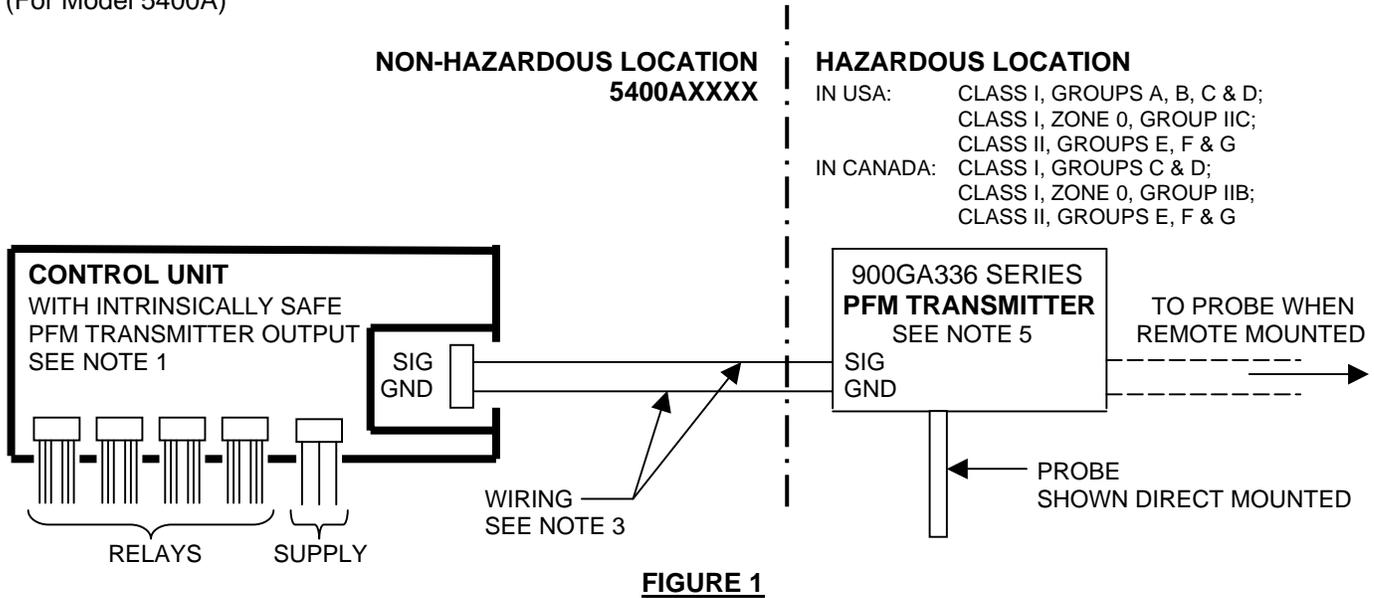
FIGURE 2

WHEN CONNECTED AS SHOWN THE PFM TRANSMITTER AND PROBE ARE INTRINSICALLY SAFE FOR HAZARDOUS LOCATIONS:
CLASS I, DIVISION 1, GROUPS A, B, C & D; CLASS II, DIVISION 1, GROUPS E, F & G; CLASS III;
CLASS I, ZONE 0, GROUP IIC

NOTES:

1. Selected safety barriers shall be listed or approved with intrinsically safe circuits for Class I, II, and III, Division 1, Groups A, B, C, D, E, F and G, and Class I, Zone 0, Group IIC as appropriate for the application.
2. Output current of barrier must be limited by a resistor such that the output voltage current plot is a straight line drawn between open circuit voltage and short circuit current.
3. Safety barriers must be installed in accordance with manufacturer's installation instructions.
4. Safety barrier and its intrinsically safe wiring must be installed in accordance with article 504 of NEC ANSI/NFPA 70 or, if applicable, with the Canadian Electrical Code.
5. The safety barrier must meet the following parameters:
 $V_{oc} \leq V_{max} = 15.7 \text{ V}$ $I_{sc} \leq I_{max} = 386.8 \text{ mA}$ $C_a \geq C_i + C_{cable}$ $L_a \geq L_i + L_{cable}$
6. If the electrical parameters of the cable are unknown, the following values must be used:
 Capacitance = 60 pF/ft. Inductance = 0.20 uH/ft.
 Example: 1000 feet of cable would equal: $C_{cable} = 1000 \times 60 \text{ pF} = 0.06 \text{ uF}$ $L_{cable} = 1000 \times 0.20 \text{ uH} = 0.2 \text{ mH}$
7. If the safety barrier requires an earth ground, then the resistance between the terminal on the safety barrier and earth ground shall be less than 1 ohm.
8. The PFM Transmitter entity parameters are: $V_{max} = 15.7 \text{ V}$ $I_{max} = 386.8 \text{ mA}$ $C_i = 0.54 \text{ uF}$ $L_i = 0$
9. Recommended safety Barriers:
 A. R. Stahl incorporated No. 9001/01-158-390-10 (UL Listed, FM Approved & CSA Certified).
 B. Measurement Technology Ltd. No. MTL 715P+ (FM Approved & CSA Certified).
10. The control unit must have an intrinsically safe PFM Output and be listed or approved and have entity parameters as described in Note 5.
11. Robertshaw Model 702, 728, 729, 736, 737, 738, 739, 740, 741, 750, 150KB284 or 150KB285 probe. Insulated probes only may be used in Class II, Group E & F areas.
12. Tighten PFM field wiring terminal screws to 5 pound-inches (0.56Nm)
13. PFM Transmitter: Part Numbers 900GA336-01, -03, -05 & -07 are probe mounted.
 Part Numbers 900GA336-02, -04, -06 & -08 are remote mounted.

DRAWING 907GA826 Rev B
(For Model 5400A)

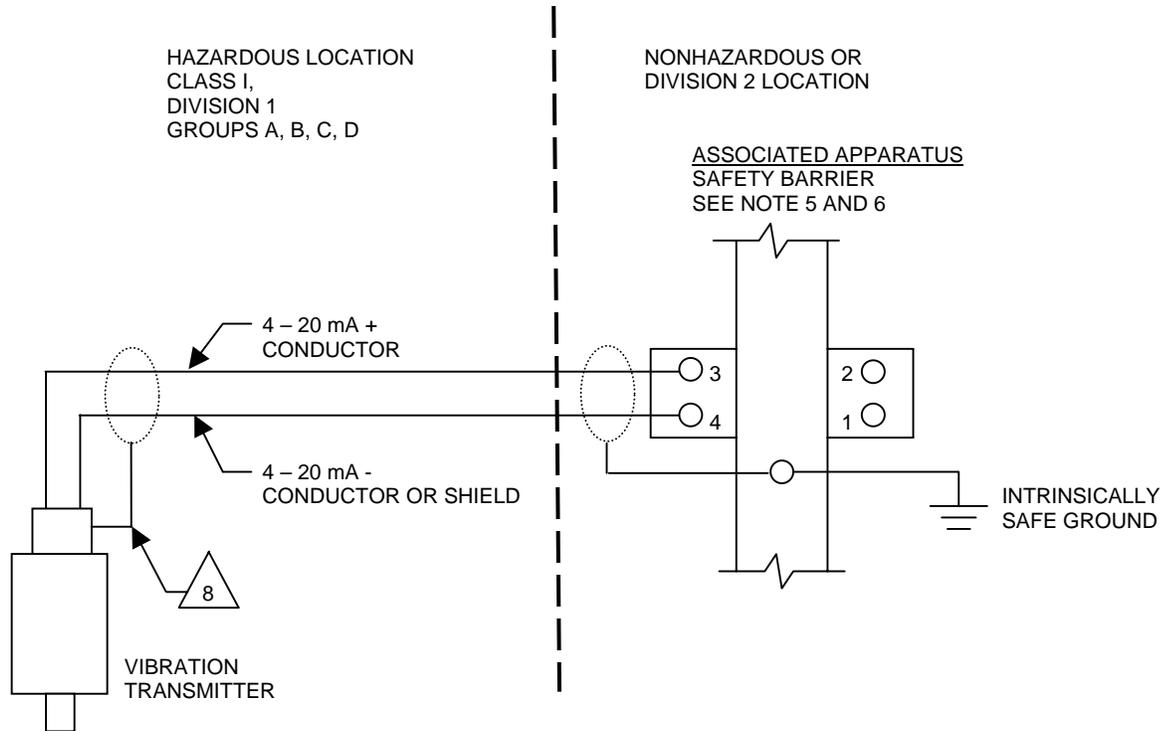


NOTES:

- When connected as shown the PFM Transmitter and probe are intrinsically safe for hazardous locations:

In USA: Class I, Division 1, Groups A, B, C and D;	In Canada: Class I, Division 1, Groups C and D;
Class I, Zone 0, Group IIC;	Class I, Zone 0, Group IIB;
Class II, Division 1, Groups E, F and G;	Class II, Division 1, Groups E, F and G;
Class III	Class III
- Grounds on the controller 5400A I.S. GND terminal must be connected to earth GND of the AC feeder supply circuit. Resistance must not be less than 1 ohm.
- Intrinsically safe wiring must be installed in accordance with Article 504 of the NEC ANSI/NFPA 70 and ISA RP12.6 or, if applicable, with the Canadian Electrical Code.
Maximum length of wiring:

In USA:	333 feet
In Canada:	1000 feet (305 M)
- Tighten field wiring terminal screws to 5 pound-inches (0.56 Nm).
- PFM Transmitter shall be installed in accordance with PFM Transmitter installation instructions.
- When the control unit has an explosion proof enclosure, the control unit conduits shall be sealed within 18 inches (46 cm).



CONNECTION DIAGRAM, FOR INTRINSICALLY SAFE ROBERTSHAW VIBRATION TRANSMITTER IN DIVISION 1 LOCATION

APPROVED MODEL NUMBERS
571A-A
571A-B
571A-C
571A-D
571A-E
571A-F

ENTITY PARAMETERS	
GROUPS: A, B, C, D, E, F, G	
V_{max} or U_i	= 30 Vdc
I_{max} or I_i	= 106 mA

NOTES:

- NO REVISION TO DRAWING WITHOUT PRIOR CSA APPROVAL.
- $V_{oc} \leq V_{max}$, $I_{sc} \leq I_{max}$, $C_a \geq C_i$ & C_{cable} , $L_a \geq L_i$ & L_{cable} .
- CONTROL EQUIPMENT CONNECTED TO BARRIER MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc.
- INSTALL IN ACCORDANCE WITH:
 - CANADA - CANADIAN ELECTRICAL CODE (CEC) PART 1.
 - USA - ANSI/ISA RP12.6 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS" AND THE NATIONAL ELECTRICAL CODE (ANSI/NFQA 70).
 - EUROPE - MUST COMPLY WITH THE INSTALLATION REQUIREMENTS OF THE COUNTRY OF USE, e.g. IN THE U.K., BS 5345:PART 4:1977.
- ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.
- BARRIER MUST BE CERTIFIED, SINGLE CHANNEL GROUNDED SHUNT-DIODE ZENER BARRIER OR A SINGLE CHANNEL ISOLATING BARRIER.
- FOR UNITS WHICH ARE CONNECTED THROUGH A GROUNDED SHUNT-DIODE SAFETY BARRIER, ENSURE THAT THE TRANSMITTER IS MOUNTED TO A SURFACE WHICH IS AT THE SAME POTENTIAL AS THE BARRIER GROUND.
- SHIELD OF CABLE OR CASE OF TRANSMITTER TO BE TIED TO AN INTRINSICALLY SAFE GROUND.



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