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	REV	DESCRIPTION	CHG. NO.	APP'D	DATE
	AA	NEW RELEASE	RTC1025256	A.J.W.	1/2/08
	AB	UPDATE NOTES & ADD RTD TO DIAGRAMS	RTC1025712	A.J.W.	2/28/08
AC	UPDATES FOR FIELDBUS SUBMITTAL	RTC1058998	A.S.	2/5/14	


ENTITY APPROVALS FOR MODEL 305ISMV

OUTPUT CODE 'A' and 'F' I.S. ENTITY PARAMETERS SHEET 2
 OUTPUT CODE 'A' (4-20 mA HART) I.S. SEE SHEET 3
 OUTPUT CODE 'F' (FIELDBUS) I.S. SEE SHEET 4
 FISCO SEE SHEETS 5-6
 ALL OUTPUT CODE NONINCENDIVE SEE SHEET 7

THE ROSEMOUNT TRANSMITTERS LISTED ABOVE ARE F.M. APPROVED AS INTRINSICALLY SAFE WHEN USED IN CIRCUIT WITH F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED IN THE CLASS I, II, AND III, DIVISION 1 GROUPS INDICATED.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING INSTRUCTIONS AND THE APPLICABLE CIRCUIT DIAGRAM.

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UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125 -TOLERANCE- .X ± .1 [2,5] .XX ± .02 [0,5] .XXX ± .010 [0,25] FRACTIONS ANGLES ± 1/32 ± 2° DO NOT SCALE PRINT	CONTRACT NO.		 ROSEMOUNT 8200 Market Boulevard • Chanhassen, MN 55317 USA		
	DR. Myles Lee Miller	12/17/07			TITLE
	CHK'D		INDEX OF I.S. & NONINCENDIVE F.M. FOR 305ISMV		
	APP'D.		SIZE	FSCM NO	DWG NO.
	APP'D. GOVT.		A		03151-1206
		SCALE	N/A	WT.	SHEET 1 OF 8

Form Rev AC



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ENTITY CONCEPT APPROVALS

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAX. OPEN CIRCUIT VOLTAGE (V_{oc} , U_o OR V_t) AND MAX. SHORT CIRCUIT CURRENT (I_{sc} , I_o , OR I_t) AND MAX. POWER $P_o(V_{oc} \times I_{sc}/4)$ OR $(V_t \times I_t/4)$, FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (V_{max} , OR U_i), MAXIMUM SAFE INPUT CURRENT (I_{max} OR I_i), AND MAXIMUM SAFE INPUT POWER (P_{max} OR P_i) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (C_a) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (C_i) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (L_a) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (L_i) OF THE INTRINSICALLY SAFE APPARATUS.

NOTE: ENTITY PARAMETERS LISTED APPLY ONLY TO ASSOCIATED APPARATUS WITH LINEAR OUTPUT.

FOR OUTPUT CODE 'A' MODEL 305ISMV CLASS I, DIV. 1, GROUPS A, B, C AND D

U_i or $V_{MAX} = 30V$	U_o, V_T or V_{OC} IS LESS THAN OR EQUAL TO 30V
I_i or $I_{MAX} = 300mA$	I_o, I_T or I_{SC} IS LESS THAN OR EQUAL TO 300mA
P_i or $P_{MAX} = 1.0$ WATT	$(\frac{V_T \times I_T}{4})$ or $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1.0 WATT
$C_i = 14.8nF$	C_A IS GREATER THAN 14.8nF
$L_i = 0\mu H$	L_A IS GREATER THAN $0\mu H$
T4 ($T_a = -50^\circ C$ to $+70^\circ C$)	

FOR OUTPUT CODE 'F' MODEL 305ISMV CLASS I, DIV. 1, GROUPS A, B, C AND D

U_i or $V_{MAX} = 30V$	U_o, V_T , OR V_{OC} IS LESS THAN OR EQUAL TO 30V
I_i or $I_{MAX} = 300mA$	I_o, I_T , OR I_{SC} IS LESS THAN OR EQUAL TO 300mA
P_i or $P_{MAX} = 1.3$ WATT	$P_i (\frac{V_T \times I_T}{4})$ OR $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1.3 WATT
$C_i = 0\mu f$	C_A IS GREATER THAN $0\mu f$
$L_i = 0\mu H$	L_A IS GREATER THAN $0\mu H$
T4 ($T_a = -50^\circ C$ TO $+60^\circ C$)	

HART RTD SENSOR PARAMETERS

$V_t = 7.14$
$I_t = 3.64mA$
$P_o = 6.5mW$
$C_a = 13.5nF$
$L_a = 1H$

FIELDBUS RTD SENSOR PARAMETERS

$V_t = 30V$
$I_t = 18.24mA$
$P_o = 137mW$
$C_a = 65.2nF$
$L_a = 239mH$

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DR. **Myles Lee Miller**

ISSUED

SIZE **A**

SCALE **N/A**

FSCM NO

WT. _____

DWG NO.

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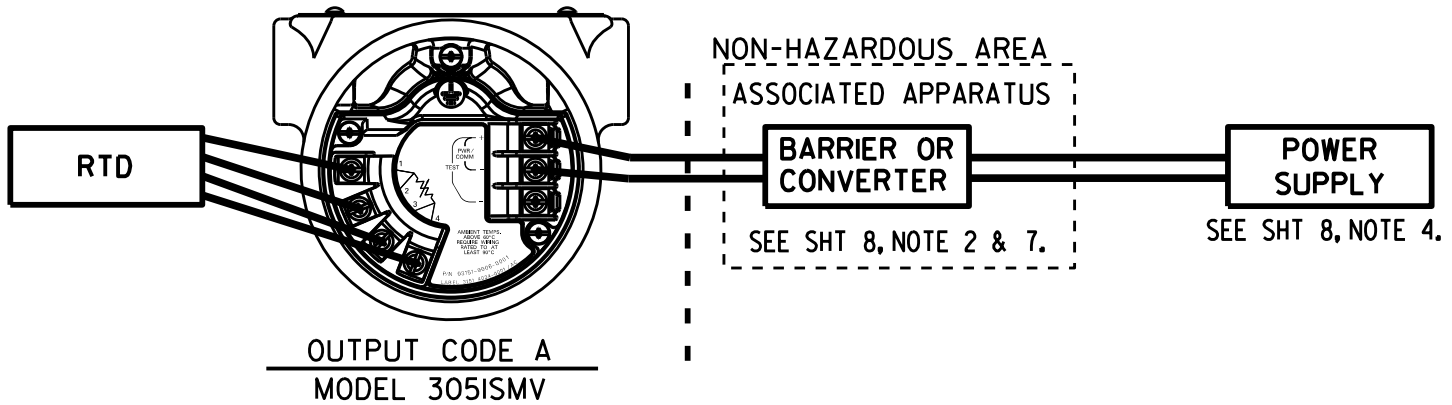
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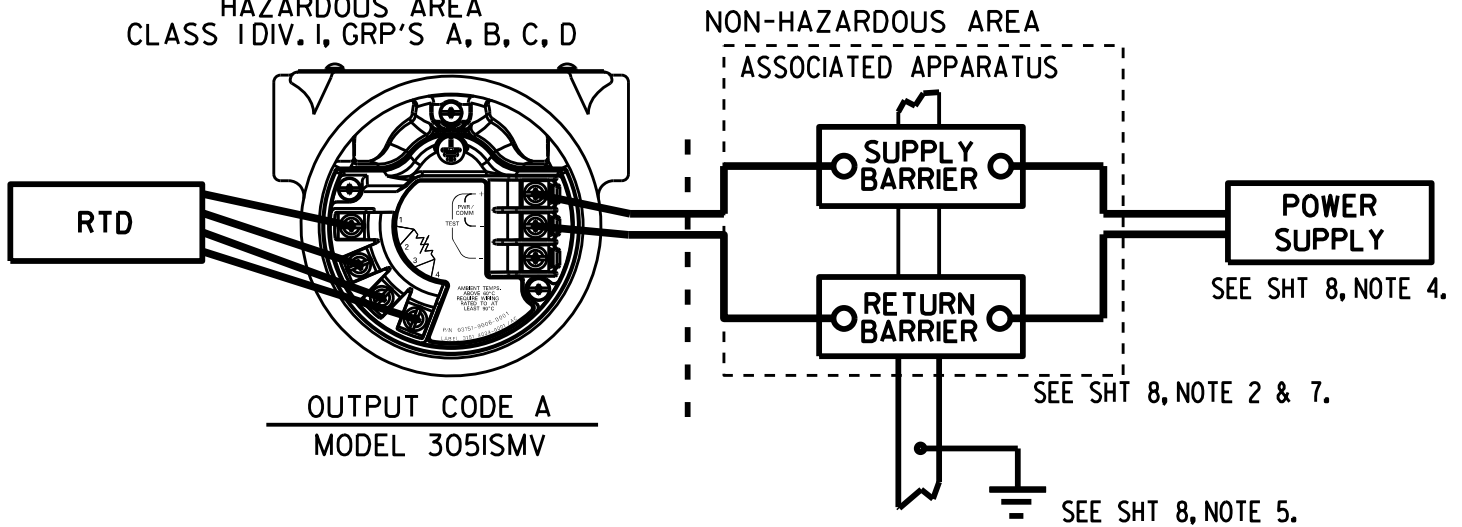
**CIRCUIT DIAGRAM 1
ONE BARRIER OR CONVERTER:
SINGLE OR DUAL CHANNEL**

HAZARDOUS AREA
CLASS I DIV. I, GRP'S A, B, C, D



**CIRCUIT DIAGRAM 2
SUPPLY AND RETURN BARRIERS
(ONLY FOR USE WITH BARRIERS APPROVED IN THIS CONFIGURATION)**

HAZARDOUS AREA
CLASS I DIV. I, GRP'S A, B, C, D



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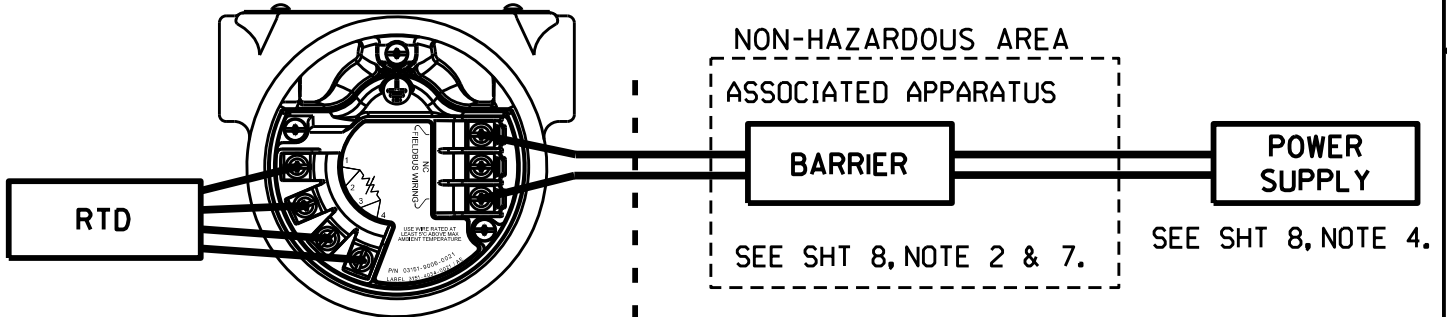
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REVISIONS				
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CIRCUIT DIAGRAM I
ONE BARRIER OR CONVERTER:
SINGLE OR DUAL CHANNEL

HAZARDOUS AREA
CLASS I, DIV. I, GRP'S A, B, C, D



OUTPUT CODE F
MODELS INCLUDED
305ISMV WITH 300SMV
PLANTWEB HOUSING

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SIZE **A**

FSCM NO

DWG NO.

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SCALE

N/A

WT.

SHEET

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8



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FISCO CONCEPT

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (U_1 OR V_{max}), THE CURRENT (I_1 OR I_{max}), AND THE POWER (P_1 OR P_{max}) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (U_0 , V_{oc} , OR V_t), THE CURRENT (I_0 , I_{sc} , OR I_t) AND THE POWER (P_0 OR P_{max}) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (C_1) AND THE INDUCTANCE (L_1) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF AND 10 μ H RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE U_0 (OR V_{oc} OR V_t) OF THE ASSOCIATED APPARATUS IS LIMITED TO A RANGE OF 14V TO 24Vd.c. ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50 μ A FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

Loop Resistance R' :	15.....150 Ohm/km
Inductance per unit length L' :	0.4.....1 mH/km
Capacitance per unit length C' :	80.....200 nF
$C' = C' \text{ line/line} + 0.5C' \text{ line/screen}$, if both lines are floating, or	
$C' = C' \text{ line/line} + C' \text{ line/screen}$, if the screen is connected to one line	
Length of trunk cable:	less than or equal to 1000m
Length of spur cable:	less than or equal to 30m
Length of spur splice:	less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:

$$R = 90.....100\text{Ohm} \quad C = 0.....2.2\mu\text{F}$$

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED DUE TO I. S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITTED. THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

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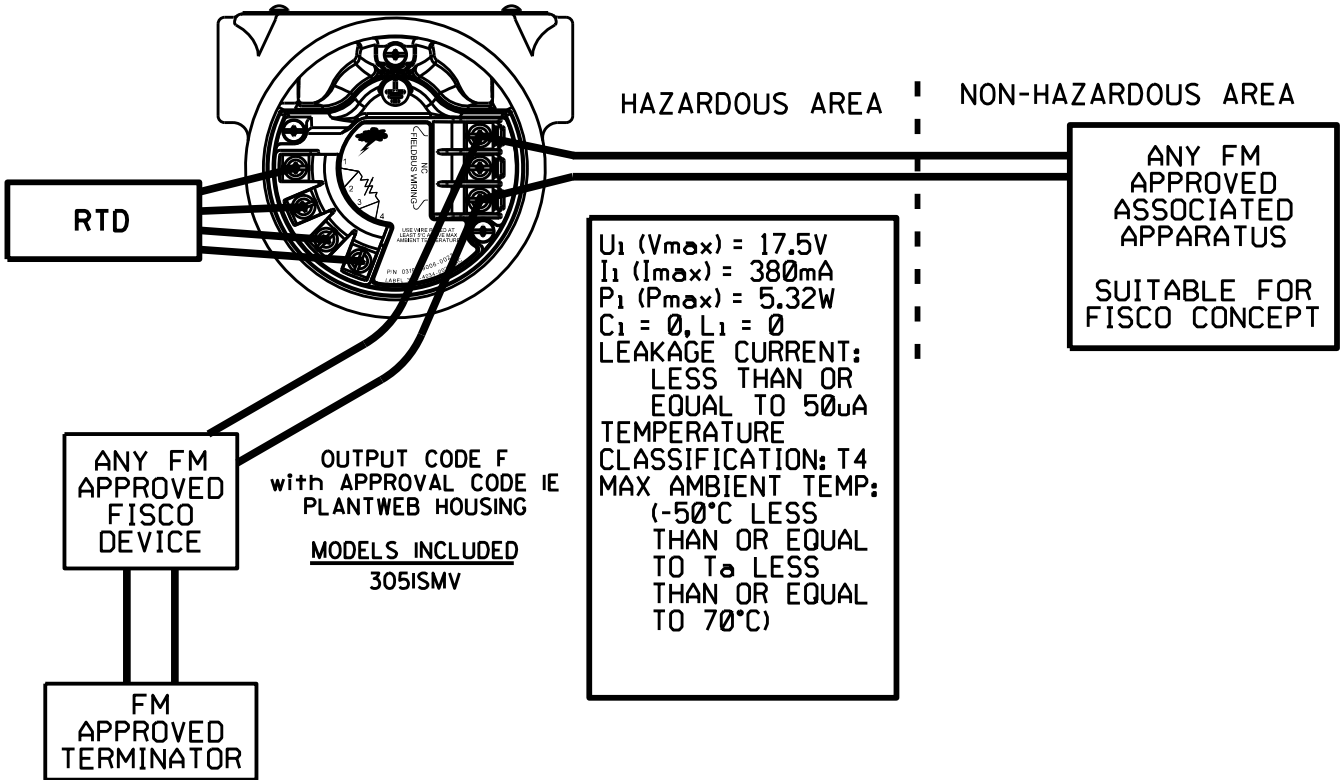
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ISSUED		SCALE	N/A	WT.	_____	SHEET	5 OF 8



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HAZARDOUS AREA
CLASS I DIV. I, GRP'S A, B, C, D



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A		03151-1206		
SCALE	N/A	WT.	SHEET	6 OF 8

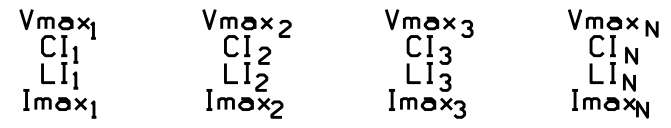
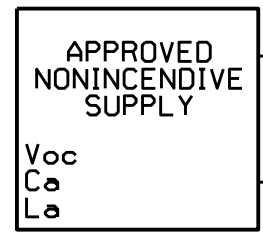
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**NONINCENDIVE FIELD CIRCUIT
CLASS 1, DIV. 2 LOCATIONS**

NON-CLASSIFIED LOCATION

HAZARDOUS (CLASSIFIED) LOCATION
CLASS 1, DIV. 2, GRP'S A, B, C, D



WIRING PER NEC® (NFPA 70) 501-4 (b) EXCEPTION (NONINCENDIVE FIELD CIRCUIT) NFPA 70 National Electrical Code® ARTICLE 501-4(b) EXCEPTION: "WIRING IN NONINCENDIVE CIRCUITS SHALL BE PERMITTED USING ANY OF THE METHODS SUITABLE FOR WIRING IN ORDINARY LOCATIONS."

IN NORMAL OPERATION
DEVICES CONTROL THROUGH-CURRENT

PARAMETERS
(NON-INCENDIVE
FIELD WIRING)

DEVICE

ROSEMOUNT 3051SMV

	4-20mA / HART	FIELD BUS	FISCO
V_{max}	42.4v	32v	17.5v
Maximum normal operating current	22mA	17.5mA	17.5mA
C_1	14.8nF	0nF	0nF
L_1	0uH	0uH	0uH

$I_{maxN} \geq I_{qN} + I_{signalN}$

I_{max} for an individual device = $I_q + I_{signal}$
 I_q = Quiescent current through device
 (Maximum quiescent current for the device)
 I_{signal} = Signaling current through device
 (Protocol may limit signaling to one device at a time)
 Operating $I_{max} = I_{q1} + I_{q2} + \dots + I_{qN} + I_{signal\ max}$
 $I_{signal\ max} = \text{Max. of } (I_{signal1}, I_{signal2}, \dots, I_{signalN})$
 TEMP CODE: T4 ($T_a = -50^\circ\text{C TO } +70^\circ\text{C}$)

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NOTES:

1. NO REVISION TO THIS DRAWING WITHOUT PRIOR FM APPROVAL.
2. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.
3. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN CLASS II AND CLASS III ENVIRONMENTS.
4. CONTROL EQUIPMENT CONNECTED TO ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms or Vdc.
5. RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN 1.0 OHM.
6. INSTALLATION SHOULD BE IN ACCORDANCE WITH ANSI/ISA-RP12.06.01 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS" AND THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70).
7. THE ASSOCIATED APPARATUS MUST BE FM APPROVED.
8. WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
9. THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED APPARATUS WHEN THE FOLLOWING IS TRUE:
 V_{max} or U_i IS GREATER THAN or EQUAL TO V_{oc} , V_t or U_o
 I_{max} or I_i IS GREATER THAN or EQUAL TO I_{sc} , I_t or I_o
 P_{max} or P_i IS GREATER THAN or EQUAL TO P_o
 C_a IS GREATER THAN or EQUAL TO THE SUM OF ALL C_i 's PLUS C_{cable}
 L_a IS GREATER THAN or EQUAL TO THE SUM OF ALL L_i 's PLUS L_{cable}
10. WARNING - TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.
11. THE ASSOCIATED APPARATUS MUST BE A RESISTIVELY LIMITED SINGLE OR MULTIPLE CHANNEL FM APPROVED BARRIER HAVING PARAMETERS LESS THAN THOSE QUOTED, AND FOR WHICH THE OUTPUT AND THE COMBINATIONS OF OUTPUTS IS NON-IGNITION CAPABLE FOR THE CLASS, DIVISION AND GROUP OF USE.
12. USE WIRE RATED AT LEAST 5°C ABOVE MAXIMUM AMBIENT TEMPERATURE.

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