

## Appendix B Approvals

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### HAZARDOUS LOCATIONS INSTALLATIONS

The flowmeter is designed with explosion-proof housings and circuitry suitable for intrinsically safe and non-incendive operation. Each flowmeter is clearly marked with a tag indicating the approvals. To maintain certified ratings for installed transmitters, install in accordance with all applicable installation codes and approval drawings. Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications. Both transmitter covers must be fully engaged to meet explosion proof requirements.

### ROSEMOUNT 3051SFA PRODUCT CERTIFICATIONS

#### Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA  
Emerson Process Management GmbH & Co. — Wessling, Germany  
Emerson Process Management Asia Pacific Private Limited — Singapore  
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

#### European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting an Emerson Process Management representative.

#### ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

#### European Pressure Equipment Directive (PED) (97/23/EC)

Models 3051S\_CA4; 3051S\_CD2, 3, 4, 5; *(also with P9 option)*  
Pressure Transmitters — QS Certificate of Assessment -  
EC No. PED-H-20, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters  
— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold  
— Sound Engineering Practice

Primary Elements, Flowmeter  
— See appropriate Primary Element QIG

# Annubar Flowmeter Series

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## Electro Magnetic Compatibility (EMC) (89/336/EEC)

All Models: EN 50081-1: 1992; EN 50082-2:1995;  
EN 61326-1:1997 – Industrial

## Ordinary Location Certification for FM

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## Hazardous Locations Certifications

### North American Certifications

#### FM Approvals

- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G; hazardous locations; enclosure Type 4X, conduit seal not required when installed according to Rosemount drawing 03151-1003.
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1006; Non-incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X  
For entity parameters see control drawing 03151-1006.

### Canadian Standards Association (CSA)

- E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 03151-1013, CSA Enclosure Type 4X; conduit seal not required.
- I6** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1016; For entity parameters see control drawing 03151-1016.

### European Certifications

- I1** ATEX Intrinsic Safety  
Certificate No.: BAS01ATEX1303X  II 1G  
EEx ia IIC T5 (-60 °C ≤ T<sub>a</sub> ≤ 40 °C)  
T4 (-60 °C ≤ T<sub>a</sub> ≤ 70 °C)  
T4 (-60 °C ≤ T<sub>a</sub> ≤ 40 °C) (FISCO)  
cE 1180

| Loop / Power                   | Groups   |
|--------------------------------|--|
| $U_i = 30 \text{ V}$           | HART / FOUNDATION Fieldbus/ Remote Display / SIS |
| $U_i = 17.5 \text{ V}$         | FISCO  |
| $I_i = 300 \text{ mA}$         | HART / FOUNDATION Fieldbus/ Remote Display / SIS |
| $I_i = 380 \text{ mA}$         | FISCO  |
| $P_i = 1.0 \text{ W}$          | HART / Remote Display / SIS                      |
| $P_i = 1.3 \text{ W}$          | FOUNDATION Fieldbus                              |
| $P_i = 5.32 \text{ W}$         | FISCO  |
| $C_i = 30 \text{ nF}$          | SuperModule™                                     |
| $C_i = 11.4 \text{ nF}$        | HART / SIS                                       |
| $C_i = 0$                      | FOUNDATION Fieldbus / Remote Display / FISCO     |
| $L_i = 0$                      | HART / FOUNDATION Fieldbus/ SIS / FISCO          |
| $L_i = 60 \text{ }\mu\text{H}$ | Remote Display                                   |

### Special conditions for safe use (x)

1. The apparatus, excluding the Types 3051 S-T and 3051 S-C (In-line and Coplanar SuperModules respectively), is not capable of withstanding the 500 V test as defined in Clause 6.4.12 of EN 50020. This must be considered during installation.
2. The terminal pins of the Types 3051 S-T and 3051 S-C must be protected to IP20 minimum.

#### N1 ATEX Type n

Certificate No.: BAS01ATEX3304X  II 3 G  
 EEx nL IIC T5 ( $T_a = -40 \text{ }^\circ\text{C TO } 70 \text{ }^\circ\text{C}$ )  
 $U_i = 45 \text{ Vdc max}$   
 IP66  
 CE

### Special conditions for safe use (x)

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 9.1 of EN 50021: 1999. This must be taken into account when installing the apparatus.

#### ND ATEX Dust

Certificate No.: BAS01ATEX1374X  II 1 D  
 $T_{105} \text{ }^\circ\text{C} (-20 \text{ }^\circ\text{C} \leq T_{amb} \leq 85 \text{ }^\circ\text{C})$   
 $V_{max} = 42.4 \text{ volts max}$   
 $A = 24 \text{ mA}$   
 IP66  
 CE 1180

# Annubar Flowmeter Series

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## Special conditions for safe use (x)

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliampere, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 3051S must be securely screwed in place to maintain the ingress protection of the enclosure.

## E1 ATEX Flameproof

Certificate No.: KEMA00ATEX2143X Ⓢ II 1/2 G

EEx d IIC T6 ( $-50\text{ °C} \leq T_{\text{amb}} \leq 65\text{ °C}$ )

EEx d IIC T5 ( $-50\text{ °C} \leq T_{\text{amb}} \leq 80\text{ °C}$ )

$V_{\text{max}} = 42.4\text{ V}$

CE 1180

## Special conditions for safe use (x)

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime. The Model 3051S pressure transmitter must include a Series 300S housing integrally mounted to a Series Model 3051S Sensor module as per Rosemount drawing 03151-1023.

## Australian Certifications

### E7 SAA Explosion-proof and DIP

Certification No.: AUS Ex 3798X

Ex d IIC T6 ( $T_a = 60\text{ °C}$ ) IP66

DIP A21 TA T6 ( $T_a = 60\text{ °C}$ ) IP66

## Special conditions for safe use (x)

1. It is a condition of manufacture that each transmitter module shall be pressure tested in accordance with clause 4.3 of AS 2380.2 at minimum pressure of 1450 kPa. As the model 300S housing passed tests at 4 times the reference pressures (400 kPa for single and 3800 kPa for dual compartment housing) and are not of welded construction, they may be exempted from the routing pressure test of clause 4.3 of AS 2380.2.
2. It is a condition of manufacture that each transmitter module and housing combination shall be subjected to a routine high voltage test in accordance with clause 6.2 of AS 2380.1, with the following variation. The test voltage applied to each single or dual compartment housing shall not be less than 500 V, 47 to 62 Hz, for a period of not less than one minute, with a breakdown current of less than 5 mA.

3. It is a condition of safe use that each housing shall be connected to external circuits via suitable conduit or Standards Australia certified cable glands. Where only one entry is used for connection to external circuits, the unused entry shall be closed by means of the blanking plug supplied by the equipment manufacturer or by a suitable Standards Australia certified blanking plug.
4. It is a condition of safe use that a dielectric strength test shall be applied whenever the terminal block is changed or replaced in either the dual compartment or single compartment housings. The breakdown current shall be less than 5 mA, when 500 V, 47 to 62 Hz, is applied for one minute. Note: if tested with an optional T1 transient protector terminal block fitted, the protection will operate and hence there will be no current indicated.
5. It is a condition of safe use that each transmitter module shall be used with a Model 300S housing, in order to comply with flameproof requirements.
6. It is a condition of safe use that each model 300S housing fitted with a transmitter module shall be marked with the same certification marking code information. Should the housing be replaced after initial supply to another model 300S housing, the replacement housing shall have the same certification marking code information as the housing it replaces.

## IECEX Certifications

### I7 IECEX Intrinsic Safety

Certificate No.: IECEXBAS04.0017X

Ex ia IIC T5 ( $T_a = -60\text{ °C}$  to  $40\text{ °C}$ ) -Hart/SIS/Remote Meter

Ex ia IIC T4 ( $T_a = -60\text{ °C}$  to  $70\text{ °C}$ ) -Hart/SIS/Remote Meter

Ex ia IIC T4 ( $T_a = -60\text{ °C}$  to  $70\text{ °C}$ ) -FOUNDATION Fieldbus

Ex ia IIC T4 ( $T_a = -60\text{ °C}$  to  $40\text{ °C}$ ) -FISCO

IP66

| Loop / Power                  | Groups   |
|-------------------------------|--|
| $U_i = 30\text{ V}$           | HART / FOUNDATION Fieldbus/ Remote Display / SIS |
| $U_i = 17.5\text{ V}$         | FISCO  |
| $I_i = 300\text{ mA}$         | HART / FOUNDATION Fieldbus/ Remote Display / SIS |
| $I_i = 380\text{ mA}$         | FISCO  |
| $P_i = 1.0\text{ W}$          | HART / Remote Display / SIS                      |
| $P_i = 1.3\text{ W}$          | FOUNDATION Fieldbus                              |
| $P_i = 5.32\text{ W}$         | FISCO  |
| $C_i = 30\text{ nF}$          | SuperModule™                                     |
| $C_i = 11.4\text{ nF}$        | HART / SIS                                       |
| $C_i = 0$                     | FOUNDATION Fieldbus / Remote Display / FISCO     |
| $L_i = 0$                     | HART / FOUNDATION Fieldbus/ SIS / FISCO          |
| $L_i = 60\text{ }\mu\text{H}$ | Remote Display                                   |

### Special conditions for safe use (x)

1. The Models 3051S HART 4-20mA, 3051S Fieldbus, 3051S Profibus and 3051S FISCO are not capable of withstanding the 500 V test as defined in clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.
2. The terminal pins of the Types 3051S-T and 3051S-C must be protected to IP20 minimum.

# Annubar Flowmeter Series

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**N7** IECEx Type n  
Certificate No.: IECExBAS04.0018X  
Ex nC IIC T5 (Ta = -40 °C to 70 °C)  
Ui = 45 Vdc MAX  
IP66

**Special conditions for safe use (x)**

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 8 of IEC 79-15: 1987.

**Combinations of Certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K1** Combination of E1, I1, N1, and ND
- K5** Combination of E5 and I5
- K6** Combination of E6 and I6
- K7** Combination of E7, I7, and N7
- KA** Combination of E1, I1, E6, and I6
- KB** Combination of E5, I5, I6, and E6
- KC** Combination of E5, E1, I5, and I1
- KD** Combination of E5, I5, E6, I6, E1, and I1

**ROSEMOUNT 3095MFA  
PRODUCT  
CERTIFICATIONS**

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting our local sales office.

**ATEX Directive (94/9/EC)**

Emerson Process Management complies with the ATEX Directive.

**European Pressure Equipment Directive (PED) (97/23/EC)**

3095M\_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-20

Module H Conformity Assessment

All other 3095\_ Transmitters/Level Controller —  
Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold —  
Sound Engineering Practice

3095MFP Integral Orifice Mass Flowmeter —

Refer to declaration of conformity for 1195 Integral Orifice Series classification.

**Electro Magnetic Compatibility (EMC) (89/336/EEC)**

3095MV Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995;  
EN 61326-1:1997 – Industrial

## Hazardous Locations Certifications

### Ordinary Location Certification for Factory Mutual

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### North American Certifications

#### FM Approvals

- E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.
- I5 Intrinsically Safe for use in Class I, II, and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

### Canadian Standards Association (CSA)

- E6 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. CSA enclosure Type 4X suitable for indoor and outdoor hazardous locations. Provides nonincendive RTD connection for Class I, Division 2, Groups A, B, C, and D. Factory Sealed. Install in accordance with Rosemount Drawing 03095-1024. Approved for Class I, Division 2, Groups A, B, C, and D.
- I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

For input parameters and installation see control drawing 03095-1021.

### European Certifications

- I1 ATEX Intrinsic Safety  
Certificate Number: BAS98ATEX1359X  II 1 G  
EEx ia IIC T5 ( $T_{amb} = -45\text{ °C to }40\text{ °C}$ )  
EEx ia IIC T4 ( $T_{amb} = -45\text{ °C to }70\text{ °C}$ )  
cE 1180

## Annubar Flowmeter Series

Table B-1. Connection Parameters (Power/Signal Terminals)

|                                    |
|------------------------------------|
| $U_i = 30 \text{ V}$               |
| $I_i = 200 \text{ mA}$             |
| $P_i = 1.0 \text{ W}$              |
| $C_i = 0.012 \text{ } \mu\text{F}$ |
| $L_i = 0$                          |

Table B-2. Temperature Sensor Connection Parameters

|                                    |
|------------------------------------|
| $U_o = 30 \text{ V}$               |
| $I_o = 19 \text{ mA}$              |
| $P_o = 140 \text{ mW}$             |
| $C_i = 0.002 \text{ } \mu\text{F}$ |
| $L_i = 0$                          |

Table B-3. Temp Sensor Terminals Connection Parameters

|   |               |
|---|---------------|
| $C_o = 0.066 \text{ } \mu\text{F}$              | Gas Group IIC |
| $C_o = 0.560 \text{ } \mu\text{F}$              | Gas Group IIB |
| $C_o = 1.82 \text{ } \mu\text{F}$               | Gas Group IIA |
| $L_o = 96 \text{ mH}$                           | Gas Group IIC |
| $L_o = 365 \text{ mH}$                          | Gas Group IIB |
| $L_o = 696 \text{ mH}$                          | Gas Group IIA |
| $L_o/R_o = 247 \text{ } \mu\text{H}/\text{ohm}$ | Gas Group IIC |
| $L_o/R_o = 633 \text{ } \mu\text{H}/\text{ohm}$ | Gas Group IIB |
| $L_o/R_o = 633 \text{ } \mu\text{H}/\text{ohm}$ | Gas Group IIA |

**Special Conditions for Safe Use**

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 V insulation test required by EN50 020, Clause 6.4.12 (1994). This condition must be accounted for during installation.

**N1 ATEX Type N**

Certificate Number: BAS98ATEX3360X  II 3 G

EEx nL IIC T5 ( $T_{amb} = -45 \text{ } ^\circ\text{C}$  to  $40 \text{ } ^\circ\text{C}$ )

EEx nL IIC T4 ( $T_{amb} = -45 \text{ } ^\circ\text{C}$  to  $70 \text{ } ^\circ\text{C}$ )

$U_i = 55 \text{ V}$

**CE**

The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD)

**Special Conditions for Safe Use**

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 V insulation test required by EN50 021, Clause 9.1 (1995). This condition must be accounted for during installation.

**E1 ATEX Flameproof**

Certificate Number: KEMA02ATEX2320X  II 1/2 G

EEx d IIC T5 ( $-50 \text{ } ^\circ\text{C} \leq T_{amb} \leq 80 \text{ } ^\circ\text{C}$ )

T6 ( $-50 \text{ } ^\circ\text{C} \leq T_{amb} \leq 65 \text{ } ^\circ\text{C}$ )

**CE** 1180

**Special Conditions for Safe Use (x):**

The device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

**ND ATEX Dust**

Certificate Number: KEMA02ATEX2321  II 1 D

V = 55 Vdc MAX

I = 23 mA MAX

IP66

CE 1180

**Combinations of Certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

K5 E5 and I5 combination

K6 E6 and I6 combination

K1 I1, N1, E1, and ND combination

# Annubar Flowmeter Series

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## **INSTALLATION DRAWINGS**

### **Rosemount 3051SFA ProBar Flowmeter**

Rosemount Drawing 03031-1019, 12 Sheets:  
Factory Mutual (FM) Installation Drawing.

Rosemount Drawing 00268-0031, 7 Sheet:  
Factory Mutual (FM) Installation Drawing.

Rosemount Drawing 03031-1024, 1 Sheet:  
Canadian Standards Association (CSA) Installation Drawing.

### **Rosemount 3095MFA Mass ProBar Flowmeter**

Rosemount Drawing 03095-1025, 1 Sheet:  
Factory Mutual (FM) Installation Drawing.

Rosemount Drawing 03095-1020, 1 Sheet:  
Factory Mutual (FM) Installation Drawing.

Rosemount Drawing 03095-1021, 1 Sheet:  
Canadian Standards Association (CSA) Installation Drawing.

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### **IMPORTANT**

Once a device labeled with multiple approval types is installed, it should not be reinstalled using any of the other labeled approval types. To ensure this, the approval label should be permanently marked to distinguish the used from the unused approval type(s).

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Figure B-1. FM Installation  
 Drawing 03031-1019, Rev. AC  
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| CONFIDENTIAL AND PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY | REVISIONS |                                       |            |               |         |
|--|-----------|---------------------------------------|------------|---------------|---------|
|  | REV       | DESCRIPTION                           | CHG. NO.   | APP'D         | DATE    |
|  | AA        | ADD FIELDBUS                          | RTC1004088 | <b>M.L.M.</b> | 5/28/98 |
|  | AB        | ADD PROFIBUS, NONINCENDIVE PARAMETERS | RTC1008309 | <b>P.C.S.</b> | 2/4/00  |
|  | AC        | ADD FISCO DETAILS                     | RTC1011731 | J.P.W.        | 9/19/01 |

ENTITY APPROVALS FOR

|        |        |
|--------|--------|
| 3051C  | 3001C  |
| 3051L  | 3001CL |
| 3051P  | 3001CH |
| 3051H  | 3001S  |
| 3051CA | 3001SL |
| 3051T  | 3001SH |

OUTPUT CODE A (4-20 mA HART) I.S. SEE SHEETS 2-4  
 OUTPUT CODE M (LOW POWER) I.S. SEE SHEETS 5-6  
 OUTPUT CODE F/W (FIELDBUS) I.S. SEE SHEETS 7-11  
 ALL OUTPUT CODES NONINCENDIVE SEE SHEETS 12

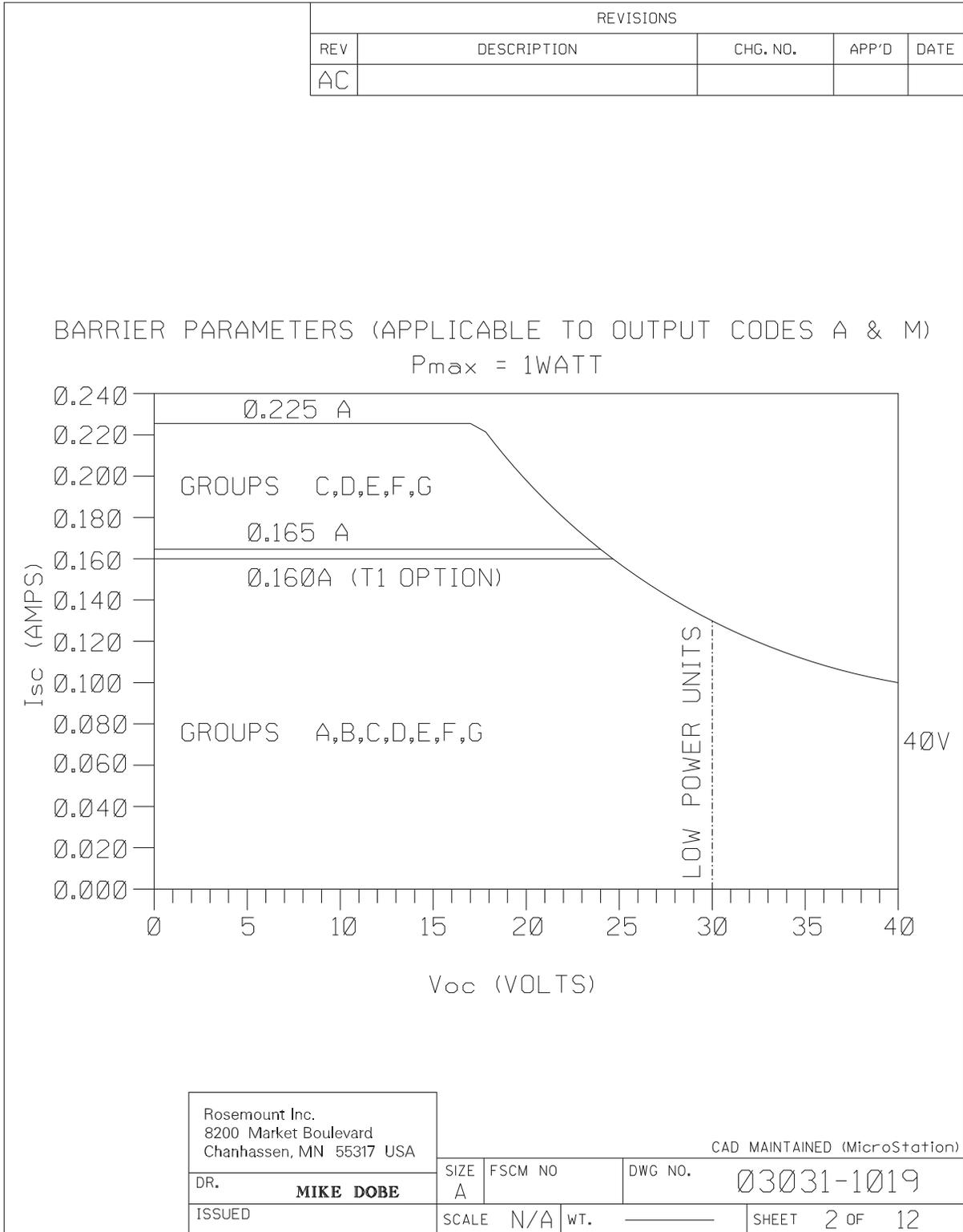
THE ROSEMOUNT TRANSMITTERS LISTED ABOVE ARE F.M. APPROVED AS INTRINSICALLY SAFE WHEN USED IN CIRCUIT WITH F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED IN THE CLASS I, II, AND III, DIVISION 1 GROUPS INDICATED, TEMP CODE T4. ADDITIONALLY, THE ROSEMOUNT 751 FIELD SIGNAL INDICATOR IS F.M. APPROVED AS INTRINSICALLY SAFE WHEN CONNECTED IN CIRCUIT WITH ROSEMOUNT TRANSMITTERS (FROM ABOVE) AND F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED FOR CLASS I, II, AND III, DIVISION 1, GROUPS INDICATED, TEMP CODE T4.

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.

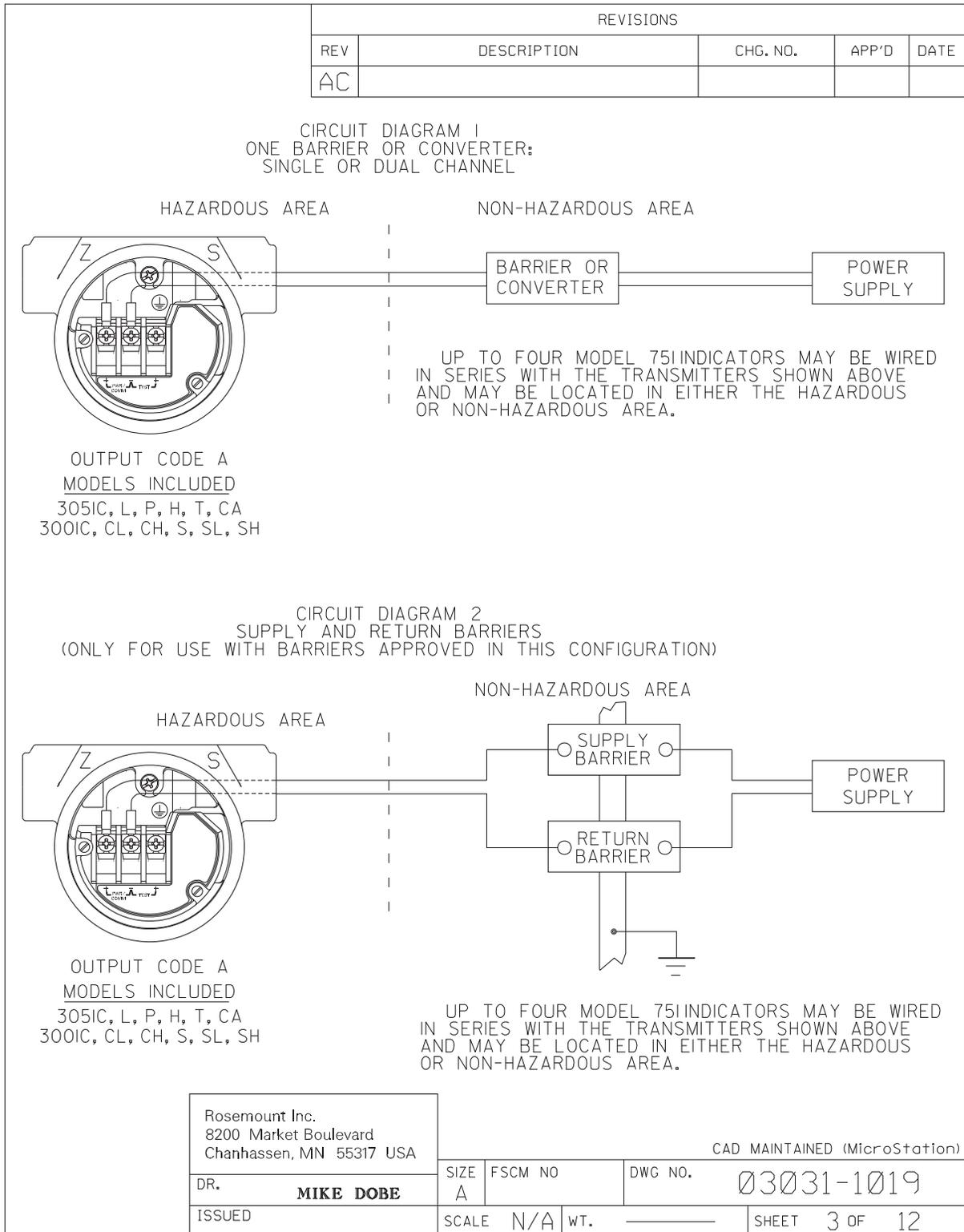
CAD MAINTAINED (MicroStation)

|  |                                   |   |               |
|--|-----------------------------------|---|---------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125<br><br>-TOLERANCE-<br>.X ± .1 [2,5]<br>.XX ± .02 [0,5]<br>.XXX ± .010 [0,25]<br><br>FRACTIONS      ANGLES<br>± 1/32            ± 2°<br><br>DO NOT SCALE PRINT | CONTRACT NO.                      |  <b>ROSEMOUNT®</b><br>8200 Market Boulevard • Chanhassen, MN 55317 USA |               |
|  | DR. <b>MIKE DOBE</b> 03/21/89     | TITLE<br>INDEX OF I.S. & NONINCENDIVE<br>F.M. FOR 3051C/L/P/H/T<br>AND 3001C/S  |               |
|  | CHK'D                             |   |               |
|  | APP'D. <b>KELLY ORTH</b> 03/22/89 | SIZE<br>A   | FSCM NO       |
| APP'D. GOVT.   | SCALE N/A                         | WT. _____   | SHEET 1 OF 12 |

03031-1019A01A



03031-1019A02A



03031-1019A03A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

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 ( $V_{oc}$  OR  $V_t$ ) AND MAX. SHORT CIRCUIT CURRENT ( $I_{sc}$  OR  $I_t$ ) AND MAX. POWER ( $V_{oc} \times I_{sc}/4$ ) OR ( $V_t \times I_t/4$ ), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE ( $V_{max}$ ), MAXIMUM SAFE INPUT CURRENT ( $I_{max}$ ), AND MAXIMUM SAFE INPUT POWER ( $P_{max}$ ) 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.

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

CLASS I, DIV. 1, GROUPS A AND B

|                    |  |
|--------------------|--|
| $V_{MAX} = 40V$    | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 165mA$  | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 165mA   |
| $P_{MAX} = 1$ WATT | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .01\mu f$   | $C_A$ IS GREATER THAN $.01\mu f$   |
| $L_I = 10\mu H$    | $L_A$ IS GREATER THAN $10\mu H$  |

\* FOR T1 OPTION:

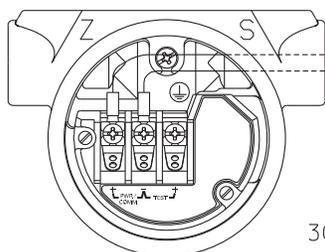
|                   |  |
|-------------------|--|
| $I_{max} = 160mA$ | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 160mA |
| $L_I = 1.05mH$    | $L_A$ IS GREATER THAN 1.05mH                     |

CLASS I, DIV. 1, GROUPS C AND D

|                    |  |
|--------------------|--|
| $V_{MAX} = 40V$    | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 225mA$  | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 225mA   |
| $P_{MAX} = 1$ WATT | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .01\mu f$   | $C_A$ IS GREATER THAN $.01\mu f$   |
| $L_I = 10\mu H$    | $L_A$ IS GREATER THAN $10\mu H$  |

\* FOR T1 OPTION:

|                |                              |
|----------------|------------------------------|
| $L_I = 1.05mH$ | $L_A$ IS GREATER THAN 1.05mH |
|----------------|------------------------------|



HAZARDOUS AREA | NON-HAZARDOUS AREA

ASSOCIATED APPARATUS

(SEE SHEET 3)

OUTPUT CODE A  
MODELS INCLUDED  
305IC, L, P, H, T, CA  
300IC, CL, CH, S, SL, SH

|   |           |                               |                           |  |
|---|-----------|-------------------------------|---------------------------|--|
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhassen, MN 55317 USA |           | CAD MAINTAINED (MicroStation) |                           |  |
| DR. <b>MIKE DOBE</b>  | SIZE<br>A | FSCM NO                       | DWG NO. <b>03031-1019</b> |  |
| ISSUED  | SCALE N/A | WT. _____                     | SHEET 4 OF 12             |  |

03031-1019A04A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

FOR OUTPUT CODE M

CLASS I, DIV. 1, GROUPS A AND B

|                            |  |
|----------------------------|--|
| $V_{MAX} = 30V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 30V   |
| $I_{MAX} = 165mA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 165mA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .042\mu f$          | $C_A$ IS GREATER THAN $.042\mu f$  |
| $L_I = 10\mu H$            | $L_A$ IS GREATER THAN $10\mu H$  |

\* FOR T1 OPTION:

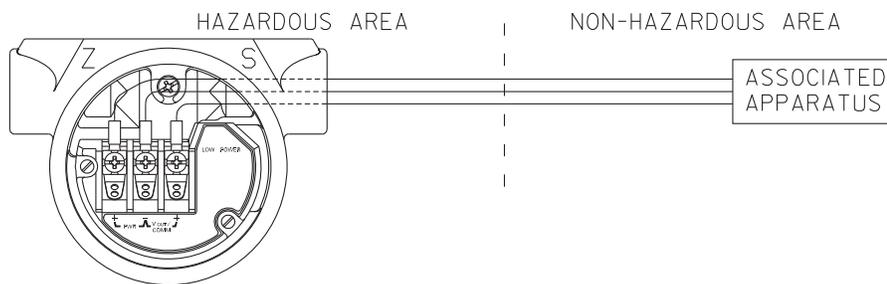
|                |                                |
|----------------|--------------------------------|
| $L_I = 0.75mH$ | $L_A$ IS GREATER THAN $0.75mH$ |
|----------------|--------------------------------|

CLASS I, DIV. 1, GROUPS C AND D

|                            |  |
|----------------------------|--|
| $V_{MAX} = 30V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 30V   |
| $I_{MAX} = 225mA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 225mA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .042\mu f$          | $C_A$ IS GREATER THAN $.042\mu f$  |
| $L_I = 10\mu H$            | $L_A$ IS GREATER THAN $10\mu H$  |

\* FOR T1 OPTION:

|                |                                |
|----------------|--------------------------------|
| $L_I = 0.75mH$ | $L_A$ IS GREATER THAN $0.75mH$ |
|----------------|--------------------------------|



OUTPUT CODE M  
 AVAILABLE FOR THE MODELS LISTED

|       |        |
|-------|--------|
| 305IC | 305IH  |
| 305IL | 305ICA |
| 305IP | 305IT  |

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 Chanhassen, MN 55317 USA

CAD MAINTAINED (MicroStation)

DR. **MIKE DOBE**

SIZE  
 A

FSCM NO

DWG NO.

03031-1019

ISSUED

SCALE

N/A

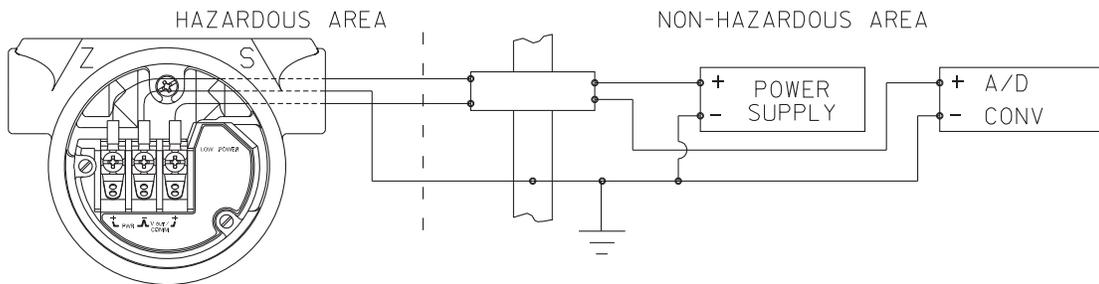
WT.

SHEET

5 OF 12

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

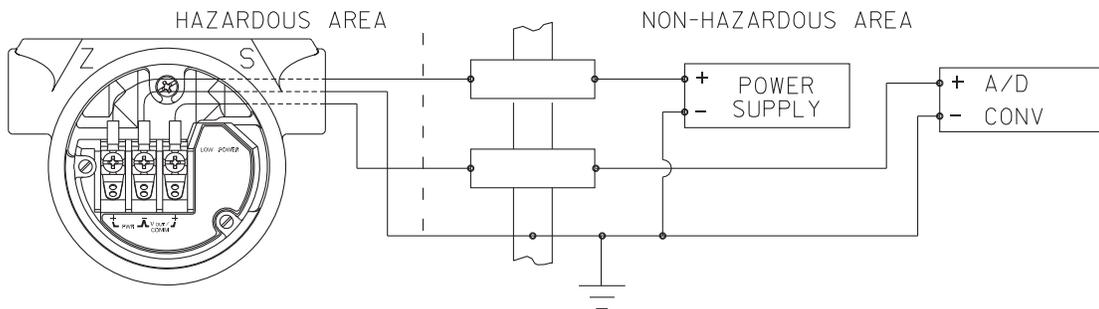
CIRCUIT DIAGRAM 3  
ONE DUAL CHANNEL BARRIER



OUTPUT CODE M  
AVAILABLE FOR THE MODELS LISTED

|       |        |
|-------|--------|
| 305IC | 305IH  |
| 305IL | 305ICA |
| 305IP | 305IT  |

CIRCUIT DIAGRAM 4  
TWO SINGLE CHANNEL BARRIERS  
(ONLY FOR USE WITH BARRIERS APPROVED  
IN THIS CONFIGURATION)



OUTPUT CODE M  
AVAILABLE FOR THE MODELS LISTED

|       |        |
|-------|--------|
| 305IC | 305IH  |
| 305IL | 305ICA |
| 305IP | 305IT  |

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CAD MAINTAINED (MicroStation)

DR. **SANDI MANSON**

SIZE  
A

FSCM NO

DWG NO.

03031-1019

ISSUED

SCALE

N/A

WT.

\_\_\_\_\_

SHEET

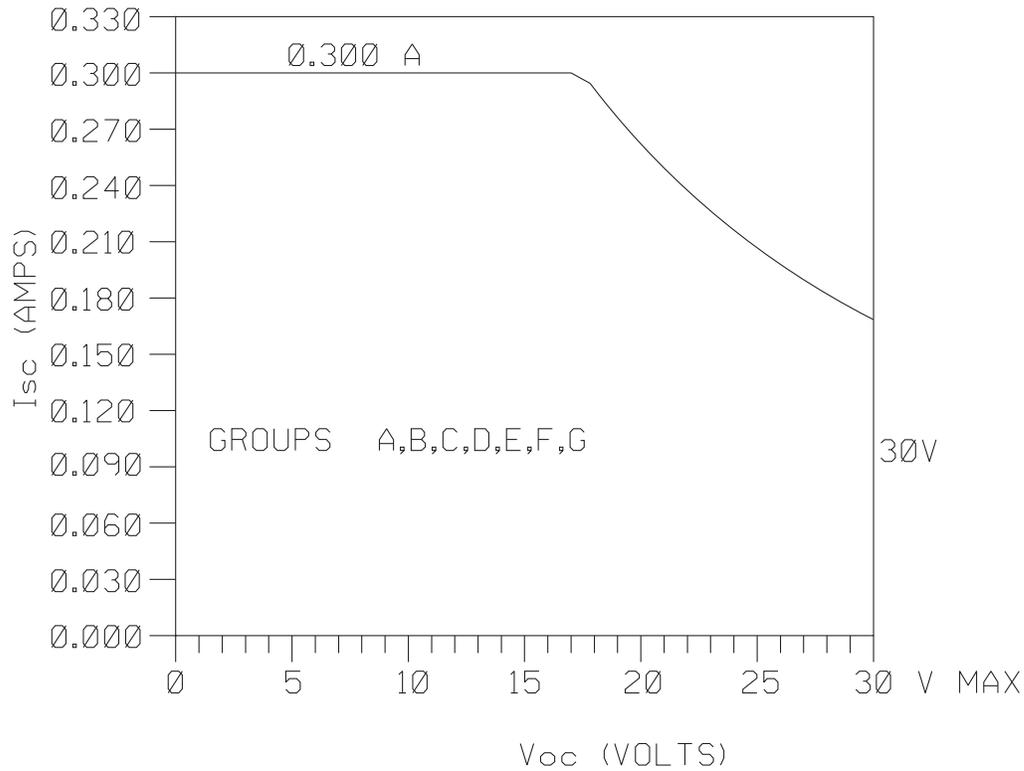
6 OF 12

03031-1019A06A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

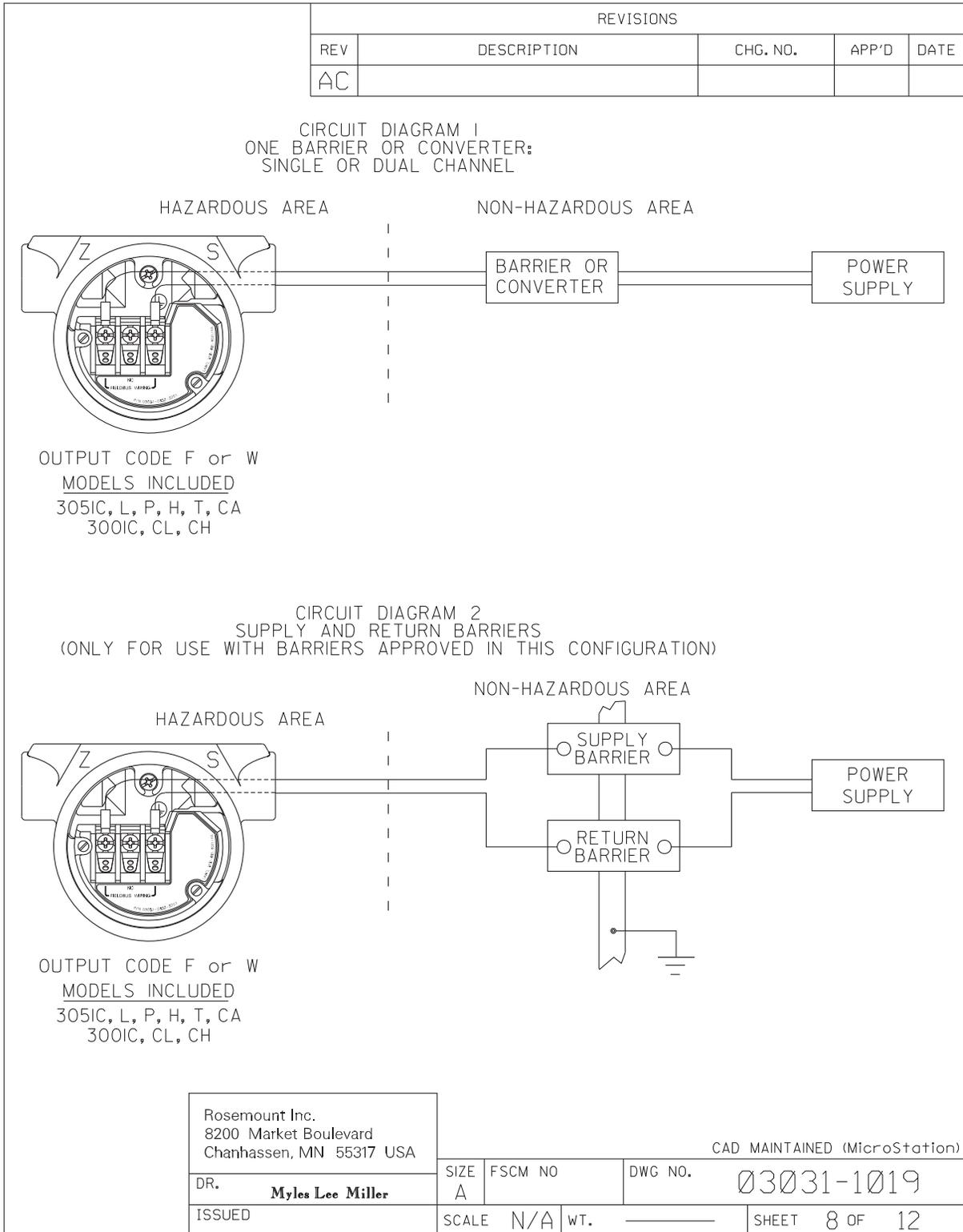
3051 WITH FOUNDATION FIELDBUS OR PROFIBUS.  
 (OUTPUT CODE F OR W)

BARRIER PARAMETERS (APPLICABLE TO OUTPUT CODE F OR W)  
 $P_{max} = 1.3 \text{ WATT}$



|   |           |                               |            |            |
|---|-----------|-------------------------------|------------|------------|
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| DR. <b>Myles Lee Miller</b>   | SIZE<br>A | FSCM NO                       | DWG NO.    | 03031-1019 |
| ISSUED  | SCALE N/A | WT.                           | SHEET 7 OF | 12         |

03031-1019A07A



03031-1019A08A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

ENTITY CONCEPT APPROVALS

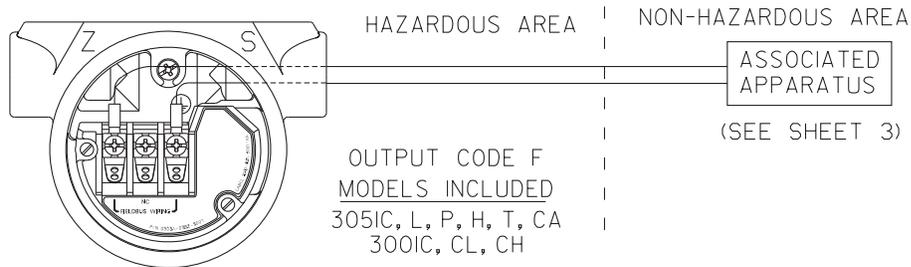
THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAX. OPEN CIRCUIT VOLTAGE ( $V_{oc}$  OR  $V_t$ ) AND MAX. SHORT CIRCUIT CURRENT ( $I_{sc}$  OR  $I_t$ ) AND MAX. POWER ( $V_{oc} \times I_{sc}/4$ ) OR ( $V_t \times I_t/4$ ), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE ( $V_{max}$ ), MAXIMUM SAFE INPUT CURRENT ( $I_{max}$ ), AND MAXIMUM SAFE INPUT POWER ( $P_{max}$ ) 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 F or W

CLASS I, DIV. 1, GROUPS A, B, C AND D

|                              |  |
|------------------------------|--|
| $V_{MAX} = 30V$              | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 30V   |
| $I_{MAX} = 300mA$            | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 300mA   |
| $P_{MAX} = 1.3 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ 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 $0 \mu H$  |



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| DR. <b>Myles Lee Miller</b> | SIZE<br>A    | FSCM NO. | DWG NO.<br>03031-1019 |
| ISSUED                      | SCALE<br>N/A | WT.      | SHEET 9 OF 12         |

03031-1019A09A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

## FISCO CONCEPT APPROVALS

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. FOR THIS INTERCONNECTION TO BE VALID THE VOLTAGE ( $U_1$  or  $V_{max}$ ), THE CURRENT ( $I_1$  or  $I_{max}$ ), AND THE POWER ( $P_1$  or  $P_{ma}$ ) THAT INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE, INCLUDING FAULTS, MUST BE EQUAL OR GREATER THAN THE 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. ALSO, THE MAXIMUM UNPROTECTED CAPACITANCE ( $C_1$ ) AND THE INDUCTANCE ( $L_1$ ) OF EACH APPARATUS (BESIDES THE TERMINATION) CONNECTED TO THE FIELD BUS MUST BE LESS THAN OR EQUAL TO 5nF AND 10μH RESPECTIVELY. ONLY ONE ACTIVE DEVICE IN EACH SECTION (USUALLY THE ASSOCIATED APPARATUS) IS ALLOWED TO CONTRIBUTE THE DESIRED ENERGY FOR THE FIELD BUS SYSTEM. THE ASSOCIATED APPARATUS' VOLTAGE  $U_0$  (or  $V_{oc}$  or  $V_t$ ) IS LIMITED TO A RANGE OF 14V TO 24 V.D.C. ALL OTHER EQUIPMENT COMBINED IN THE BUS CABLE MUST BE PASSIVE (THEY CANNOT PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50 μA FOR EACH CONNECTED DEVICE) SEPARATELY POWERED EQUIPMENT REQUIRES A GALVANIC ISOLATION TO AFFIRM THAT THE INTRINSICALLY SAFE FIELD BUS CIRCUIT WILL REMAIN PASSIVE. THE PARAMETER OF THE CABLE USED TO INTERCONNECT THE DEVICES MUST BE IN THE FOLLOWING RANGE:

LOOP RESISTANCE R': 15...150 OHM/km  
 INDUCTANCE PER UNIT LENGTH L': 0.4...1mH/KM  
 CAPACITANCE PER UNLIT LENGTH C': 80...200nF

C' = C' LINE/LINE +0.5C' LINE/SCREEN, IF BOTH LINES ARE FLOATING, OR  
 C' = C' LINE/LINE +C' LINE/SCREEN, IF THE SCREEN IS CONNECTED TO ONE LINE  
 TRUNK CABLE LENGTH: ≤ 1000 m  
 SPUR CABLE LENGTH: ≤ 30 m  
 SPLICE LENGTH: ≤ 1 m

AN APPROVED INFALLIBLE LINE TERMINATION TO EACH END OF THE TRUNK CABLE, WITH THE FOLLOWING PARAMETERS IS APPROPRIATE:

R = 90...100 OHMS                      C = 2.2μF

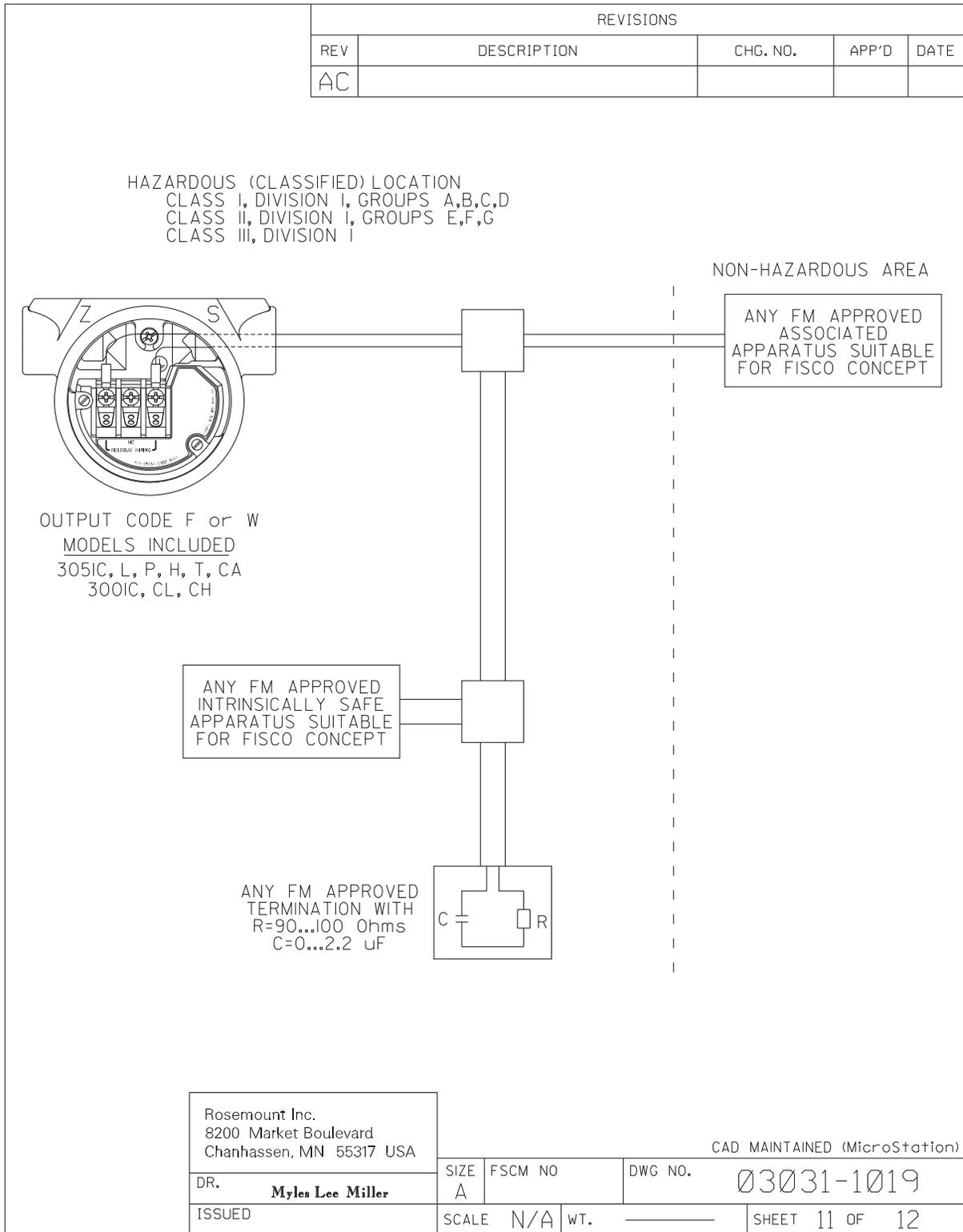
AN ALLOWED TERMINATION MIGHT ALREADY BE LINKED IN THE ASSOCIATED APPARATUS. DUE TO I.S. REASONS, THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED. IF THE RULES ABOVE ARE FOLLOWED, UP TO A TOTAL LENGTH OF 1000 m (THE SUMMATION OF TRUNK AND ALL SPUR CABLES), THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT DAMAGE THE INTRINSIC SAFETY OF THE SYSTEM.

NOTES:  
 INTRINSICALLY SAFE CLASS I, DIV. 1, GROUPS A, B, C, D

1. THE MAXIMUM NON-HAZARDOUS AREA VOLTAGE MUST NOT EXCEED 250 V.
2. CAUTION: ONLY USE SUPPLY WIRES SUITABLE FOR 5°C ABOVE SURROUNDING TEMPERATURE.
3. WARNING: REPLACEMENT OF COMPONENTS MAY DAMAGE INTRINSIC SAFETY.

|   |           |                               |           |                |
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| DR. <b>Myles Lee Miller</b>   | SIZE<br>A | FSCM NO                       | DWG NO.   | 03031-1019     |
| ISSUED  | SCALE     | N/A                           | WT. _____ | SHEET 10 OF 12 |

03031-1019A10A



03031-1019A11A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AC        |             |          |       |      |

NON-HAZARDOUS LOCATION

APPROVED NONINCENDIVE SUPPLY

DIVISION 2 HAZARDOUS (CLASSIFIED) LOCATION

|            |            |            |            |
|------------|------------|------------|------------|
| $V_{max1}$ | $V_{max2}$ | $V_{max3}$ | $V_{maxN}$ |
| $C_{I1}$   | $C_{I2}$   | $C_{I3}$   | $C_{IN}$   |
| $L_{I1}$   | $L_{I2}$   | $L_{I3}$   | $L_{IN}$   |
| $I_{max1}$ | $I_{max2}$ | $I_{max3}$ | $I_{maxN}$ |

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          | DEVICE   | ROSEMOUNT 3051/3001  |
|---------------------|--|--|
| $V_{oc}$            | $\leq$ Minimum of $(V_{max1}, V_{max2}, \dots, V_{maxN})$                                    | 4-20mA / HART      FIELDBUS (F or W)   |
| $I_{max1}$          | $\geq I_{q1} + I_{signal1}$  | $V_{max}$ 40v      30v   |
| $I_{max2}$          | $\geq I_{q1} + I_{signal2}$  | Maximum normal operating current      22mA      27mA   |
| .                   | .  | $C_a$ .010uF      0uF  |
| .                   | .  | $L_a$ 10uH      0uH  |
| $I_{maxN}$          | $\geq I_{qN} + I_{signalN}$  |  |
| $C_a$               | $\leq C_{I1} + C_{I2} + \dots + C_{IN} + C_{cable}$  | ROSEMOUNT 3051 TRANSMITTERS ARE CURRENT CONTROLLERS ON INDIVIDUAL PARALLEL BRANCHES WITH RESPECT TO THE POWER SUPPLY. IN NONINCENDIVE INSTALLATIONS THE $I_{max}$ FOR EACH TRANSMITTER IS NOT RELATED TO THE MAXIMUM CURRENT OF THE POWER SUPPLY ( $I_{sc}$ ) IN THE SAME MANNER AS FOR TRANSMITTER INSTALLED PER I.S. REQUIREMENTS, BECAUSE NONINCENDIVE REQUIREMENTS INCLUDE ONLY NORMAL OPERATING CONDITIONS. |
| $L_a$               | $\leq L_{I1} + L_{I2} + \dots + L_{IN} + L_{cable}$  |  |
| $I_{max}$           | for an individual device = $I_q + I_{signal}$  | REFERENCE: APPENDIX A7.3 (FM3611)  |
| $I_q$               | = Quiescent current through device<br>(Maximum quiescent current for the device)             |  |
| $I_{signal}$        | = Signaling current through device<br>(Protocol may limit signaling to one device at a time) |  |
| Operating $I_{max}$ | = $I_{q1} + I_{q2} + \dots + I_{qN} + I_{signal\ max}$                                       |  |
| $I_{signal\ max}$   | = Max. of $(I_{signal1}, I_{signal2}, \dots, I_{signalN})$                                   |  |

|   |  |
|---|--|
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| DR. <b>Jon Steffens</b>   | SIZE <b>A</b> FSCM NO.      DWG NO. <b>03031-1019</b>  |
| ISSUED  | SCALE <b>N/A</b> WT.      SHEET <b>12</b> OF <b>12</b> |

03031-1019A12A

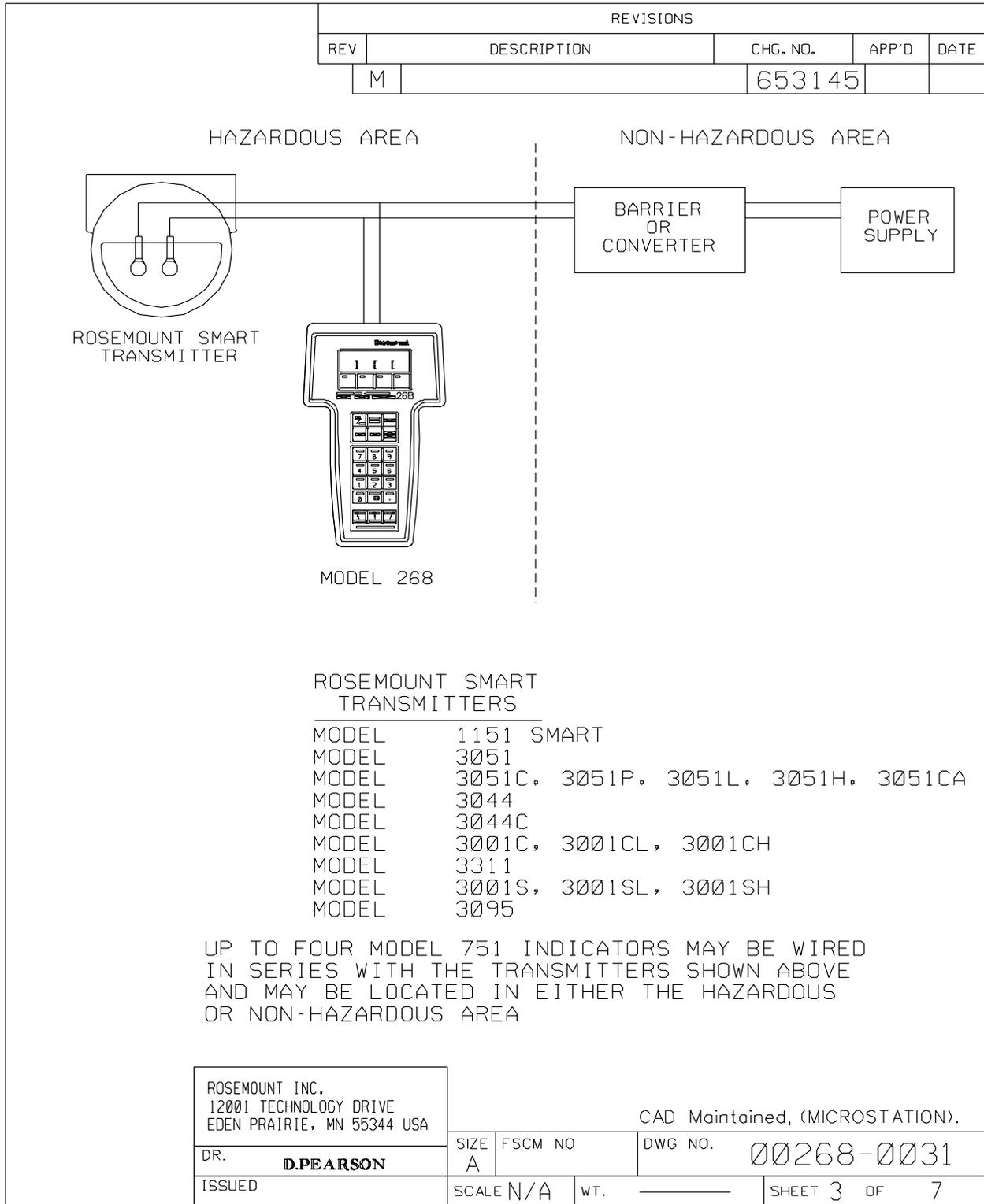
Figure B-2. FM Installation  
 Drawing 00268-0031, Rev. M  
 Page 1 of 7

| CONFIDENTIAL AND PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY   |  | REVISIONS  |                                     |  |               |                    |
|--|--|--|-------------------------------------|--|---------------|--------------------|
|  |  | REV  | DESCRIPTION                         | CHG. NO.   | APP'D         | DATE               |
|  |  | G  | ADD SHT 4&5, DELETE CLASS II & III. | 636328   | <b>B.S.J.</b> | 08/01/90           |
|  |  | H  | ADD 3051 P/L/H, 3001C CL /CH        | 636904   | <b>K.D.V.</b> | 09/06/90           |
|  |  | J  | ADD SHT. 6, FIX TBL. 1.             | 638723   | <b>B.S.J.</b> | 01/02/91           |
|  |  | K  | ADD 3044C                           | 641710   | <b>W.R.K.</b> | 06/13/91           |
|  |  | L  | ADD 3001S & SHT 7 FOR 3051C-LP      | 642380   | <b>G.E.M.</b> | 8/13/91            |
|  |  | M  | ADD 3095                            | 653145   | <b>K.D.V.</b> | 4/8/93             |
| <p>THE ROSEMOUNT MODEL 268 SMART FAMILY INTERFACE IS APPROVED BY FACTORY MUTUAL AS INTRINSICALLY SAFE FOR THE CLASS I, DIVISION 1 GROUPS INDICATED WHEN USED IN CIRCUIT WITH THE BARRIERS AND CONVERTERS LISTED BELOW AND THE ROSEMOUNT SMART FAMILY TRANSMITTERS DEPICTED IN THE ACCOMPANYING CIRCUIT DIAGRAMS.</p> |  |  |                                     |  |               |                    |
| BARRIER MANUFACTURER   |  | MODEL  |                                     | APPROVED FOR CLASS I DIVISION 1, GROUPS  |               |                    |
| FOXBORO  |  | 2AI-I2V-FGB<br>2AI-I3V-FGB<br>2AS-I3I-FGB<br>3A2-I2D-CS-E/FGB-A<br>3A2-I3D-CS-E/FGB-A  |                                     | A, B, C, D   |               |                    |
| HONEYWELL  |  | 38545-000-0110-113-F5B5<br>38545-000-0110-111/112-F5B5   |                                     | C, D   |               |                    |
| MTL  |  | 115<br>122<br>322<br>715<br>722  |                                     | A, B, C, D   |               |                    |
| R. STAHL   |  | 8901/31-199/100/7<br>8901/30-199/100/7<br>8901/31-280/165/7<br>8901/30-280/165/7<br>[ 8903/51-200/050/7<br>8901/31-086/150/7<br>[ 8901/31-280/165/7<br>8901/31-086/150/7<br>9005/01-245/060<br>9005/01-252/100 |                                     | A, B, C, D<br>A, B, C, D<br>C, D<br>C, D<br>A, B, C, D<br>A, B, C, D   |               |                    |
| TAYLOR   |  | 5850FL81200<br>5851FL81200<br>1130FF21000<br>1130FF22000<br>1135FF21000<br>1135FF22000   |                                     | C, D   |               |                    |
| CAD Maintained, (MICROSTATION).  |  |  |                                     |  |               |                    |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES (mm). REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125   |  | CONTRACT NO.   |                                     | <b>ROSEMOUNT MEASUREMENT</b><br>FISHEROSEMOUNT<br>ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |               |                    |
|  |  | DR. <b>MIKE DOBE</b> 2/7/90  |                                     |  |               |                    |
| -TOLERANCE-<br>.X * .1 [2.5]<br>.XX * .02 [0.5]<br>.XXX * .010 [0.25]<br>FRACTIONS ANGLES<br>* 1/32 * 2°   |  | CHK'D  |                                     | TITLE<br>INDEX OF I.S. BARRIER SYSTEMS FOR MOD. 268 SMART FAMILY INTERFACE   |               |                    |
|  |  | APP'D. <b>K. CARLSON</b> 03/13/90  |                                     |  |               |                    |
| DO NOT SCALE PRINT   |  | APP'D. GOVT.   |                                     | SIZE<br>A  | FSCM NO       | DWG NO. 00268-0031 |
|  |  |  |                                     | SCALE  | WT. _____     | SHEET 1 OF 7       |

0031A01A

| REVISIONS   |                  |   |           |  |
|---|------------------|---|-----------|--|
| REV   | DESCRIPTION      | CHG. NO.  | APP'D     | DATE   |
| M   |                  | 653145  |           |  |
| <p>ENTITY CONCEPT APPROVALS</p> <p>THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAXIMUM OPEN CIRCUIT VOLTAGE (<math>V_T</math> OR <math>V_{OC}</math>) AND MAXIMUM SHORT CIRCUIT CURRENT (<math>I_T</math> OR <math>I_{SC}</math>) AND MAXIMUM OUTPUT POWER (<math>\frac{V_{OC} \times I_{SC}}{4}</math> OR <math>\frac{V_T \times I_T}{4}</math>), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (<math>V_{MAX}</math>), MAXIMUM SAFE INPUT CURRENT (<math>I_{MAX}</math>) AND MAXIMUM SAFE INPUT POWER (<math>P_{MAX}</math>) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAXIMUM ALLOWABLE CONNECTED CAPACITANCE (<math>C_A</math>) AND INDUCTANCE (<math>L_A</math>) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE MAXIMUM UNPROTECTED INTERNAL CAPACITANCE (<math>C_I</math>) AND INDUCTANCE (<math>L_I</math>) OF THE INTRINSICALLY SAFE APPARATUS. THE APPROVED ENTITY CONCEPT PARAMETERS ARE AS FOLLOWS:</p> <p style="text-align: center;">NOTE: ENTITY PARAMETERS LISTED APPLY ONLY TO ASSOCIATED APPARATUS WITH LINEAR OUTPUT.</p> |                  |   |           |  |
| INPUT PARAMETERS (CLASS I, DIV. 1, GROUPS A, B, C, D)   |                  |   |           |  |
| VMAX = 32 VDC   |                  | V <sub>T</sub> or V <sub>OC</sub> of barrier must be ≤ 32 Vdc |           |  |
| IMAX = 186 MA   |                  | I <sub>T</sub> or I <sub>SC</sub> of barrier must be ≤ 186 mA |           |  |
| CI = 0.01 UF  |                  | C <sub>A</sub> of barrier must be ≥ 0.01 μF                   |           |  |
| LI = 1.1 MH   |                  | L <sub>A</sub> of barrier must be ≥ 1.1 mH                    |           |  |
| P <sub>MAX</sub> :  | 1.1W             | 0.8W  | 0.6W      | V <sub>OC</sub> × I <sub>SC</sub> of barrier must be ≤ specified value.<br>4 |
| TEMP CODE   | T4A              | T5  | T6        |  |
| OUTPUT PARAMETERS   |                  |   |           |  |
| VOC = 1.5 VD.C.   |                  |   |           |  |
| ISC = 27 MA   |                  |   |           |  |
| C <sub>A</sub> = 10,000 UF  |                  |   |           |  |
| L <sub>A</sub> = 46 MH  |                  |   |           |  |
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA  |                  | CAD Maintained, (MICROSTATION).                               |           |  |
| DR.   | <b>D.PEARSON</b> | SIZE<br>A   | FSCM NO   | DWG NO. <b>00268-0031</b>  |
| ISSUED  |                  | SCALE N/A   | WT. _____ | SHEET 2 OF 7   |

0031A02A



0031A03A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| M         |             | 653145   |       |      |

THE MAXIMUM ALLOWABLE CONNECTED INDUCTANCE ( $L_a$ ) OF THE ASSOCIATED APPARATUS IS DETERMINED BY ADDING 27 mA TO THE  $I_{sc}$  OF THE BARRIER ( $I_m = I_{sc} + 27\text{mA}$ ) AND ENTERING TABLE 1 (SHT 5) AT THE RESULTING VALUE,  $I_m$ , OR THE NEXT HIGHER VALUE OF  $I_m$ , TO DETERMINE THE  $L_a$ . (THE  $L_a$  MUST INCLUDE THE  $L_1$  OF THE MODEL 268, WHICH IS 1.1mH).

EXAMPLE #1:  $I_{sc}$  OF BARRIER = 100mA.  
 $I_m = 100\text{mA} + 27\text{mA} = 127\text{mA}$   
 ENTER TABLE AT  $I_m = 130\text{mA}$ ;  $L_a = 2.0\text{mH}$

--WARNING-- BEFORE CONNECTING THE MODEL 268 INTO THE LOOP, DETERMINE THE CONNECTED INDUCTANCE OF THE SYSTEM BY ADDING THE  $L_1$  OF THE TRANSMITTER, CABLE, AND MODEL 268. THE SUM MUST BE LESS THAN THE  $L_a$  DETERMINED FROM THE TABLE IN ORDER FOR THE MODEL 268 TO BE CONNECTED INTO THE LOOP. IF THE CONNECTED INDUCTANCE IS GREATER THAN THE VALUE DETERMINED FROM THE TABLE, A BARRIER WITH A LOWER  $I_{sc}$  MUST BE CHOSEN.

EXAMPLE #2: BARRIER  $I_{sc}$  = 41.8mA; BARRIER  $L_a$  = 20.0mH  
 $I_m = 41.8\text{mA} + 27\text{mA} = 68.8\text{mA}$ ;  
 ENTER TABLE AT 70mA AND READ  $L_a = 7.5\text{mH}$   
 ADD CONNECTED INDUCTANCE OF SYSTEM:

|                            |                       |
|----------------------------|-----------------------|
| MODEL 268                  | $L_1 = 1.1\text{mH}$  |
| MODEL 3051 TRANSMITTER     | $L_1 = 0.48\text{mH}$ |
| INDUCTANCE OF LOOP WIRING  | 1.0mH                 |
| -----                      |                       |
| TOTAL CONNECTED INDUCTANCE | = 2.58mH              |

TOTAL CONNECTED INDUCTANCE IS LESS THAN  $L_a = 7.5\text{mH}$  AS DETERMINED ABOVE AND IS ALSO LESS THAN THE BARRIER  $L_a$ . THE MODEL 268 MAY SAFELY BE CONNECTED INTO THE LOOP. IF THE MODEL 751 INDICATORS ARE USED, THEIR TOTAL INDUCTANCE (LABEL VALUE \* NUMBER OF INDICATORS) MUST ALSO BE INCLUDED.

|  |           |                                 |                    |   |
|--|-----------|---------------------------------|--------------------|---|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |                    |   |
| DR. <b>S.BARDUSON</b> 30JUL90  | SIZE<br>A | FSCM NO                         | DWG NO. 00268-0031 |   |
| ISSUED   | SCALE N/A | WT. _____                       | SHEET 4 OF         | 7 |

0031A04A

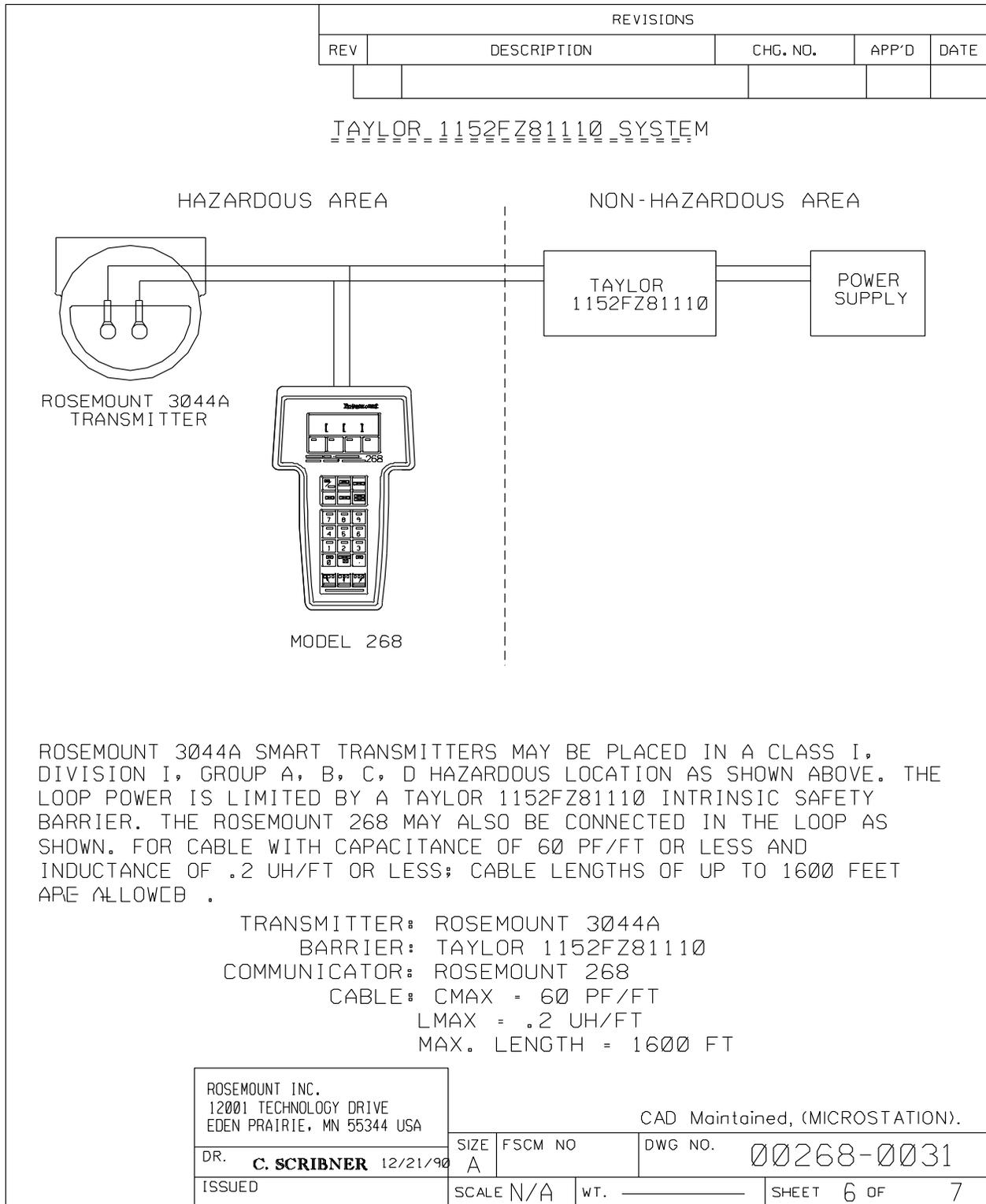
| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| M         |             | 653145   |       |      |

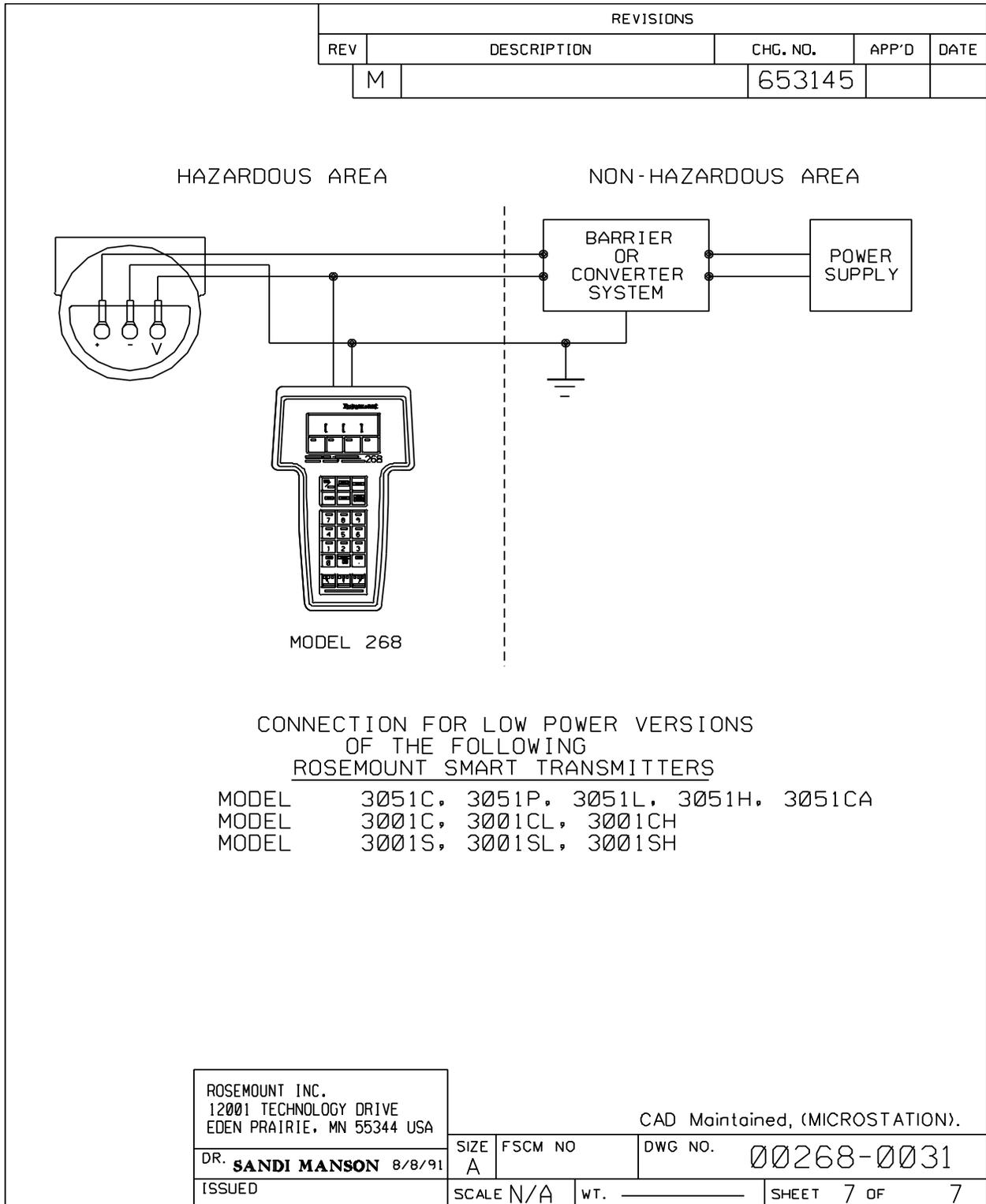
| Im (mA) | La (mH) |
|---------|---------|
| 150     | 1.3     |
| 145     | 1.5     |
| 140     | 1.6     |
| 130     | 2.0     |
| 120     | 2.5     |
| 110     | 3.0     |
|         |         |
| 100     | 4.0     |
| 90      | 5.0     |
| 85      | 5.5     |
| 80      | 6.0     |
| 75      | 6.7     |
|         |         |
| 70      | 7.5     |
| 65      | 8.8     |
| 62      | 9.5     |
| 60      | 10.0    |
| 57      | 11.0    |
|         |         |
| 55      | 12.0    |
| 50      | 15.0    |
| 45      | 19.0    |
| 40      | 23.0    |
| 35      | 31.0    |

TABLE 1

|  |         |                                 |           |                    |
|--|---------|---------------------------------|-----------|--------------------|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |         | CAD Maintained, (MICROSTATION). |           |                    |
| DR. <b>S.BARDUSON</b>  | 30JUL90 | SIZE<br>A                       | FSCM NO   | DWG NO. 00268-0031 |
| ISSUED   |         | SCALE N/A                       | WT. _____ | SHEET 5 OF 7       |

0031A05A





# Annubar Flowmeter Series

Figure B-3. CSA Installation  
Drawing 03031-1024, Rev. AD  
Page 1 of 9

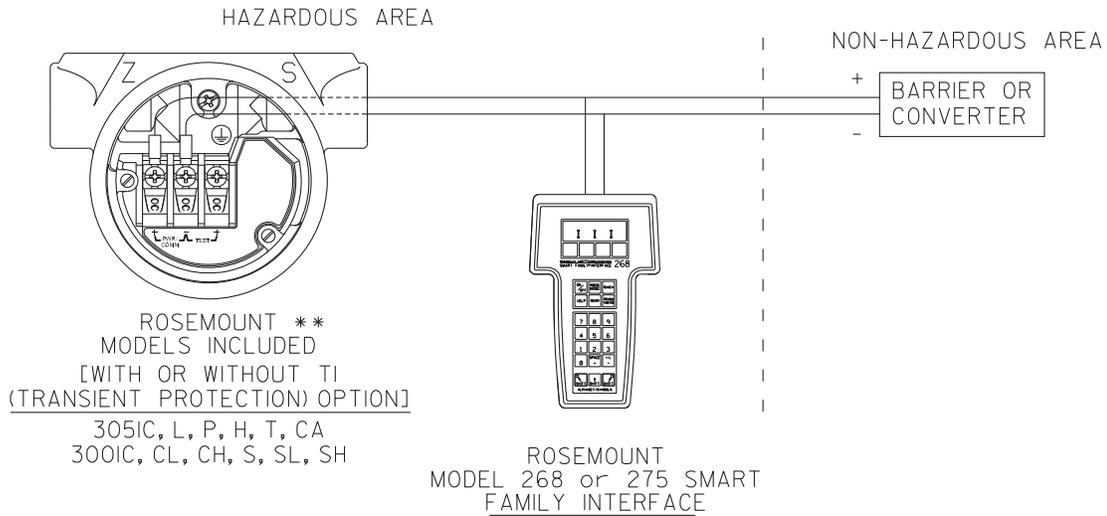
| CONFIDENTIAL AND PROPRIETARY<br>INFORMATION IS CONTAINED<br>HEREIN AND MUST BE<br>HANDLED ACCORDINGLY  | REVISIONS                        |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
|--|----------------------------------|--------------------------------------|--|---------------|---------------------------|----------------------------|-------|-------|--------|-------|--------|-------|-------|--------|--------|-------|--------|
|  | REV                              | DESCRIPTION                          | CHG. NO.   | APP'D         | DATE                      |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | AA                               | ADD FIELDBUS                         | RTC1004232   | <b>M.L.M.</b> | 5/28/98                   |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | AB                               | ADD PROFIBUS, ENTITY<br>PARAMETERS   | RTC1008326   | <b>P.C.S.</b> | 2/4/00                    |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | AC                               | REM It, Vt FROM<br>ENTITY PARAMETERS | RTC1009279   | <b>W.C.R.</b> | 7/11/00                   |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | AD                               | ADD FISCO FIELDBUS                   | RTC1012624   | <b>J.P.W.</b> | 4/4/02                    |                            |       |       |        |       |        |       |       |        |        |       |        |
| <p>APPROVALS FOR</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>3051C</td><td>3001C</td></tr> <tr><td>3051L</td><td>3001CL</td></tr> <tr><td>3051P</td><td>3001CH</td></tr> <tr><td>3051H</td><td>3001S</td></tr> <tr><td>3051CA</td><td>3001SL</td></tr> <tr><td>3051T</td><td>3001SH</td></tr> </table> <p>OUTPUT CODE A (4-20 mA HART) I.S. SEE SHEETS 2-3<br/>           OUTPUT CODE M (LOW POWER) I.S. SEE SHEETS 3-4<br/>           OUTPUT CODE F/W (FIELDBUS) I.S. SEE SHEETS 5-7<br/>           OUTPUT CODES A,F,W I.S. ENTITY PARAMETERS SHEET 8-9</p> <p>TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER AND BARRIER<br/>           MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING<br/>           INSTRUCTIONS AND THE APPLICABLE CIRCUIT DIAGRAM.</p> <p>WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS<br/>           MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.</p> <p>AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS<br/>           PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMES<br/>           DE CLASSE I, DIVISION 2.</p> |                                  |                                      |  |               |                           | 3051C                      | 3001C | 3051L | 3001CL | 3051P | 3001CH | 3051H | 3001S | 3051CA | 3001SL | 3051T | 3001SH |
| 3051C  | 3001C                            |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| 3051L  | 3001CL                           |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| 3051P  | 3001CH                           |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| 3051H  | 3001S                            |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| 3051CA   | 3001SL                           |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| 3051T  | 3001SH                           |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| CAD MAINTAINED (MicroStation)  |                                  |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS IN INCHES [mm].<br>REMOVE ALL BURRS AND<br>SHARP EDGES. MACHINE<br>SURFACE FINISH 125<br><br>-TOLERANCE-<br>.X ± .1 [2,5]<br>.XX ± .02 [0,5]<br>.XXX ± .010 [0,25]<br><br>FRACTIONS      ANGLES<br>± 1/32            ± 2°<br><br>DO NOT SCALE PRINT   | CONTRACT NO.                     |                                      | <b>ROSEMOUNT®</b><br><small>8200 Market Boulevard • Chanhassen, MN 55317 USA</small> |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | DR. <b>Mike Dobe</b> 08/27/90    |                                      | TITLE<br><b>INDEX OF I.S. CSA FOR<br/>           3051C/L/P/H/T &amp; 3001C/S</b>     |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | CHK'D                            |                                      |  |               |                           |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | APP'D. <b>GLEN MONZO</b> 8/31/90 |                                      | SIZE   | FSCM NO       | DWG NO. <b>03031-1024</b> |                            |       |       |        |       |        |       |       |        |        |       |        |
|  | APP'D. GOVT.                     |                                      | A  |               | SCALE                     | N/A WT. _____ SHEET 1 OF 9 |       |       |        |       |        |       |       |        |        |       |        |

03031-1024A01A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AD        |             |          |       |      |

CSA INTRINSIC SAFETY APPROVALS  
 CIRCUIT CONNECTION WITH BARRIER OR CONVERTER

Ex ia  
 INTRINSICALLY SAFE/SECURITE INTRINSEQUE  
 4-20 mA, ("A" OUTPUT CODE)



\*\* FOR THE LOW POWER OPTION, SEE PAGE 4 FOR THE CIRCUIT CONNECTION WITH BARRIER OR CONVERTER. FOR FIELDBUS OPTIONS("F" or "W" OUTPUT CODE), SEE PAGE 5 FOR PARAMETERS AND CIRCUIT CONNECTION TO BARRIER.

|   |           |                               |            |            |
|---|-----------|-------------------------------|------------|------------|
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhassen, MN 55317 USA |           | CAD MAINTAINED (MicroStation) |            |            |
| DR. <b>Mike Dobe</b> 08/27/90                                       | SIZE<br>A | FSCM NO.                      | DWG NO.    | 03031-1024 |
| ISSUED  | SCALE N/A | WT.                           | SHEET 2 OF | 9          |

03031-1024A02A

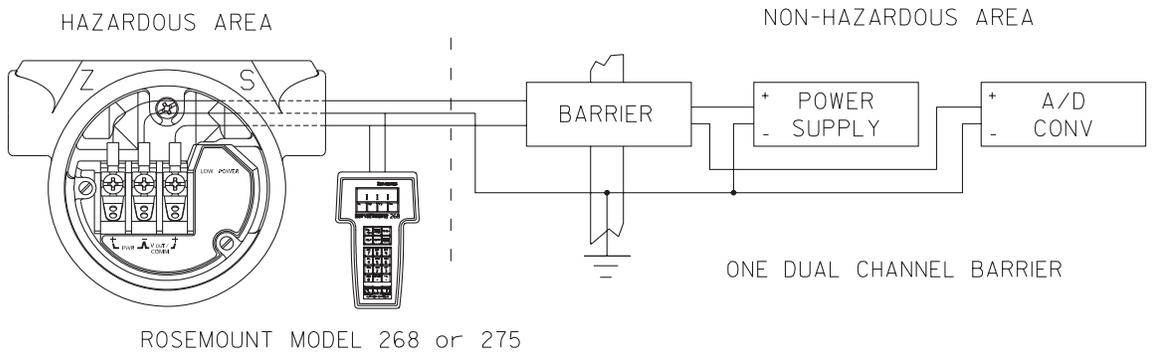
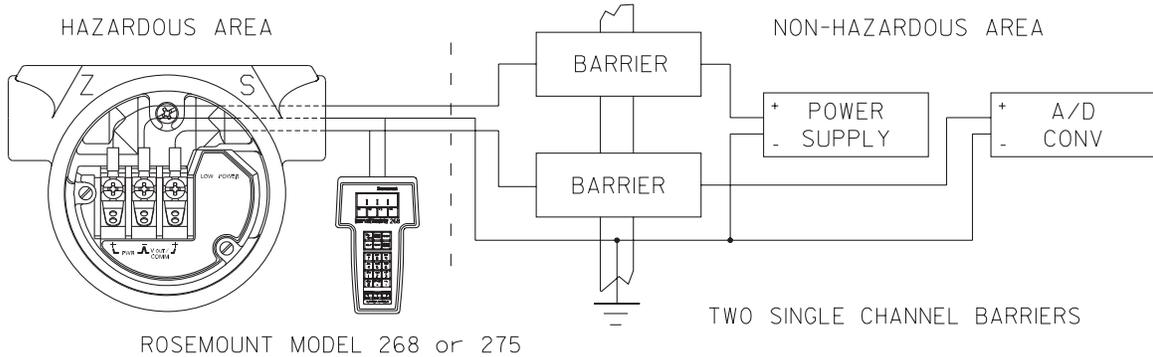
|   |  | REVISIONS                     |                            |      |  |
|---|--|-------------------------------|----------------------------|------|--|
| REV   | DESCRIPTION  | CHG. NO.                      | APP'D                      | DATE |  |
| AD  |  |                               |                            |      |  |
| 4-20 mA, ("A" OUTPUT CODE)  |  |                               |                            |      |  |
| DEVICE  | PARAMETERS   | APPROVED FOR CLASS I, DIV.I   |                            |      |  |
| CSA APPROVED SAFETY BARRIER   | 30 V OR LESS<br>* 330 OHMS OR MORE<br>* 28 V OR LESS<br>* 300 OHMS OR MORE<br>25 V OR LESS<br>200 OHMS OR MORE<br>* 22 V OR LESS<br>* 180 OHMS OR MORE | GROUPS A, B, C, D             |                            |      |  |
| FOXBORO CONVERTER<br>2AI-I2V-CGB, 2AI-I3V-CGB,<br>2AS-I3I-CGB, 3A2-I2D-CGB,<br>3A2-I3D-CGB, 3AD-I3I-CGB,<br>3A4-I2D-CGB, 2AS-I2I-CGB,<br>3F4-I2DA |  | GROUPS B, C, D                |                            |      |  |
| CSA APPROVED SAFETY BARRIER   | 30 V OR LESS<br>150 OHMS OR MORE   | GROUPS C, D                   |                            |      |  |
| LOW POWER, ("M" OUTPUT CODE)  |  |                               |                            |      |  |
| DEVICE  | PARAMETERS   | APPROVED FOR CLASS I, DIV.I   |                            |      |  |
| CSA APPROVED SAFETY BARRIER   | Supply $\leq 28V, \geq 300 \Omega$<br>Return $\leq 10V, \geq 47 \Omega$  | GROUPS A, B, C, D             |                            |      |  |
|   | Supply $\leq 30V, \geq 150 \Omega$<br>Return $\leq 10V, \geq 47 \Omega$  | GROUPS C, D                   |                            |      |  |
| * MAY BE USED WITH ROSEMOUNT MODEL 268 or 275 SMART FAMILY INTERFACE.   |  |                               |                            |      |  |
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhassen, MN 55317 USA   |  | CAD MAINTAINED (MicroStation) |                            |      |  |
| DR. <b>Mike Dobe</b>  | SIZE<br>A  | FSCM NO                       | DWG NO. <b>03031-1024</b>  |      |  |
| ISSUED  | SCALE <b>N/A</b>   | WT. _____                     | SHEET <b>3</b> OF <b>9</b> |      |  |

03031-1024A03A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AD        |             |          |       |      |

CSA INTRINSIC SAFETY APPROVALS  
 3051C LOW POWER CIRCUIT CONNECTION WITH INTRINSIC SAFETY BARRIERS

Ex ia  
 INTRINSICALLY SAFE/SECURITE INTRINSEQUE  
 LOWPOWER, ("M" OUTPUT CODE)



APPROVED FOR CLASS I, DIVISION I, GROUPS A,B,C,D WHEN USED IN CIRCUIT WITH TWO CSA APPROVED SINGLE CHANNEL SAFETY BARRIERS, ONE WITH APPROVED SAFETY PARAMETERS OF 28 VOLTS OR LESS AND 300 OHMS OR MORE IN +PWR LINE, AND ONE WITH APPROVED SAFETY PARAMETERS OF 10 VOLTS OR LESS AND 47 OHMS OR MORE IN  $V_{out}$  LINE, OR ONE CSA APPROVED DUAL CHANNEL SAFETY BARRIER WITH IDENTICAL APPROVED SAFETY PARAMETERS CONNECTED IN LIKE MANNER, AS ABOVE.

APPROVED FOR CLASS I, DIVISION I, GROUPS C,D WHEN USED IN CIRCUIT WITH TWO CSA APPROVED SINGLE CHANNEL SAFETY BARRIERS, ONE WITH APPROVED SAFETY PARAMETERS OF 30 VOLTS OR LESS AND 150 OHMS OR MORE IN +PWR LINE AND ONE WITH APPROVED SAFETY PARAMETERS OF 10 VOLTS OR LESS AND 47 OHMS OR MORE IN  $V_{out}$  LINE.

|  |                     |                               |         |                        |
|--|---------------------|-------------------------------|---------|------------------------|
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhasen, MN 55317 USA |                     | CAD MAINTAINED (MicroStation) |         |                        |
| DR.  | <b>SANDI MANSON</b> | SIZE                          | FSCM NO | DWG NO. 03031-1024     |
| ISSUED   |                     | SCALE                         | N/A     | WT. _____ SHEET 4 OF 9 |

03031-1024A04A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AD        |             |          |       |      |

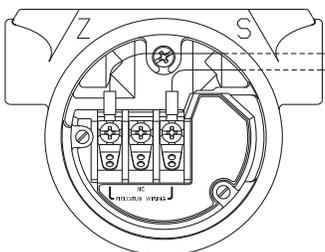
FIELDBUS, ("F" or "W" OUTPUT CODE)

|                             |  |                              |
|-----------------------------|--|------------------------------|
| DEVICE                      | PARAMETERS   | APPROVED FOR CLASS I, DIV. I |
| CSA APPROVED SAFETY BARRIER | 30 V OR LESS<br>300 OHMS OR MORE<br>28 V OR LESS<br>235 OHMS OR MORE<br>25 V OR LESS<br>160 OHMS OR MORE<br>22 V OR LESS<br>100 OHMS OR MORE | GROUPS A, B, C, D            |

CSA INTRINSIC SAFETY APPROVALS  
CIRCUIT CONNECTION WITH BARRIER OR CONVERTER

Ex ia  
INTRINSICALLY SAFE/SECURITE INTRINSEQUE  
FIELDBUS, ("F" or "W" OUTPUT CODE)

HAZARDOUS AREA



NON-HAZARDOUS AREA

+  
BARRIER OR CONVERTER  
-

ROSEMOUNT \*\*  
MODELS INCLUDED  
[WITH OR WITHOUT TI  
(TRANSIENT PROTECTION) OPTION]  
305IC, L, P, H, T, CA  
300IC, CL, CH, S, SL, SH

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS  
MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

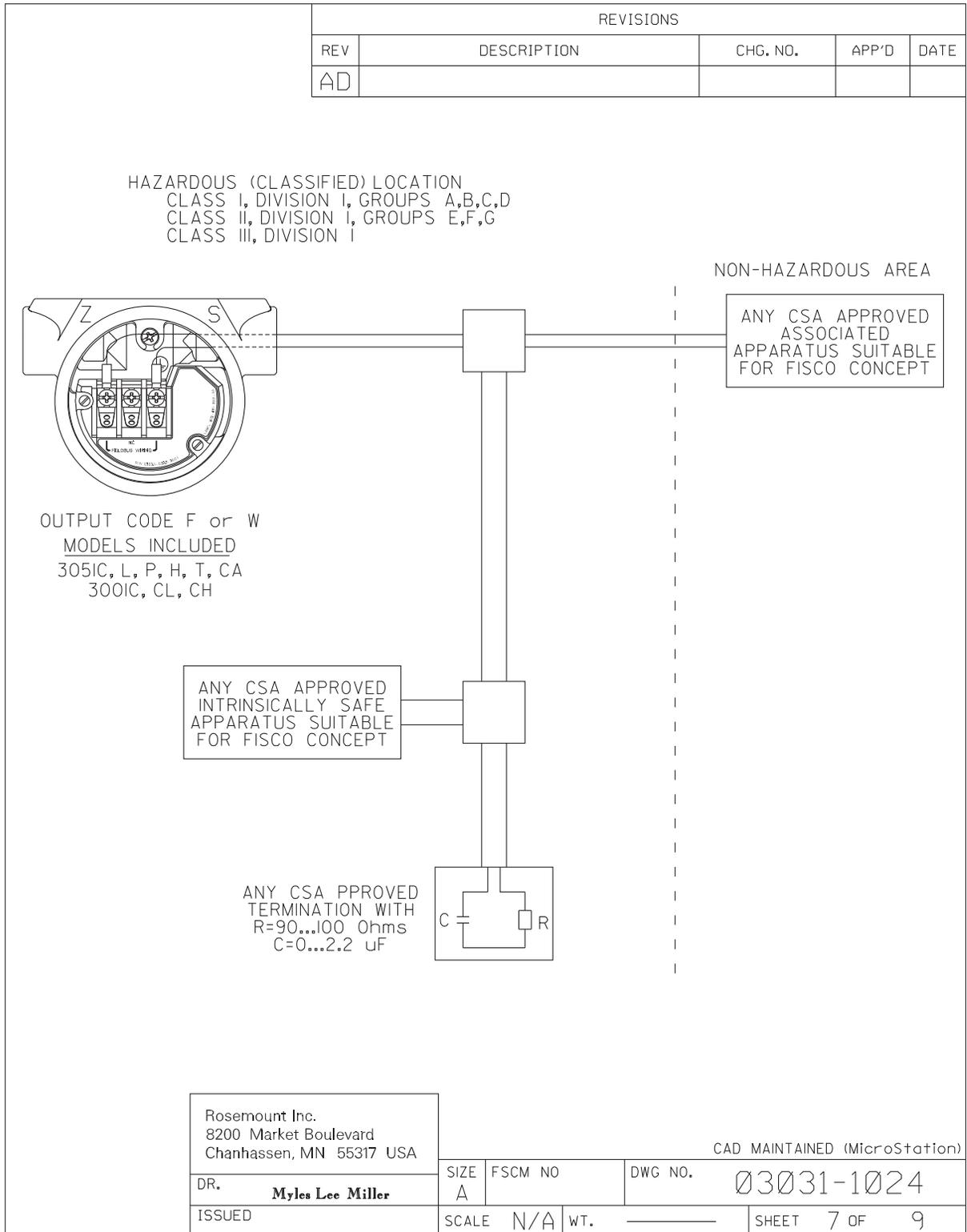
AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS  
PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMES  
DE CLASSE I, DIVISION 2.

|   |           |                               |         |            |
|---|-----------|-------------------------------|---------|------------|
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhassen, MN 55317 USA |           | CAD MAINTAINED (MicroStation) |         |            |
| DR. <b>Myles Lee Miller</b>   | SIZE<br>A | FSCM NO                       | DWG NO. | 03031-1024 |
| ISSUED  | SCALE N/A | WT.                           | SHEET   | 5 OF 9     |

03031-1024A05A



# Annubar Flowmeter Series



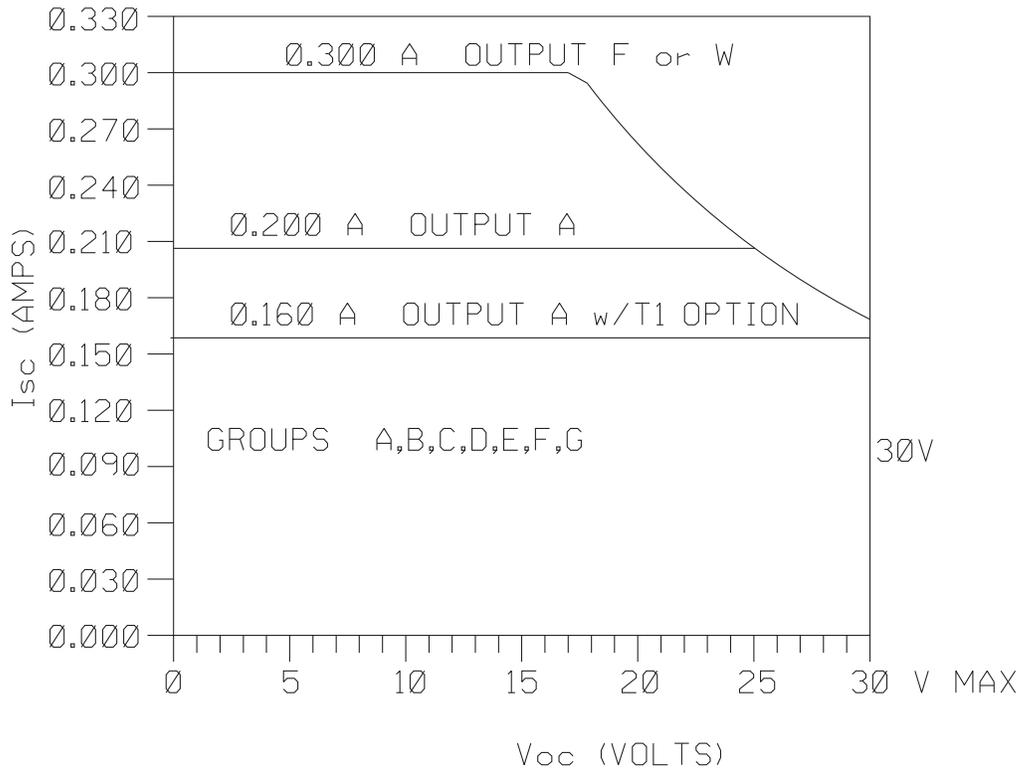
03031-1024A07A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AD        |             |          |       |      |

3051 I.S. ENTITY PARAMETERS.  
 (OUTPUT CODE A,F, or W)

BARRIER PARAMETERS (APPLICABLE TO OUTPUT CODE A,F, or W)

$P_{max} = 1.3$  WATT OUTPUT F or W  
 $P_{max} = 1.0$  WATT OUTPUT A



Rosemount Inc.  
 8200 Market Boulevard  
 Chanhassen, MN 55317 USA

CAD MAINTAINED (MicroStation)

|                         |           |           |                           |
|-------------------------|-----------|-----------|---------------------------|
| DR. <b>JON STEFFENS</b> | SIZE<br>A | FSCM NO.  | DWG NO. <b>03031-1024</b> |
| ISSUED                  | SCALE N/A | WT. _____ | SHEET 8 OF 9              |

03031-1024A08A

| REVISIONS |             |          |       |      |
|-----------|-------------|----------|-------|------|
| REV       | DESCRIPTION | CHG. NO. | APP'D | DATE |
| AD        |             |          |       |      |

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 ( $V_{oc}$ ) AND MAX. SHORT CIRCUIT CURRENT ( $I_{sc}$ ) AND MAX. POWER ( $V_{oc} \times I_{sc}/4$ ), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE ( $V_{max}$ ), MAXIMUM SAFE INPUT CURRENT ( $I_{max}$ ), AND MAXIMUM SAFE INPUT POWER ( $P_{max}$ ) 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.

FOR OUTPUT CODE A

CLASS I, DIV. 1, GROUPS A, B, C AND D

|                            |  |
|----------------------------|--|
| $V_{MAX} = 30V$            | $V_{OC}$ IS LESS THAN OR EQUAL TO 30V                              |
| $I_{MAX} = 200mA$          | $I_{SC}$ IS LESS THAN OR EQUAL TO 200mA                            |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .01\mu f$           | $C_A$ IS GREATER THAN $.01\mu f + C$ CABLE                         |
| $L_I = 10\mu H$            | $L_A$ IS GREATER THAN $10\mu H + L$ CABLE                          |

\* FOR T1 OPTION:

|                   |  |
|-------------------|--|
| $I_{max} = 160mA$ | $I_{SC}$ IS LESS THAN OR EQUAL TO 160mA  |
| $L_I = 1.05mH$    | $L_A$ IS GREATER THAN $1.05mH + L$ CABLE |

FOR OUTPUT CODE F or W

CLASS I, DIV. 1, GROUPS A, B, C AND D

|                              |  |
|------------------------------|--|
| $V_{MAX} = 30V$              | $V_{OC}$ IS LESS THAN OR EQUAL TO 30V                                |
| $I_{MAX} = 300mA$            | $I_{SC}$ IS LESS THAN OR EQUAL TO 300mA                              |
| $P_{MAX} = 1.3 \text{ WATT}$ | $(\frac{V_{oc} \times I_{sc}}{4})$ IS LESS THAN OR EQUAL TO 1.3 WATT |
| $C_I = 0\mu f$               | $C_A$ IS GREATER THAN $0\mu f + C$ CABLE                             |
| $L_I = 0\mu H$               | $L_A$ IS GREATER THAN $0\mu H + L$ CABLE                             |

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

|   |  |                           |           |                           |
|---|--|---------------------------|-----------|---------------------------|
| Rosemount Inc.<br>8200 Market Boulevard<br>Chanhassen, MN 55317 USA | CAD MAINTAINED (MicroStation)  |                           |           |                           |
| DR. <b>JON STEFFENS</b>   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">SIZE<br/>A</td> <td style="width: 25%;">FSCM NO</td> <td style="width: 60%;">DWG NO. <b>03031-1024</b></td> </tr> </table> | SIZE<br>A                 | FSCM NO   | DWG NO. <b>03031-1024</b> |
| SIZE<br>A   | FSCM NO  | DWG NO. <b>03031-1024</b> |           |                           |
| ISSUED  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">SCALE N/A</td> <td style="width: 25%;">WT. _____</td> <td style="width: 50%;">SHEET 9 OF 9</td> </tr> </table>             | SCALE N/A                 | WT. _____ | SHEET 9 OF 9              |
| SCALE N/A   | WT. _____  | SHEET 9 OF 9              |           |                           |

03031-1024A09A

Figure B-4. FM Installation  
 Drawing 03095-1025, Rev. AA  
 Page 1 of 3

|   |           |             |            |               |         |
|---|-----------|-------------|------------|---------------|---------|
| CONFIDENTIAL AND PROPRIETARY<br>INFORMATION IS CONTAINED<br>HEREIN AND MUST BE<br>HANDLED ACCORDINGLY | REVISIONS |             |            |               |         |
|   | REV       | DESCRIPTION | CHG. NO.   | APP'D         | DATE    |
|   | AA        | ADD 2055    | RTC1004207 | <b>L.M.E.</b> | 5/13/98 |

**12.** INSTALLATION TO BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE.

**9.** NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING THE TEMPERATURE SENSING ASSEMBLY. WHEN USING NON-INCENDIVE FIELD WIRING, THE CONNECTION HEAD AND TEMPERATURE SENSOR ASSEMBLY NEED NOT BE EXPLOSION PROOF, BUT ALL COMPONENTS CONNECTED TO THE TEMP SENSOR CONNECTOR MUST BE CLASSIFIED "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2V, 0.1A, 25MW, OR 20 $\mu$ J (RTD'S QUALIFY AS SIMPLE APPARATUS).

**8.** DIVISION 2 WIRING METHOD.

6. CLASS II INSTALLATIONS MUST USE A CSA APPROVED DUST-IGNITIONPROOF SENSOR.

5. IN AMBIENTS GREATER THAN 40°C, SPRING LOADED TEMPERATURE SENSORS USED WITHOUT AN EXPLOSIONPROOF THERMOWELL MUST BE RATED FOR AT LEAST 85°C.

4. COMPONENTS REQUIRED TO BE APPROVED MUST BE APPROVED FOR GAS GROUP APPROPRIATE TO AREA CLASSIFICATION.

3. ALL CONDUIT THREADS TO BE ASSEMBLED WITH FIVE FULL THREADS MINIMUM.

**2.** TRANSMITTER MUST NOT BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250VAC.

**1.** WIRING METHOD SUITABLE FOR CLASS I, DIV 1, ANY LENGTH.

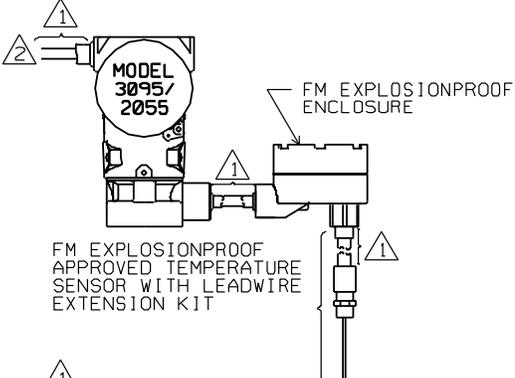
NOTES: CAD Maintained, (MICROSTATION).

|  |                                     |  |           |  |
|--|-------------------------------------|--|-----------|--|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS IN INCHES [mm].<br>REMOVE ALL BURRS AND<br>SHARP EDGES. MACHINE<br>SURFACE FINISH 125 | CONTRACT NO.                        | <b>ROSEMOUNT® MEASUREMENT</b>  |           | ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |
|  | DR. <b>Myles Lee Miller</b> 7/21/93 | FISHER · ROSEMOUNT   |           |  |
| -TOLERANCE-<br>.X * .1 [2.5]<br>.XX * .02 [0.5]<br>.XXX * .010 [0.25]<br>FRACTIONS      ANGLES<br>* 1/32           * 2°        | CHK'D <b>BLL</b>                    | TITLE<br>MODEL 3095/2055<br>EXPLOSIONPROOF INSTALLATION<br>DRAWING, FACTORY MUTUAL |           |  |
| DO NOT SCALE PRINT   | APP'D. <b>BEN LOUWAGIE</b> 8/17/93  | SIZE <b>A</b>  | FSCM NO   | DWG NO. <b>03095-1025</b>  |
|  | APP'D. GOVT.                        | SCALE  | WT. _____ | SHEET <b>1</b> OF <b>3</b>   |

3095-1025A01A

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AA        |             | RTC1004207 |       |      |

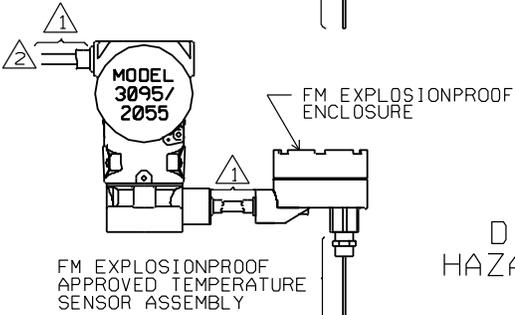
  



MODEL 3095/2055

FM EXPLOSIONPROOF ENCLOSURE

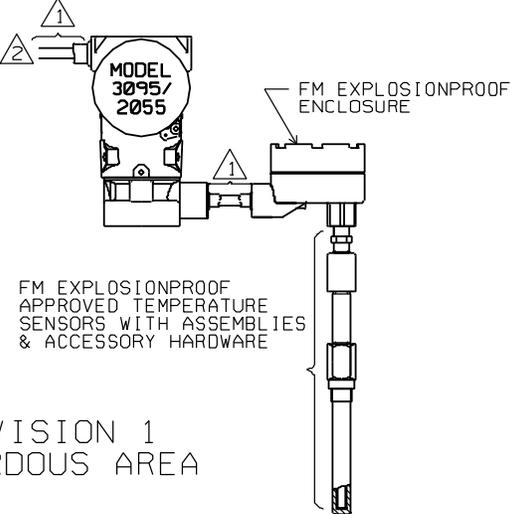
FM EXPLOSIONPROOF APPROVED TEMPERATURE SENSOR WITH LEADWIRE EXTENSION KIT



MODEL 3095/2055

FM EXPLOSIONPROOF ENCLOSURE

FM EXPLOSIONPROOF APPROVED TEMPERATURE SENSOR ASSEMBLY



MODEL 3095/2055

FM EXPLOSIONPROOF ENCLOSURE

FM EXPLOSIONPROOF APPROVED TEMPERATURE SENSORS WITH ASSEMBLIES & ACCESSORY HARDWARE

DIVISION 1  
HAZARDOUS AREA

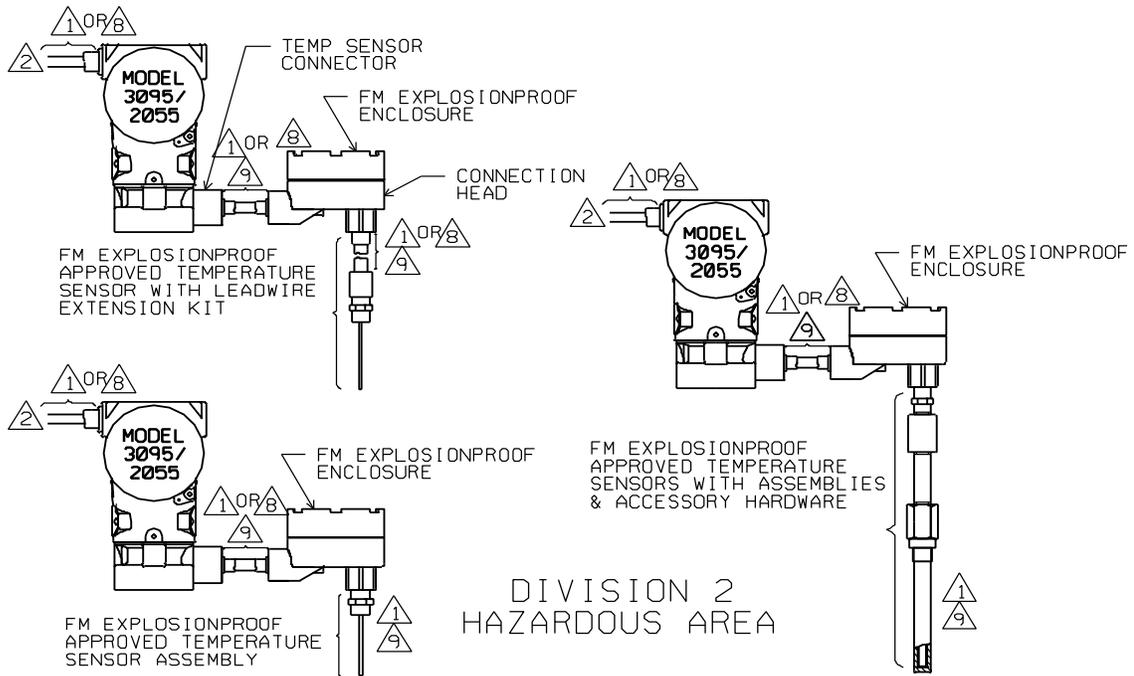
ROSEMOUNT INC.  
12001 TECHNOLOGY DRIVE  
EDEN PRATITE, MN 55344 USA

CAD Maintained, (MICROSTATION).

|                             |           |           |                           |
|-----------------------------|-----------|-----------|---------------------------|
| DR. <b>Myles Lee Miller</b> | SIZE<br>A | FSCM NO   | DWG NO. <b>03095-1025</b> |
| ISSUED                      | SCALE N/A | WT. _____ | SHEET 2 OF 3              |

3095-1025A02A

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AA        |             | RTC1004207 |       |      |



ROSEMOUNT INC.  
 12001 TECHNOLOGY DRIVE  
 EDEN PRAIRIE, MN 55344 USA

CAD Maintained, (MICROSTATION).

|        |                         |       |         |         |                   |
|--------|-------------------------|-------|---------|---------|-------------------|
| DR.    | <b>Myles Lee Miller</b> | SIZE  | FSCM NO | DWG NO. | <b>03095-1025</b> |
| ISSUED |                         | SCALE | N/A     | WT.     |                   |
|        |                         |       | SHEET   |         | 3 OF 3            |

3095-1025A03A

# Annubar Flowmeter Series

Figure B-5. FM Installation  
Drawing 03095-1020, Rev. AB  
Page 1 of 8

| CONFIDENTIAL AND PROPRIETARY<br>INFORMATION IS CONTAINED<br>HEREIN AND MUST BE<br>HANDLED ACCORDINGLY | REVISIONS |                                     |            |               |         |
|---|-----------|-------------------------------------|------------|---------------|---------|
|   | REV       | DESCRIPTION                         | CHG. NO.   | APP'D         | DATE    |
|   | B         | ADD OPTIONAL<br>COMPUTER CONNECTION | 655550     | <b>D.B.W.</b> | 8/17/94 |
|   | C         | CORRECT ENTITY<br>PARAMETERS        | 660398     | <b>K.D.V.</b> | 5/16/94 |
|   | D         | INCREASE VMAX                       | 660728     | <b>K.D.V.</b> | 6/1/94  |
|   | AA        | ADD 3Ø95C                           | RTC10Ø3705 | <b>G.H.</b>   | 4/17/98 |
|   | AB        | ADD 2Ø55                            | RTC10Ø4254 | <b>L.M.E.</b> | 6/9/98  |

ENTITY APPROVALS  
FOR  
3Ø95/2Ø55

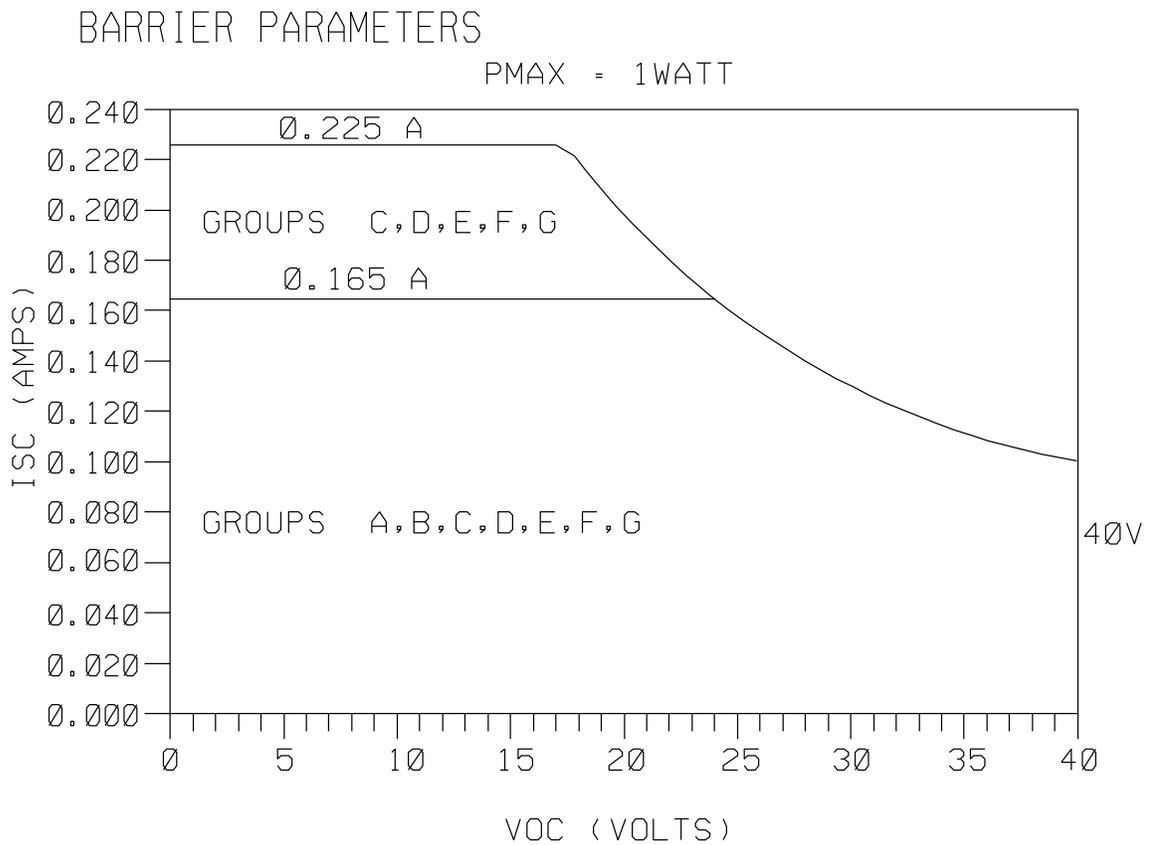
THE ROSEMOUNT TRANSMITTERS LISTED ABOVE ARE F.M. APPROVED AS INTRINSICALLY SAFE WHEN USED IN CIRCUIT WITH F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED IN THE CLASS I, II, AND III, DIVISION 1 GROUPS INDICATED, TEMP CODE T4. ADDITIONALLY, THE ROSEMOUNT 751 FIELD SIGNAL INDICATOR ESM, APPROVED AS INTRINSICALLY SAFE WHEN CONNECTED IN CIRCUIT WITH ROSEMOUNT TRANSMITTERS (FROM ABOVE) AND F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED FOR CLASS I, II, AND III, DIVISION 1, GROUPS INDICATED, TEMP CODE T4.

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 INDICATED ON SHEET 3,5, OR 7.

CAD Maintained, (MICROSTATION).

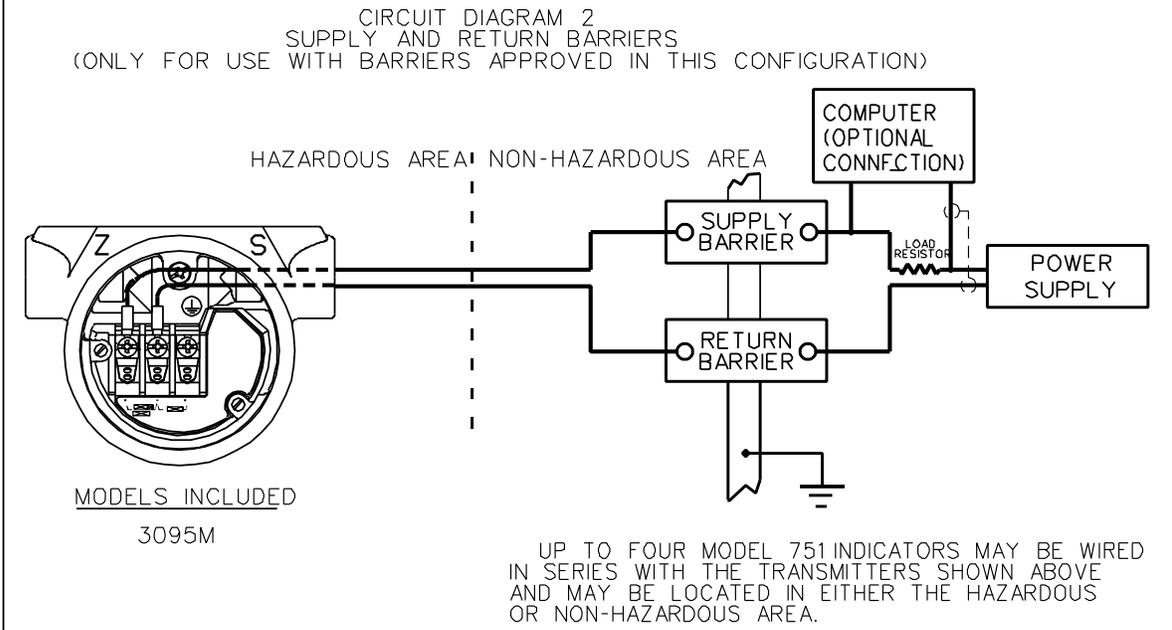
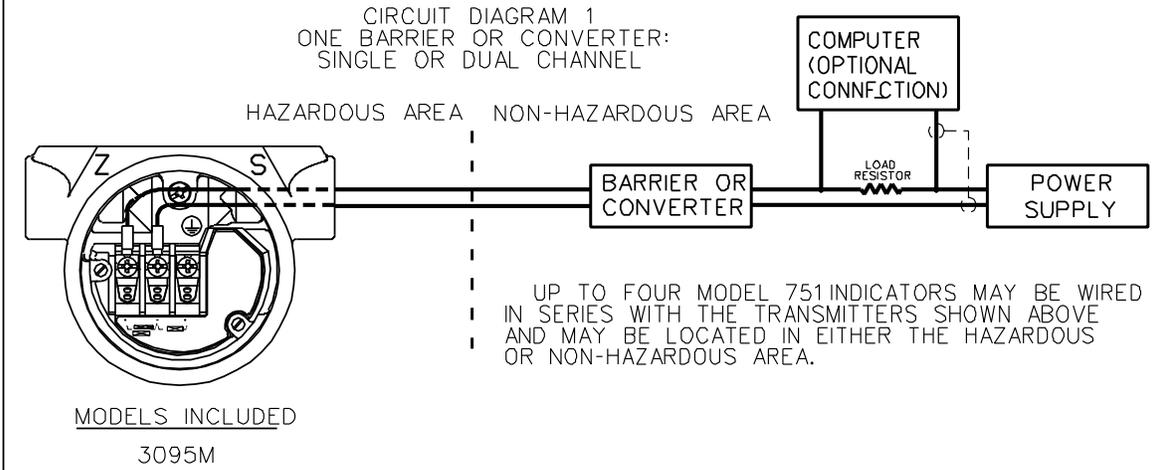
|  |                                     |   |           |  |
|--|-------------------------------------|---|-----------|--|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS IN INCHES (mm).<br>REMOVE ALL BURRS AND<br>SHARP EDGES. MACHINE<br>SURFACE FINISH 125 | CONTRACT NO.                        | <b>ROSEMOUNT® MEASUREMENT</b>           |           | ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |
|  | DR. <b>Myles Lee Miller</b> 3/19/93 | FISHER ROSEMOUNT                        |           |  |
|  | CHK'D                               | TITLE<br>INDEX OF I.S. F.M. FOR<br>3Ø95 |           |  |
|  | APP'D. <b>Kevia Voegle</b> 4/8/93   | SIZE<br>A                               | FSCM NO   | DWG NO.  |
| DO NOT SCALE PRINT   | APP'D. GOVT.                        | SCALE N/A                               | WT. _____ | SHEET 1 OF 8   |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |



|  |           |                                 |                    |  |
|--|-----------|---------------------------------|--------------------|--|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |                    |  |
| DR.<br><b>Myles Lee Miller</b>   | SIZE<br>A | FSCM NO                         | DWG NO. 03095-1020 |  |
| ISSUED   | SCALE N/A | WT.                             | SHEET 2 OF 8       |  |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |



|  |           |                                 |                    |  |
|--|-----------|---------------------------------|--------------------|--|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |                    |  |
| DR. <b>Myles Lee Miller</b>  | SIZE<br>A | FSCM NO                         | DWG NO. 03095-1020 |  |
| ISSUED   | SCALE N/A | WT.                             | SHEET 3 OF 8       |  |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

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 (VOC OR VT) AND MAX. SHORT CIRCUIT CURRENT (ISC OR IT) AND MAX. POWER (VOC X ISC/4) OR (VT X IT/4). FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (VMAX), MAXIMUM SAFE INPUT CURRENT (IMAX), AND MAXIMUM SAFE INPUT POWER (PMAX) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (CA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (CI) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (LA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (LI) OF THE INTRINSICALLY SAFE APPARATUS.

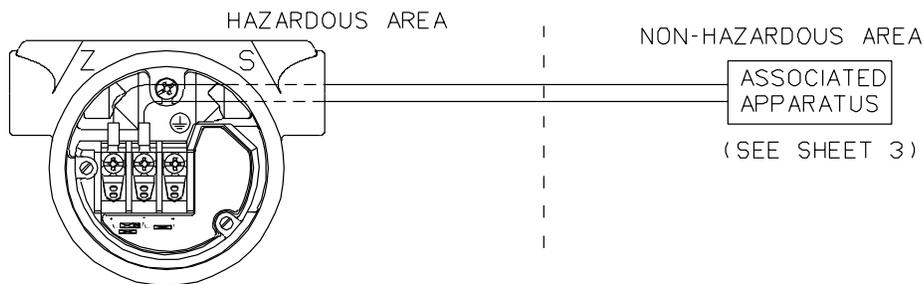
NOTE: ENTITY PARAMETERS LISTED APPLY ONLY TO ASSOCIATED APPARATUS WITH LINEAR OUTPUT.

CLASS I, DIV. 1, GROUPS A AND B

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 165MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 165MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN $.012\mu F$  |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN $20\mu H$  |

CLASS I, DIV. 1, GROUPS C AND D

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 225MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 225MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN $.012\mu F$  |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN $20\mu H$  |



MODELS INCLUDED

3095M

ROSEMOUNT INC.  
 12001 TECHNOLOGY DRIVE  
 EDEN PRAIRIE, MN 55344 USA

CAD Maintained, (MICROSTATION).

DR. **Myles Lee Miller**

SIZE A FSCM NO

DWG NO. 03095-1020

ISSUED

SCALE N/A WT.

SHEET 4 OF 8

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

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

HAZARDOUS AREA      NON-HAZARDOUS AREA

MODELS INCLUDED  
3095C

UP TO FOUR MODEL 751 INDICATORS MAY BE WIRED IN SERIES WITH THE TRANSMITTERS SHOWN ABOVE AND MAY BE LOCATED IN EITHER THE HAZARDOUS OR NON-HAZARDOUS AREA.

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

HAZARDOUS AREA      NON-HAZARDOUS AREA

MODELS INCLUDED  
3095C

UP TO FOUR MODEL 751 INDICATORS MAY BE WIRED IN SERIES WITH THE TRANSMITTERS SHOWN ABOVE AND MAY BE LOCATED IN EITHER THE HAZARDOUS OR NON-HAZARDOUS AREA.

|  |                  |                                 |                           |        |
|--|------------------|---------------------------------|---------------------------|--------|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |                  | CAD Maintained, (MICROSTATION). |                           |        |
| DR. <b>Myles Lee Miller</b>  | SIZE<br>A        | FSCM NO                         | DWG NO. <b>03095-1020</b> |        |
| ISSUED   | SCALE <b>N/A</b> | WT.                             | SHEET                     | 5 OF 8 |

| REV | DESCRIPTION | CHG. NO.   | APP'D | DATE |
|-----|-------------|------------|-------|------|
| AB  |             | RTC1004254 |       |      |

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 (VOC OR VT) AND MAX. SHORT CIRCUIT CURRENT (ISC OR IT) AND MAX. POWER (VOC X ISC/4) OR (VT X IT/4), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (VMAX), MAXIMUM SAFE INPUT CURRENT (IMAX), AND MAXIMUM SAFE INPUT POWER (PMAX) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (CA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (CI) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (LA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (LI) OF THE INTRINSICALLY SAFE APPARATUS.

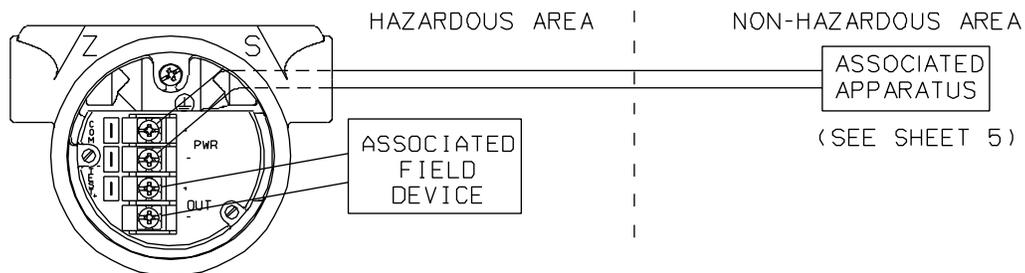
NOTE: ENTITY PARAMETERS ARE FOR 3095C ONLY. USER MUST TAKE ENTITY PARAMETERS OF THE ASSOCIATED FIELD DEVICE INTO CONSIDERATION FOR INSTALLATION.

CLASS I, DIV. 1, GROUPS A AND B

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 165MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 165MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN $.012\mu F$  |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN $20\mu H$  |

CLASS I, DIV. 1, GROUPS C AND D

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 225MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 225MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN $.012\mu F$  |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN $20\mu H$  |



MODELS INCLUDED

3095C

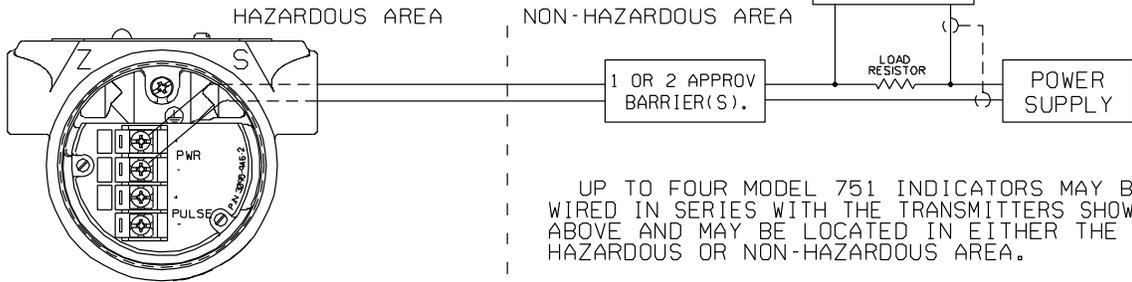
|  |
|--|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |
| DR. <b>Myles Lee Miller</b>  |
| ISSUED   |

CAD Maintained, (MICROSTATION).

|              |         |                       |
|--------------|---------|-----------------------|
| SIZE<br>A    | FSCM NO | DWG NO.<br>03095-1020 |
| SCALE<br>N/A | WT.     | SHEET 6 OF 8          |

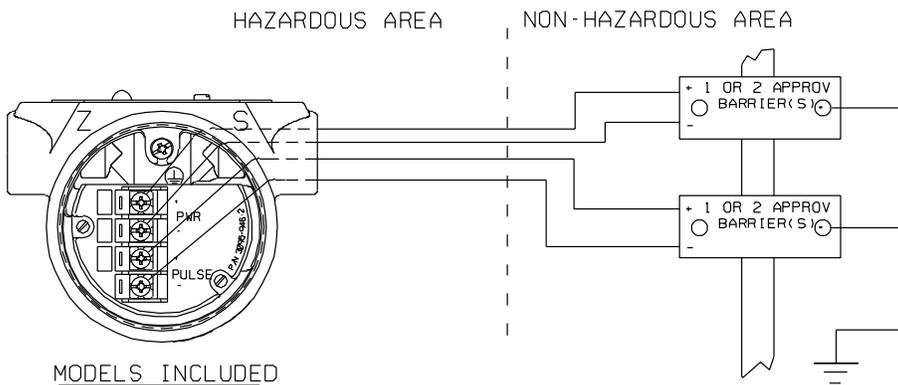
| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

CIRCUIT DIAGRAM 1  
ORIFICE OR LINEAR DEVICE WITH  
A PASSIVE PULSE ENCODER.  
ONE BARRIER OR CONVERTER:  
SINGLE OR DUAL CHANNEL



MODELS INCLUDED  
2055/3095FT

CIRCUIT DIAGRAM 2  
LINEAR DEVICE WITH AN ACTIVE PULSE SIGNAL  
REQUIRING EXTERNAL POWER.  
(ONLY FOR USE WITH BARRIERS APPROVED IN THIS CONFIGURATION)



MODELS INCLUDED  
2055/3095FT

|  |           |                                 |                    |  |
|--|-----------|---------------------------------|--------------------|--|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |                    |  |
| DR. <b>Myles Lee Miller</b>  | SIZE<br>A | FSCM NO                         | DWG NO. 03095-1020 |  |
| ISSUED   | SCALE N/A | WT.                             | SHEET 7 OF 8       |  |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

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 (VOC OR VT) AND MAX. SHORT CIRCUIT CURRENT (ISC OR IT) AND MAX. POWER (VOC X ISC/4) OR (VT X IT/4). FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (VMAX), MAXIMUM SAFE INPUT CURRENT (IMAX), AND MAXIMUM SAFE INPUT POWER (PMAX) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (CA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (CI) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (LA) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (LI) OF THE INTRINSICALLY SAFE APPARATUS.

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

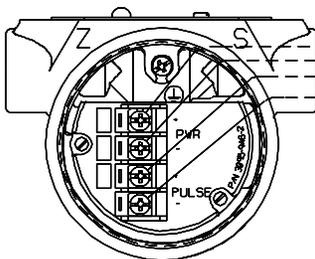
CLASS I, DIV. 1, GROUPS A AND B

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 165MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 165MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN .012μF   |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN 20μH   |

CLASS I, DIV. 1, GROUPS C AND D

|                            |  |
|----------------------------|--|
| $V_{MAX} = 40V$            | $V_T$ OR $V_{OC}$ IS LESS THAN OR EQUAL TO 40V   |
| $I_{MAX} = 225MA$          | $I_T$ OR $I_{SC}$ IS LESS THAN OR EQUAL TO 225MA   |
| $P_{MAX} = 1 \text{ WATT}$ | $(\frac{V_T \times I_T}{4})$ OR $(\frac{V_{OC} \times I_{SC}}{4})$ IS LESS THAN OR EQUAL TO 1 WATT |
| $C_I = .012\mu F$          | $C_A$ IS GREATER THAN .012μF   |
| $L_I = 20\mu H$            | $L_A$ IS GREATER THAN 20μH   |

NON-HAZARDOUS AREA



FMRC  
 APPROVED  
 ASSOCIATED  
 APPARATUS

SEE PAGE 7

MODELS INCLUDED  
 2055/3095FT

ROSEMOUNT INC.  
 12001 TECHNOLOGY DRIVE  
 EDEN PRAIRIE, MN 55344 USA

CAD Maintained, (MICROSTATION).

DR. **Myles Lee Miller**

SIZE  
 A

FSCM NO. \_\_\_\_\_  
 DWG NO. 03095-1020

ISSUED

SCALE N/A WT. \_\_\_\_\_

SHEET 8 OF 8

# Annubar Flowmeter Series

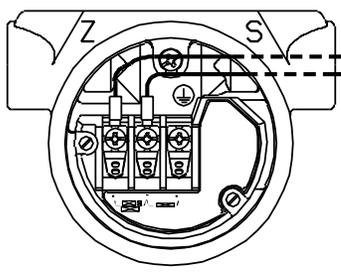
Figure B-6. CSA Installation  
 Drawing 03095-1021, Rev. AB  
 Page 1 of 4

| CONFIDENTIAL AND PROPRIETARY<br>INFORMATION IS CONTAINED<br>HEREIN AND MUST BE<br>HANDLED ACCORDINGLY | REVISIONS |                          |            |               |          |
|---|-----------|--------------------------|------------|---------------|----------|
|   | REV       | DESCRIPTION              | CHG. NO.   | APP'D         | DATE     |
|   | C         | ADD 3095-5000 TO DEVICES | 656973     | <b>M.L.S.</b> | 11/03/93 |
|   | AA        | ADD 3095C                | RTC1003705 | <b>G.H.</b>   | 4/17/98  |
|   | AB        | ADD 2055                 | RTC1004254 | <b>L.M.E.</b> | 6/9/98   |

**CSA INTRINSIC SAFETY APPROVALS**  
 CIRCUIT CONNECTION WITH BARRIER OR CONVERTER  
*Ex ia*  
 INTRINSICALLY SAFE/SECURITE INTRINSEQUE

HAZARDOUS AREA



ROSEMOUNT  
MODELS INCLUDED  
[WITH OR WITHOUT T1  
(TRANSIENT PROTECTION) OPTION]  
3095M

NON-HAZARDOUS AREA

+  
BARRIER OR  
- CONVERTER

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS  
 MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.  
  
 AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS  
 PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMES  
 DE CLASSE I, DIVISION 2.

CAD Maintained, (MICROSTATION).

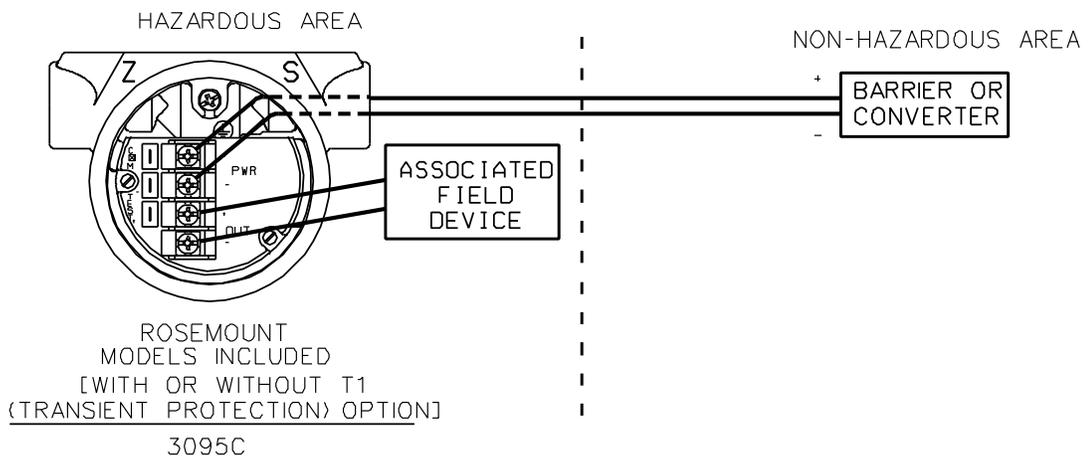
|  |                                     |  |  |
|--|-------------------------------------|--|--|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS IN INCHES (mm).<br>REMOVE ALL BURRS AND<br>SHARP EDGES. MACHINE<br>SURFACE FINISH 125 | CONTRACT NO.                        | <b>ROSEMOUNT MEASUREMENT</b><br>FISHER-ROSEMOUNT<br>TITLE<br><h2 style="margin: 0;">INDEX OF I.S. CSA FOR<br/>3095/2055</h2> | ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |
| -TOLERANCE-<br>.X * .1 [2.5]<br>.XX * .02 [0.5]<br>.XXX * .010 [0.25]<br>FRACTIONS ANGLES<br>* 1/32 * 2°                       | DR. <b>Myles Lee Miller</b> 3/19/93 |  | APP'D. <b>Kevin Voegele</b> 4/8/93                                     |
| DO NOT SCALE PRINT   | APP'D. GOVT.                        | SIZE A FSCM NO _____ DWG NO. <b>03095-1021</b><br>SCALE N/A WT. _____ SHEET 1 OF 4   |  |

|   |  | REVISIONS                       |                    |      |  |
|---|--|---------------------------------|--------------------|------|--|
| REV   | DESCRIPTION  | CHG. NO.                        | APP'D              | DATE |  |
| AB  |  | RTC1004254                      |                    |      |  |
| DEVICE  | PARAMETERS   | APPROVED FOR CLASS I, DIV.1     |                    |      |  |
| CSA APPROVED SAFETY BARRIER   | 30 V OR LESS<br>330 OHMS OR MORE<br>28 V OR LESS<br>300 OHMS OR MORE<br>25 V OR LESS<br>200 OHMS OR MORE<br>22 V OR LESS<br>180 OHMS OR MORE | GROUPS A, B, C, D               |                    |      |  |
| FOXBORO CONVERTER<br>2A1-12V-CGB, 2A1-13V-CGB,<br>2AS-131-CGB, 3A2-12D-CGB,<br>3A2-13D-CGB, 3AD-131-CGB,<br>3A4-12D-CGB, 2AS-121-CGB,<br>3F4-12DA |  | GROUPS B, C, D                  |                    |      |  |
| CSA APPROVED SAFETY BARRIER   | 30 V OR LESS<br>150 OHMS OR MORE   | GROUPS C, D                     |                    |      |  |
| ROSEMOUNT<br>03095-5000-1012<br>03095-5000-2002   | 19 V OR LESS<br>200 OHMS OR MORE   | GROUPS A, B, C, D               |                    |      |  |
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA  |  | CAD Maintained, (MICROSTATION). |                    |      |  |
| DR. <b>Myles Lee Miller</b>   | SIZE<br>A  | FSCM NO                         | DWG NO. 03095-1021 |      |  |
| ISSUED  | SCALE N/A  | WT.                             | SHEET 2 OF 4       |      |  |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

CSA INTRINSIC SAFETY APPROVALS  
CIRCUIT CONNECTION WITH BARRIER OR CONVERTER

Ex ia  
INTRINSICALLY SAFE/SECURITE INTRINSEQUE



NOTE: SEE I.S. INSTALLATION DRAWING OF ASSOCIATED APPARATUS TO INSURE PROPER INSTALLATION.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.

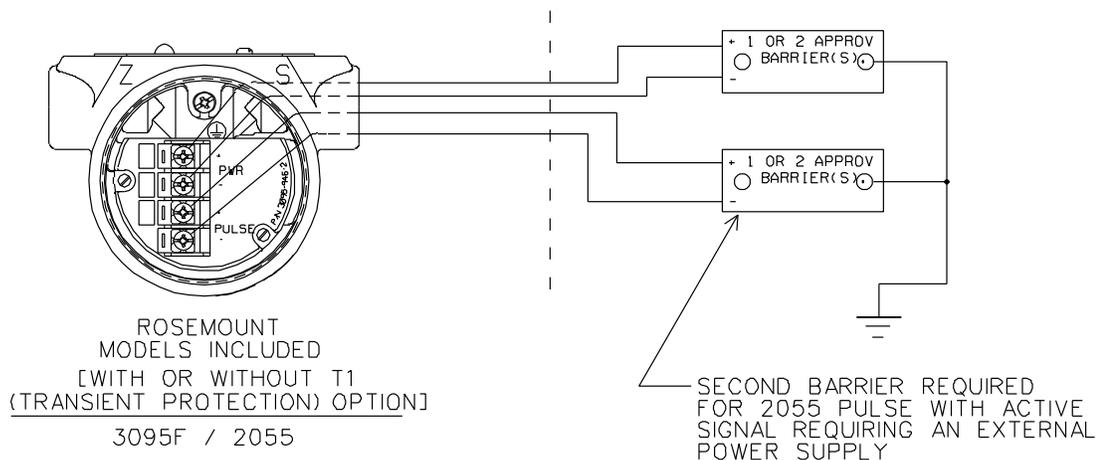
AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMES DE CLASSE 1, DIVISION 2.

|  |           |                                 |         |              |
|--|-----------|---------------------------------|---------|--------------|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |         |              |
| DR. <b>Myles Lee Miller</b>  | SIZE<br>A | FSCM NO                         | DWG NO. | 03095-1021   |
| ISSUED   | SCALE     | N/A                             | WT.     | SHEET 3 OF 4 |

| REVISIONS |             |            |       |      |
|-----------|-------------|------------|-------|------|
| REV       | DESCRIPTION | CHG. NO.   | APP'D | DATE |
| AB        |             | RTC1004254 |       |      |

CSA INTRINSIC SAFETY APPROVALS  
 CIRCUIT CONNECTION WITH BARRIER OR CONVERTER

Ex ia  
 INTRINSICALLY SAFE/SECURITE INTRINSEQUE  
 \*INTRINSICALLY SAFE OUTPUT PARAMETERS (SEE PAGE 2)



NOTE: SEE I.S. INSTALLATION DRAWING OF ASSOCIATED APPARATUS TO INSURE PROPER INSTALLATION.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.

\* WHEN USING MORE THAN ONE CHANNEL OF A CSA APPROVED BARRIER, THE EFFECTIVE VOLTAGE AND RESISTANCE OF THE COMBINED LINES MUST COMPLY WITH THE LISTED INTRINSICALLY SAFE OUTPUT PARAMETERS. THE EFFECTIVE VOLTAGE AND RESISTANCE ARE TO BE CALCULATED AS FOLLOWS:

VOLTAGE: EFFECTIVE VOLTAGE= HIGHEST BARRIER VOLTAGE (NOTE: BOTH LINES MUST BE REFERENCED TO A COMMON GROUND)

RESISTANCE: EFFECTIVE RESISTANCE= PARALLEL COMBINATION OF EACH LINE (NOTE: DIODE RETURNS DO NOT NEED TO BE INCLUDED FOR THIS CALCULATION).

|  |           |                                 |                    |  |
|--|-----------|---------------------------------|--------------------|--|
| ROSEMOUNT INC.<br>12001 TECHNOLOGY DRIVE<br>EDEN PRAIRIE, MN 55344 USA |           | CAD Maintained, (MICROSTATION). |                    |  |
| DR. <b>Jon T Steffens</b>  | SIZE<br>A | FSCM NO                         | DWG NO. 03095-1021 |  |
| ISSUED   | SCALE N/A | WT.                             | SHEET 4 OF 4       |  |

# Annubar Flowmeter Series

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**Reference Manual**  
00809-0100-4809, Rev CB  
March 2012



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