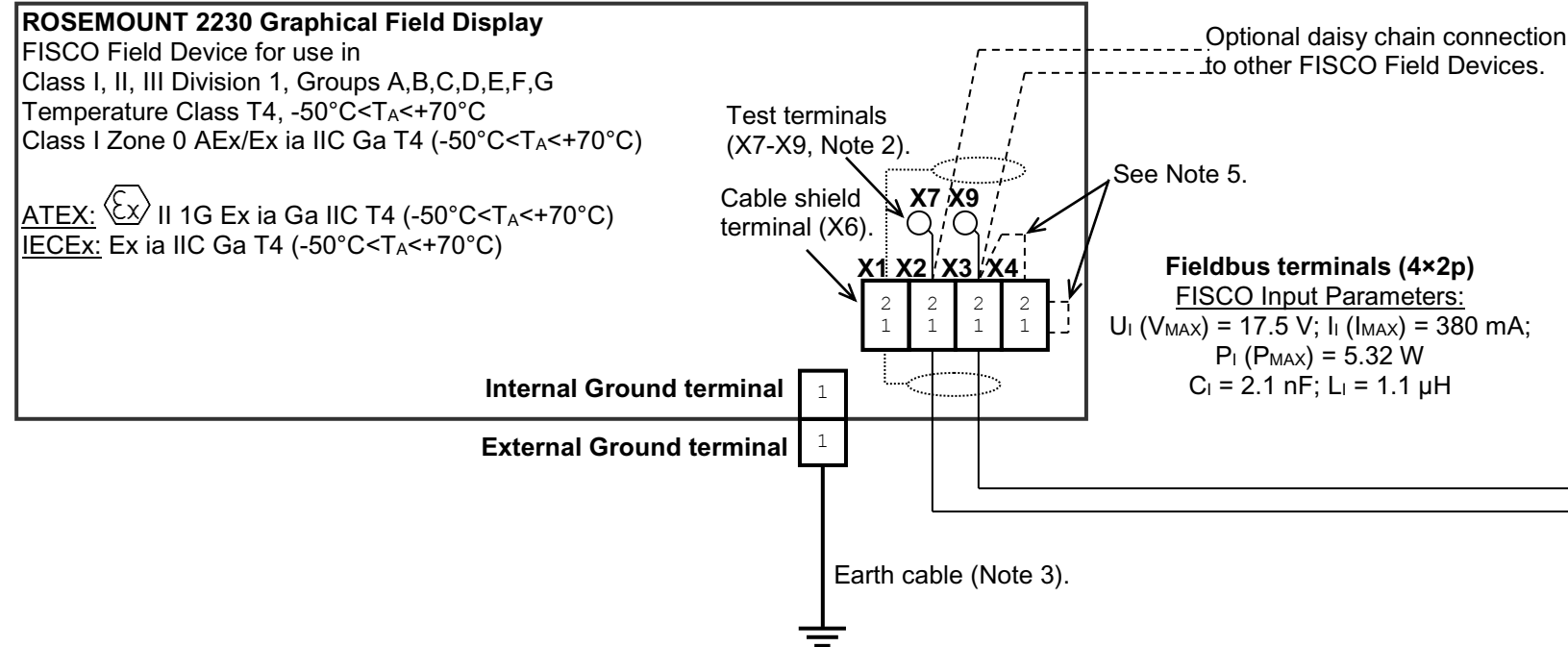
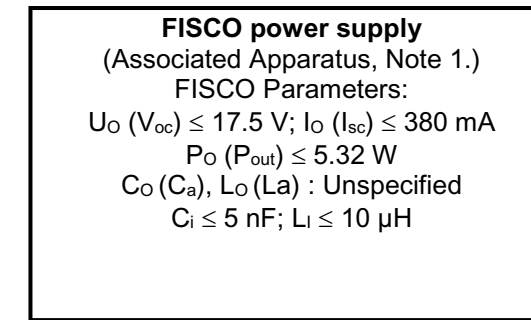


ISSUE	CHANGE ORDER No	WEEK	ISSUE	CHANGE ORDER No	WEEK	ISSUE	CHANGE ORDER No	WEEK
2	SME-7571	1306	3	SMF-8219	1709			

### HAZARDOUS LOCATION



### HAZARDOUS OR NON-HAZARDOUS LOCATION



### FIELD BUS INTRINSICALLY SAFE CONCEPT (FISCO) APPROVAL

FISCO allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is that the voltage ( $U_i$  or  $V_{MAX}$ ), current ( $I_i$  or  $I_{MAX}$ ) and power ( $P_i$  or  $P_{MAX}$ ) which an intrinsically safe apparatus can receive and remain intrinsically safe considering faults, must be equal to or greater than the voltage ( $U_o, V_{oc}$  or  $V_i$ ), current ( $I_o, I_{sc}$  or  $I_i$ ) and power ( $P_o$  or  $P_{MAX}$ ) levels which can be delivered by the Associated Apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance ( $C_i$ ) and the inductance ( $L_i$ ) of each apparatus (other than the termination) connected to the Fieldbus must be less than or equal to 5 nF and 10  $\mu\text{H}$  respectively.

In each I.S. Fieldbus segment only one active device, normally the Associated Apparatus, is allowed to provide the necessary energy for the Fieldbus. The voltage ( $U_o, V_{oc}$  or  $V_i$ ) of the Associated Apparatus is limited to a range of 14 V to 17.5 V. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except a leakage current of 50  $\mu\text{A}$  for each connected device. Separately powered equipment needs galvanic isolation to assure that the intrinsically safe Fieldbus circuit remains passive.

The cables used to interconnect devices need to have characteristics in the following range:

- Loop Resistance  $R_c$ : 15.....150 ohm/km
- Loop Inductance  $L_c$ : 0.4.....1 mH/km
- Capacitance per unit length  $C_c$ : 45.....200 nF/km
- $C_c = C_{line \text{ to line}} + 0.5 \times C_{line \text{ to screen}}$  if both lines are floating or
- $C_c = C_{line \text{ to line}} + C_{line \text{ to screen}}$  if screen is connected to one line
- Length of trunk cable: Less than or equal to 1 km
- Length of spur cable: Less than or equal to 60 m

At each end of the trunk cable an approved infallible line terminator with the following parameters should be installed:  $R \geq 90 \text{ ohm}$ ,  $C \leq 2.2 \mu\text{F}$  (recommended parameters are:  $R = 100 \pm 2 \text{ ohm}$ ,  $C = 1.0 \pm 0.2 \mu\text{F}$ ).

One of the allowed terminations may be integrated in the Associated Apparatus.

This Field Device is also equipped with an integrated terminator; see note 5.

FISCO limits the number of passive devices connected to a single segment to 32 devices. If the above rules are respected, a total length of up to 1 km of cable is permitted (sum of trunk and spur cables). The inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

### Notes:

1. Control equipment connected to the Associated Apparatus must not use or generate more than 250  $V_{RMS}$  or  $V_{DC}$ .
2. Test terminals for temporary connection of Intrinsically Safe Rosemount 375 or 475 Field Communicator.
3. Earth connection cable area: min. 4  $\text{mm}^2$ .
4. Installation should be in accordance with IEC 60079-14 "Electrical Installations in Hazardous Areas (other than mines)" or according to a valid national standard or code of practice for hazardous area installations. Installation in the USA should be in accordance with ANSI/ISA-RP12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70). Dust tight conduit seals must be used when installed in Class II and Class III environments.
5. A built-in Fieldbus terminator can be invoked by connecting a jumper between either X3:2-X4:2 or X4:2-X4:1.

**WARNING:** To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

**WARNING:** Substitution of components may impair intrinsic safety.

**AVERTISSEMENT:** Ne pas ouvrir en cas de présence d'atmosphère explosive.

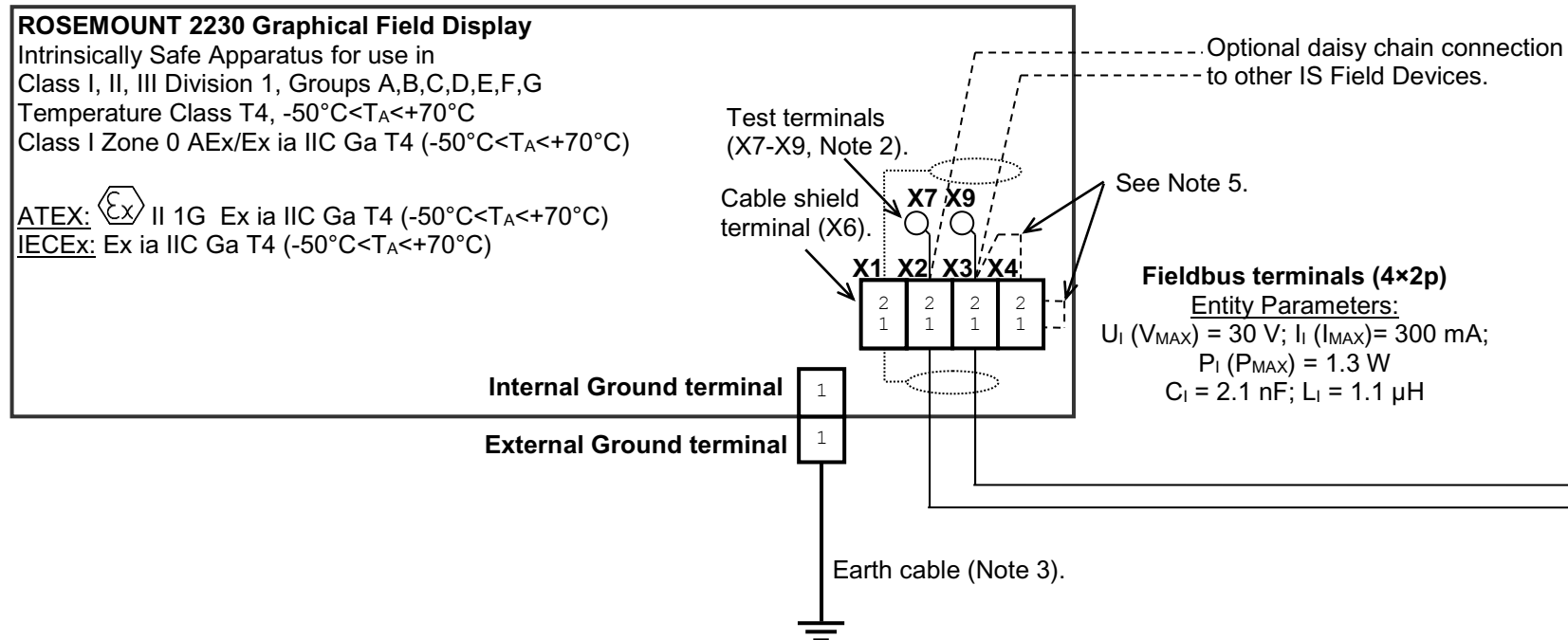
**AVERTISSEMENT:** La substitution de composants peut compromettre la sécurité intrinsèque.

**FM APPROVED PRODUCT**  
 No revision to this drawing without prior Factory Mutual approval

<b>D9240040-949</b>	ISSUED BY <b>EE-RJ</b>	WEEK <b>1007</b>	PRODUCT CODE <b>2230</b>	TITLE <b>SYSTEM CONTROL DWG FM</b>	
	APPROVED BY <b>EAp</b>	WEEK <b>1007</b>	DOC. TYPE <b>6</b>	FILE <b>WORD</b>	<b>Rosemount 2230</b>
	ALL DIMENSIONS ARE IN MILLIMETRES. TOLERANCES, UNLESS OTHERWISE STATED:			FINISH, UNLESS OTHERWISE STATED:	
	DWG NO. <b>D9240040-949</b>			ISSUE <b>3</b>	SHEET <b>1/2</b>
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### HAZARDOUS LOCATION



### HAZARDOUS OR NON-HAZARDOUS LOCATION

**Intrinsically Safe power supply**  
(Associated Apparatus, Note 1.)

Entity Parameters:  
 $U_o (V_{oc}) \leq 30 \text{ V}$ ;  $I_o (I_{sc}) \leq 300 \text{ mA}$ ;  $P_o (P_{out}) \leq 1.3 \text{ W}$   
 $C_o (C_a) \geq \text{Total capacitance of connected cables and Fieldbus Devices.}$   
 $L_o (L_a) \geq \text{Total inductance of connected cables and Fieldbus Devices.}$

#### ENTITY CONCEPT APPROVAL

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 ( $U_o$ ,  $V_{oc}$  or  $V_i$ ), max. short circuit current ( $I_o$ ,  $I_{sc}$  or  $I_i$ ) and max. power ( $P_o$  or  $V_{oc} \times I_{oc} / 4$  or  $V_i \times I_i / 4$ ), for the associated apparatus must be less than or equal to the maximum safe input voltage ( $U_i$  or  $V_{MAX}$ ), maximum safe input current ( $I_i$  or  $I_{MAX}$ ) and maximum safe input power ( $P_i$  or  $P_{MAX}$ ) of the intrinsically safe apparatus. In addition, the approved max. allowable connected capacitance ( $C_o$  or  $C_a$ ) 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 ( $L_o$  or  $L_a$ ) 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.

#### Notes:

- Control equipment connected to the Associated Apparatus must not use or generate more than 250  $V_{RMS}$  or  $V_{DC}$ .
- Test terminals for temporary connection of Intrinsically Safe Rosemount 375 or 475 Field Communicator.
- Earth connection cable area: min. 4  $mm^2$ .
- Installation should be in accordance with IEC 60079-14 "Electrical Installations in Hazardous Areas (other than mines)" or according to a valid national standard or code of practice for hazardous area installations. Installation in the USA should be in accordance with ANSI/ISA-RP12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70). Dust tight conduit seals must be used when installed in Class II and Class III environments.
- A built-in Fieldbus terminator can be invoked by connecting a jumper between either X3:2-X4:2 or X4:2-X4:1.

**WARNING:** To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

**WARNING:** Substitution of components may impair intrinsic safety.

**AVERTISSEMENT:** Ne pas ouvrir en cas de présence d'atmosphère explosive.

**AVERTISSEMENT:** La substitution de composants peut compromettre la sécurité intrinsèque.

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