



# FM Hazardous Area Approvals Fisher™ FIELDVUE™ DVC6200 Series Digital Valve Controllers

## Hazardous Area Approvals and Special Instructions for “Safe Use” and Installations in Hazardous Locations

Certain nameplates may carry more than one approval, and each approval may have unique installation/wiring requirements and/or conditions of “safe use”. These special instructions for “safe use” are in addition to, and may override, the standard installation procedures. Special instructions are listed by approval type.

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### Note

This information supplements the nameplate markings affixed to the product and the DVC6200 Series quick start guide ([D103556X012](#)), available from your Emerson sales office or at [Fisher.com](#).

Always refer to the nameplate itself to identify the appropriate certification.

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### **⚠ WARNING**

**Failure to follow these conditions of “safe use” could result in personal injury or property damage from fire or explosion and area re-classification.**

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## Explosion-proof, Dust-Ignition proof, Non-Incendive, Suitable for Use

### DVC6200 and DVC6205 Series (HART HW1 & HW2, SIS, FOUNDATION Fieldbus, PROFIBUS)

XP: Class I, Division 1, Groups B,C,D  
 DIP: Class II, III, Division 1, Groups E,F,G  
 NI: Class I, Division 2, Groups A,B,C,D  
 S: Class II, III, Division 2, Groups F,G  
 Class I Zone 1 AEx d IIC  
 Class I Zone 2 Ex nC IIC  
 T5 Ta = 80°C, T6 Ta = 75°C  
 Type 4X, IP66

**DVC6215 Remote Mount\***

XP: Class I, Division 1, Groups A,B,C,D  
 DIP: Class II, III, Division 1, Groups E,F,G  
 NI: Class I, Division 2, Groups A,B,C,D  
 S: Class II, III, Division 2, Groups F,G  
 Class I Zone 1 AEx d IIC  
 Class I Zone 2 Ex nA IIC  
 T4 Ta = 125°C, T5 Ta = 90°C, T6 Ta = 75°C  
 Type 4X, IP66

\*Poured seal required within 2 inches of the enclosure for explosion-proof installations of the DVC6215NA.

**Intrinsically Safe and Nonincendive Field Wiring**

**Intrinsic Safety**

IS Class I, II, III Division 1 Groups A,B,C,D,E,F,G  
 Class I Zone 0 AEx ia IIC  
 Class I Zone 2 AEx ic IIC

**Nonincendive Field Wiring**

NI Class I Division 2 Groups A,B,C,D

Type 4X, IP66

Intrinsically safe or Nonincendive Field Wiring when connected per control drawing GE42819, as shown in the following figures

**DVC6200 HW2 and DVC6200 SIS**

Intrinsically Safe ..... figure 1 and 15  
 Intrinsically Safe or Nonincendive Field Wiring ..... figure 2 and 15

**DVC6205, DVC6205 SIS, and DVC6215 Remote Mount**

Intrinsically Safe ..... figure 3 and 15  
 Intrinsically Safe or Nonincendive Field Wiring ..... figure 4 and 15

**DVC6200f and DVC6200p**

Entity Fieldbus Loop: Intrinsically Safe ..... figure 5 and 15  
 Entity Fieldbus Loop: Intrinsically Safe or Nonincendive Field Wiring ..... figure 6 and 15  
 FISCO Installations: Intrinsically Safe ..... figure 7 and 15  
 FISCO Installations: Intrinsically Safe or Nonincendive Field Wiring ..... figure 8 and 15

**DVC6205f, DVC6205p, and DVC6215 Remote Mount**

Entity Fieldbus Loop: Intrinsically Safe ..... figure 9 and 15  
 Entity Fieldbus Loop: Intrinsically Safe or Nonincendive Field Wiring ..... figure 10 and 15  
 FISCO Installations: Intrinsically Safe ..... figure 11 and 15  
 FISCO Installations: Intrinsically Safe or Nonincendive Field Wiring ..... figure 12 and 15

**DVC6200 HW1**

Intrinsically Safe ..... figure 13 and 15  
 Intrinsically Safe or Nonincendive Field Wiring ..... figure 14 and 15

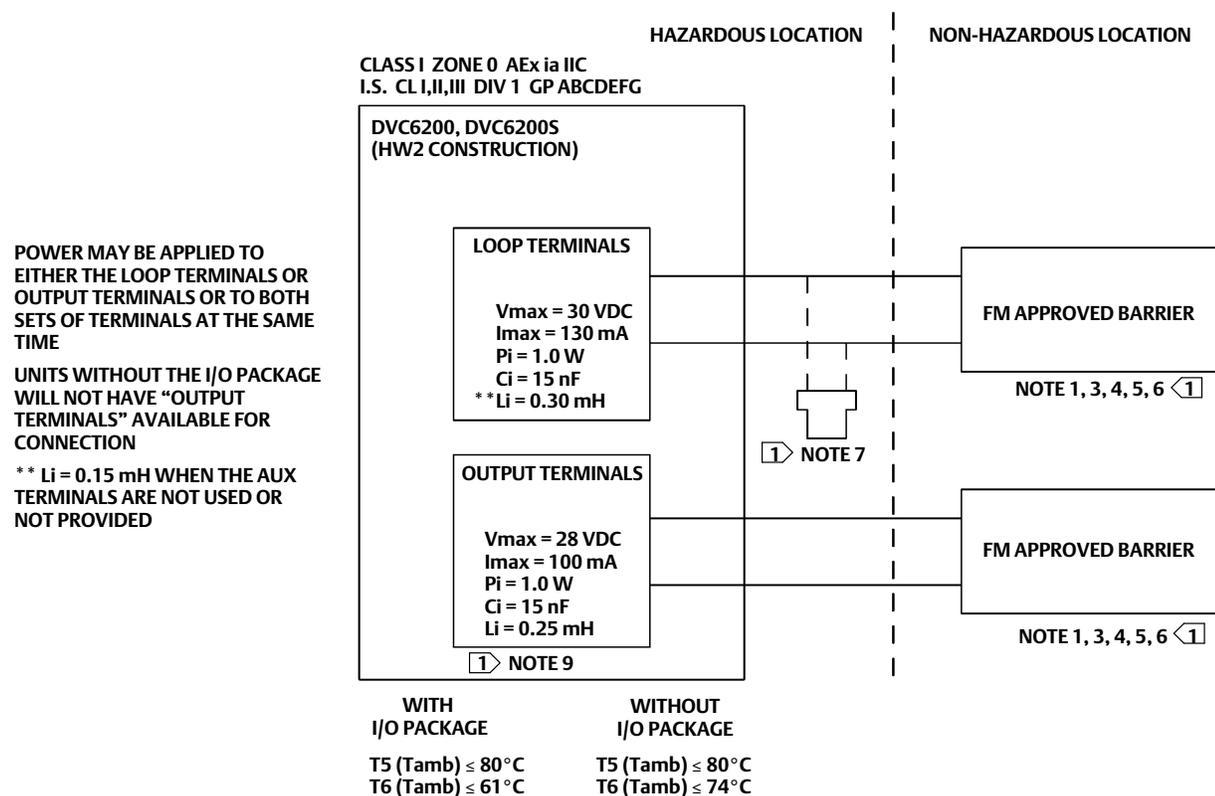
**Special Conditions of Safe Use**

- When product is used with natural gas as the pneumatic medium, the maximum working pressure of the natural gas supply shall be limited to 10 bar (145 psi).
- When product is used with natural gas as the pneumatic medium the product shall not be permitted in a Class I, Division 2, Group A, B, C, D location without the proper venting installation per the manufacturer's instruction manual.
- The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

- Part of the enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

Figure 1. FM Loop Schematics—FIELDVUE DVC6200 HW2 and DVC6200 SIS

INTRINSICALLY SAFE

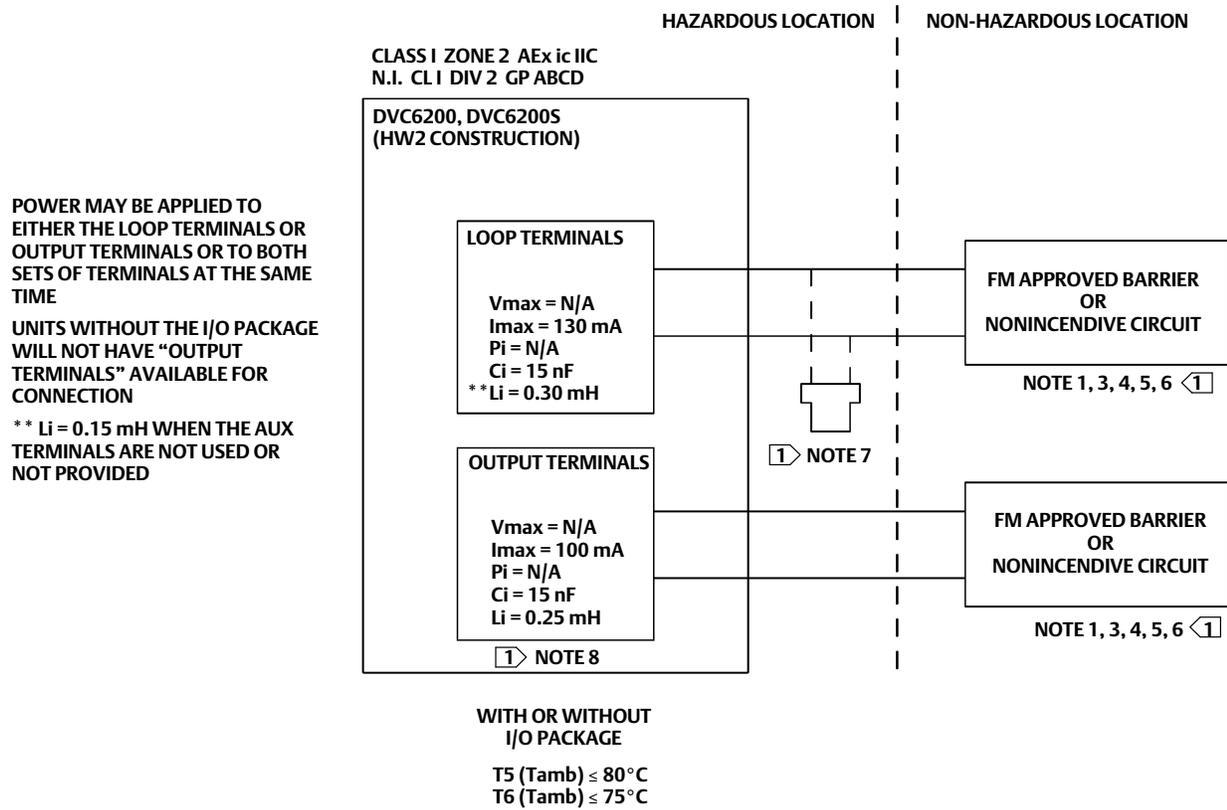


1 SEE NOTES IN FIGURE 15

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Figure 2. FM Loop Schematics—FIELDVUE DVC6200 HW2 and DVC6200 SIS

### INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING

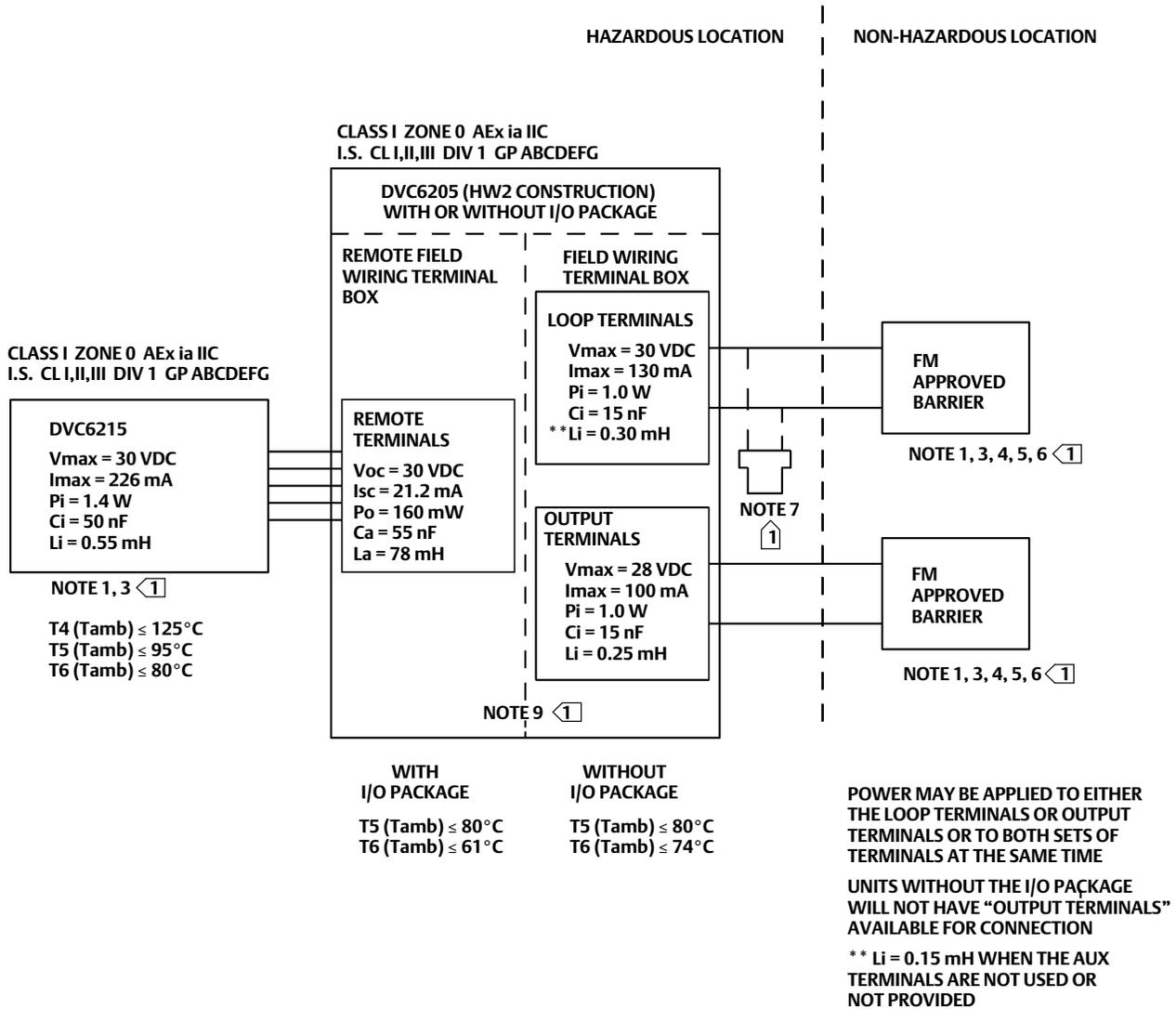


**1** SEE NOTES IN FIGURE 15

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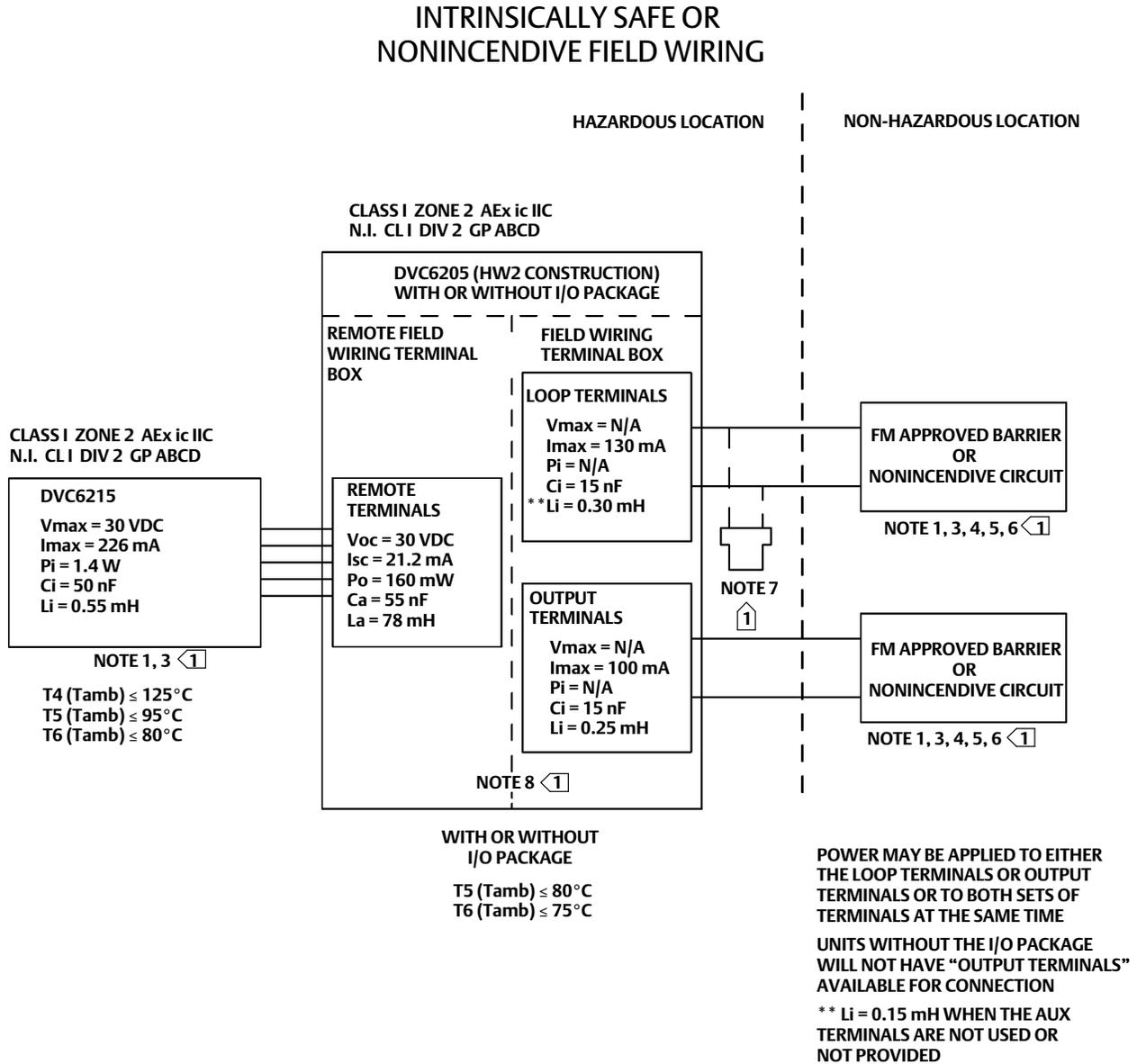
Figure 3. FM Loop Schematics—FIELDVUE DVC6205, DVC6205 SIS, and DVC6215

INTRINSICALLY SAFE



<1> SEE NOTES IN FIGURE 15

Figure 4. FM Loop Schematics—FIELDVUE DVC6205, DVC6205 SIS, and DVC6215



**1** SEE NOTES IN FIGURE 15

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Figure 5. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, Entity Fieldbus Loop

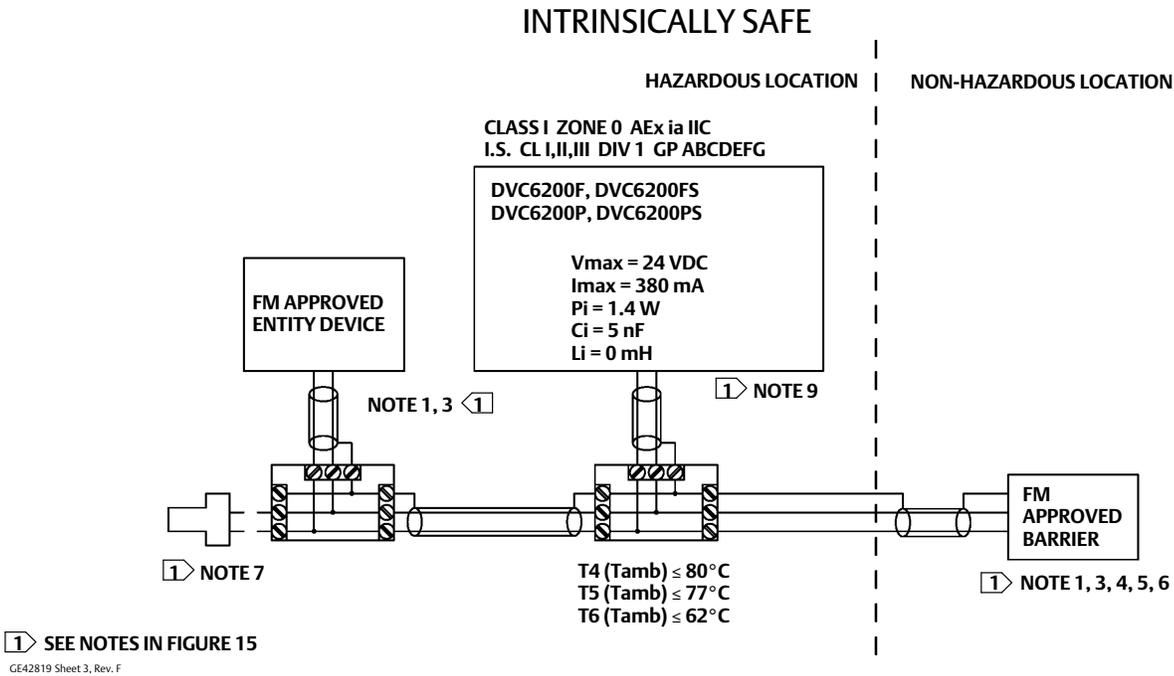


Figure 6. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, Entity Fieldbus Loop

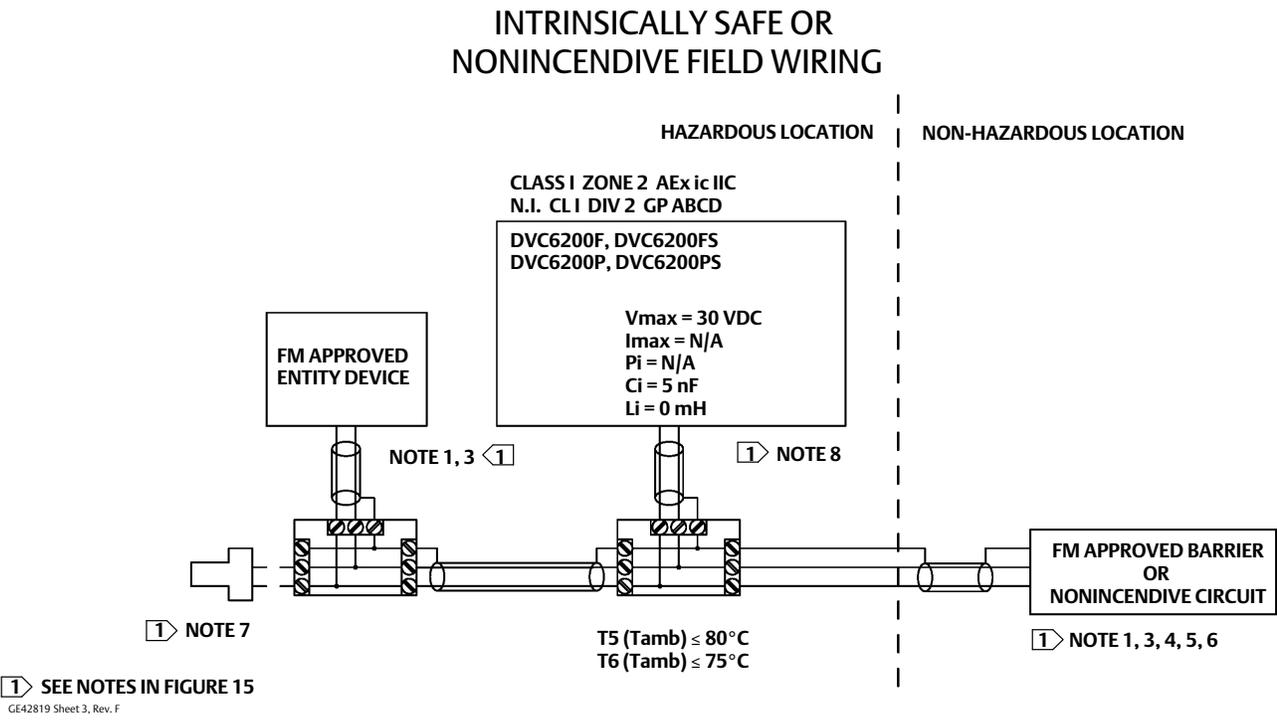


Figure 7. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, FISCO Installations

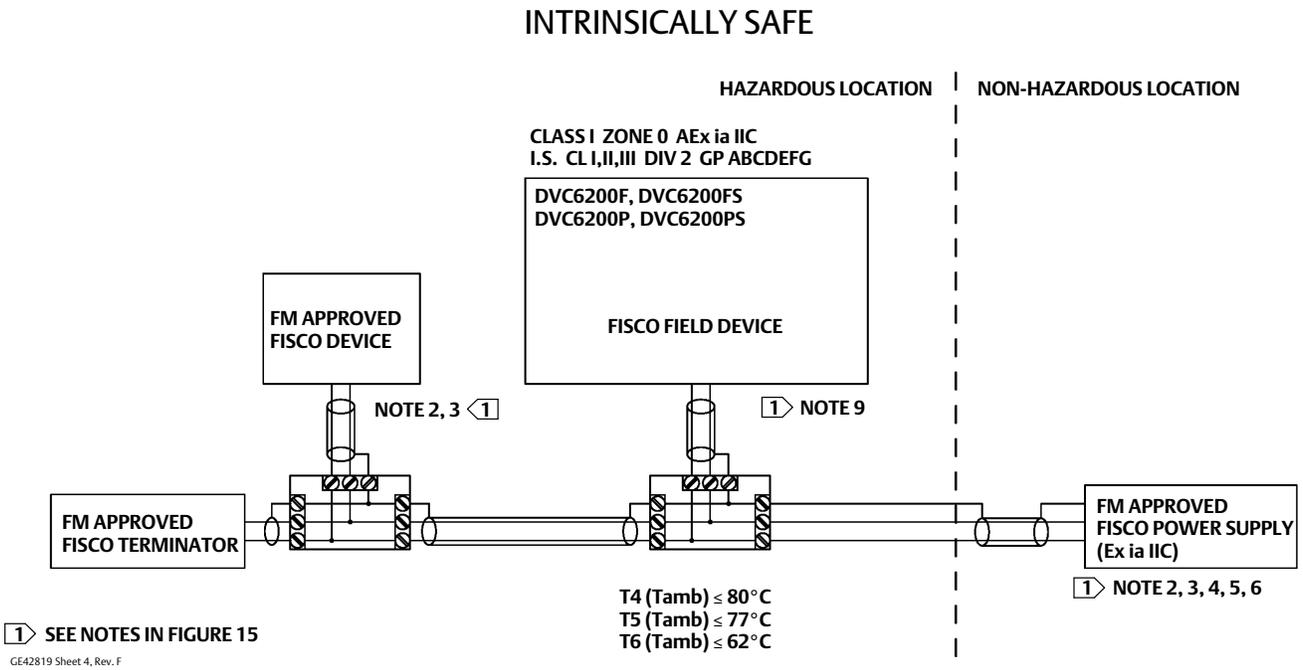


Figure 8. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, FISCO Installations

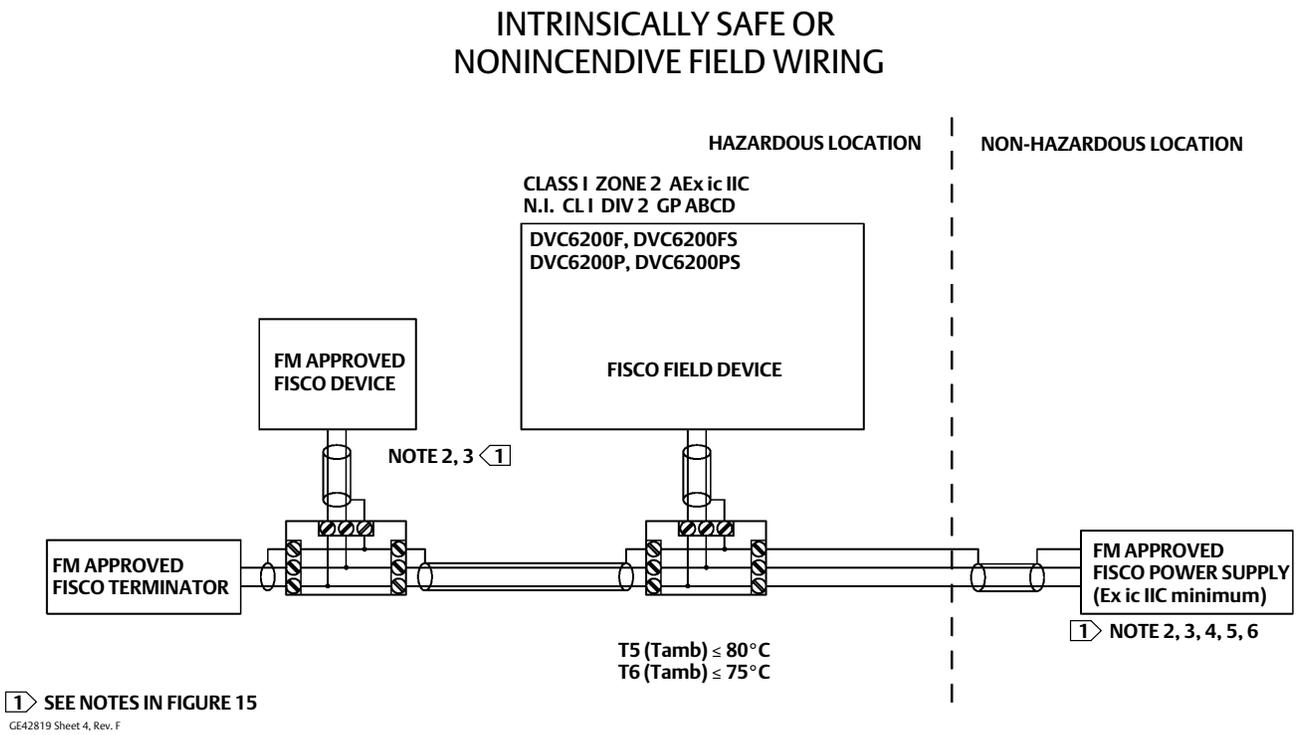
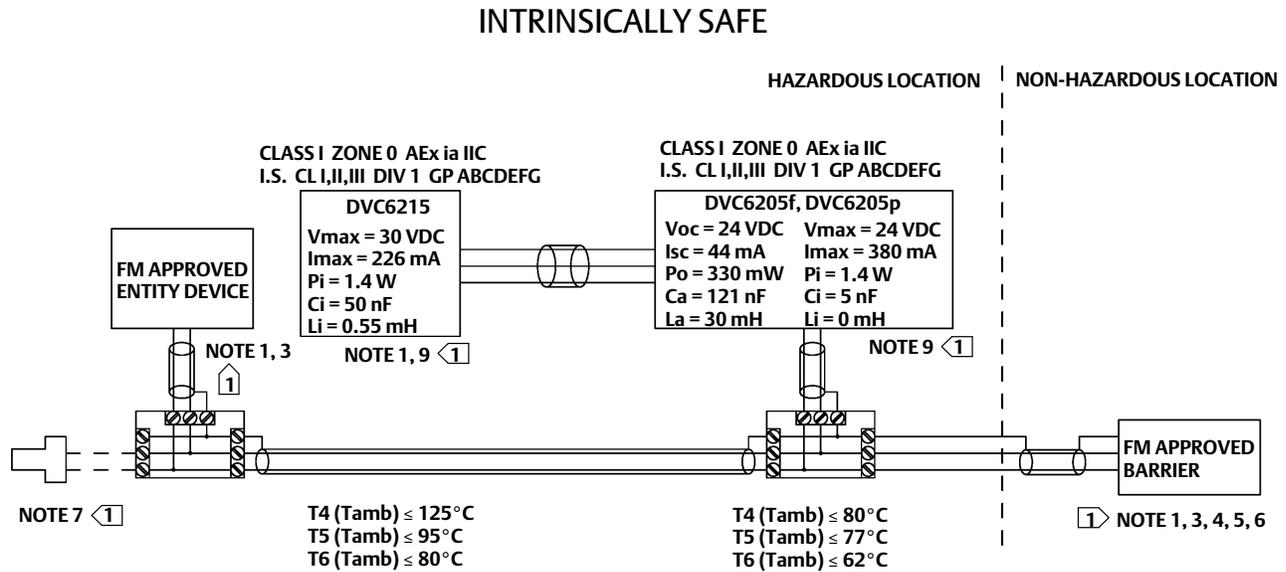


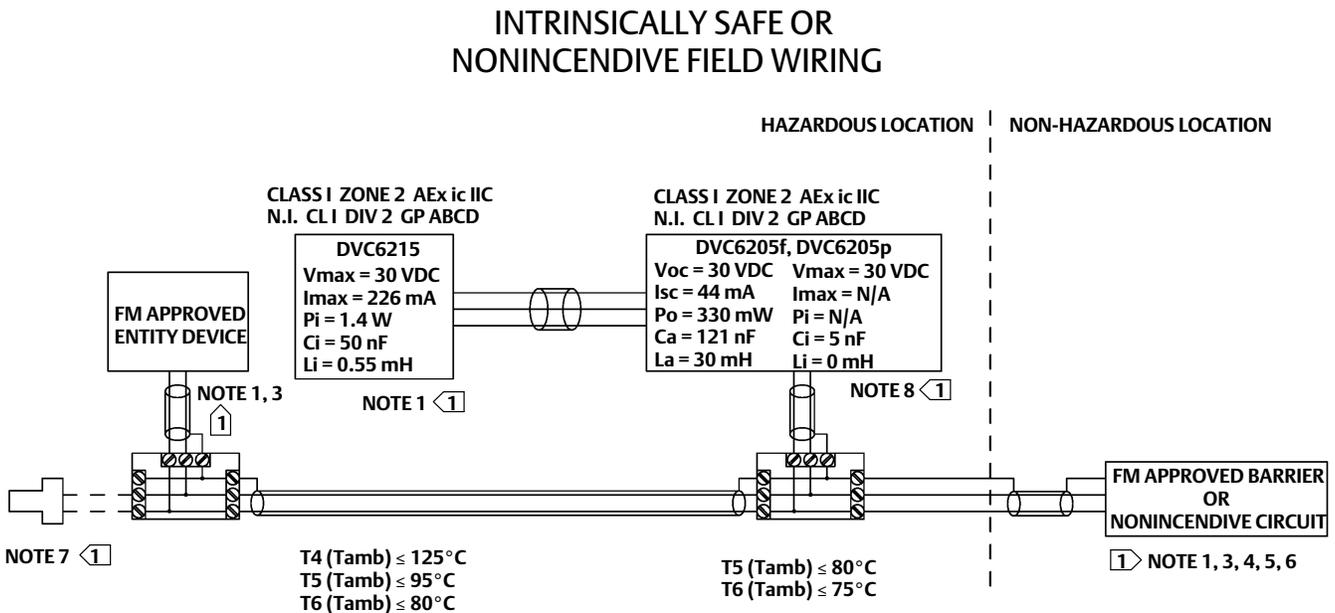
Figure 9. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, Entity Fieldbus Loop



SEE NOTES IN FIGURE 15

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Figure 10. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, Entity Fieldbus Loop



SEE NOTES IN FIGURE 15

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Figure 11. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, FISCO Installations

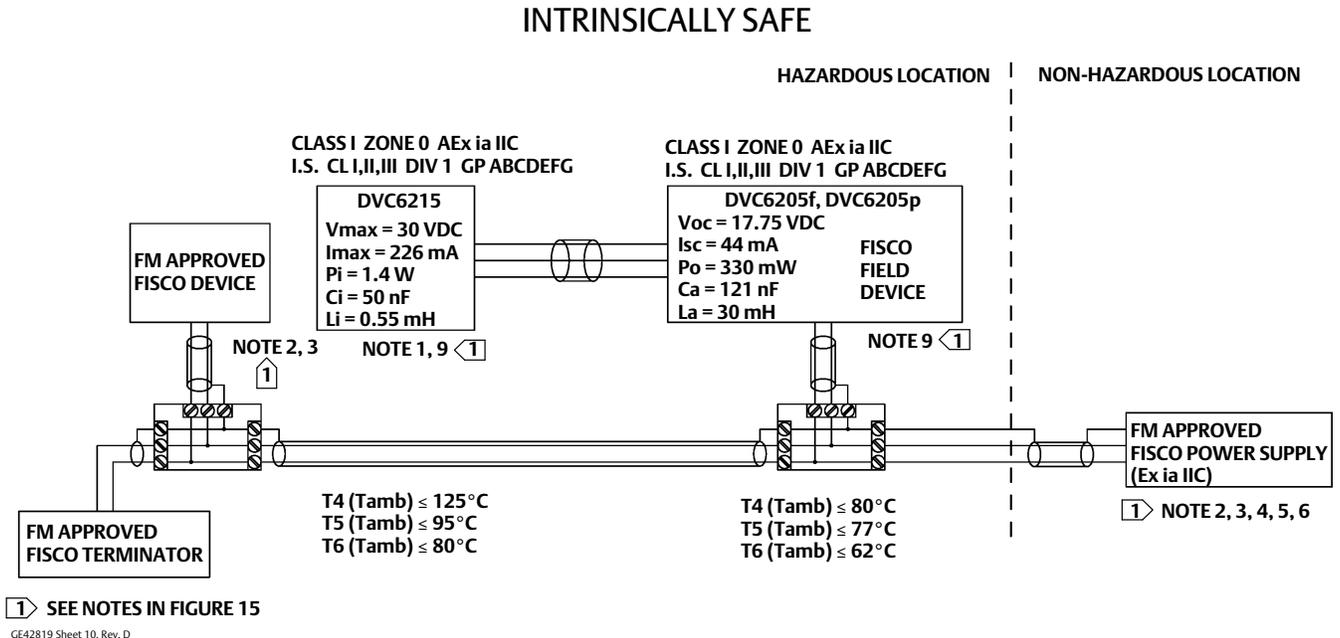


Figure 12. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, FISCO Installations

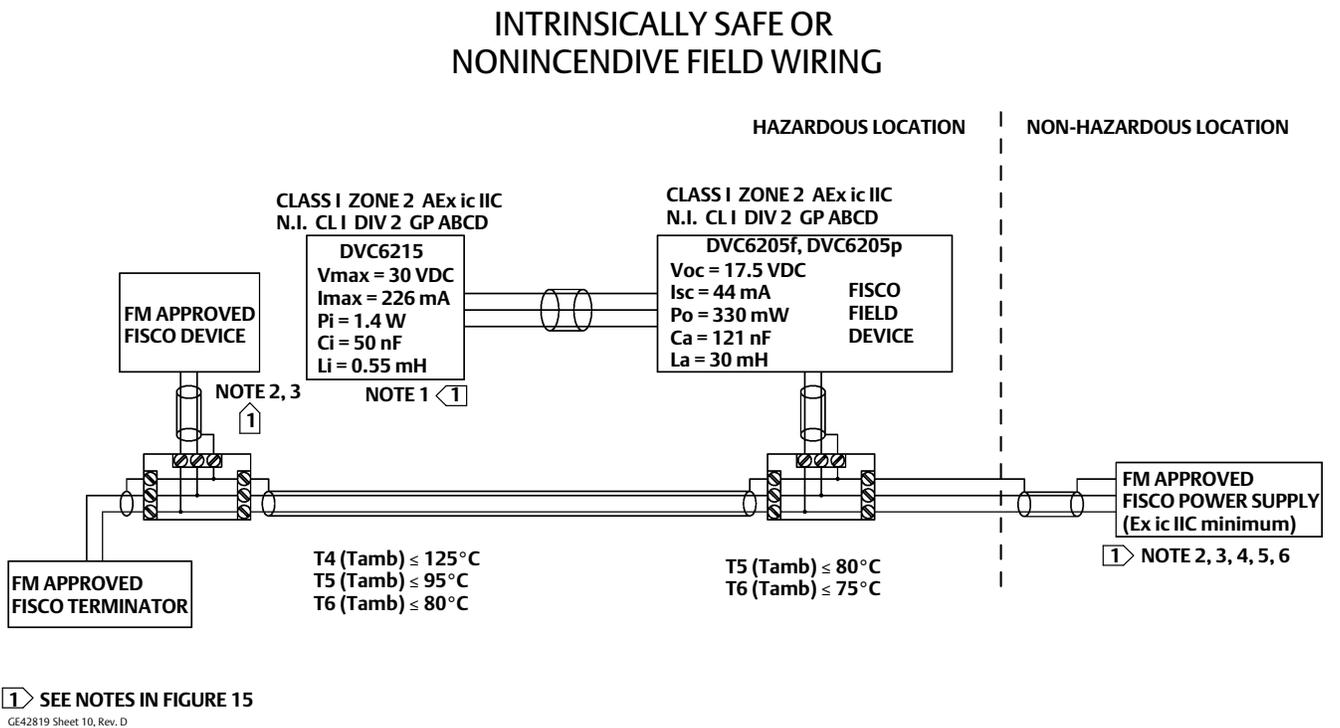


Figure 13. FM Loop Schematic—FIELDVUE DVC6200 HW1

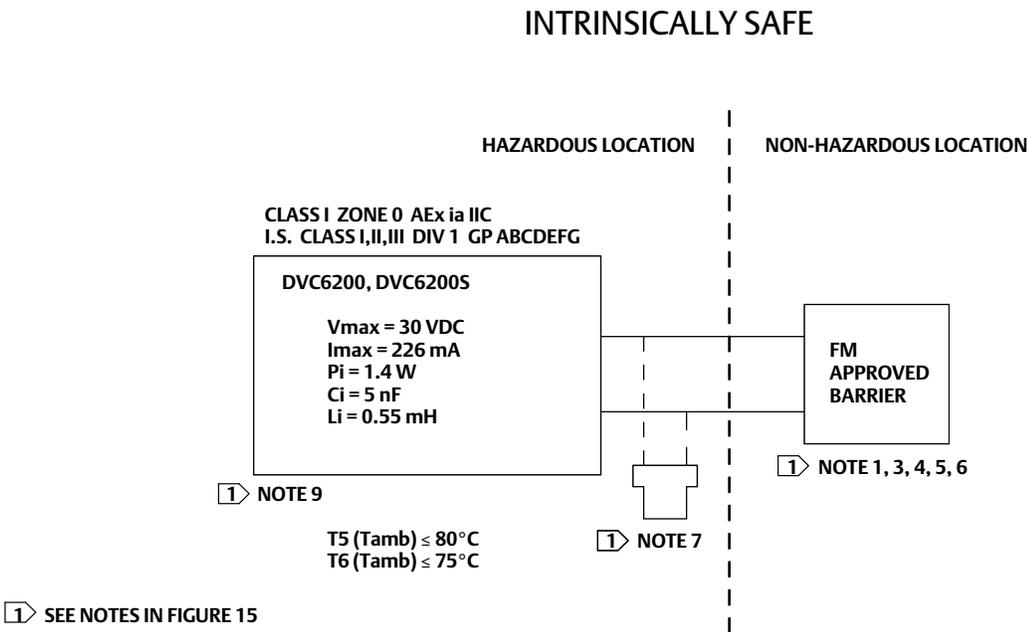


Figure 14. FM Loop Schematic—FIELDVUE DVC6200 HW1

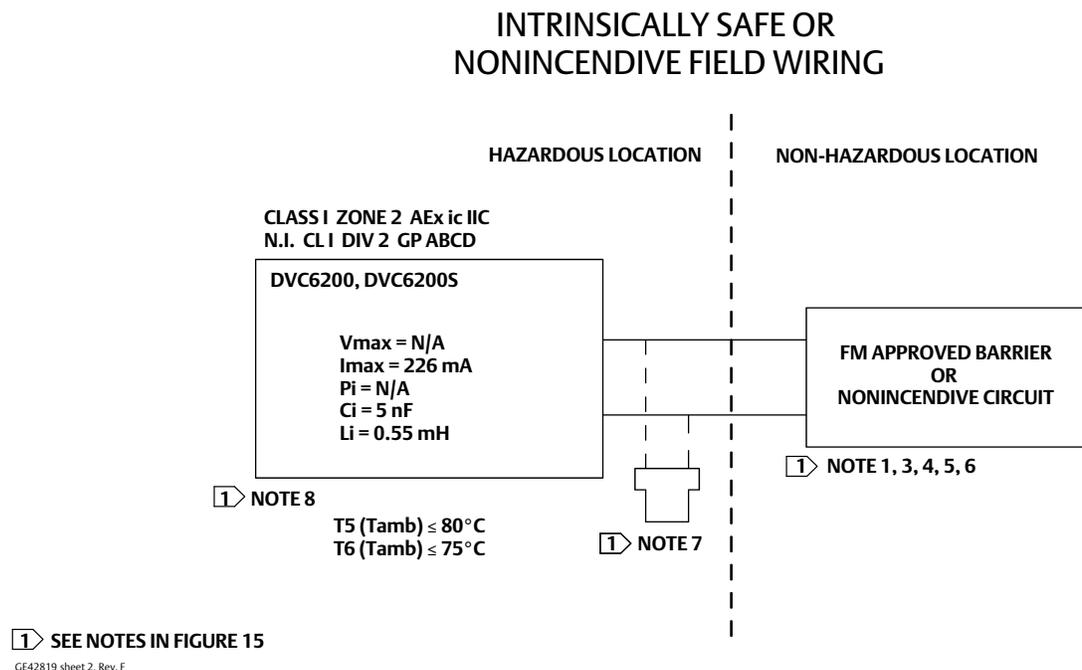


Figure 15. Notes for FM Loop Schematics

1 THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE ( $V_{max}$  OR  $U_i$ ), THE CURRENT ( $I_{max}$  OR  $I_i$ ), AND THE POWER ( $P_{max}$  OR  $P_i$ ) OF THE INTRINSICALLY SAFE APPARATUS MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE ( $V_{oc}$  OR  $U_o$ ), AND THE CURRENT ( $I_{sc}$  OR  $I_o$ ), AND THE POWER ( $P_o$ ) DEFINED BY THE ASSOCIATED APPARATUS. IN ADDITION, THE SUM OF THE MAX UNPROTECTED CAPACITANCE ( $C_i$ ) AND MAX UNPROTECTED INDUCTANCE ( $L_i$ ), INCLUDING THE INTERCONNECTING CABLING CAPACITANCE ( $C_{cable}$ ) AND CABLING INDUCTANCE ( $L_{cable}$ ) MUST BE LESS THAN THE ALLOWABLE CAPACITANCE ( $C_a$ ) AND INDUCTANCE ( $L_a$ ) DEFINED BY THE ASSOCIATED APPARATUS. IF THE ABOVE CRITERIA IS MET, THEN THE COMBINATION MAY BE CONNECTED.

$V_{max}$  or  $U_i \geq V_{oc}$  or  $U_o$     $I_{max}$  or  $I_i \geq I_{sc}$  or  $I_o$     $P_{max}$  or  $P_i \geq P_o$     $C_i + C_{cable} \leq C_a$     $L_i + L_{cable} \leq L_a$

2 THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR THE INTERCONNECTION IS THAT THE VOLTAGE ( $V_{max}$  OR  $U_i$ ), CURRENT ( $I_{max}$  OR  $I_i$ ), AND POWER ( $P_{max}$  OR  $P_i$ ), WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE, CONSIDERING FAULTS, MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE ( $V_{oc}$  OR  $U_o$ ), CURRENT ( $I_{sc}$  OR  $I_o$ ), AND POWER ( $P_o$ ) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION THE MAXIMUM UNPROTECTED CAPACITANCE ( $C_i$ ) AND 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  $\mu$ H RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE ( $U_o$  OR  $V_{oc}$  OR  $V_t$ ) OF THE ASSOCIATED APPARATUS HAS TO BE LIMITED TO THE RANGE OF 9 V TO 17.5 VDC. 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 FOR A LEAKAGE CURRENT OF 50  $\mu$ A FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS A GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

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

LOOP RESISTANCE R':                      15 TO 150 ohms/km

INDUCTANCE PER UNIT LENGTH L:        0.4 TO 1 mH/km

CAPACITANCE PER UNIT LENGTH C':      80 TO 200 nF/km

$C' = C' \text{ LINE/LINE} + 0.5' \text{ LINE/SCREEN}$ , IF BOTH LINES ARE FLOATING OR

$C' = C' \text{ LINE/LINE} + C' \text{ LINE/SCREEN}$ , IF THE SCREEN IS CONNECTED TO ONE LINE.

LENGTH OF SPLICE:                      < 1 m (T-BOX MUST ONLY CONTAIN TERMINAL CONNECTIONS WITH NO ENERGY STORAGE CAPABILITY)

LENGTH OF SPUR CABLE:                < 30 M

LENGTH OF TRUNK CABLE:              < 1 km

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:  $R = 90$  TO  $100$  ohms AND  $C = 0$  TO  $2.2$   $\mu$ F

NOTE, A BUILT-IN TERMINATOR IS INCLUDED IN THE FIELD SIDE AND A SELECTABLE TERMINATOR IS AVAILABLE ON THE HOST SIDE.

THE NUMBER OF PASSIVE DEVICES CONNECTED TO THE BUS SEGMENT IS NOT LIMITED IN THE FISCO CONCEPT FOR INTRINSICALLY SAFE REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF THE LENGTH OF THE TRUNK CABLE AND ALL SPUR CABLES), THE INDUCTANCE AND CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION

3 INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ANSI/ISA RP12.6.01

4 MAXIMUM SAFE AREA VOLTAGE SHOULD NOT EXCEED 250  $V_{rms}$

5 RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN ONE OHM

6 LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTIONS

7 IF HAND-HELD COMMUNICATOR OR MULTIPLEXER IS USED, IT MUST BE FM APPROVED WITH ENTITY PARAMETERS AND INSTALLED PER THE MANUFACTURER'S CONTROL DRAWINGS

Figure 15. Notes for FM Loop Schematics

**CONTINUED**

**8) FOR NONINCENDIVE APPLICATION, E.G. CLASS I DIVISION 2 OR AEx ic, PLEASE NOTE THE FOLLOWING:**

**HART MODELS**

DURING NORMAL OPERATION, THE VOLTAGE OF THE FIELD WIRING CIRCUIT CONNECTED TO THE DIGITAL VALVE CONTROLLER IS CONTROLLED BY THE DIGITAL VALVE CONTROLLER ITSELF. THEREFORE, THE LIMITING FACTOR IS THE MAXIMUM CURRENT,  $I_{max}$  OR  $I_i$ , WHICH MUST NOT BE EXCEEDED.

**FIELDBUS/PROFIBUS MODELS**

DURING NORMAL OPERATION, THE CURRENT OF THE FIELD WIRING CIRCUIT CONNECTED TO THE DIGITAL VALVE CONTROLLER IS CONTROLLED BY THE DIGITAL VALVE CONTROLLER ITSELF. THEREFORE THE LIMITING FACTOR IS THE MAXIMUM VOLTAGE,  $V_{max}$  OR  $U_i$ , WHICH MUST NOT BE EXCEEDED.

**9)  CAUTION/WARNING**

**THE APPARATUS ENCLOSURE CONTAINS ALUMINUM AND IS CONSIDERED TO CONSTITUTE A POTENTIAL RISK OF IGNITION BY IMPACT AND FRICTION. AVOID IMPACT AND FRICTION DURING INSTALLATION AND USE TO PREVENT RISK OF IGNITION.**

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