



FM Hazardous Area Approvals Fisher™ FIELDVUE™ DVC6005 Series Remote Mount 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.

Note

This information supplements the nameplate markings affixed to the product and the DVC6005 Series Remote Mount quick start guide ([D103784X012](#)), available from your [Emerson sales office](#), Local Business Partner or at [Fisher.com](#).

Approval information is for both aluminum and stainless steel constructions.

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

⚠ 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.

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

DVC6005 Series (HART HW1 & HW2, FOUNDATION FIELDBUS)

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 AEx nC IIC
 T5 Ta = 80°C, T6 Ta = 75°C
 Type 4X, IP66
 -52°C ≤ Ambient ≤ +80°C

DVC6015, DVC6025, DVC6035

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 AEx nA IIC
 T4 Ta = 125°C, T5 Ta = 95°C, T6 Ta = 80°C
 Type 4X, IP66
 -60°C ≤ Ambient ≤ +125°C

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
 -52°C ≤ Ambient ≤ +80°C

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

DVC6005 HW1 and DVC6015, DVC6025, DVC6035
 Intrinsically Safe figure 1 and 9
 Intrinsically Safe or Nonincendive Field Wiring figure 2 and 9

DVC6005 HW2 and DVC6015, DVC6025, DVC6035
 Intrinsically Safe figure 3 and 9
 Intrinsically Safe or Nonincendive Field Wiring figure 4 and 9

DVC6005f and DVC6015, DVC6025, DVC6035
 Entity Fieldbus Loop: Intrinsically Safe figure 5 and 9
 Entity Fieldbus Loop: Intrinsically Safe or Nonincendive Field Wiring figure 6 and 9
 FISCO Installations: Intrinsically Safe figure 7 and 9
 FISCO Installations: Intrinsically Safe or Nonincendive Field Wiring figure 8 and 9

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 psig).
- 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 DVC6005 HW1 and DVC6015, DVC6025, DVC6035

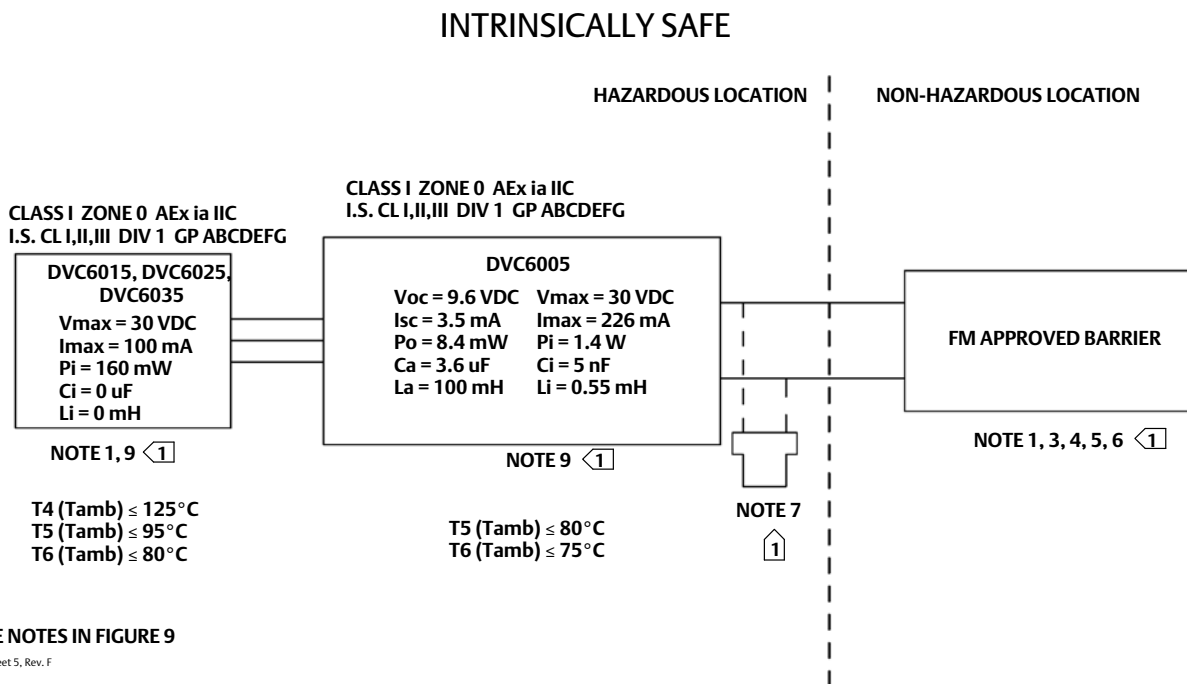


Figure 2. FM Loop Schematics FIELDVUE DVC6005 HW1 and DVC6015, DVC6025, DVC6035

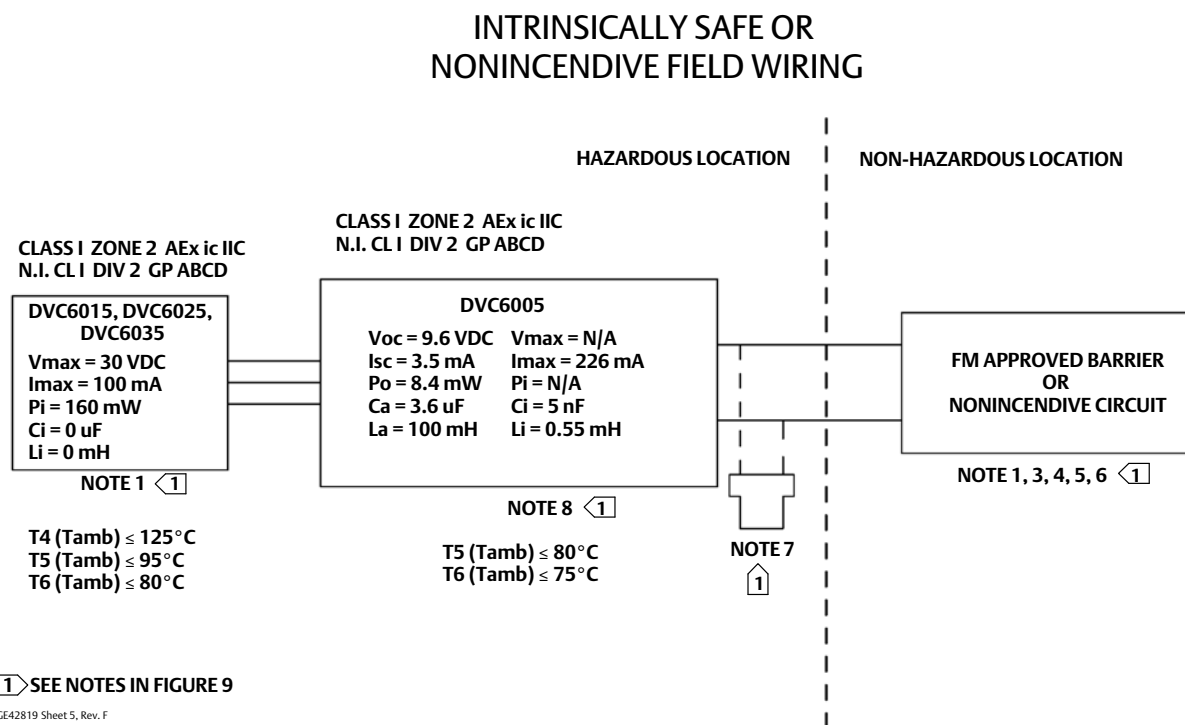
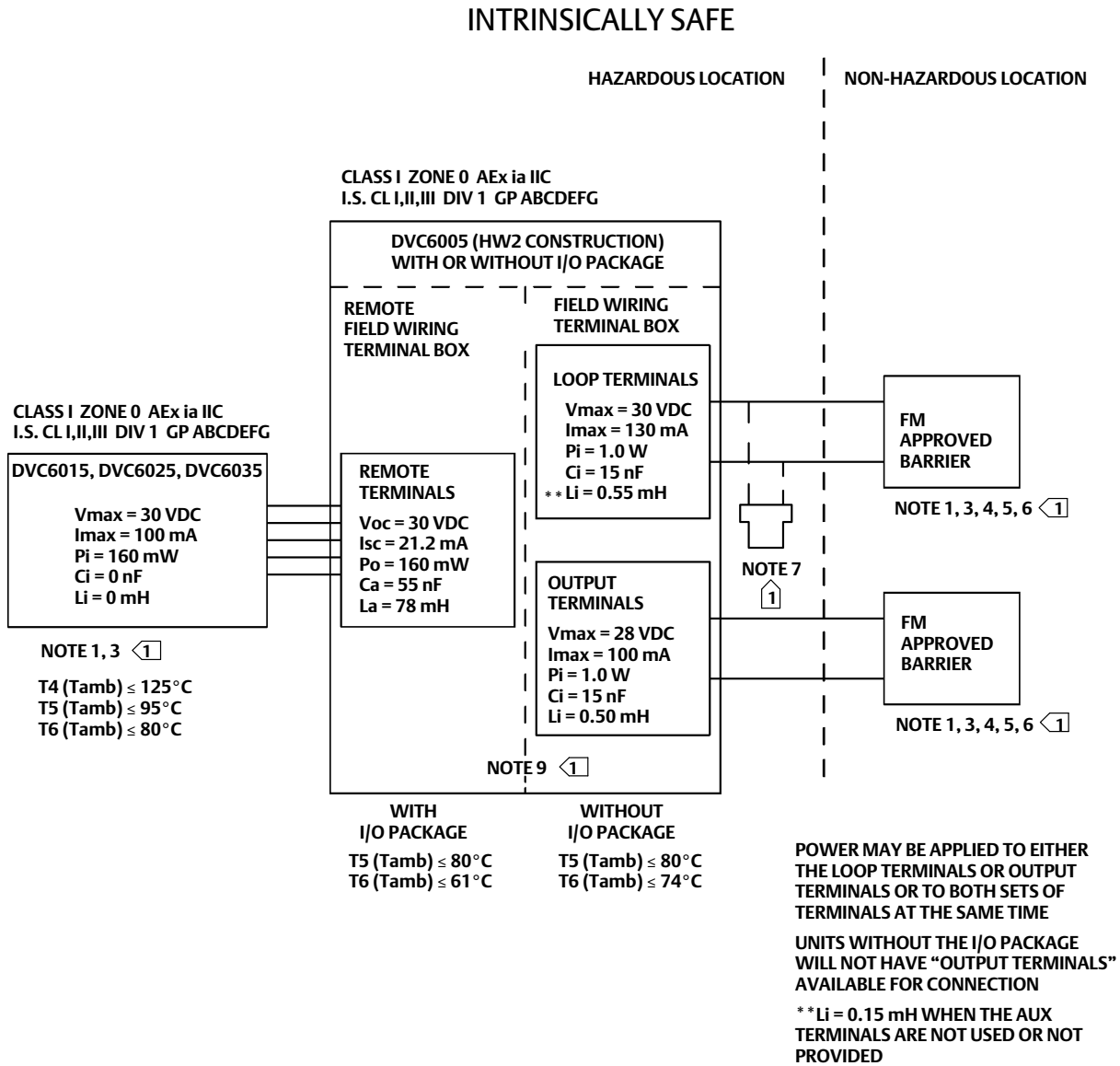


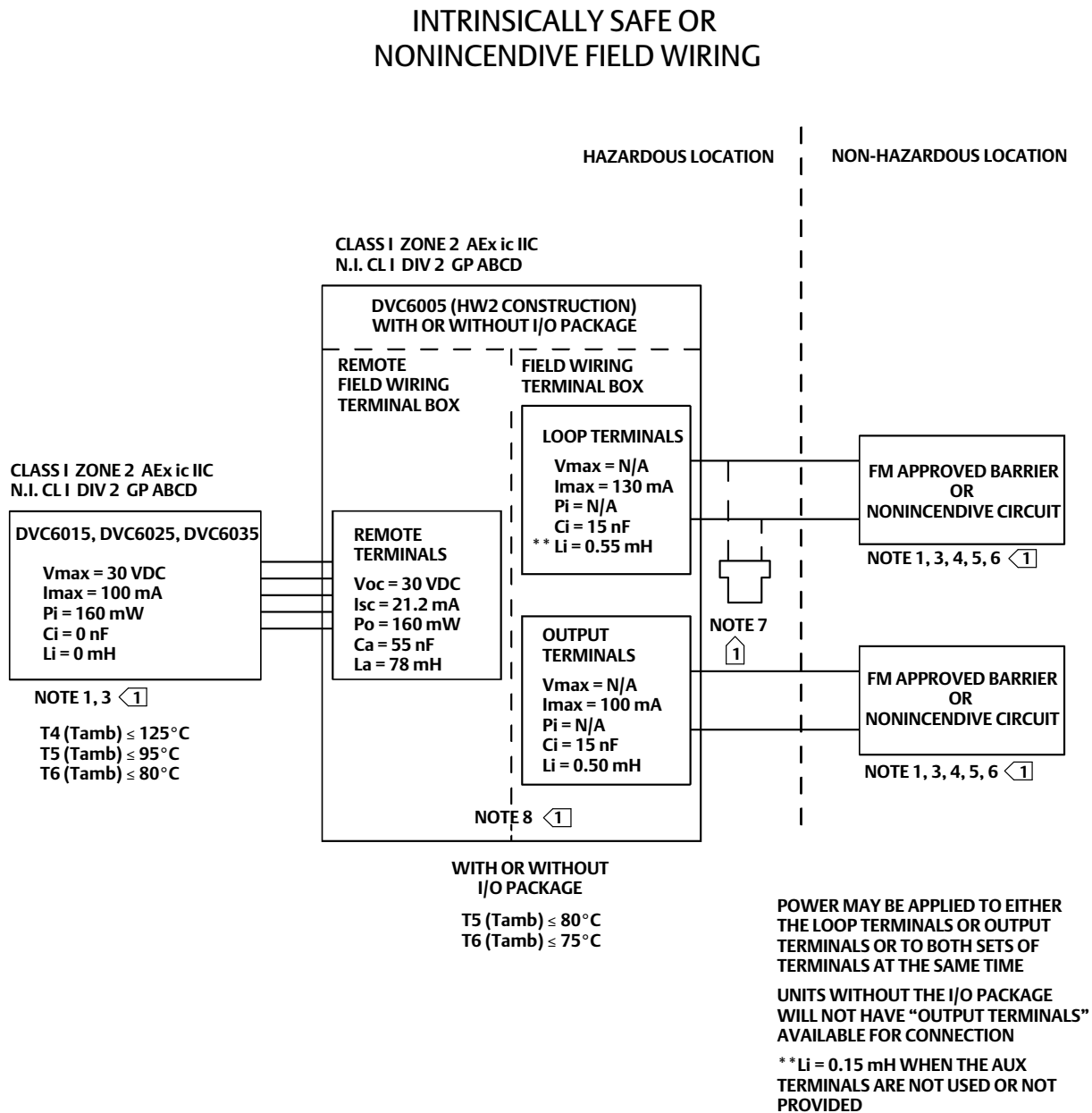
Figure 3. FM Loop Schematics FIELDVUE DVC6005 HW2 and DVC6015, DVC6025, DVC6035



1 SEE NOTES IN FIGURE 9

GE42819 Sheet 13, Rev. C

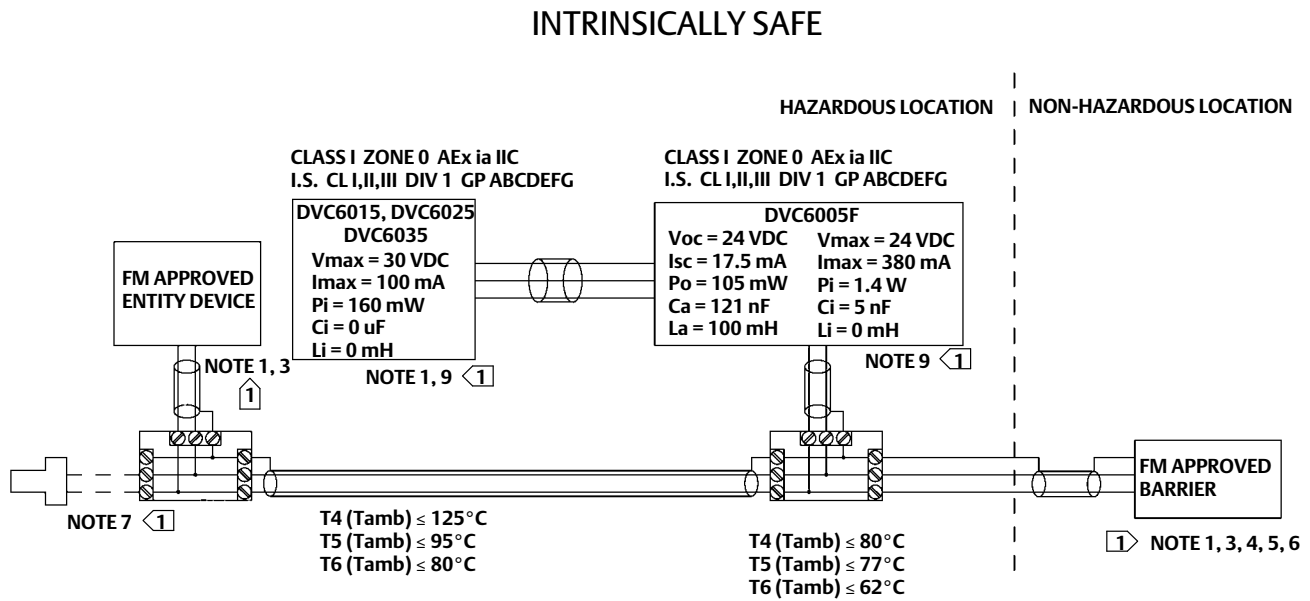
Figure 4. FM Loop Schematics FIELDVUE DVC6005 HW2 and DVC6015, DVC6025, DVC6035



<1> SEE NOTES IN FIGURE 9

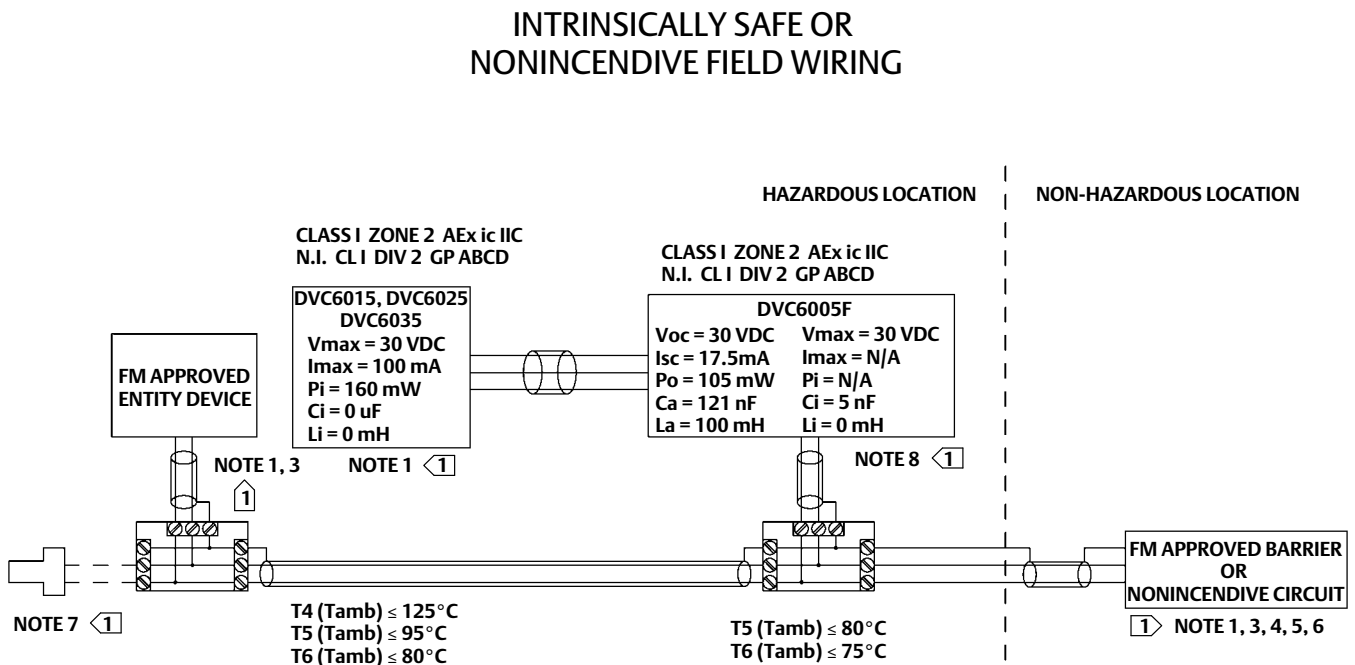
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Figure 5. FM Loop Schematics FIELDVUE DVC6005f and DVC6015, DVC6025, DVC6035, Entity Fieldbus Loop



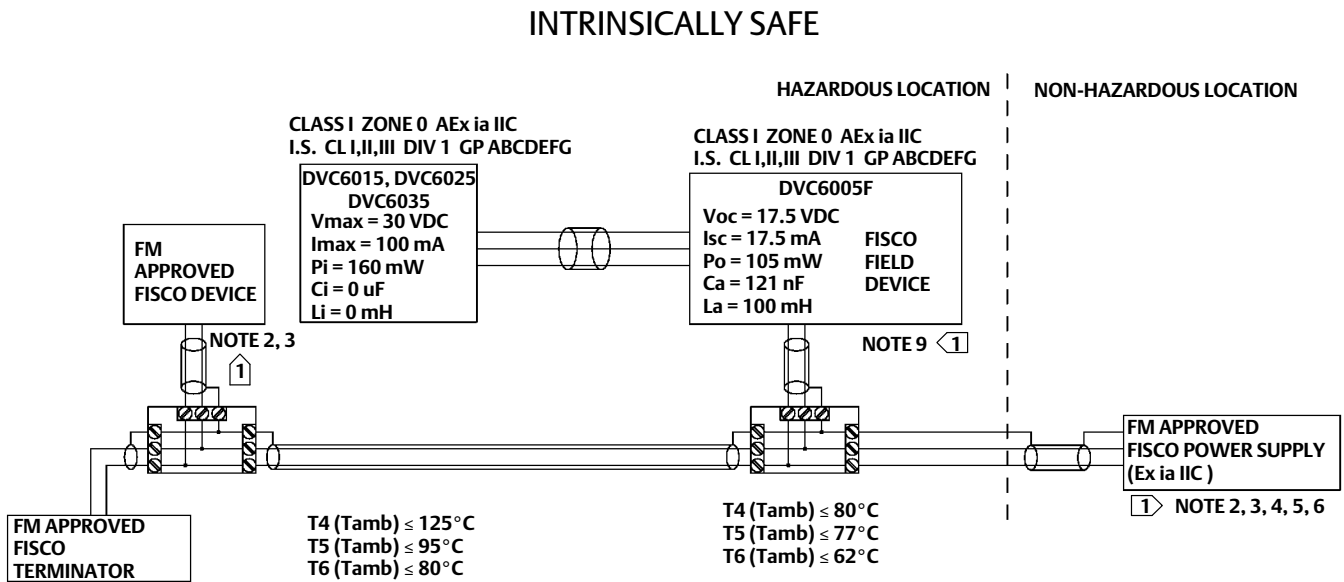
SEE NOTES IN FIGURE 9
GE42819 Sheet 6, Rev. F

Figure 6. FM Loop Schematics FIELDVUE DVC6005f and DVC6015, DVC6025, DVC6035, Entity Fieldbus Loop



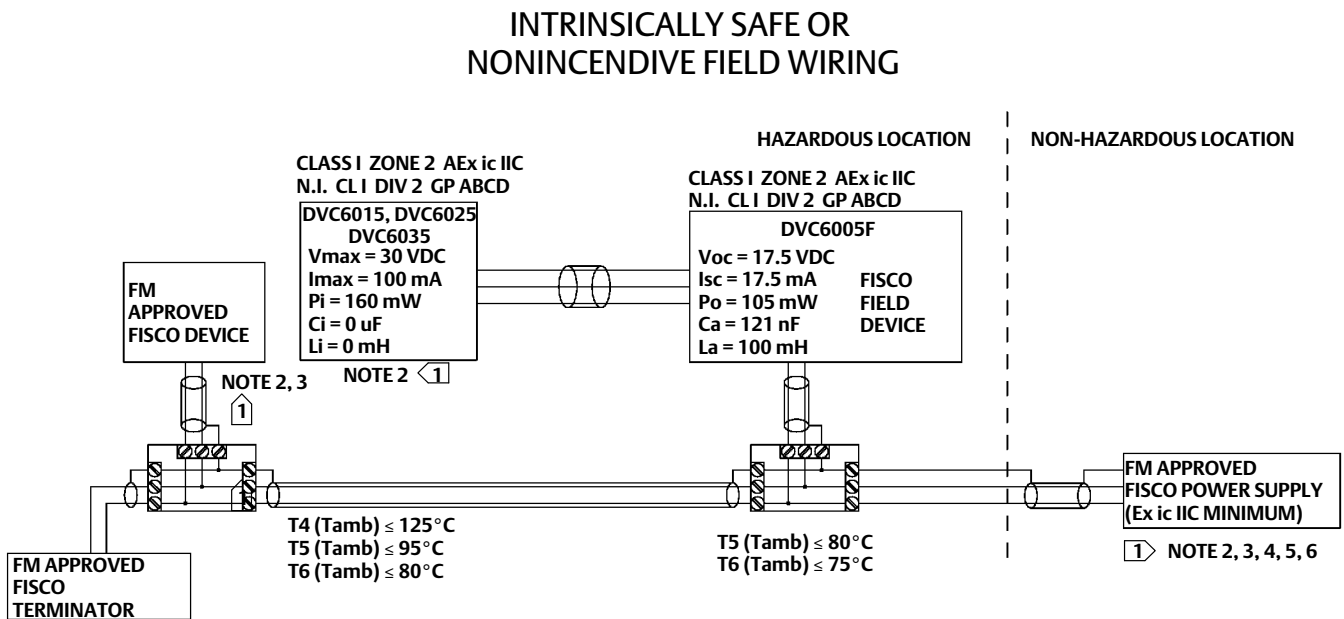
SEE NOTES IN FIGURE 9
GE42819 Sheet 6, Rev. F

Figure 7. FM Loop Schematics FIELDVUE DVC6005f and DVC6015, DVC6025, DVC6035, FISCO Installations



SEE NOTES IN FIGURE 9
GE42819 Sheet 7, Rev. F

Figure 8. FM Loop Schematics FIELDVUE DVC6005f and DVC6015, DVC6025, DVC6035, FISCO Installations



SEE NOTES IN FIGURE 9
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Figure 9. 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.

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

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 FIELD BUS MUST BE LESS THAN OR EQUAL TO 5 nF AND 10 μ H RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELD BUS 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 μ A FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS A GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELD BUS 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 μ 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 9. 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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