CSA Hazardous Area Approvals Fisher™ FIELDVUE™ DLC3020f Digital Level Controller for FOUNDATION™ Fieldbus

Hazardous Area Classifications 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.

Note

This information supplements the nameplate markings affixed to the product and the DLC3020f quick start guide (D103470X012) and instruction manual (D103434X012), available from your Emerson sales office or Fisher.com.

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, or area re-classification.

Intrinsically Safe, Explosion-proof, Division 2, Dust Ignition-proof

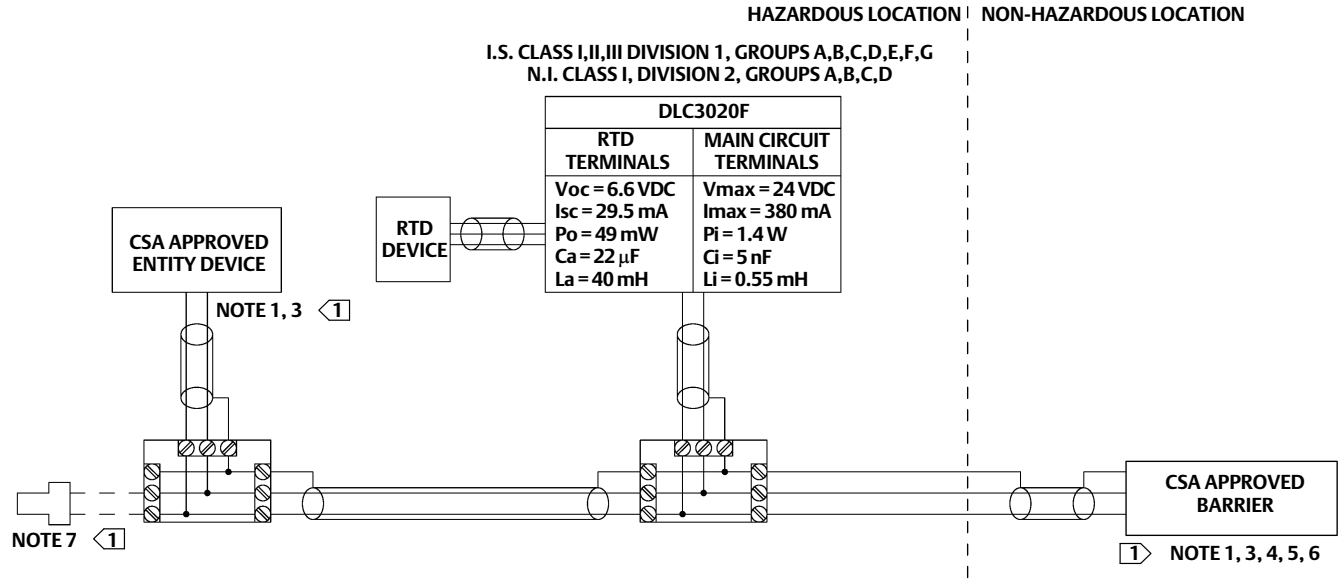
No special conditions for safe use.

Refer to table 1 for approval information.

Table 1. Approval Information

Certification Body	Certification Obtained	Entity Rating		Temperature Code
CSA	Intrinsically Safe Class I, II, III Division 1 Groups A,B,C,D,E,F,G T4 per drawing GE37118 (see figure 1)	Fieldbus		T4 (Tamb ≤ 80°C)
		RTD Terminals Voc = 6.6 VDC Isc = 29.5 mA Po = 49 mW Ca = 22 µF La = 40 mH	**Main Circuit Terminals** Vmax = 24 VDC Imax = 380 mA Pi = 1.4 W Ci = 5 nF Li = 0.55 mH	
		FISCO		
		RTD Terminals Voc = 6.6 VDC Isc = 29.5 mA Po = 49 mW Ca = 22 µF La = 40 mH	**Main Circuit Terminals** Vmax = 17.5 VDC Imax = 380 mA Pi = 5.32 W Ci = 5 nF Li = 0 mH	
	Explosion-proof Class I Division 1 Groups B,C,D T6	---	---	T6 (Tamb ≤ 80°C)
	Class I Division 2 Groups A,B,C,D T6	---	---	T6 (Tamb ≤ 80°C)
	Dust Ignition-proof Class II Division 1,2 Groups E,F,G T6	---	---	T6 (Tamb ≤ 80°C)
	Class III	---	---	T6 (Tamb ≤ 80°C)

Figure 1. CSA Schematic — Drawing GE37118 (Refer to figure 2 for Notes)



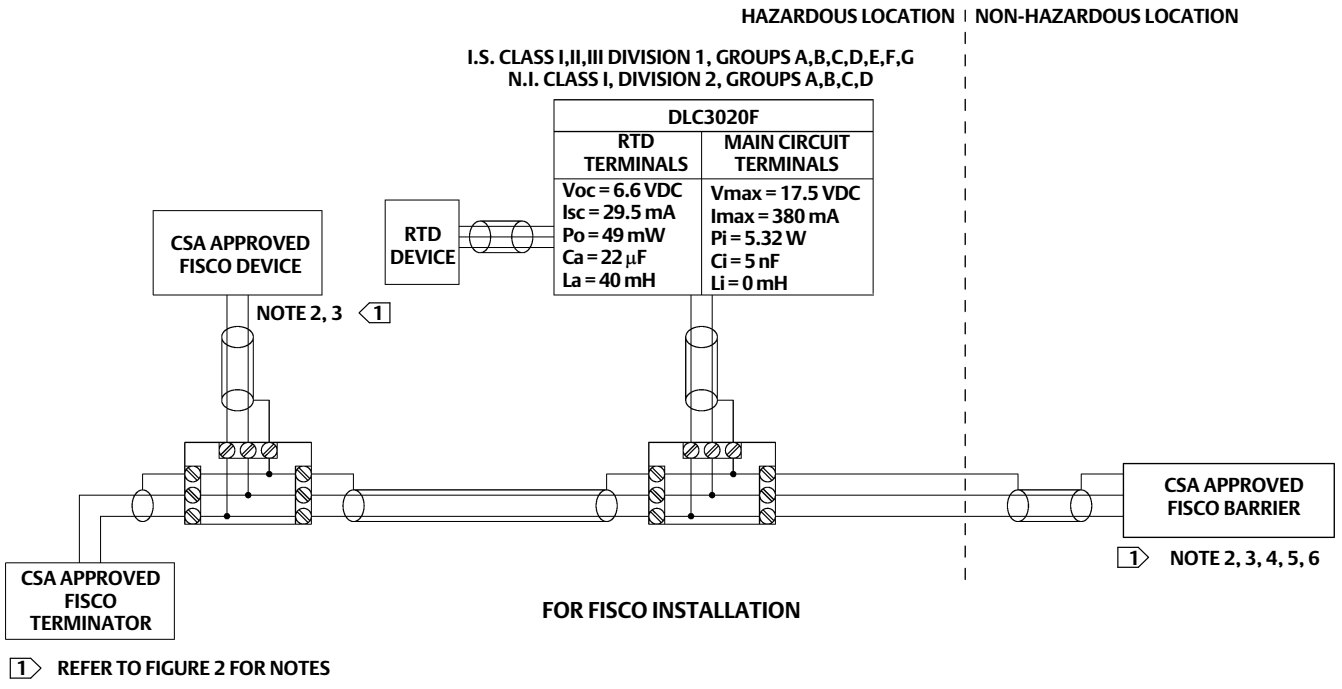


Figure 2. CSA Schematics (Notes)

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 (Vmax or Ui), THE CURRENT (Imax or Ii), AND THE POWER (Pmax or Pi) OF THE INTRINSICALLY SAFE APPARATUS MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc or Uo) AND THE CURRENT (Isc or Io), AND THE POWER (Po) DEFINED BY THE ASSOCIATED APPARATUS. IN ADDITION, THE SUM OF THE MAX UNPROTECTED CAPACITANCE (Ci) AND MAX UNPROTECTED INDUCTANCE (Li), INCLUDING THE INTERCONNECTING CABLING CAPACITANCE (Ccable) AND CABLING INDUCTANCE (Lcable), MUST BE LESS THAN THE ALLOWABLE CAPACITANCE (Ca) AND INDUCTANCE (La) DEFINED BY THE ASSOCIATED APPARATUS. IF THE ABOVE CRITERIA IS MET, THEN THE COMBINATION MAY BE CONNECTED.

Vmax or Ui ≥ Voc or Uo Imax or Ii ≥ Isc or Io Pmax or Pi ≥ Po Ci + Ccable ≤ Ca Li + Lcable ≤ La

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 (Vmax or Ui), CURRENT (Imax or Ii) AND POWER (Pmax or Pi), WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE, CONSIDERING FAULTS, MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc or Uo), CURRENT (Isc or Io), AND POWER (Po) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF AND 10 uH 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 (Uo or Voc or Vt) 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 uA 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 INTERCONNECT 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' LINE/LINE + 0.5' LINE/SCREEN, IF BOTH LINES ARE FLOATING OR	
C' = C' LINE/LINE + C' 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 uF. NOTE, A BUILT-IN TERMINATOR IS INCLUDED ON 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 CANADIAN ELECTRICAL CODE (CEC) PART 1 AND ANSI/ISA RP12.6

4 MAXIMUM SAFE AREA VOLTAGE SHOULD NOT EXCEED 250 Vrms

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 CSA APPROVED WITH ENTITY PARAMETERS AND INSTALLED PER THE MANUFACTURER'S CONTROL DRAWING

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