



71078165

CSA Control Drawing 960006752 C

Cerabar S/Deltabar S
PMP71/72/75, FMD77/78, PMD75
PROFIBUS PA/FOUNDATION Fieldbus
(IS + XP)

Endress+Hauser

People for Process Automation



The Cerabar S / Deltabar S with electronic insert for PROFIBUS PA / FOUNDATION Fieldbus is suitable for the connection to a PA and FF system according to both the Entity-Concept or the FISCO-Concept (as described below).

FISCO-Concept

The FISCO-Concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination.

The criteria for interconnection is that the voltage (Ui or Vmax), the current (Ii or Imax) and the power (Pi or Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc or Vi), the current (Io or Isc or It) and the power (Po or Pmax) 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 µH 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 Vi) of the associated apparatus has to be limited to the range of 14 V to 24 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 to a leakage current of 50 µA 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...150 Ω/km
- inductance per unit length L : 0.4...1 mH/km
- capacitance per unit length C : 80...200 nF/km
- C' = C' line/line + 0.5 C' 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 spur cable: ≤ 30 m
- length of trunk cable: ≤ 1 km
- length of splice: ≤ 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable: R = 90...100 Ω

$$C = 0...2.2 \mu F$$

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

Notes:

- INTRINSICALLY SAFE Class I, Div. 1, Groups A, B, C, D; Ex ia IIC T6
- CSA certified apparatus must be installed in accordance with manufacturer instructions.
- CSA certified associated apparatus must meet the following requirements:
Uo or Voc or Vi ≤ Ui (Vmax) and Io or Isc or It ≤ Ii (Imax) and Po or Pmax ≤ Pi (Pmax).
- The maximum non-hazardous area voltage must not exceed 250 V.
- The installation must be in accordance with the Canadian Electrical Code or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
- Be aware of multiple earthing of screen. The screen must be connected in accordance with Canadian Electrical Code or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
- Caution: Use only supply wires suitable for 5 °C above surrounding temperature.
- Warning: Substitution of components may impair intrinsic safety.
- The polarity for connecting is of no importance due to an internal rectifier.
- Remark: Versions with optional terminal block with integrated overvoltage protection have an isolation voltage greater than 420 VDC between terminal connections and potentially grounded metal parts.

Suitable for Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G

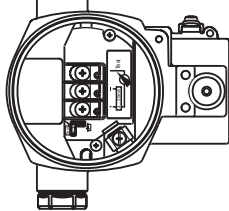
HAZARDOUS LOCATION INSTALLATION

- Install per Canadian Electrical Code (CEC) or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
- Intrinsic safety barrier not required. Max. supply voltage 32 V. For T-code see table.
- WARNING: Explosion Hazard - do not disconnect equipment unless power has been switched off or the area is known to be non hazardous.
- AVERTISSEMENT : Risque d'explosion - avant de déconnecter l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.
- WARNING: Substitution of components may impair suitability for Class I, Div. 2.
- AVERTISSEMENT : La substitution de composant peut rendre ce matériel inacceptable pour les emplacements de Class I, Div. 2.

HAZARDOUS (CLASSIFIED) LOCATION

Ex ia IIC T6
Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1

CERABAR S / DELTABAR S



Cerabar/Deltabar S with electronic insert PROFIBUS PA / FOUNDATION Fieldbus (Entity-Concept)	
Ui (Vmax) = 24 V	
Ii (Imax) = 250 mA	
Pi (Pmax) = 1.2 W	
Ci ≤ 5 nF	Li ≤ 10 µH
Leakage current ≤ 50 µA	
Temperature classification	T6
Max. ambient temperature	40 °C 104 °F
Min. ambient temperature:	-40 °C (optional -50 °C)

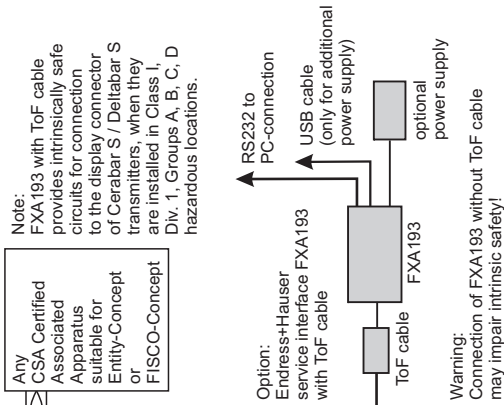
Cerabar/Deltabar S with electronic insert PROFIBUS PA / FOUNDATION Fieldbus (FISCO-Concept)	
Ui (Vmax) = 17.5 V	
Ii (Imax) = 500 mA	
Pi (Pmax) = 5.5 W	
Ci ≤ 5 nF	Li ≤ 10 µH
Leakage current ≤ 50 µA	
Temperature classification	T6
Max. ambient temperature	40 °C 104 °F
Min. ambient temperature:	-40 °C (optional -50 °C)

Cerabar S, PMP71, PMP72, PMP75; Dual Seal Device acc. ISA 12.27.01; Gas tight conduit seal not required.	
Temperature classification	T4
Max. ambient temperature	70 °C 158 °F
Min. ambient temperature:	-40 °C (optional -50 °C)

Deltabar S, FMD77, FMD78, PMD75; This device does not rely on a single seal to allow passage of process fluids into the electrical or conduit system. Hence, Sec. 18, clause 18-092... of the CEC does not apply and a secondary seal is not required in the conduit.	
Temperature classification	T4
Max. ambient temperature	70 °C 158 °F
Min. ambient temperature:	-40 °C (optional -50 °C)

Any CSA Certified
Termination with
R = 90...100 Ω
C = 0...2.2 µF

NON HAZARDOUS LOCATION



Warning:
Connection of FXA193 without ToF cable
may impair intrinsic safety!

This device is suitable to be installed in accordance with the wiring methods of Division 1 / Zone 0 for intrinsic safety (as defined above) or for Division 1 / Zone 1 for explosion proof protection.

For installations in accordance with the requirements of explosion proof protection the device is suitable for:

Cerabar S:
Cl. I, Div. 1, Groups B, C, D, Cl. II, Div. 1, Groups E, F, G, Cl. III; Ex d IIC T6.
For pressure range 700 bar / 10500 psi:
Cl. I, Div. 1, Groups C, D, Cl. II, Div. 1, Groups E, F, G, Cl. III; Ex d IIC T6

Deltabar S:
Cl. I, Div. 1, Groups A, B, C, D, Cl. II, Div. 1, Groups E, F, G, Cl. III; Ex d IIC T6
seals must be installed within 18 inches of enclosure

Max. supply voltage: 32 VDC
Ambient temperature range: -40...75 °C (optional Ta min -50 °C)

Warning: Changing the type of protection after first installation may impair the explosion protection.