

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 (C) 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 m
- 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 µF.

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.

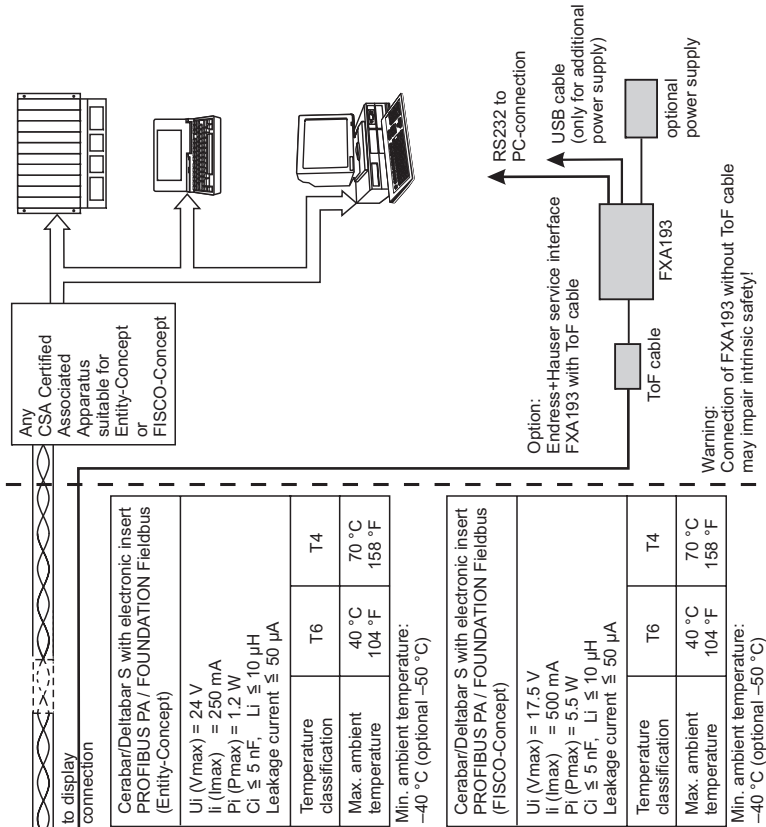
Notes:

1. **INTRINSICALLY SAFE Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III; Ex ia IIC T6**
 2. CSA certified apparatus must be installed in accordance with manufacturer instructions. CSA 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).
 3. The maximum non-hazardous area voltage must not exceed 250 V.
 4. The installation must be in accordance with the Canadian Electrical Code or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
 5. 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.
 6. **Caution:** Use only supply wires suitable for 5 °C above surrounding temperature.
 7. **Warning:** Substitution of components may impair intrinsic safety.
 8. The polarity for connecting is of no importance due to an internal rectifier.
 9. **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.
 10. Type of protection for Cerabar S PMP71 and Deltabar S FMD76:
Intrinsically safe (Ex ia), Ci I, Div. 1, Groups A, B, C, D, Ci II, Div. 1, Group G + coal dust, Ex ia IIC T6.
- Suitable for Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G
HAZARDOUS LOCATION INSTALLATION (not for separated housing)
1. 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.
 2. **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 designé 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.

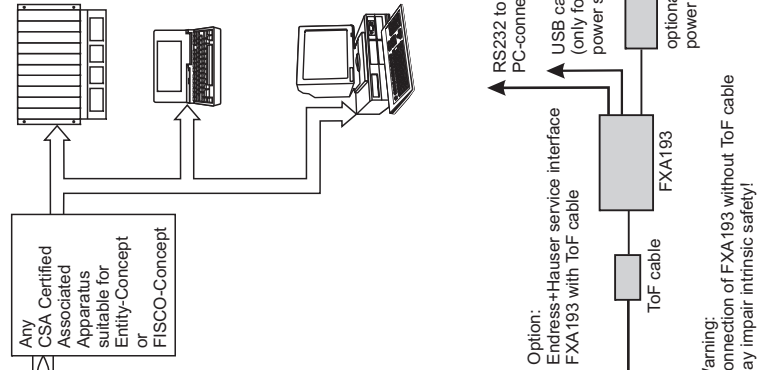
HAZARDOUS (CLASSIFIED) LOCATION

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



NON HAZARDOUS LOCATION



Note:
FXA193 with ToF cable provides intrinsically safe circuits for connection to the display connector of Cerabar S / Deltabar S transmitters, when they are installed in Class I, Div. 1, Groups A, B, C, D hazardous locations.

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

Option:
Endress+Hauser service interface FXA193 with ToF cable

