

**HAZARDOUS (CLASSIFIED) LOCATION**

The Cerabar S/Deltabar S with electronic insert for PROFIBUS PA/FOUNDATION Fieldbus is suitable for the connection to a PROFIBUS PA 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 (U<sub>i</sub> or V<sub>max</sub>), the current (I<sub>i</sub> or I<sub>max</sub>) and the power (P<sub>i</sub> or P<sub>max</sub>) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U<sub>o</sub> or V<sub>oc</sub> or V<sub>t</sub>), the current (I<sub>o</sub> or I<sub>sc</sub> or I<sub>t</sub>) and the power (P<sub>o</sub> or P<sub>max</sub>) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (C) and inductance (L) 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 U<sub>o</sub> (or V<sub>oc</sub> or V<sub>t</sub>) of the associated apparatus has to be limited to the range of 14V to 24V d.c. 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<sub>1</sub> line/line + 0.5 C<sub>2</sub> line/screen, if both lines are floating or
- C = C<sub>1</sub> line/line + C<sub>2</sub> 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 inflexible line termination with the following parameters is suitable:

- R = 90...100 Ohm
- 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. INT. 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.
3. CSA certified associated apparatus must meet the following requirements:  
 U<sub>o</sub> or V<sub>oc</sub> or V<sub>t</sub> ≤ U<sub>i</sub> (V<sub>max</sub>) and I<sub>o</sub> or I<sub>sc</sub> or I<sub>t</sub> ≤ I<sub>i</sub> (I<sub>max</sub>) and P<sub>o</sub> or P<sub>max</sub> ≤ P<sub>i</sub> (P<sub>max</sub>)
4. The maximum non-hazardous area voltage must not exceed 250 V.
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 terminalblock 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 PMC71: Intrinsically safe (Ex ia) CII, Div.1, GP, ABCD, CII, Div.1, GP G + coal dust, Ex ia IIC T6.
11. Avoid electrostatic charge of plastic surfaces, plastic process connections or coatings.

**Suitable for CLASS I, DIV.2, GROUPS A,B,C,D, CLASS II, DIV.1, GROUPS E,F,G**

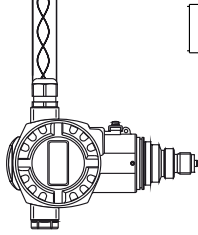
**HAZARDOUS LOCATION INSTALLATION (not for separated housing)**

1. Install per Canadian Electrical Code (CEC) or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
  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 - Ne pas débrancher tant que le circuit est sous tension, à moins qu'il s'agisse d'un emplacement non dangereux.
- WARNING: Explosion Hazard - Substitution of components may impair suitability for CLASS I, Div.2.
- AVERTISSEMENT : Risque d'explosion - La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Class I, Div.2.

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/DELATABAR S**

to display connection



Cerabar S/Deltabar S with electronic insert PROFIBUS PA/FOUNDATION Fieldbus (Entity-Concept) (FISCO-Concept)	
U <sub>i</sub> (V <sub>max</sub> ) = 24 V	U <sub>t</sub> (V <sub>max</sub> ) = 17.5 V
I <sub>i</sub> (I <sub>max</sub> ) = 250 mA	I <sub>t</sub> (I <sub>max</sub> ) = 500 mA
P <sub>i</sub> (P <sub>max</sub> ) = 1.2 W	P <sub>t</sub> (P <sub>max</sub> ) = 5.5 W
C <sub>i</sub> ≤ 5 nF	L <sub>i</sub> ≤ 10 µH
Leakage current ≤ 50 µA	
Temperature classification	T6
Max. ambient temperature	40°C 104°F
	T4
	70°C 158°F

Min. ambient temperature: -40°C (optional -50°C)

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

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, Group A,B,C,D, haz. loc.

The devices are CSA Certified as Single Seal or Dual Seal per ANSI/ISA 12.27.01 as tabulated below; therefore installation of external secondary seals is not required.

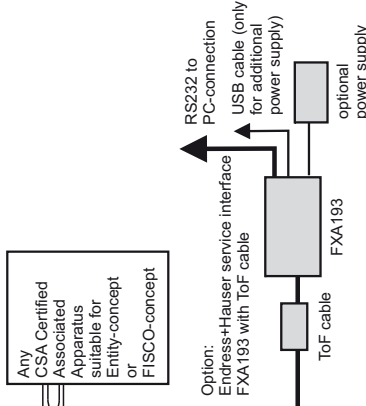
Dual Seal	Model	Media	Annunciation in case of primary seal failure	
			Annunciation method	Pressure range for effective annunciation
MWP*	PMP71, PMP75, PMP71 (without separate housing)	gas	audible	0.4 bar (5.8 psi)
		liquid	audible/visible	1 bar (14.5 psi)
Single Seal	Model	Limited to:		
		MWP*	Process Temperature**	
		PMP71, PMP75 (without separate housing; pressure range 200...400 bar (2900...5800 psi))	400 bar (5800 psi)	-40°C...+100°C
		PMP71, PMP75 (with separate housing)	400 bar (5800 psi)	-40°C...+100°C
PMC71 (with separate housing)	40 bar (600 psi)	-40°C...+125°C		
PMD75, FMD77, FMD78	420 bar (6091 psi)	-40°C...+ 85°C		

\* Limitations of the Maximum Working Pressure (MWP) are marked on the nameplate and must be considered!

\*\* Limitations of the process temperature range depending on the used version are specified in the applicable technical information of the manufacturer and must be considered!  
 PMP75, FMD77, FMD78 allows higher process temperatures depending on the used diaphragm seal. This is allowable provided the above specified process temperatures are guaranteed at the sensor close to the enclosure (location of primary seal) for these types.

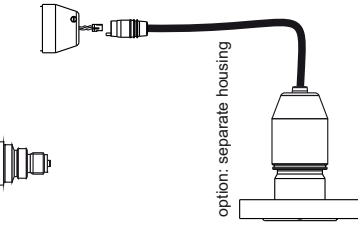
Any CSA Certified Termination with  
 R = 90...100 Ω  
 C = 0...2.2 µF

**NONHAZARDOUS LOCATION**



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

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, Group A,B,C,D, haz. loc.



option: separate housing

Any CSA Certified Intrinsically Safe Apparatus suitable for Entity-Concept or FISCO-Concept

to display connection

Any CSA Certified Associated Apparatus suitable for Entity-Concept or FISCO-Concept

Option: Endress+Hauser service interface FXA193 with ToF cable

RS232 to PC-connection

USB cable (only for additional power supply)

optional power supply



**CSA Control Drawing**  
**960006717-G**

Cerabar S PMC71, PMP71, PMP75  
 Deltabar S PMD75, FMD77, FMD78  
 PA, FF

