Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Prosonic S
FDU90/91, FDU91F, FDU92/93/95/96

Ex ma IIC T5 Gb (FDU90)
Ex ma IIC T6 Gb (FDU91/91F/92/93/95/96)
Ex ta/tb IIIC Txx°C Da/Db IP68
Ex tb IIIC Txx°C Db IP68

IECEx BVS 08.0012

XA00481F-B

Safety instructions for electrical apparatus for explosion-hazardous areas according to IEC standards

XA00481F-B/00/EN/13.10
71128187

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Prosonic S
FDU90, FDU91, FDU91F, FDU92, FDU93, FDU95, FDU96

english

Associated Documentation

This document is an integral part of the following Operating Instructions:
TI396/00

The Operating Instructions which are supplied and correspond to the device type apply.

Supplementary Documentation

Explosion-protection brochure:
CP021Z/00

Designation

Explanation of the labelling and type of protection can be found in the explosion protection brochure.

Designation according to IECEx	
Equipment protection level (EPL)	**Gb**
Designation of explosion protection	**Ex ma IIC T5 Gb** (only FDU90) **Ex ma IIC T6 Gb** (except FDU90)

Designation according to IECEx	
Equipment protection level (EPL)	**Da/Db** **Db**
Designation of explosion protection	**Ex ta/tb IIIC Txx°C Da/Db IP68** **Ex tb IIIC Txx°C Db IP68**

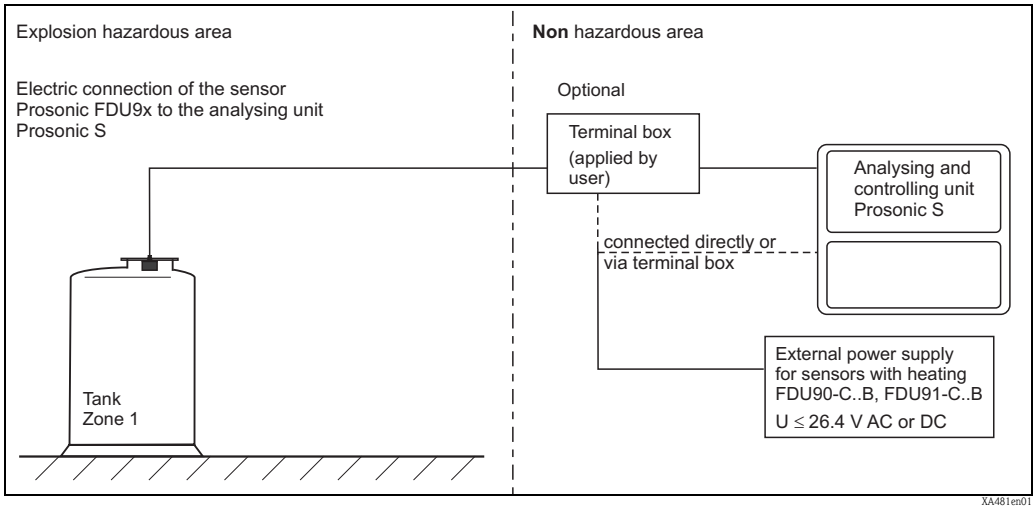

Fig. 1

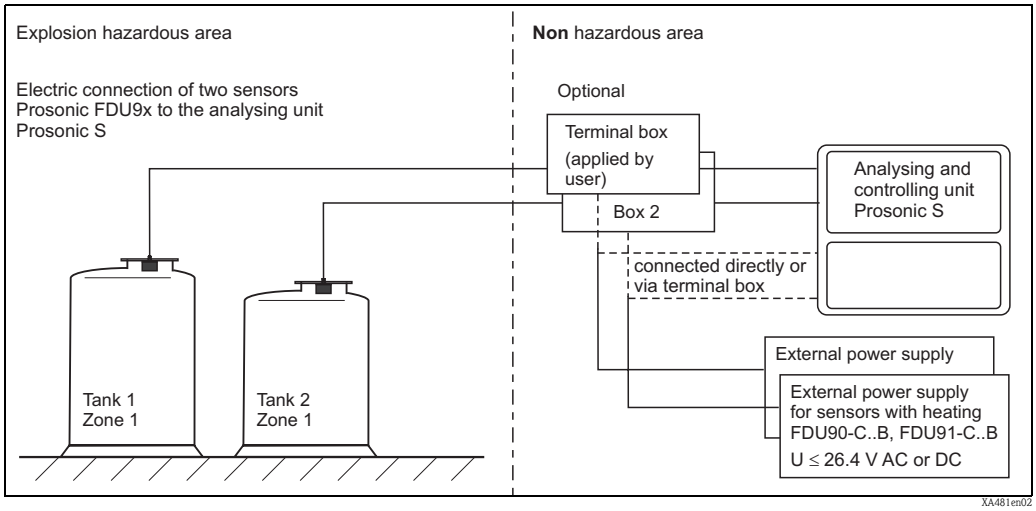

Fig. 2

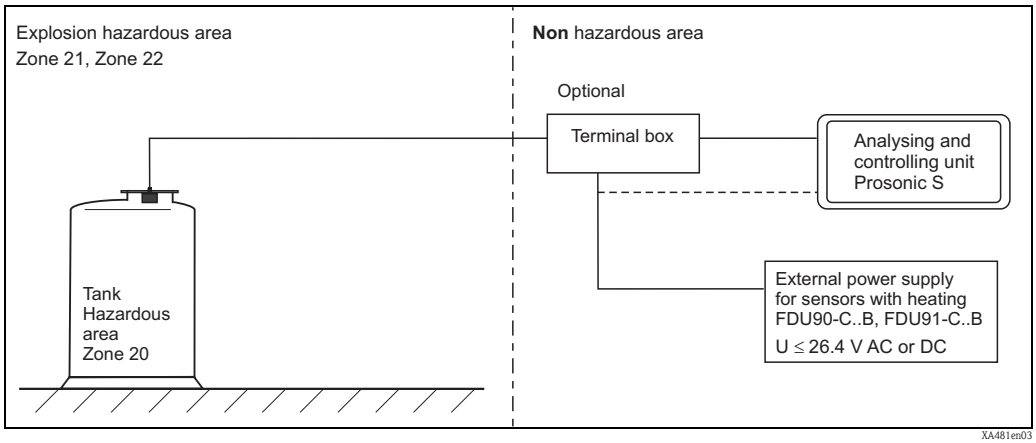

Fig. 3

Installation with alignment unit

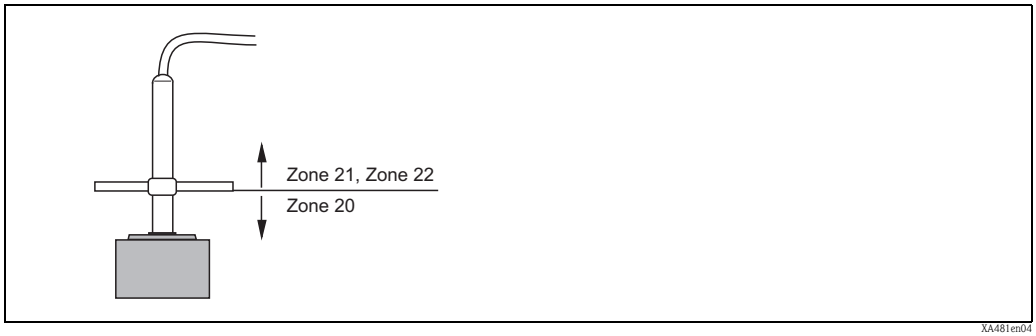

Fig. 4

Power supply	For connecting to the analysing and controlling unit Prosonic S FMU90, FMU95

Equipment protection level (EPL)	Gb	Sensor and cable in Zone 1
Type of protection	Ex ma IIC T5...T3 Gb (only FDU90) Ex ma IIC T6...T3 Gb (except FDU90)	

Equipment protection level (EPL)	Da/Db Db	Sensor in Zone 20 and cable in Zone 21 Sensor and cable in Zone 21
Type of protection	Ex ta/tb IIIC Txx°C Da/Db Ex tb IIIC Txx°C Db	

Housing protection	IP68

Sensor	FDU90	FDU91	FDU91F	FDU92	FDU93	FDU95-D1	FDU96-D
Max. working pressure*1	0.4 MPa	0.4 MPa	0.4 MPa	0.4 MPa	0.3 MPa	0.15 MPa	0.3 MPa
Max. process temperature	+60 °C	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C	+140 °C

*1 outside explosion hazard atmospheres at 20 °C

Safety instructions: Installation

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- Do not operate the device outside the specified electrical and thermal parameters.
- Only install the devices in media for which the wetted materials have sufficient durability.
- The sensor can be mounted using the alignment device FAU40.
- When using plastic accessories check the suitability for explosion hazardous areas. Observe the instructions concerning electrostatic charging.
- Versions with NPT adapter are intended for connection to a conduit which is suitable for the type of protection. The adapter has to be connected to the local grounding system either directly via the metallic conduit or by other measures.

FDU90

- For usage of the sensor in explosion hazardous ares due to combustible gases, mists or vapours of the category IIC and IIB: Avoid electrostatic charging of the sensor.

FDU91, FDU92

- The sensor must be mounted in a protected position, if mechanical stress is to be expected.

FDU92

- For usage of the sensor in explosion hazardous ares due to combustible gases, mists or vapours of the category IIC: Avoid electrostatic charging of the sensor.

FDU91F, FDU93, FDU95, FDU96

- Sensor housing consists of conductive material and is connected as well as the membrane and the mounting connection to the earth lead of the sensor cable, which must be connected to the local grounding system of the plant.

FDU93, FDU95, FDU96

- The ultrasonic sensor can be screwed into a durable plastic flange with conductive cladding, a durable unclad plastic flange with a surface resistance $\leq 10^9\ \Omega$ or a metal flange. When using a clad plastic flange, the free plastic surface may not be within the filling curtain. The cladding must be connected to the plant local grounding system. Conducting or metal flanges are preferred.

Tab. 1
Zone 1 - Application

	Temperature class			
	T6	T5	T4	T3
	Permissible range of ambient temperature			
FDU90-C..A. (without heating)	–	–40...+60 °C	–40...+ 80 °C	–40...+ 80 °C
FDU90-C..B. (with heating)	–	–40...+60 °C	–40...+ 80 °C	–40...+ 80 °C
FDU91-C..A. (without heating)	–40...+60 °C	–40...+80 °C	–40...+ 80 °C	–40...+ 80 °C
FDU91-C..B. (with heating)	–40...+40 °C	–40...+60 °C	–40...+ 80 °C	–40...+ 80 °C
FDU91F-C...	–40...+60 °C	–40...+80 °C	–40...+ 80 °C	–40...+ 80 °C
FDU92-C...	–40...+60 °C	–40...+80 °C	–40...+ 80 °C	–40...+ 80 °C
FDU93-D...	–40...+60 °C	–40...+80 °C	–40...+ 80 °C	–40...+ 80 °C
FDU95-D1...	–40...+60 °C	–40...+80 °C	–40...+ 80 °C	–40...+ 80 °C
FDU96-D...	–40...+75 °C	–40...+90 °C	–40...+125 °C	–40...+140 °C

Tab. 2
Zone 20/21 - Application

	Sensor in Zone 20		Sensor in Zone 21		Permissible range of ambient temperature
	Max. surface temperature at ambient temperature				
	Ta = 40 °C	Ta = T_{max}	Ta = 40 °C	Ta = T_{max}	
FDU90-C..A. (without heating)	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU90-C..B. (with heating)	110 °C	110 °C	80 °C	100 °C	–40...+ 80 °C
FDU91-C..A. (without heating)	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU91-C..B. (with heating)	110 °C	110 °C	80 °C	100 °C	–40...+ 80 °C
FDU91F-C...	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU92-C...	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU93-D...	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU95-D1...	100 °C	100 °C	80 °C	100 °C	–40...+ 80 °C
FDU96-D...	65 °C	168 °C	65 °C	168 °C	–40...+140 °C

Tab. 3
Electrical performance limits

	FDU90	FDU91	FDU91F	FDU92	FDU93	FDU95-D1	FDU96
Emmission/signal circuit:	(FMU90, FMU95 to FDU9x)						
Transmission voltage	≤ 55 Veff	≤ 55 Veff	≤ 55 Veff	≤ 55 Veff	≤ 55 Veff	≤ 55 Veff	≤ 55 Veff
Sending frequency (20 °C)	90.0 kHz	43.0 kHz	42.0 kHz	30.5 kHz	27.3 kHz	17.1 kHz	10.9 kHz
Power consumption (eff. long-term power)	0.9 W	0.4 W	0.9 W	0.9 W	0.7 W	0.7 W	0.7 W
NTC power supply:	(FMU90, FMU95 to FDU9x)						
Power supply	≤ 12 V	≤ 12 V	≤ 12 V	≤ 12 V	≤ 12 V	≤ 12 V	≤ 12 V
Power consumption (eff. long-term power)	≤ 0.4 mW	≤ 0.4 mW	≤ 0.4 mW	≤ 0.4 mW	≤ 0.4 mW	≤ 0.4 mW	≤ 0.4 mW
External power supply for heating circuit:	≤ 26.4 V AC or DC	≤ 26.4 V AC or DC	–	–	–	–	–

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