

# Safety Instructions

## Deltabar S

### PMD75, FMD77, FMD78

4-20 mA HART, PROFIBUS PA,  
FOUNDATION Fieldbus

II 1/2 G Ex ia IIC Ga/Gb

II 2 G Ex db IIC Gb





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## About this document



This document has been translated into several languages. Legally determined is solely the English source text.

The document translated into EU languages is available:

- In the download area of the Endress+Hauser website:  
[www.endress.com](http://www.endress.com) -> Downloads -> Manuals and Datasheets -> Type: Ex Safety Instruction (XA) -> Text Search: ...
- In the Device Viewer: [www.endress.com](http://www.endress.com) -> Product tools -> Access device specific information -> Check device features



If not yet available, the document can be ordered.

## Associated documentation

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

HART

- BA00270P/00
- BA00274P/00

PROFIBUS PA

- BA00294P/00
- BA00296P/00

FOUNDATION Fieldbus

- BA00301P/00
- BA00303P/00

## Supplementary documentation

Explosion-protection brochure: CP00021Z/11

The Explosion-protection brochure is available:

- In the download area of the Endress+Hauser website:  
[www.endress.com](http://www.endress.com) -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

## General notes: Combined approval

The device is suitable for installation with explosion protection "Intrinsic safety Ex ia" or "Flameproof enclosure Ex db".

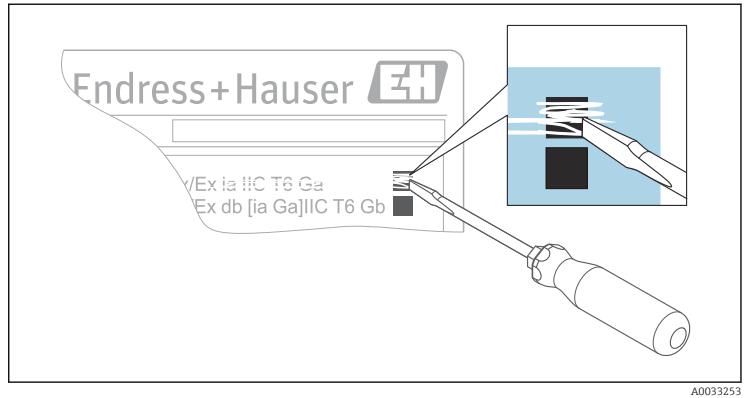
- Before initial commissioning, specify the type of protection.
- It is not permitted to change the type of protection after initial commissioning as this can jeopardize the explosion protection.

For aluminum enclosures:


Void out the explosion protection that is not used on the nameplate.

For stainless steel enclosures:

Using a striking tool, mark the explosion protection used, or void out the explosion protection that is not used.



 1

 Depending on the type of protection used: Observe the safety instructions for installation with explosion protection "Intrinsic safety Ex ia" or "Flameproof enclosure Ex db".

## Manufacturer's certificates

### EU Declaration of Conformity

Declaration Number:  
EG05001

The EU Declaration of Conformity is available:  
In the download area of the Endress+Hauser website:  
[www.endress.com](http://www.endress.com) -> Downloads -> Declaration ->  
Type: EU Declaration -> Product Code: ...

### EU type-examination certificate

Certificate number:  
KEMA 05 ATEX 1009 X

List of applied standards: See EU Declaration of Conformity.

## Manufacturer address

Endress+Hauser SE+Co. KG  
Hauptstraße 1  
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

**Other standards** Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

**Extended order code** The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

**Structure of the extended order code**

PMD75, FMD7x	-	*****	+	A*B*C*D*E*F*G*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

\* = Placeholder  
 At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

*Basic specifications*

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available. The selected option of a feature can consist of several positions.

*Optional specifications*

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

**Extended order code: Deltabar S**

The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

*Device type*

PMD75, FMD77, FMD78

*Basic specifications*

Position 1 (Approval)		
Selected option		Description
PMD75 FMD7x	B	ATEX II 1/2 G Ex ia IIC T6 Ga/Gb ATEX II 2 G Ex db IIC T6 Gb
	F	ATEX Ex ia / Ex db + FM/CSA IS + XP ATEX II 1/2 G Ex ia IIC T6 + ATEX II 2 G Ex db IIC T6 + FM/CSA IS + XP Cl. I, II, Div. 1, Gr. A-G/B-G FM/CSA: Zone 1, 2

Position 2 (Output, Operating)		
Selected option		Description
PMD75 FMD7x	A, B, C	4-20 mA HART
	D, E, F	4-20 mA HART, L <sub>1</sub> = 0
	M, N, O	PROFIBUS PA
	P, Q, R	FOUNDATION Fieldbus

Position 3 (Housing, Cover Sealing, Cable Entry)		
Selected option		Description
PMD75 FMD7x	A, G, 1, 7	T14 Alu or 316L, IP66/67 NEMA6P; M20
	B, 2	T14 Alu or 316L, IP66/67 NEMA6P; G1/2
	C, H, 3, 8	T14 Alu or 316L, IP66/67 NEMA6P; NPT1/2
	J	T15 Alu, IP66/67 NEMA6P; M20
	K	T15 Alu, IP66/67 NEMA6P; G1/2
	L	T15 Alu, IP66/67 NEMA6P; NPT1/2

Position 10 (Additional Option 1) or Position 11 (Additional Option 1)		
Selected option		Description
PMD75 FMD7x	M	Overvoltage protection

Position 11 (Additional Option 2) or Position 12 (Additional Option 2)		
Selected option		Description
PMD75 FMD7x	M	Overvoltage protection

### Optional specifications

ID Jx (Test, Certificate)		
Selected option		Description
PMD75 FMD7x	JN	Ambient temperature transmitter -50 °C/-58 °F

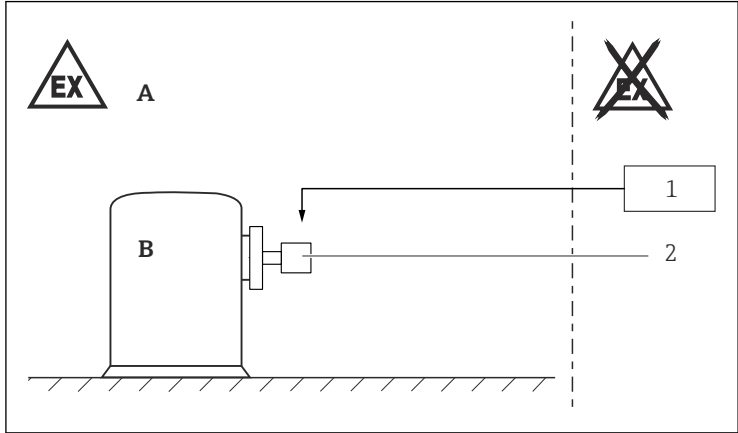
## Safety instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of EN IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- Comply with the installation and safety instructions in the Operating Instructions.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. enclosure, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)



**Safety  
instructions:  
Special conditions**

- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- For light metal flanges or flange faces (e.g. titanium, zirconium), avoid sparks caused by impact and friction.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
  - Observe the danger of electrostatic charging and discharge.
  - Do not install in the vicinity of processes ( $\leq 0.5$  m) generating strong electrostatic charges.

**Intrinsic safety****Explosion protection "Intrinsic safety Ex ia"****Safety instructions:  
Installation**

A0041997

- A Zone 1, Electronic  
 B Zone 0, Process  
 1 Certified associated apparatus  
 2 PMD75, FMD77, FMD78

After aligning (rotating) the enclosure, retighten the fixing screw.

**Intrinsic safety**

- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least  $500 V_{\text{rms}}$ .
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB. Do not operate the sensor in Zone 0 if connecting to an intrinsically safe circuit of Category Ex ib.

**Overvoltage protection**

Device type PMD75, Basic specification, Position 10 + 11 = M

Device type FMD77, FMD78, Basic specification, Position 11 + 12 = M

The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least  $290 V_{\text{rms}}$ .

**Temperature tables**

Optional specification, ID Jx = JN

Lower limit of the ambient temperature for explosion protection changes to  $-50\text{ }^{\circ}\text{C}$ .

Temperature class	Process temperature $T_p$ (process)	Ambient temperature $T_a$ (ambient): enclosure
T6	$\leq 80\text{ }^\circ\text{C}$	$-40\text{ }^\circ\text{C} \leq T_a \leq +40\text{ }^\circ\text{C}$
T4	$\leq 120\text{ }^\circ\text{C}$ <sup>1)</sup>	$-40\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$
T3 <sup>2)</sup>	$\leq 180\text{ }^\circ\text{C}$	$-40\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$
T2 <sup>2)</sup>	$\leq 280\text{ }^\circ\text{C}$	$-40\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$

- 1) Only Device type PMD75
- 2) Only Device type PMP75, depending on process connection



Do not exceed the max. ambient temperature at the enclosure.

#### *Device type PMD75*

The process temperatures refer to the temperature at the separation membrane.

#### *Device type FMD77*

Deratings between process temperature and ambient temperature at the enclosure depending on the way of installation as well as functional aspects: See Operating Instructions.

#### *Device type FMD78*

The external heat influence depends only on the mounting position of the transmitter itself. Therefore a sufficient capillary length to mount the enclosure at a position with an allowed ambient temperature must be ordered.

## Connection data

*Basic specification, Position 2 = A, B, C, D, E, F*

Power supply
$U_i \leq 30\text{ V}_{\text{DC}}$ $I_i \leq 300\text{ mA}$ $P_i \leq 1\text{ W}$ $C_i \leq 11.8\text{ nF}$ $L_i \leq 225\text{ }\mu\text{H}$ <sup>1)</sup> or $L_i = 0$ <sup>2)</sup>

- 1) Basic specification, Position 2 = A, B, C
- 2) Basic specification, Position 2 = D, E, F

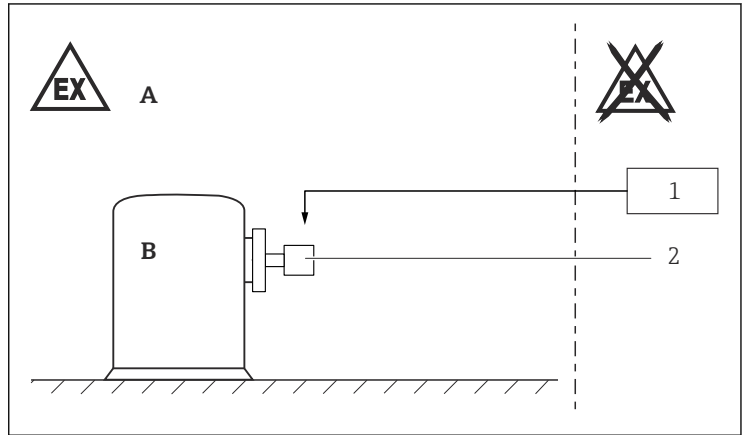
*Basic specification, Position 2 = M, N, O, P, Q, R*

<b>Power supply</b>	
FISCO	Entity
$U_i \leq 17.5 \text{ V}_{\text{DC}}$	$U_i \leq 24 \text{ V}_{\text{DC}}$
$I_i \leq 500 \text{ mA}$	$I_i \leq 250 \text{ mA}$
$P_i \leq 5.5 \text{ W}$	$P_i \leq 1.2 \text{ W}$
$C_i \leq 5 \text{ nF}$	$C_i \leq 5 \text{ nF}$
$L_i \leq 10 \text{ }\mu\text{H}$	$L_i \leq 10 \text{ }\mu\text{H}$

## Flameproof enclosure

## Explosion protection "Flameproof enclosure Ex db"

### Safety instructions: Installation



A0041997

- A Zone 1, Electronic  
 B Zone 1, Process  
 1 Power supply  
 2 PMD75, FMD77, FMD78

- After aligning (rotating) the enclosure, retighten the fixing screw.
- In potentially explosive atmospheres: Do not open the connection compartment cover and the electronics compartment cover when energized.
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing clamp on the cover.
- Connect the device:
  - Using suitable cable and wire entries of protection type "Flameproof Enclosure (Ex db)".
  - Using piping systems of protection type "Flameproof Enclosure (Ex db)".
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- For ambient temperatures higher than +70 °C, use suitable heat resisting cables or wires.

- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Only use certified cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Only use genuine spare parts from Endress+Hauser which are specified for the device.

*Basic specification, Position 3 = B, 2, K*

Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations. Application of this equipment shall comply with the local installation requirements.

## Safety instructions: Ex d joints

If required or if in doubt: ask manufacturer for specifications.

## Temperature tables



*Optional specification, ID Jx = JN*

Lower limit of the ambient temperature for explosion protection changes to  $-50\text{ °C}$ .

*Device type PMD75*

Option: Process Connection	Temperature class	Process temperature $T_p$ (process)	Ambient temperature $T_a$ (ambient)
all	T6	$-40\text{ °C} \leq T_p \leq +75\text{ °C}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$
	T4	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$



The process temperatures refer to the temperature at the separation membrane.

### Device type FMD77, FMD78

Option: Process Connection	Temperature class	Process temperature $T_p$ (process)	Ambient temperature $T_a$ (ambient)
FMD77: all	T6	$-40\text{ °C} \leq T_p \leq +75\text{ °C}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$
FMD78: <sup>1)</sup>	T4	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$
FMD7x: <sup>1)</sup>	T3	$-40\text{ °C} \leq T_p \leq +185\text{ °C}^{2)}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$
	T2	$-40\text{ °C} \leq T_p \leq +285\text{ °C}^{2)}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$
	T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}^{2)}$	$-40\text{ °C} \leq T_a \leq +75\text{ °C}$

- 1) Depending on the selected design  
 2) Depending on the selected version; see Operating Instructions



- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the enclosure.

#### Device type FMD77

Deratings between process temperature and ambient temperature at the enclosure depending on the way of installation as well as functional aspects: See Operating Instructions.

#### Device type FMD78

The external heat influence depends only on the mounting position of the transmitter itself. Therefore a sufficient capillary length to mount the enclosure at a position with an allowed ambient temperature must be ordered.

### Connection data

Basic specification, Position 2 = A, B, C, D, E, F

Power supply
$U \leq 45\text{ V}_{DC}$ $P \leq 3\text{ W}$

Basic specification, Position 2 = M, N, O, P, Q, R

Power supply
$U \leq 32\text{ V}_{DC}$ $P \leq 3\text{ W}$



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