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Safety Instructions
Deltabar S
PMD75, FMD77, FMD78

4-20 mA HART, PROFIBUS PA,
FOUNDATION Fieldbus

II 1/2 G Ex ia IIC T6...T4 Ga/Gb
II 1/2 D Ex ia IIIC T_{200} 100°C Da/Db

Endress+Hauser
People for Process Automation

Deltabar S PMD75, FMD77, FMD78

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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 -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

UK Declaration of Conformity

Declaration Number:
UK_00223

The UK Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: UKCA Declaration -> Product Code: ...

UKCA type-examination certificate

Certificate number:
CML 21UKEX2437X

List of applied standards: See UK 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*..
(Device type)		*(Basic specifications)*		*(Optional specifications)*

* = 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

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
PMD75	3	ATEX II 1/2 G Ex ia IIC T6...T4 Ga/Gb ATEX II 1/2 D Ex ia IIIC T_{200} 100°C Da/Db

Position 2 (Output, Operating)		
Selected option		**Description**
PMD75	A, B, C	4-20 mA HART
	D, E, F	4-20 mA HART, $L_i = 0$
	M, N, O	PROFIBUS PA
	P, Q, R	FOUNDATION Fieldbus

Position 10 (Additional Option 1)		
Selected option		**Description**
PMD75	M	Overvoltage protection

Position 11 (Additional Option 2)		
Selected option		**Description**
PMD75	M	Overvoltage protection

Optional specifications

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

ID Lx (Additional Approval)	
Selected option	**Description**
PMD75 LU	UK marking

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

FMD77, FMD78

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FMD7x	3	ATEX II 1/2 G Ex ia IIC T6...T4 Ga/Gb ATEX II 1/2 D Ex ia IIIC T_{200} 100°C Da/Db

Position 2 (Output, Operating)		
Selected option		**Description**
FMD7x	A, B, C	4-20 mA HART
	D, E, F	4-20 mA HART, $L_i = 0$
	M, N, O	PROFIBUS PA
	P, Q, R	FOUNDATION Fieldbus

Position 11 (Additional Option 1)		
Selected option		**Description**
FMD7x	M	Overvoltage protection

Position 12 (Additional Option 2)		
Selected option		**Description**
FMD7x	M	Overvoltage protection

Optional specifications

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

ID Lx (Additional Approval)	
Selected option	**Description**
FMD7x LU	UK marking

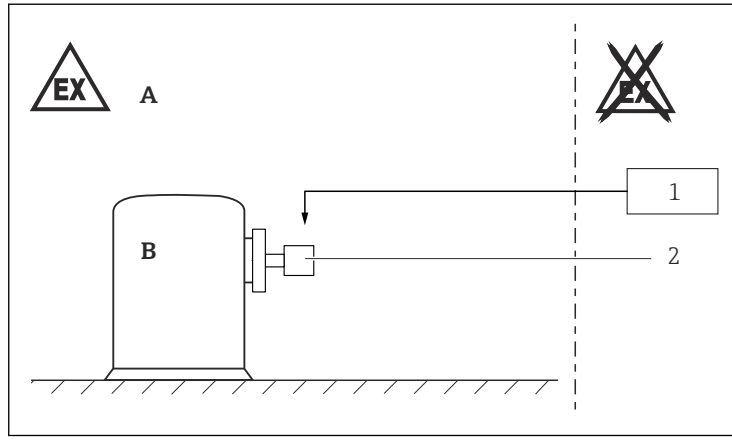
Safety instructions: General

- 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

- 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 (≤ 0.5 m) generating strong electrostatic charges.

Safety instructions: Installation



A Zone 1, Zone 21, Electronic
B Zone 0, Zone 20, Process
1 Certified associated apparatus
2 PMD75, FMD77, FMD78

- After aligning (rotating) the enclosure, retighten the fixing screw.
- The device is designed for operation in Zone 1 or Zone 21 (enclosure) as well as Zone 0 or Zone 20 (process connection). In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

Intrinsic safety

- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{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 and
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_{rms}.

Safety instructions: Zone 0

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
  - Temperature: −20 to +60 °C
  - Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
  - Air with normal oxygen content, usually 21 % (V/V)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.
- Associated devices with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.
- Overvoltage protection is not required depending on the design of this device.

Safety instructions: Zone 20, Zone 21

- Seal the cable entry or piping tight (see protection type of enclosure in the "Temperature tables" chapter).
- Connect the device using suitable cable and wire entries of protection type "Equipment dust ignition protection by enclosure (Ex t)" or "Increased safety (Ex e)" (ingress protection of at least IP65).
  Lay connecting cable and secure.

Temperature tables

Optional specification, ID Jx = JN
Lower limit of the ambient temperature for explosion protection changes to −50 °C.

Ex ia IIC T6...T4 Ga/Gb

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient): enclosure
T6	≤ 80 °C	−40 °C ≤ T_a ≤ +40 °C
T4	≤ 120 °C [1]	−40 °C ≤ T_a ≤ +70 °C

1) Only Device type PMD75

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 mountig 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.

Ex ia IIIC T_{200} 100°C Da/Db

- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the enclosure.
- Surface temperatures at the process side maybe higher and must be considered by the user (e.g. at high temperature process connections).
- The T-marking is based on the process temperature of the compact designs.
- 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.
- The process temperatures refer to the temperature at the separation membrane.

Device Type PMD75

Maximum surface temperature	Process temperature range	Ambient temperature range
T100 °C	$-40\ °C \leq T_p \leq +80\ °C$	$-40\ °C \leq T_a \leq +50\ °C$
	$-40\ °C \leq T_p \leq +100\ °C$	$-40\ °C \leq T_a \leq +45\ °C$

Device Type FMD77, FMD78

Maximum surface temperature	Process temperature range	Ambient temperature range
T100 °C	−40 °C ≤ T_p ≤ +200 °C	−40 °C ≤ T_a ≤ +55 °C
	−40 °C ≤ T_p ≤ +300 °C	−40 °C ≤ T_a ≤ +55 °C
	−40 °C ≤ T_p ≤ +400 °C	−40 °C ≤ T_a ≤ +50 °C

Specific conditions of use:
The surface temperature is
- for equipment protection level (EPL) Da: T_{200} 100 °C (with 200 mm dust deposit)
- and equipment protection level (EPL) Db: T_L 100 °C (with dust accumulation T_L)

T_L marking:
The assigned surface temperature without dust layer is the same.

Connection data

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

Power supply
U_i ≤ 30 V_{DC} I_i ≤ 300 mA P_i ≤ 1 W C_i ≤ 11.8 nF L_i ≤ 225 µH [1] or L_i = 0 [2]

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

Power supply	
FISCO	Entity
U_i ≤ 17.5 V_{DC} I_i ≤ 500 mA P_i ≤ 5.5 W C_i ≤ 5 nF L_i ≤ 10 µH	U_i ≤ 24 V_{DC} I_i ≤ 250 mA P_i ≤ 1.2 W C_i ≤ 5 nF L_i ≤ 10 µH

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