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# Safety Instructions
# **Deltabar S**
# **PMD75, FMD77, FMD78**

4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

Ex ia IIC T4/T6 Ga/Gb


Document: XA00550P-E
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

Endress+Hauser
People for Process Automation

# Deltabar S PMD75, FMD77, FMD78

4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

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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**

**NEPSI Declaration of Conformity**

Certificate number:
GYJ20.1135X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):
- GB3836.1-2010
- GB3836.4-2010
- GB3836.20-2010

**Manufacturer address**

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

Address of the manufacturing plant: See nameplate.

**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 | H | NEPSI Ex ia IIC T4/T6 Ga/Gb |

| 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 | G | Separate housing, cable length see additional spec. + housing mounting bracket, wall/pipe, 316L |
| | M | Overvoltage protection |

*Optional specifications*

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

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 | H | NEPSI Ex ia IIC T4/T6 Ga/Gb |

| 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 | G | Separate housing, cable length see additional spec. + housing mounting bracket, wall/pipe, 316L |
| | M | Overvoltage protection |

*Optional specifications*

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

**Safety instructions: General**

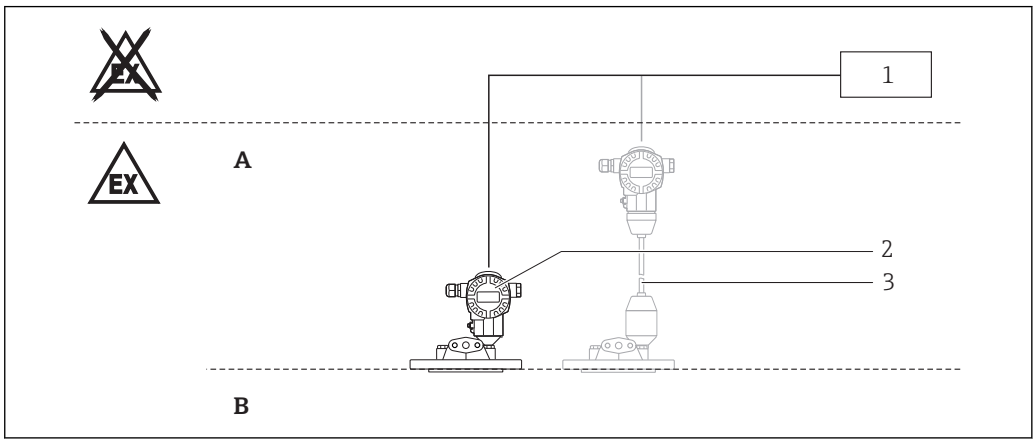
- Comply with the installation and safety instructions in the Operating Instructions.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.

- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
  - GB 50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
  - GB 3836.13-2013: "Explosive atmospheres, Part 13: Equipment repair, overhaul and reclamation".
  - GB/T 3836.15-2017: "Explosive atmospheres, Part 15: Electrical installations design, selection and erection".
  - GB/T 3836.16-2017: "Explosive atmospheres, Part 16: Electrical installations inspection and maintenance".
  - GB/T 3836.18-2017: "Explosive atmospheres, Part 18: Intrinsically safe electrical systems".
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, 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.
- In the event of additional or alternative special varnishing on the housing or other metal parts:
  - Observe the danger of electrostatic charging and discharge.
  - Do not rub surfaces with a dry cloth.

**Safety instructions: Installation**




*A Zone 1, Electronic*
*B Zone 0, Process*
*1 Certified associated apparatus*
*2 PMD75, FMD77, FMD78*
*3 Option: Separate housing*

After aligning (rotating) the housing, 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 $V_{rms}$.
- 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 (Additional Option 1 + 2) = M*
*Device type FMD77, FMD78, Basic specification, Position 11 + 12 (Additional Option 1 + 2) = 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.

**Temperature tables**

| Type of protection | Temperature class | Process temperature $T_p$ (process) | Ambient temperature $T_a$ (ambient): housing |
|---|---|---|---|
| Ex ia IIC T4/T6 Ga/Gb | 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 housing.

*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 housing 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 housing at a position with an allowed ambient temperature must be ordered.

*Optional specification, ID Jx (Test; Certificate) = JN*
Lower limit of the ambient temperature for explosion protection changes to −50 °C.

**Connection data**

*Basic specification, Position 2 (Output; Operating) = A, B, C, D, E, F*

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

1) Basic specification, Position 2 (Output; Operating) = A, B, C
2) Basic specification, Position 2 (Output; Operating) = D, E, F

*Basic specification, Position 2 (Output; Operating) = M, N, O, P, Q, R*

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