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Safety Instructions
Proline Promag 200

NEPSI: Zone 1, Zone 21
Ex d version

Endress+Hauser
People for Process Automation

Proline Promag 200

Table of contents

Associated documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter serial number from nameplate.
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

To commission the device, please observe the Operating Instructions pertaining to the device:

Measuring device	Documentation code		
	HART	FOUNDATION Fieldbus	PROFIBUS PA
Promag H 200	BA01110D	BA01377D	BA01375D
Promag P 200	BA01111D	BA01378D	BA01376D

Additional documentation

Contents	Document type	Documentation code
Remote display FHX50	Special documentation	SD01007F
	Safety Instructions Zone 0, Zone 21; Ex ia	XA01076F
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

Certificates and declarations

NEPSI Declaration of Conformity

Certificate number:

GYJ23.1040X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):

- GB/T 3836.1-2021
- GB/T 3836.2-2021
- GB/T 3836.4-2021
- GB/T 3836.31-2021

Certificate holder

Endress+Hauser Flowtec AG
Kägenstrasse 7
4153 Reinach BL
Switzerland

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

* * * * * *	–	* * * * * ... * * * * *	+	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.

Device type

The device and the device design is defined in the "Device type" section (Product root).

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.

Device type

Position	Order code for	Option selected	Description
1	Instrument family	5	Electromagnetic flowmeter
2	Sensor	H, P [1)]	Sensor type
3	Transmitter	2	Transmitter type: 2-wire, compact version

Position	Order code for	Option selected	Description
4	Generation index	B	Platform generation
5, 6	Nominal diameter	Examples: 02, 04, 40, 50, 1H, 1Z, T0, E4 [2) 3)]	Nominal diameter of sensor

1) For replacement transmitter only: X
2) For the exact specification of the nominal diameter, see nameplate
3) For replacement transmitter only: XX

Basic specifications

Position	Order code	Selected option	Description
1, 2	Approval	NJ	Ex db [ia] IIC T1...T6 Gb
		N7	Ex db [ia] IIC T1...T6 Gb, Ex tb IIIC T**°C Db
3	Output	A	4-20mA HART
		B	4-20mA HART, Pulse/frequency/switch output
		E	FOUNDATION Fieldbus, Pulse/frequency/switch output
		G	PROFIBUS PA, Pulse/frequency/switch output
4	Display; Operation	A	W/o; via communication
		C	SD02 4-line; push buttons + data backup function
		E	SD03 4-line, illum.; touch control + data backup function
		L	Prepared for display FHX50 + M12 connection [1)]
		M	Prepared for display FHX50 + custom connection [1)]
		X	Sensor only

1) FHX50 is seperately approved.

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

- 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 or guidelines (e.g. GB/T 3836.15-2017)
- Install the device according to the manufacturer's instructions and the following standards:
  - GB 50257-2014 "Code for construction and acceptance of electric device for explosive atmospheres and fire hazard electrical equipment installation engineering"
  - GB/T 3836.13-2021 "Explosive atmospheres – Part 13: Equipment repair, overhaul, reclamation and modification"
  - 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"
  - GB 15577-2018: "Safety regulations for dust explosion prevention and protection". (Only if installed in dust hazardous areas.)
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application, and the temperature classes.
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- When using in hybrid mixtures (gas and dust occurring simultaneously), observe additional measures for explosion protection.
- In devices with damaged Ex d threads:
  - Use in hazardous areas is not permitted.
  - Repair of Ex d threads is not permitted.
- Observe all the technical data of the device (see nameplate).

Safety instructions: Installation

- Continuous service temperature of the connecting cable: −40 to +80 °C; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$ and $T_{a,max}$ + 20 K).
- Only use certified cable entries suitable for the application. Observe selection criteria as per GB/T3836.15-2017. Accordingly, the connection terminal does not include any ignition sources.
- When the measuring device is connected, attention must be paid to explosion protection at the transmitter.
- Suitable certified cable entry and blanking plug for unused holes approved by ExTL according to GB/T 3836.1-2021 and GB/T 3836.2-2021 with Ex marking "Ex db IIC" shall be used and correctly installed (for terminal compartment).
- The external earth connection facility of the enclosure shall be connected reliably.
- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover when energized.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- 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 sealing plugs. The metal sealing plugs supplied meet this requirement.

Intrinsic safety

- The device can be connected to the Endress+Hauser FXA291 service tool: refer to the Operating Instructions.
- The device can be connected to the remote display FHX50 with Ex ia explosion protection; refer to the Special Documentation and Ex documentation.

Potential equalization

- Integrate the device into the potential equalization → 🖹 11.
- If the ground connection has been established via the pipe as specified, it is also possible to integrate the sensor into the potential equalization system via the pipe.

Safety instructions: Zone 21

- To ensure dust-tightness, securely seal all housing openings, cable entries and sealing plugs.
- Only open all housing briefly, ensuring that no dust or moisture enters the housing.
- Only use certified cable entries. The metal cable entries, extensions and sealing plugs supplied meet this requirement.
- If the transmitter is connected to the remote display FHX50, the circuit has type of protection Ex ia IIIC.
  Connection values → 10

Temperature tables

Ambient temperature

Minimum ambient temperature

Basic specification, position 3 (Output) = A, B, E, G:

T_a = −40 °C

Maximum ambient temperature:
T_a = +60 °C depending on the medium temperature and temperature class

Medium temperature

Minimum medium temperature

T_m = −40 to 0 °C depending on the selected device version (see nameplate!)

Maximum medium temperature

T_m for T1…T6 depending on the maximum ambient temperature T_a

Compact version

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	80	95	130	150	150	150
55	–	95	130	150	150	150
60 [1)]	–	95	130	150	150	150

1) The following applies for Basic specification, Position 3 (Output) = A, B, E, G:
P_i = 0.85 W

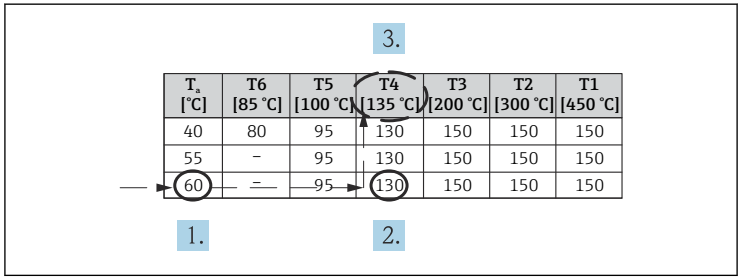
Explosion hazards arising from gas and dust

Determining the temperature class and surface temperature with the temperature table

- In the case of gas: Determine the temperature class as a function of the maximum ambient temperature T_a and the maximum medium temperature T_m.
- In the case of dust: Determine the maximum surface temperature as a function of the maximum ambient temperature T_a and the maximum medium temperature T_m.

Example

- Measured maximum ambient temperature: T_{ma} = 63 °C
- Measured maximum medium temperature: T_{mm} = 108 °C



T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	80	95	130	150	150	150
55	–	95	130	150	150	150
60	–	95	130	150	150	150

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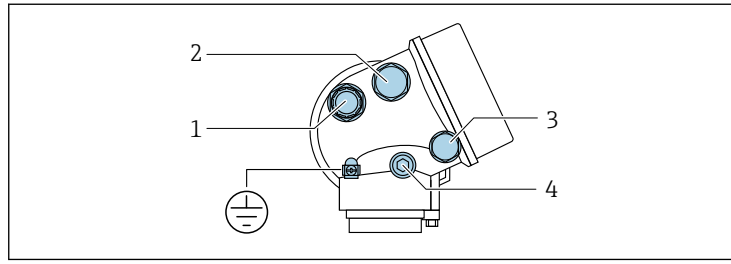
1 *Procedure for determining the temperature class and surface temperature*

1. In the column for the maximum ambient temperature T_a select the temperature that is immediately greater than or equal to the maximum ambient temperature T_{ma} that is present.
   ↳ T_a = 60 °C.
   The row showing the maximum medium temperature is determined.
2. Select the maximum medium temperature T_m of this row, which is immediately greater than or equal to the maximum medium temperature T_{mm} that is present.
   ↳ The column with the temperature class for gas is determined: 108 °C ≤ 130 °C → T4.
3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: T4 = 135 °C.

Connection data: Signal circuits

The following tables contain specifications which are dependent on the transmitter type and its input and output assignment. Compare the following specifications with those on the nameplate of the transmitter.

Connecting the transmitter



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Position		Basic specification, position 1, 2: Approval	Type of protection used for cable entry	Description
1	Cable entry for output 1	NJ N7	Ex db Ex db/Ex tb	Plastic sealing plugs act as safeguards during transportation and must be replaced by suitable, individually approved installation material. The metal extensions and dummy plugs supplied are tested and certified as part of the housing for explosion protection Ex db IIC. The various threaded versions are labeled as follows for identification purposes: ▪ Md: M20 x 1.5 ▪ NPTd: NPT ½" ▪ Gd: G ½"
2	Cable entry for output 2	NJ N7	Ex db Ex db/Ex tb	Plastic sealing plugs act as safeguards during transportation and must be replaced by suitable, individually approved installation material. The metal extensions and dummy plugs supplied are tested and certified as part of the housing for explosion protection Ex db IIC. The various threaded versions are labeled as follows for identification purposes: ▪ Md: M20 x 1.5 ▪ NPTd: NPT ½" ▪ Gd: G ½"
3	Cable entry of the remote display and operating module FHX50	NJ N7	Ex ia Ex ia/Ex tb	The following applies for devices with basic specification, position 1, 2 (Approval) = N7: In the case of device versions with metal extensions and sealing plugs, the latter are part of the device approval and meet the requirements of the explosion protection indicated on the nameplate. In the case of device versions with a cable entry, this entry has a separate component approval and meets the requirements of the explosion protection indicated on the nameplate.

Position		Description
4	Pressure compensation plug	**NOTICE** **Housing degree of protection voided due to insufficient sealing of the housing.** ► Do not open - not a cable entry.
⏚	Potential equalization	**NOTICE** **Terminal for connection to potential equalization.** ► Pay attention to the grounding concept of the facility.

Terminal assignment

Transmitter

The order code is part of the extended order code. Detailed information on the features of the device and on the structure of the extended order code → 5.

Connection versions

Order code for "Output"	Terminal numbers			
	Output 1		Output 2	
	1 (+)	2 (-)	3 (+)	4 (-)
Option **A**	4-20mA HART (passive)		-	
Option **B** [1]	4-20mA HART (passive)		Pulse/frequency/switch output (passive)	
Option **E** [2]	FOUNDATION Fieldbus		Pulse/frequency/switch output (passive)	
Option **G** [3]	PROFIBUS PA		Pulse/frequency/switch output (passive)	

1) Output 1 must always be used; output 2 is optional.
2) FOUNDATION Fieldbus with integrated reverse polarity protection.
3) PROFIBUS PA with integrated reverse polarity protection.

Intrinsically safe values

The order code is part of the extended order code. Detailed information on the features of the device and on the structure of the extended order code → 5.

Safety-related values

The order code is part of the extended order code. Detailed information on the features of the device and on the structure of the extended order code → 5.

Type of protection Ex d

Order code for "Output"	Output type	Safety-related values
Option A	4-20mA HART	U_{nom} = DC 35 V U_{max} = 250 V
Option B	4-20mA HART	U_{nom} = DC 35 V U_{max} = 250 V
	Pulse/frequency/switch output	U_{nom} = DC 35 V U_{max} = 250 V P_{max} = 1 W [1]

Order code for "Output"	Output type	Safety-related values
Option E	FOUNDATION Fieldbus	U_{nom} = DC 32 V U_{max} = 250 V P_{max} = 0.88 W
	Pulse/frequency/switch output	U_{nom} = DC 35 V U_{max} = 250 V P_{max} = 1 W [1]
Option G	PROFIBUS PA	U_{nom} = DC 32 V U_{max} = 250 V P_{max} = 0.88 W
	Pulse/frequency/switch output	U_{nom} = DC 35 V U_{max} = 250 V P_{max} = 1 W [1]

1) Internal circuit limited by R_i = 760.5 Ω

Remote display FHX50

Basic specification, position 1, 2 Approval	Cable specification	Basic specification, position 4 Display; operation Option L, M
Option **NJ, N7**	Max. cable length: 60 m (196.85 ft)	U_o = 7.3 V
		I_o = 327 mA
		P_o = 362 mW
		L_o = 149 µH
		C_o = 388 nF
		C_c ≤ 125 nF
		L_c ≤ 149 µH

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