

Safety Instructions

Proline Promag 200

KCs: Zone 1
Ex ia version

KCs



Proline Promag 200

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About this document



The document number of these Safety Instructions (XA) must match the information on the nameplate.

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 instrument | 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 Ex ia | XA02277F |
| Overvoltage Protection (OVP) | Special documentation | SD01090F |
| Explosion Protection | Brochure | CP00021Z/11 |

Certificates and declarations

KCs certificate of conformity

- 25-KA4BO-0782
- 25-KA4BO-0784

Affixing the certificate number certifies conformity with Protection device Safety Certification Notification No. 2021-22.

Manufacturer address

Endress+Hauser Flow France S.A.S.U.
35, rue de l'Europe
68700 Cernay
France

Endress+Hauser Flowtec (China) Co. Ltd.
 Su-Hong-Zhong-Lu No. 465
 Suzhou Industrial Park
 215021 Suzhou
 Province Jiangsu
 China

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*... |
| <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.

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 | Selected option | Description |
|----------|-------------------|-----------------------------------------------------------------|----------------------------------------------|
| 1 | Instrument family | 5 | Electromagnetic flowmeter |
| 2 | Sensor | H, P ¹⁾ | Sensor type |
| 3 | Transmitter | 2 | Transmitter type: 2-wire, compact version |
| 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 for | Selected option | Type of protection |
|----------|----------------|-----------------|----------------------|
| 1, 2 | Approval | KJ | Ex ia IIC T6...T1 Gb |

| Position | Order code for | Selected option | Description |
|----------|--------------------|-----------------|--------------------------------------------------------------|
| 3 | Output; Input | 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⁾ |

- 1) FHX50 is separately approved.

Optional specifications

| ID | Order code for | Selected option | Description |
|----|-------------------|-----------------|------------------------------|
| Nx | Accessory mounted | NA | Overvoltage Protection (OVP) |

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. KS C IEC 60079-14)
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Use the device only in media where the wetted materials are known to be suitable.
- 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.
- An additional assessment must be conducted to confirm that the device is suitable for installation in hybrid mixtures (explosive gas and dust occurring simultaneously).
- Observe all the technical data of the device (see nameplate).
- Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, cleaning or maintaining:
 - For external non-metallic surfaces, e.g. housing, attached additional plates, RFID tag.
 - For attached external metallic parts that are not integrated into the local potential equalization system, e.g. nameplate tag, RFID tag.
 - Do not use in areas where the devices/electronic housing are exposed to highly charge-generating processes, pneumatically conveyed dusts and/or charge spraying in an electrostatic coating process.
 - Do not rub surfaces dry. Clean only with moist cloth.
 - Information on electrostatic hazards and how to minimize the generation of static electricity can be found in the technical specification IEC/TS 60079-32-1.

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 glands suitable for the application. Observe selection criteria as per KS C IEC 60079-14.
- When the measuring device is connected, attention must be paid to the type of protection at the transmitter.

Intrinsic safety

- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. KS C IEC 60079-14 , proof of intrinsic safety).
- The intrinsically safe input power circuit of the device is isolated from ground. If the device is only equipped with one input, the dielectric strength of the input is at least $500 V_{\text{rms}}$. If the device is equipped with more than one input, the dielectric strength of each individual input to ground is at least $500 V_{\text{rms}}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $500 V_{\text{rms}}$.
- The device can be connected to the remote display FHX50 with explosion protection; refer to the Special Documentation and Ex documentation.

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

The device's intrinsically safe input/output circuits are rated Ex ia IIC Ga. When connected to certified intrinsically safe apparatus with an Ex ib IIC Gb or Ex ib IIB Gb rating, the level of protection of the overall system becomes Ex ib IIC Gb or Ex ib IIB Gb , respectively.

Potential equalization

- The device must be connected to the potential equalization system using designated protective ground terminals.
- It is also possible to integrate the device into the potential equalization system through a pipe system, provided that the pipe system meets the grounding requirements of applicable national regulations.

Overvoltage protection

Optional specification, ID Nx (Accessory Mounted) = NA

- Minimum ambient temperature when using Overvoltage Protection (OVP): -40°C
- When using the internal overvoltage protection: Reduce the admissible ambient temperature at the housing by 2 K.
- For installations which require overvoltage protection to comply with national regulations or standards, install the device using overvoltage protection (e.g. HAW56x from Endress+Hauser).
- Observe the safety instructions of the overvoltage protection.
- If an overvoltage protection according to against atmospheric over voltages is required: no other circuits may leave the housing during normal operation without additional measures.
- The intrinsically safe input power circuit of the device is isolated from ground. If the device is only equipped with one input, the dielectric strength of the input is at least $290 V_{\text{rms}}$. If the device is equipped with more than one input, the dielectric strength of each individual input to ground is at least $290 V_{\text{rms}}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $290 V_{\text{rms}}$.

Temperature tables

Ambient temperature

Minimum ambient temperature:

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

$$T_{a, \min} = -40\text{ °C}$$

Maximum ambient temperature:

$T_{a, \max} = +60\text{ °C}$ depending on the medium temperature and temperature class

Medium temperature

Minimum medium temperature

$T_{m, \min} = -40$ to 0 °C depending on the selected device version (see nameplate!)

Maximum medium temperature

$T_{m, \max}$ for T6...T1 depending on the maximum ambient temperature $T_{a, \max}$.

Compact version

NOTICE

The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.

The following applies to the basic specification, position 1, 2 (approval) = KJ:

$$\blacktriangleright T_a = T_a - 2\text{ K}$$

| $T_{a, \max}$ [°C] | $T_{m, \max}$ | | | | | |
|-----------------------|---------------|----------------|----------------|----------------|----------------|----------------|
| | 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:
 $P_i = 0.85\text{ W}$

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 $T_{a, \max}$ and the maximum medium temperature $T_{m, \max}$.
- In the case of dust: Determine the maximum surface temperature as a function of the maximum ambient temperature $T_{a, \max}$ and the maximum medium temperature $T_{m, \max}$.

Example

- Measured maximum ambient temperature: $T_{a, \max} = 63 \text{ }^\circ\text{C}$
- Measured maximum medium temperature: $T_{m, \max} = 108 \text{ }^\circ\text{C}$

| T_a [$^\circ\text{C}$] | T6 [85 $^\circ\text{C}$] | T5 [100 $^\circ\text{C}$] | T4 [135 $^\circ\text{C}$] | T3 [200 $^\circ\text{C}$] | T2 [300 $^\circ\text{C}$] | T1 [450 $^\circ\text{C}$] |
|-------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 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 $T_{a, \max}$ select the temperature that is immediately greater than or equal to the maximum ambient temperature $T_{a, \max}$ that is present.

↳ $T_{a, \max} = 60 \text{ }^\circ\text{C}$.

The row showing the maximum medium temperature is determined.

2. Select the maximum medium temperature $T_{m, \max}$ of this row, which is immediately greater than or equal to the maximum medium temperature $T_{m, \max}$ that is present.

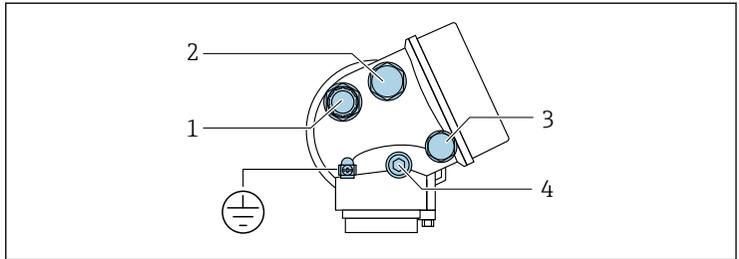
↳ The column with the temperature class for gas is determined:
 $108 \text{ }^\circ\text{C} \leq 130 \text{ }^\circ\text{C} \rightarrow \text{T4}$.

3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: $T_4 = 135 \text{ }^\circ\text{C}$.

Connection values: 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 | KJ | Ex ia | - |
| 2 | Cable entry for output 2 | KJ | Ex ia | - |
| 3 | Optional order code ¹⁾ : Cable entry of the remote display and operating module FHX50 | KJ | Ex ia | - |
| 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. | |

1) Basic specification, position 4 (display; operation) = L, M

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 ^{1) 2)} | FOUNDATION Fieldbus | | Pulse/frequency/switch output (passive) | |
| Option G ^{1) 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.

Type of protection Ex ia

| Order code for "Output" Selected option | Output type | Intrinsically safe values | |
|--------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| A | 4-20mA HART | $U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$ | |
| B | 4-20mA HART | $U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$ | |
| | Pulse/frequency/switch output | $U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$ | |
| E | FOUNDATION Fieldbus | STANDARD $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1.2\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$ | FISCO $U_i = 17.5\ V$ $I_i = 550\ mA$ $P_i = 5.5\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$ |
| | Pulse/frequency/switch output | $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$ | |
| G | PROFIBUS PA | STANDARD $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1.2\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$ | FISCO $U_i = 17.5\ V$ $I_i = 550\ mA$ $P_i = 5.5\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$ |
| | Pulse/frequency/switch output | $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$ | |

Remote display FHX50

| Basic specification, position 1, 2 Approval | Cable specification | Basic specification, position 4 Display; operation Option L, M |
|---------------------------------------------------|----------------------------------------|----------------------------------------------------------------------|
| Option KJ | Max. cable length: 60 m (196.85 ft) | $U_o = 7.3 \text{ V}$ |
| | | $I_o = 327 \text{ mA}$ |
| | | $P_o = 362 \text{ mW}$ |
| | | $L_o = 149 \text{ } \mu\text{H}$ |
| | | $C_o = 388 \text{ nF}$ |
| | | $C_c \leq 125 \text{ nF}$ |
| | | $L_c \leq 149 \text{ } \mu\text{H}$ |



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