

Safety Instructions

Proline Promag 200

UKEX: II2G
II2D
Ex i version



Proline Promag 200

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Associated documentation

All documentation is available:

- On the CD-ROM supplied (not included in the delivery for all device versions).
- Available for all device versions via:
 - Internet: www.endress.com/deviceviewer
 - Smart phone/tablet: *Endress+Hauser Operations App*
- In the Download Area of the Endress+Hauser web site: www.endress.com → Download.

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

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 II2G, II2D Ex ia	XA01053F
Overvoltage Protection (OVP)	Special documentation	SD01090F
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

Manufacturer's certificates**UK Declaration of Conformity**

Documentation code: UK_00340

UKCA type-examination certificate

Certificate number: CML 21UKEX11112X

Manufacturer address

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

$$\begin{array}{c} \text{*****} \quad - \quad \text{***** ... *****} \quad + \quad \text{A*B*C*D*E*F*G*...} \\ \hline \text{(Device type)} \quad \quad \quad \text{(Basic specifications)} \quad \quad \quad \text{(Optional specifications)} \end{array}$$

* = 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	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	H: DN 2 to 25 P: DN 15 to 200	Nominal diameter of sensor

Basic specifications

Position	Order code	Selected option	Description
1, 2	Approval	UJ	Ex ia IIC T6...T1 Gb
		U5	Ex ia IIC T6...T1 Gb
			Ex tb IIIC Txx °C Db ¹⁾
3	Output, input	A	4-20mA HART
		B	4-20 mA 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 ²⁾
		M	Prepared for display FHX50 + customer connection ²⁾

1) The labeling changes according to whether "Display; operation" = "L" or "M": Ex tb|ia Da| IIIC Txx °C Db.

2) FHX50 is separately approved.

Optional specifications

ID	Order code for	Option selected	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. EN 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.
- 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.
- Modifications 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.
- 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 EN 60079-14.
- When the measuring device is connected, attention must be paid to explosion protection at the transmitter.

Intrinsic safety

- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. EN 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 $500 V_{rms}$. If the device is equipped with more than one input, the dielectric strength of each individual input to ground is at least $500 V_{rms}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $500 V_{rms}$.
- 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 explosion protection; refer to the Special Documentation and Ex documentation.

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

- When the intrinsically safe Ex ia circuits of the device are connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC or IIB, the type of protection changes to Ex ib IIC or Ex ib IIB.
- When the intrinsically safe Ex ic circuits of the device are connected to certified intrinsically safe circuits of Category Ex ic for Equipment Groups IIB, the type of protection changes from Ex ic IIC to Ex ic IIB.

Potential equalization

- Integrate the device into the local potential equalization .
- 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.

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 against atmospheric over voltages is required: no other circuits may leave the enclosure 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 $290\text{ V}_{\text{rms}}$. If the device is equipped with more than one input, the dielectric strength of each individual input to ground is at least $290\text{ V}_{\text{rms}}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $290\text{ V}_{\text{rms}}$.

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.
- 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 and sealing plugs. 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 IIC.
Connection values

Temperature tables

Ambient temperature

Minimum ambient temperature

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

$$T_a = -40 \text{ °C}$$

Maximum ambient temperature:

$T_a = +60 \text{ °C}$ depending on the medium temperature and temperature class

Medium temperature

Minimum medium temperature

$T_m = -40 \text{ to } 0 \text{ °C}$ depending on the selected device version (see nameplate!)

Maximum medium temperature

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

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) = UJ, U5:

► $T_a = T_a - 2 \text{ K}$

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

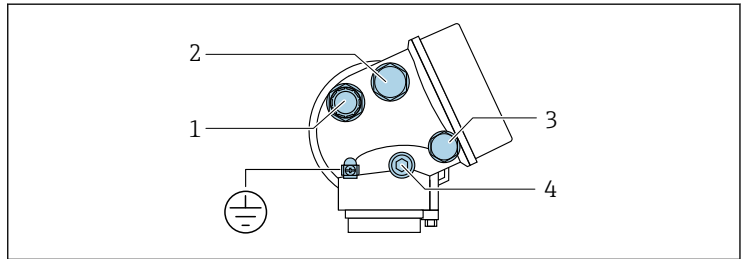
1. In the column for the maximum ambient temperature T_a select the temperature that is immediately greater than or equal to the maximum ambient temperature T_{ma} that is present.
 - ↳ T_a = 60 °C.
The row showing the maximum medium temperature is determined.

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:
 $108\text{ °C} \leq 130\text{ °C} \rightarrow T4$.
3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: $T4 = 135\text{ °C}$.

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	UJ U5	Ex ia Ex ia/Ex tb	The following applies for devices with basic specification, position 1, 2 (approval) = U5: In the case of device versions with a plastic transport sealing plug, this plug does not meet the explosion protection requirements and must be replaced during installation by a suitable entry that meets the approval specifications. 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.
2	Cable entry for output 2	UJ U5	Ex ia Ex ia/Ex tb	The following applies for devices with basic specification, position 1, 2 (approval) = U5: 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.
3	Optional order code ¹⁾ : Cable entry of the remote display and operating module FHX50	UJ U5	Ex ia Ex ia/Ex tb ²⁾	The following applies for devices with basic specification, position 1, 2 (approval) = U5: 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.		

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

2) The labeling changes according to whether "Display; operation" = "L" or "M": Ex tb|ia Da| IIIC Txx °C Db.

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.

Type of protection Ex ia

Order code for "Output"	Output type	Intrinsically safe values
Option A	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$
Option 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	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$
Option E	FOUNDATION Fieldbus	STANDARD $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1.2\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$
	Pulse/frequency/switch output	$U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$
Option G	PROFIBUS PA	STANDARD $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1.2\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$
	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 UJ, U5	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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