

# Safety Instructions

## Proline Promass 200

JPN: Zone 1, Zone 0/1

Zone 21

Ex d Version





# Proline Promass 200

## Table of contents

Associated documentation .....	4
Manufacturer's certificates .....	4
Manufacturer address .....	5
Extended order code .....	5
Safety instructions: General .....	7
Safety instructions: Installation .....	8
Safety instructions: Zone 0 .....	9
Safety instructions: Zone 21 .....	9
Temperature tables .....	9
Explosion hazards arising from gas and dust .....	19
Connection values: Signal circuits .....	20

## 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](http://www.endress.com/deviceviewer)
  - Smart phone/tablet: *Endress+Hauser Operations App*
- In the Download Area of the Endress+Hauser web site: [www.endress.com](http://www.endress.com) → Download

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

Measuring device	Documentation code		
	HART	FOUNDATION Fieldbus	PROFIBUS PA
8A2B**-...	BA01821D	BA01827D	BA01828D
8E2B**-...	BA01027D	BA01314D	BA01133D
8E2C**-...	BA01638D	BA01637D	BA01639D
8F2B**-...	BA01112D	BA01315D	BA01113D

### Additional documentation

Contents	Document type	Documentation code
Remote display FHX50	Special documentation	SD01007F
	Safety Instructions Ex ia	XA01714F
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

## Manufacturer's certificates

### JPN Type Examination Certificate

Certificate number:

CML 18JPN1032X

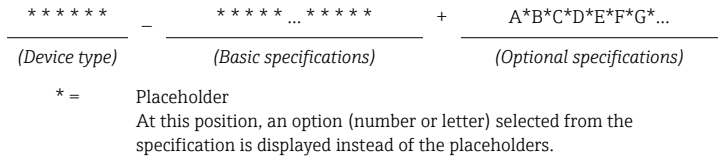
Affixing the certificate number certifies conformity with the standards (depending on the device version).

- JNIO SH-TR-46-1
- JNIO SH-TR-46-2
- JNIO SH-TR-46-6
- JNIO SH-TR-46-9
- IEC 60079-26

**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**



*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	8	Coriolis flowmeter
2 <sup>1)</sup>	Sensor	A, E, F	Sensor type
3	Transmitter	2	Transmitter type: 2-wire, compact version
4	Generation index	B, C	Platform generation
5, 6 <sup>2)</sup>	Nominal diameter	01, 02, 04, 08, 15, 25, 40, 50, 80	Nominal diameter of sensor

1) Transmitter only: X

2) Transmitter only: XX

## Basic specifications

Position	Order code for	Selected option	Device type		Type of protection	
			Position 2 Sensor	Position 5, 6 Nominal diameter	Transmitter	Sensor
1, 2 <sup>1)</sup>	Approval	JC	A, E, F	01, 02, 04, 08, 15, 25, 40, 50	Ex db [ia] IIC T6...T1 Ga/Gb	Ex ia IIC T6...T1 Ga/Gb
			F	80	Ex db [ia] IIB T6...T1 Ga/Gb	Ex ia IIB T6...T1 Ga/Gb
		JK	A, E, F	01, 02, 04, 08, 15, 25, 40, 50	Ex db [ia] IIC T6...T1 Gb	Ex ia IIC T6...T1 Gb
			F	80	Ex db [ia] IIB T6...T1 Gb	Ex ia IIB T6...T1 Gb
		J5	A, E, F	01, 02, 04, 08, 15, 25, 40, 50	Ex db [ia] IIC T6...T1 Ga/Gb Ex tb IIIC Txx °C Db <sup>2)</sup>	Ex ia IIC T6...T1 Ga/Gb Ex tb IIIC Txx°C Db
			F	80	Ex db [ia] IIB T6...T1 Ga/Gb Ex tb IIIC Txx °C Db <sup>2)</sup>	Ex ia IIB T6...T1 Ga/Gb Ex tb IIIC Txx°C Db

1) For transmitter Promass F DN80 only, position 3, 4

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

Position	Order code for	Selected option	Description
3 <sup>1)</sup>	Output; Input	A	4-20mA HART
		B	4-20mA HART, Pulse/frequency/switch output
		C	4-20mA HART + 4-20mA analog
		E	FOUNDATION Fieldbus, Pulse/frequency/switch output
		G	PROFIBUS PA, Pulse/frequency/switch output
4 <sup>2)</sup>	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 <sup>3)</sup>
		M	Prepared for display FHX50 + custom connection <sup>4)</sup>
17, 18 <sup>5)</sup>	Device Model	A1	1

- 1) For transmitter Promass F DN80 only, position 5
- 2) For transmitter Promass F DN80 only, position 6
- 3) FHX50 is approved according to CML 17JPN2332X.
- 4) FHX50 is approved according to CML 17JPN2332X.
- 5) Order code for "Device model" only for measuring devices with product code 8A2B, 8E2C, 8X2CXX

### 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. JNIOOSH-TR-NO.44)
- 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**

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.

- 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 JNIOHS-TR-NO.44. 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.
- 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 housing.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug supplied 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 remote display FHX50 with explosion protection; refer to the Special Documentation and Ex documentation.

### 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.


#### Safety instructions: Zone 0

*Basic specification, position 1, 2 (Approval) = JC, J5*

The intrinsically safe version of the device can be used in the measuring pipe in Zone 0.

In Zone 0/1 not permitted: Promass A DN1 (order code for "Diameter", Option 01)

#### Safety instructions: Zone 21

- To ensure dust-tightness, securely seal the transmitter housing, cable entries and sealing plugs.
- Only open the transmitter housing briefly, ensuring that no dust or moisture enters the housing.
- If the transmitter is connected to the remote display FHX50, the circuit has type of protection Ex ia IIC.  
Connection values →  20

#### Temperature tables

##### Ambient temperature

*Minimum ambient temperature*

*Basic specification, position 3 (Output; input) = A, B, C, 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*

- Promass 8F2B\*\*-... , Promass 8A2B\*\*-...  
 $T_m = -50\text{ °C}$
- Promass 8E2B\*\*-..., Promass 8E2C\*\*-...:  
 $T_m = -40\text{ °C}$

*Maximum medium temperature*

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

**Compact version**

*Basic specification, position 3 (output; input) = A*

*Basic specification, positions 1, 2 (approval) =*

JPN-Ex: JC, JK, J5

*Promass A*

DN	$T_{m, max}$ [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1...4	205	40	50	95	130	170	205	205
		60	–	95	130	170	205	205

*Promass E (Promass 8E2B\*\*–...)*

DN	$T_{m, max}$ [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	140	50	50	95	130	140	140	140
		60	–	95	130	140	140	140

*Promass E (Promass 8E2C\*\*–...)*

DN	$T_{m, max}$ <sup>1)</sup> [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		60	–	95	130	150	150	150
	205	40	50	95	130	170	205	205
		60	–	95	130	170	205	205

1) Maximum temperature range, see nameplate

*Promass F*

DN	$T_{m, max}$ <sup>1)</sup> [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		60	–	95	130	150	150	150
	205	40	50	95	130	170	205	205
		60	–	95	130	170	205	205
80	150	40	50	85	110	150	150	150

DN	T <sub>m,max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		60	-	85	110	150	150	150
	205	40	50	85	110	170	205	205
		60	-	85	110	170	205	205

1) Maximum temperature range, see nameplate

Basic specification, position 3 (output; input) = B

Basic specification, positions 1, 2 (approval) =

JPN-Ex: JC, JK, J5

Promass A

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1...4	205	40	50	95	130	170	205	205
		50 <sup>1)</sup>	–	95	130	170	205	205
		55	–	–	130	170	205	205
		60	–	–	130	170	205	200

1) T<sub>a</sub> = 55 °C for Impulse/Frequency/Switch output input P<sub>1</sub> ≤ 0,85 W

Promass E (Promass 8E2B\*\*–... )

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	140	140	140
		50 <sup>1)</sup>	–	95	130	140	140	140
		60	–	–	130	140	140	140

1) T<sub>a</sub> = 55 °C for Impulse/Frequency/Switch output input P<sub>1</sub> ≤ 0,85 W

Promass E (Promass 8E2C\*\*–... )

DN	T <sub>m, max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		50 <sup>2)</sup>	–	95	130	150	150	150
		55	–	–	130	150	150	150
		60	–	–	130	150	150	150
	205	40	50	95	130	170	205	205
		50 <sup>2)</sup>	–	95	130	170	205	205
		55	–	–	130	170	205	205
		60	–	–	130	170	205	200

1) Maximum temperature range, see nameplate

2) T<sub>a</sub> = 55 °C for Impulse/Frequency/Switch output input P<sub>1</sub> ≤ 0,85 W

*Promass F*

DN	$T_{m,max}^{1)}$ [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		50 <sup>2)</sup>	-	95	130	150	150	150
		55	-	-	130	150	150	150
		60	-	-	130	150	150	150
	205	40	50	95	130	170	205	205
		50 <sup>2)</sup>	-	95	130	170	205	205
		55	-	-	130	170	205	205
		60	-	-	130	170	205	200
80	150	40	50	85	110	150	150	150
		50 <sup>2)</sup>	-	85	110	150	150	150
		55	-	-	110	150	150	150
		60	-	-	110	150	150	150
	205	40	50	85	110	170	205	205
		50 <sup>2)</sup>	-	85	110	170	205	205
		55	-	-	110	170	205	205
		60	-	-	110	170	205	200

1) Maximum temperature range, see nameplate

2)  $T_a = 55\text{ °C}$  for Impulse/Frequency/Switch output input  $P_1 \leq 0,85\text{ W}$

Basic specification, position 3 (output; input) = C

Basic specification, positions 1, 2 (approval) =

JPN-Ex: JC, JK, J5

Promass A

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1...4	205	40	50	95	130	170	205	205
		55	–	95	130	170	205	205
		60	–	–	130	170	205	200

Promass E (Promass 8E2B\*\*–...)

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	140	140	140
		55	–	95	130	140	140	140
		60	–	–	130	140	140	140

Promass E (Promass 8E2C\*\*–...)

DN	T <sub>m, max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		55	–	95	130	150	150	150
		60	–	–	130	150	150	150
	205	40	50	95	130	170	205	205
		55	–	95	130	170	205	205
		60	–	–	130	170	205	200

1) Maximum temperature range, see nameplate

Promass F

DN	T <sub>m, max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40	50	95	130	150	150	150
		55	–	95	130	150	150	150
		60	–	–	130	150	150	150
	205	40	50	95	130	170	205	205

DN	$T_{m, max}^{1)}$ [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		55	-	95	130	170	205	205
		60	-	-	130	170	205	200
80	150	40	50	85	110	150	150	150
		55	-	85	110	150	150	150
		60	-	-	110	150	150	150
	205	40	50	85	110	170	205	205
		55	-	-	110	170	205	205
		60	-	-	110	170	205	200

1) Maximum temperature range, see nameplate

Basic specification, position 3 (output; input) = E

Basic specification, positions 1, 2 (approval) =

JPN-Ex: JC, JK, J5

Promass A

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1...4	205	40 <sup>1)</sup>	50	95	130	170	205	205
		55 <sup>2)</sup>	–	95	130	170	205	205
		60	–	–	130	170	205	205

1) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

2) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

Promass E (Promass 8E2B\*\*–... )

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>1)</sup>	50	95	130	140	140	140
		55 <sup>2)</sup>	–	95	130	140	140	140
		60	–	–	130	140	140	140

1) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

2) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

Promass E (Promass 8E2C\*\*–... )

DN	T <sub>m, max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>2)</sup>	50	95	130	150	150	150
		55 <sup>3)</sup>	–	95	130	150	150	150
		60	–	–	130	150	150	150
	205	40 <sup>2)</sup>	50	95	130	170	205	205
		55 <sup>3)</sup>	–	95	130	170	205	205
		60	–	–	130	170	205	205

1) Maximum temperature range, see nameplate

2) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

3) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output



*Promass F*

DN	T <sub>m,max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>2)</sup>	50	95	130	150	150	150
		55 <sup>3)</sup>	-	95	130	150	150	150
		60	-	-	130	150	150	150
	205	40 <sup>2)</sup>	50	95	130	170	205	205
		55 <sup>3)</sup>	-	95	130	170	205	205
		60	-	-	130	170	205	205
80	150	40 <sup>2)</sup>	50	85	110	150	150	150
		55 <sup>3)</sup>	-	85	110	150	150	150
		60	-	-	110	150	150	150
	205	40 <sup>2)</sup>	50	85	110	170	205	205
		55 <sup>3)</sup>	-	85	110	170	205	205
		60	-	-	110	170	205	205

- 1) Maximum temperature range, see nameplate
- 2) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output
- 3) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

Basic specification, position 3 (output; input) = G

Basic specification, positions 1, 2 (approval) =

JPN-Ex: JC, JK, J5

Promass A

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1...4	205	40 <sup>1)</sup>	50	95	130	170	205	205
		55 <sup>2)</sup>	–	95	130	170	205	205
		60	–	–	130	170	205	205

1) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

2) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

Promass E (Promass 8E2B\*\*–... )

DN	T <sub>m, max</sub> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>1)</sup>	50	95	130	140	140	140
		55 <sup>2)</sup>	–	95	130	140	140	140
		60	–	–	130	140	140	140

1) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

2) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

Promass E (Promass 8E2C\*\*–... )

DN	T <sub>m, max</sub> <sup>1)</sup> [°C]	T <sub>a</sub> [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>2)</sup>	50	95	130	150	150	150
		55 <sup>3)</sup>	–	95	130	150	150	150
		60	–	–	130	150	150	150
	205	40 <sup>2)</sup>	50	95	130	170	205	205
		55 <sup>3)</sup>	–	95	130	170	205	205
		60	–	–	130	170	205	205

1) Maximum temperature range, see nameplate

2) T<sub>a</sub> = 50 °C for use without Impulse/Frequency/Switch output

3) T<sub>a</sub> = 60 °C for use without Impulse/Frequency/Switch output

*Promass F*

DN	$T_{m,max}^{1)}$ [°C]	$T_a$ [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	150	40 <sup>2)</sup>	50	95	130	150	150	150
		55 <sup>3)</sup>	-	95	130	150	150	150
		60	-	-	130	150	150	150
	205	40 <sup>2)</sup>	50	95	130	170	205	205
		55 <sup>3)</sup>	-	95	130	170	205	205
		60	-	-	130	170	205	205
80	150	40 <sup>2)</sup>	50	85	110	150	150	150
		55 <sup>3)</sup>	-	85	110	150	150	150
		60	-	-	110	150	150	150
	205	40 <sup>2)</sup>	50	85	110	170	205	205
		55 <sup>3)</sup>	-	85	110	170	205	205
		60	-	-	110	170	205	205

- 1) Maximum temperature range, see nameplate
- 2)  $T_a = 50$  °C for use without Impulse/Frequency/Switch output
- 3)  $T_a = 60$  °C for use without Impulse/Frequency/Switch output

### 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:  $T_{ma} = 47$  °C
- Measured maximum medium temperature:  $T_{mm} = 108$  °C

	Ta [°C]	T6 [85°C]	T5 [100°C]	T4 [135°C]	T3 [200°C]	T2 [300°C]	T1 [450°C]
	35	50	85	120	140	140	140
	50	-	85	120	140	140	140
	60	-	-	120	140	140	140
	35	50	85	120	140	140	140
	45	-	85	120	140	140	140
	50	-	-	120	140	140	140

4.

1.

2.

3.

A0091223

1 Procedure for determining the temperature class and surface temperature

1. Select device (optional).

2. 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.

↳  $T_a = 50\text{ °C}$ .

The row showing the maximum medium temperature is determined.

3. 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.

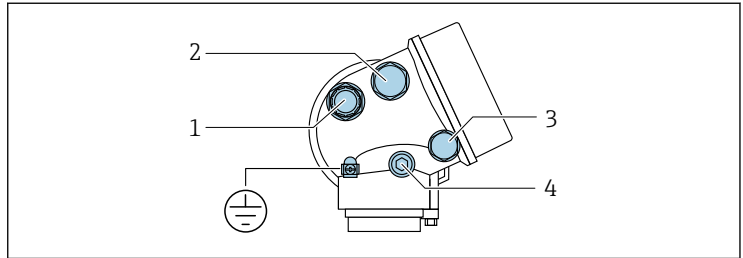
↳ The column with the temperature class for gas is determined:  
 $108\text{ °C} \leq 120\text{ °C} \rightarrow T_4$ .

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

### 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



A0023831

Position		Basic specification, Position 1, 2 Approval	Type of protection used for cable entry	Description
1	Cable entry for output 1 <sup>1)</sup>	JC, JK J5	Ex db Ex db/Ex tb	<p>Plastic sealing plugs act as safeguards during transportation and must be replaced by suitable, individually approved installation material.</p> <p>The metal extensions and dummy plugs supplied are tested and certified as part of the housing for type of protection Ex d IIC. The various threaded versions are labeled as follows for identification purposes:</p> <ul style="list-style-type: none"> <li>▪ Md: M20 x 1.5</li> <li>▪ NPTd: NPT 1/2"</li> <li>▪ Gd: G 1/2"</li> </ul>
2	Cable entry for output 2 <sup>1)</sup>	JC, JK J5	Ex db Ex db/Ex tb	<p>Plastic sealing plugs act as safeguards during transportation and must be replaced by suitable, individually approved installation material.</p> <p>The metal extensions and dummy plugs supplied are tested and certified as part of the housing for type of protection Ex d IIC. The various threaded versions are labeled as follows for identification purposes:</p> <ul style="list-style-type: none"> <li>▪ Md: M20 x 1.5</li> <li>▪ NPTd: NPT 1/2"</li> <li>▪ Gd: G 1/2"</li> </ul>
3	Optional order code <sup>2)</sup> : Cable entry of the remote display and operating module FHX50	JC, JK J5	Ex ia Ex ia/Ex tb <sup>3)</sup>	<p>The following applies for devices with basic specification, position 1, 2 (approval) = J5:</p> <p>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.</p> <p>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.</p>

Position		Basic specification, Position 1, 2 Approval	Type of protection used for cable entry	Description
Position		Description		
4	Pressure compensation plug			<p><b>NOTICE</b></p> <p><b>Housing degree of protection voided due to insufficient sealing of the housing.</b></p> <ul style="list-style-type: none"> <li>▶ Do not open - not a cable entry.</li> </ul>
⊕	Potential equalization			<p><b>NOTICE</b></p> <p><b>Terminal for connection to potential equalization.</b></p> <ul style="list-style-type: none"> <li>▶ Pay attention to the grounding concept of the facility.</li> </ul>

- 1) Please see below: Further notes on cable glands.
- 2) Basic specification, position 4 (display; operation) = L, M
- 3) The labeling changes according to whether "Display; operation" = "L" or "M": Ex tb|ia Da| IIIC Txx°C Db.

### Further notes on cable glands:

Cable Gland code 6 may be selected for following approved cable glands by Ex CBs to be installed on the device with Approval code, JC, JK, J5:

- Cable glands approved suitable for Ex d, Ex t: e.g. EXTC-16MG, KXBC-20-16
- Cable glands suitable for Ex d: e.g. KXBF-20-16

Yellow cap attached to the cable glands is a transportation safety measure only, and is to be removed when the delivered device is installed. If the third cable gland is not used, remove it and seal the thread hole with Ex d blind plug (M20x1.5).

### Information on our service center:



Service Desk 5-70-3 Nisshin-cho, Fuchu-shi, Tokyo-to

Tel: 042-314-1919

Fax: 042-314-1941

## 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 <sup>1)</sup>	4-20mA HART (passive)		Pulse/frequency/switch output (passive)	
Option C	4-20mA HART (passive)		4-20mA analog (passive)	
Option E <sup>2)</sup>	FOUNDATION Fieldbus		Pulse/frequency/switch output (passive)	
Option G <sup>3)</sup>	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.

## 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	$U_{nom} = DC\ 35\ V$ $U_{max} = 250\ V$ $P_{max} = 1\ W^{1)}$
Option C	4-20mA HART	$U_{nom} = DC\ 30\ V$
	4-20mA analog	$U_{max} = 250\ V$

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  $R_i = 760.5 \Omega$

### Remote display FHX50

Basic specification, position 1, 2 Approval	Cable specification	Basic specification, position 4 Display; operation Option L, M
Option JC, JK, J5	Max. cable length: 60 m (196.85 ft)	$U_o = 7.3 V$
		$I_o = 327 mA$
		$P_o = 362 mW$
		$L_o = 149 \mu H$
		$C_o = 388 nF$
		$C_c \leq 125 nF$
		$L_c \leq 149 \mu H$











71513357

[www.addresses.endress.com](http://www.addresses.endress.com)

---