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Safety Instructions
Proline Prosonic Flow B 200

KCs: Zone 1
Ex d version

Endress+Hauser
People for Process Automation

Proline Prosonic Flow B 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
Prosonic Flow B 200	BA01031D

Additional documentation

Contents	Document type	Documentation code
Remote display FHX50	Special documentation	SD01007F
	Safety Instructions Ex ia	XA02277F
Explosion Protection	Brochure	CP00021Z/11

Certificates and declarations

KCs certificate of conformity

- 21-KA4BO-0704
- 25-KA4BO-0798

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

Manufacturer address

Endress+Hauser Flowtec AG
Kägenstrasse 7
4153 Reinach BL
Switzerland

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*...
(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	Selected option	Description
1	Instrument family	9	Ultrasonic transit time flowmeter
2	Sensor	B	Sensor type
3	Transmitter	2	Transmitter type: 2-wire, compact version
4	Generation index	B	Platform generation
5, 6	Nominal diameter	DN 50...200	Nominal diameter of sensor

Basic specifications

Position	Order code for	Selected option	Type of protection
1, 2	Approval	KK	Ex db [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
		C	4-20mA HART + 4-20mA analog
		D	4-20mA HART, pulse/frequency/switch output; 4-20mA input
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

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. 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).
- 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).
- 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 no 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.
  Accordingly, the connection terminal does not include any ignition sources.
- When the measuring device is connected, attention must be paid to the type of 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 the device is energized.

Use of blanking elements and sealings

- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- Seal unused entries with approved blanking elements 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 blanking elements. 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

- 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.

Temperature tables

Minimum ambient temperature

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

$T_{a,\,min}$ = −40 °C

Maximum ambient temperature

$T_{a, max}$ = +60 °C depending on temperature class, maximum medium temperature and device-specific features. See the corresponding temperature tables.

Minimum medium temperature

$T_{m, min}$ = 0 °C

Maximum medium temperature

$T_{m, max}$ varies depending on temperature class, maximum ambient temperature and device-specific features. See the corresponding temperature tables.

Basic specification, position 3 (Output; Input) = A

$T_{a, max}$ [°C]	$T_{m, max}$					
	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	60	80	80	80	80	80
50	–	80	80	80	80	80
60	–	80	80	80	80	80

Basic specification, position 3 (Output; Input) = B

$T_{a, max}$ [°C]	$T_{m, max}$					
	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	– 1)	80	80	80	80	80
50	–	60 2)	80	80	80	80
60	–	–	80	80	80	80

1) $T_{a, max}$ = 60 °C for pulse/frequency/switch output P_i = 0.85 W
2) $T_{a, max}$ = 80 °C for pulse/frequency/switch output P_i = 0.85 W

Basic specification, position 3 (Output; Input) = C

$T_{a, max}$ [°C]	$T_{m, max}$					
	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	60	80	80	80	80	80
50	–	80	80	80	80	80
60	–	55	80	80	80	80

Basic specification, position 3 (Output; Input) = D

$T_{a, max}$ [°C]	$T_{m, max}$					
	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35	60	80	80	80	80	80
50	–	80	80	80	80	80
60	–	–	80	80	80	80

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: $T_{a, max}$ = 55 °C
- Measured maximum medium temperature: $T_{m, max}$ = 78 °C

3.

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	60	80	80	80	80	80
50	–	80	80	80	80	80
60	–	55	80	80	80	80

1. 2.

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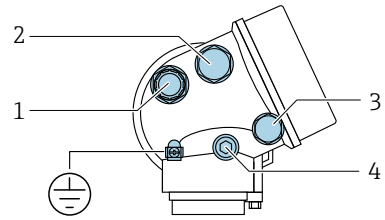
1 Procedure for determining the temperature class and surface temperature

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 °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: 78 °C ≤ 80 °C → T4.
3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: T4 = 135 °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	KK	Ex db	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 type of protection Ex d IIC. The various threaded versions are labeled as follows for identification purposes: ▪ Md: M20 x 1.5 ▪ NPTd: NPT 1/2" ▪ Gd: G 1/2"
2	Cable entry for output 2	KK	Ex db	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 type of protection Ex d IIC. The various threaded versions are labeled as follows for identification purposes: ▪ Md: M20 x 1.5 ▪ NPTd: NPT 1/2" ▪ Gd: G 1/2"
3	Optional order code [1]: Cable entry of the remote display and operating module FHX50	KK	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		Input	
	1 (+)	2 (-)	3 (+)	4 (-)	5 (+)	6 (-)
Option **A**	4-20mA HART (passive)		-		-	
Option **B** [1]	4-20mA HART (passive)		Pulse/frequency/ switch output (passive)		-	
Option **C** [1]	4-20mA HART (passive)		4-20mA analog (passive)		-	
Option **D** [1] [2]	4-20mA HART (passive)		Pulse/frequency/ switch output (passive)		4-20mA current input (passive)	

1) Output 1 must always be used; output 2 is optional.
2) The integrated overvoltage protection is not used with option D: Terminals 5 and 6 (current input) are not protected against overvoltage.

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.

Ex d type of protection

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 U_{max} = 250 V
	4-20mA analog	

Order code for "Output"	Output type	Safety-related values
Option D	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)]
	4 to 20 mA current input	U_{nom} = DC 35 V U_{max} = 250 V

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 **KK**	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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