

Safety Instructions

Proline Prosonic Flow B 200

NEPSI: Zone 1
Ex i version



Proline Prosonic Flow B 200

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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
Prosonic Flow B 200	BA01031D

Additional documentation

Contents	Document type	Documentation code
Remote display FHX50	Special documentation	SD01007F
	Safety Instructions Zone 0, Zone 21; Ex ia	XA01076F
Overvoltage Protection (OVP)	Special documentation	SD01090F
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

Certificates and declarations**NEPSI Declaration of Conformity**

Certificate number:

GYJ23.1039X

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

- GB/T 3836.1-2021
- GB/T 3836.4-2021

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

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

* = 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	9	Ultrasonic transit time flowmeter
2	Sensor	B	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	DN 50 to 200	Nominal diameter of sensor

Basic specifications

Position	Order code	Selected option	Description
1, 2	Approval	NF	Ex ia IIC T1...T6 Gb
3	Output	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

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. 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"
- 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.
- When the measuring device is connected, attention must be paid to explosion protection at the transmitter.
- This product shall be used in explosive gas atmospheres together with approved associated apparatus, follow the instruction manual of this product and associated apparatus when connecting the wiring. Connect the wiring terminals correctly.
- The user shall not change the configuration in order to maintain/ensure the protection performance of this product. Any change may impair safety.

Intrinsic safety

- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. GB/T 3836.15-2017 , 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 Ex ia explosion protection; refer to the Special Documentation and Ex documentation.

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

- 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 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.

Overvoltage protection

Optional specification, ID Nx (Accessory Mounted) = NA

- Minimum ambient temperature when using Overvoltage Protection (OVP): $-40\text{ }^{\circ}\text{C}$
- 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 (e.g. GB/T 3836.15-2017), 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 GB/T 3836.15-2017 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 $290\text{ }V_{\text{rms}}$. 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 $290\text{ }V_{\text{rms}}$.

Temperature tables

Ambient temperature

Minimum ambient temperature

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

$$T_a = -40\text{ }^{\circ}\text{C}$$

Maximum ambient temperature:

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

Medium temperature

Minimum medium temperature

$$T_m = 0\text{ }^{\circ}\text{C}$$

Maximum medium temperature

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

Compact version

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

NOTICE

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

The following applies for Basic specification, Position 1, 2 (Approval) = NF:

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

T _a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	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

NOTICE

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

The following applies for Basic specification, Position 1, 2 (Approval) = NF:

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

T _a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	- ¹⁾	80	80	80	80	80
50	-	60 ²⁾	80	80	80	80
60	-	-	80	80	80	80

1) T_m = 60 °C for pulse/frequency/switch output P_i ≤ 0.85 W

2) T_m = 80 °C for pulse/frequency/switch output P_i ≤ 0.85 W

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

NOTICE

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

The following applies for Basic specification, Position 1, 2 (Approval) = NF:

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

T _a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	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

NOTICE

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

The following applies for Basic specification, Position 1, 2 (Approval) = NF:

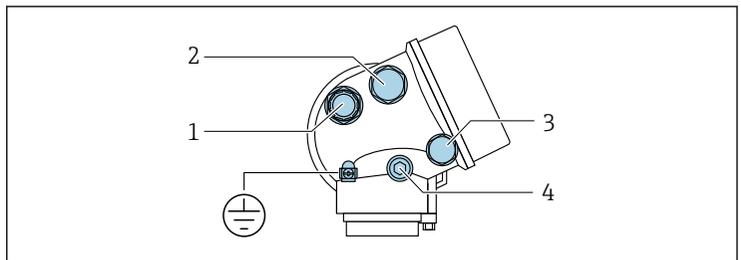
► $T_a = T_a - 2 \text{ K}$

T _a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35	60	80	80	80	80	80
50	-	80	80	80	80	80
60	-	-	80	80	80	80

**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



A0023831

Position		Basic specification, position 1, 2: Approval	Type of protection used for cable entry	Description
1	Cable entry for output 1	NF	Ex ia	-
2	Cable entry for output 2	NF	Ex ia	-
3	Cable entry of the remote display and operating module FHX50	NF	Ex ia	-
Position		Description		
4	Pressure compensation plug	<p>NOTICE</p> <p>Housing degree of protection voided due to insufficient sealing of the housing.</p> <ul style="list-style-type: none"> ▶ Do not open - not a cable entry. 		
⊕	Potential equalization	<p>NOTICE</p> <p>Terminal for connection to potential equalization.</p> <ul style="list-style-type: none"> ▶ 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		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.

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 C	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 30\ nF$
	4-20mA analog	
Option D	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	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$
	4 to 20 mA current input	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$

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.

Remote display FHX50

Basic specification, position 1, 2 Approval	Cable specification	Basic specification, position 4 Display; operation Option L, M
Option NF	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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