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Safety Instructions
Proline Prosonic Flow B 200

JPN: Zone 1
Ex d version

Endress+Hauser
People for Process Automation

Proline Prosonic Flow B 200

Table of contents

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
Prosonic Flow B 200	BA01031D

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).
- JNIOSH-TR-46-1
- JNIOSH-TR-46-2
- JNIOSH-TR-46-6

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

******	–	***** ... *****	+	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	Option selected	Description
1	Instrument family	9	Ultrasonic transit time flowmeter
2 [1)]	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 [2]	Nominal diameter	DN 50...200	Nominal diameter of sensor

1) Transmitter only: X
2) Transmitter only: XX

Basic specifications

Position	Order code for	Selected option	Type of protection	
			Transmitter	Sensor
1, 2	Approval	JK	Ex db [ia] IIC T6...T1 Gb	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
		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 [2]

1) FHX50 is approved according to CML 17JPN2332X.
2) FHX50 is approved according to CML 17JPN2332X.

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. JNIOSH-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 JNIOSH-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.

Temperature tables

Ambient temperature

Minimum ambient temperature

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

T_a = −40 °C

Maximum ambient temperature:
T_a = +60 °C depending on the medium temperature and temperature class

Medium temperature

Minimum medium temperature

T_m = 0 °C

Maximum medium temperature

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

Compact version

Basic specification, position 3 (output) = A

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) = B

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

Basic specification, position 3 (output) = C

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

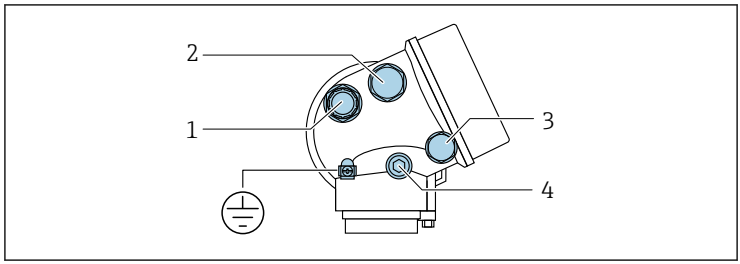
Basic specification, position 3 (output) = D

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 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 [1]	JK	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 [1]	JK	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 [2]: Cable entry of the remote display and operating module FHX50	JK	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) Please see below: Further notes on cable glands.
2) Basic specification, position 4 (display; operation) = L, M

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, JK:

- 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		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**	4-20mA HART (passive)		4-20mA analog (passive)		-	
Option **D** [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.

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 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 **JK**	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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