XA02781D/06/EN/02.22-00
71593421
2022-11-01

Safety Instructions
Proline Promag P 10

NEPSI: Zone 2

Endress+Hauser
People for Process Automation

Proline Promag P 10

Table of contents

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.

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

Measuring device	Documentation code	
	HART	Modbus
Promag P 10	BA02069D	BA02072D

Additional documentation

Contents	Document type	Documentation code
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

Manufacturer's certificates

NEPSI Declaration of Conformity

Certificate number:

GYJ21.3334X

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

- GB/T 3836.1-2021
- GB/T 3836.3-2021
- GB/T 3836.4-2021

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	5	Electromagnetic flowmeter
2	Sensor	P [1)]	Sensor type
3	Transmitter	B	Transmitter type: 4-wire, compact version

Position	Order code for	Option selected	Description
4	Generation index	B	Platform generation
5, 6	Nominal diameter	Examples: 02, 04, 40, 50, 1H, 1Z, T0, E4 [2) 3)]	Nominal diameter of sensor

1) For replacement transmitter only: X
2) For the exact specification of the nominal diameter, see nameplate
3) For replacement transmitter only: XX

Basic specifications

Position 1, 2 Order Code "Approval; Transmitter + Sensor" Option selected	Position 4, 5 Order Code "Output; Input" Option selected	Type of protection	
		Transmitter	Sensor
NS	C, U	Ex ec ic [ic] IIB T1...T4 Gc	Ex ec ic IIB T1...T4 Gc
	B, M	Ex ec ic IIB T1...T4 Gc	Ex ec ic IIB T1...T4 Gc

Position	Order code for	Option selected	Description
6	Output, input 1	B	4-20mA HART, Pulse/frequency/switch output
		C	4-20mA HART, Pulse/frequency/switch output Ex i
		M	Modbus RS485, 4-20mA
		U	Modbus RS485, 4-20mA Ex i
7	Display; Operation	A	W/o; via communication
		H	W/o; SmartBlue app
		J	LCD, 2,40"; SmartBlue app
		K	LCD, 2,40"; Touch Screen, SmartBlue app
8	Housing	A	Compact, alu, coated
		P	Remote, alu, coated
17, 18	Device Model	A1	1

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. 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.
- Observe all the technical data of the device (see nameplate).
- Attached nameplates must be included in potential equalization.
- Replaced transmitter or sensors shall not be re-used in any other application.

Safety instructions: Installation

- 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.
- 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).
- 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 or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Supplied cable glands M20 × 1.5 are only suitable for fixed installation of cables and connections. In the installation, a strain relief must be provided.
- 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.
- Please note the following if using an RFID TAG:
  - The RFID TAG shall never be exposed to high electromagnetic fields according to GB/T 3836.15-2017.
  - Electrostatic charge shall be avoided. The RFID TAG shall never be used next to strong charge-generating processes.
- Only use certified sealing plugs. The metal sealing plugs supplied meet this requirement.
- Equipment in type of protection Ex nA, shall be installed using a transient protection not exceeding 140% of the peak rated voltage value at the power supply terminals and IO terminals.

Intrinsic safety

- The device can be connected to the Endress+Hauser service tool FXA291; pay attention to the Operating Instructions. Connection to the service connector is only permitted if the atmosphere is not a potentially explosive atmosphere.
- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. GB/T 3836.15-2017 , Proof of Intrinsic Safety).
- For display use only battery from Renata type lithium CR1632, 3V.
- The use of the device without a display module is not permitted.

Potential equalization

- Integrate the device into the 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

T_a = −40 °C

Maximum ambient temperature

T_a = +60 °C depending on the medium temperature and temperature class.

Transmitter housing

Transmitter housing material	$T_{a, max}$ [°C]		
	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]
Aluminum	–	–	60

Medium temperature

Minimum medium temperature

T_m = −40 to 0 °C depending on the selected device version (see nameplate!)

Maximum medium temperature

T_m for T1 ~ T4 depending on the maximum ambient temperature T_a

Compact version

Maximum medium temperature with or without thermal insulation according to Endress+Hauser specifications

Liner	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
Without thermal insulation							
PTFE (110 °C)	55	–	–	110	110	110	110
	60	–	–	100	100	100	100
PTFE (130 °C)	55	–	–	130	130	130	130
	60	–	–	100	100	100	100
PFA	40	–	–	–	150	150	150
	55	–	–	130	130	130	130
	60	–	–	100	100	100	100
Extended neck for insulation (Optional specification, ID Cx (Sensor Option) = CG), with or without thermal insulation							
PTFE (110 °C)	55	–	–	110	110	110	110
	60	–	–	100	110	110	110
PTFE (130 °C)	55	–	–	130	130	130	130
	60	–	–	100	130	130	130

Liner	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
PFA	40	–	–	–	150	150	150
	55	–	–	130	150	150	150
	60	–	–	100	130	130	130

With thermal insulation without Endress+Hauser specifications

The specified reference temperature T_{ref} and the maximum medium temperature $T_{m, max}$ for each temperature class must not be exceeded:

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Reference temperature T_{ref}

T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
–	–	69	69	69	69

Remote version

Maximum medium temperature with or without thermal insulation according to Endress+Hauser specifications

Liner	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
PTFE (110 °C)	60	–	–	110	110	110	110
PTFE (130 °C)	60	–	–	130	130	130	130
PFA	50	–	–	130	150	150	150
	60	–	–	130	130	130	130

With thermal insulation without Endress+Hauser specifications

The specified reference temperature T_{ref} and the maximum medium temperature $T_{m, max}$ for each temperature class must not be exceeded:

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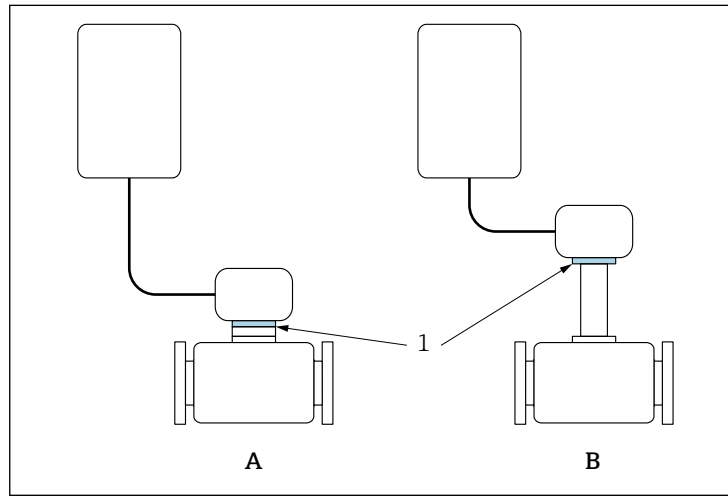


1 Position of reference point for temperature measurement

A Standard version
B Extended neck for insulation
1 Reference point (T_{ref})

Reference temperature T_{ref}

T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
–	–	63	65	70	70

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.

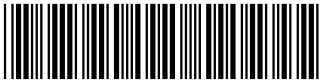
Safety-related values

Order code "Output; input"		Terminal assignment	Safety-related values
Option **B**	Current output 4 to 20 mA HART (active)	26 (+), 27 (–)	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$
	Current output 4 to 20 mA HART (passive)	24 (+), 25 (–)	
	Pulse/frequency/switch output	22 (+), 23 (–)	
Option **M**	Current output 4 to 20 mA (active)	26 (+), 27 (–)	
	Current output 4 to 20 mA (passive)	24 (+), 25 (–)	
	Modbus RS485	22 (B), 23 (A)	$U_N = 3.3\ V_{DC}$ $U_M = 250\ V_{AC}$

Intrinsically safe values

Order code "Output; input"		Terminal assignment	Safety-related values
Option **C**	Current output 4 to 20 mA HART (active)	26 (+), 27 (–)	$U_0 = 22.3\ V$ $I_0 = 93\ mA$ $P_0 = 520\ mW$ $L_0 = 29\ mH$ $C_0 = 1400\ nF$ $U_i = 6.5\ V$ $I_i = 10\ mA$ $P_i = 20\ mW$
	Current output 4 to 20 mA HART (passive)	24 (+), 25 (–)	$U_i = 30\ V$ $I_i = 100\ mA$ $P_i = 1.25\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$
	Pulse/frequency/switch output	22 (+), 23 (–)	$U_i = 30\ V$ $I_i = 100\ mA$ $P_i = 1.25\ W$ $L_i = 0\ \mu H$ $C_i = 10\ nF$

Order code "Output; input"		Terminal assignment	Safety-related values
Option **U**	Current output 4 to 20 mA (active)	26 (+), 27 (–)	U_0 = 22.3 V I_0 = 93 mA P_0 = 520 mW L_0 = 29 mH C_0 = 1 400 nF U_i = 6.5 V I_i = 10 mA P_i = 20 mW
	Current output 4 to 20 mA (passive)	24 (+), 25 (–)	U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 µH C_i = 6 nF
	Modbus RS485	22 (B), 23 (A)	U_i = 4.2 V I_i = N/A P_i = N/A L_i = 0 µH C_i = 6 nF U_0 = 4.2 V I_0 = 120 mA P_0 = 130 mW L_0 = 20 mH C_0 = 900 µF L_0/R_0 = 2.5 mH/Ω



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