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Safety Instructions
Proline Promass K 10

NEPSI: Zone 0/1
Zone 21

Endress+Hauser
People for Process Automation

Proline Promass K 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
Promass K 10	BA02074D	BA02075D

Additional documentation

Contents	Document type	Documentation code
Explosion Protection	Brochure	CP00021Z/11

Please note the documentation associated with the device.

Manufacturer address

Endress+Hauser Flowtec AG
Kägenstrasse 7
4153 Reinach BL
Switzerland

Manufacturer's certificates

NEPSI Declaration of Conformity

Certificate number:

GYJ21.3333X

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

- GB/T 3836.1-2021
- GB/T 3836.2-2021
- GB/T 3836.3-2021
- GB/T 3836.4-2021
- GB 3836.20-2010
- GB/T 3836.31-2021

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	8	Coriolis flowmeter
2	Sensor	K [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, 3E [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 or X1

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
NA	C, U	Ex db eb ib |ib| IIB T1...T4 Gb Ex tb |ib| IIIC T**°C Db	Ex ia/ib IIB T1...T4 Ga/Gb Ex tb IIIC T**°C Db
	B, M	Ex db eb ib IIB T1...T4 Gb Ex tb IIIC T**°C Db	
NC	C, U	Ex db ib |ib| IIB T1...T4 Gb Ex tb |ib| IIIC T**°C Db	
	B, M	Ex db ib IIB T1...T4 Gb Ex tb IIIC T**°C Db	

Position	Order code for	Option selected	Description
4	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
5	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
6	Housing	A	Alu, coated
14, 15	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"
  - GB 15577-2018: "Safety regulations for dust explosion prevention and protection". (Only if installed in dust hazardous areas.)
- 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.
- Observe all the technical data of the device (see nameplate).
- Open the housing cover of the transmitter housing in explosion protection Ex d only if one of the following conditions is met:
  - An explosive atmosphere is not present.
  - A waiting time of 10 minutes is observed after switching off the power supply.
    The following warning notice is on the device:
    WARNING – AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING ENCLOSURE IN TYPE OF PROTECTION EX D

- Attached nameplates must be included in potential equalization.
- In devices with damaged Ex d threads:
  - Use in hazardous areas is not permitted.
  - Repair of Ex d threads is not permitted.
- 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.
- The following applies for transmitter with a connection compartment in Ex d IIB:
  The device may only be opened after a waiting time of 10 minutes after the power supply has been switched off.
- 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.
- The following applies when connecting the transmitter with a connection compartment in Ex d:
  Only use separately certified cables and wire entries (Ex d IIB or Ex d IIC) which are suitable for operating temperatures up to 85 °C and for IP 66/67. If using conduit entries, the associated sealing mechanisms must be mounted directly on the housing.
  Plastic sealing plugs act as transport protection and have to be replaced by suitable, individually approved installation material.
  The mounted metal thread extensions and blind plugs are tested and certified as part of the housing for type of protection Ex d IIB. The thread extension or the blind plug labeled as follows for identification purposes:
  - Md: M20 x 1.5
  - d: NPT ½"

- The following applies when connecting the transmitter with a connection compartment in Ex e:
  Only use separately certified cable and wire entries and sealing plugs (Ex e IIB or Ex e IIC) which are suitable for operating temperatures up to 85 °C and for IP 66/67. The cables must be routed such that they are securely seated, and sufficient strain relief must be ensured.
  The mounted metal thread extensions and blind plugs supplied are tested and certified as part of the housing for type of protection Ex e IIB. Plastic sealing plugs act as transport protection and have to be replaced by suitable, individually approved installation material.
  Supplied cable glands are separately certified and marked as components and meet device specification requirements.
- 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.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- Only use certified sealing plugs. The metal sealing plugs supplied meet this requirement.

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.

Safety instructions: Zone 0

For sensors with EPL Ga/Gb the zone 0 is permitted in the measuring tube.

Safety instructions: Zone 21

- To ensure dust-tightness, securely seal all housing openings, cable entries and sealing plugs.
- Only open all housing briefly, ensuring that no dust or moisture enters the housing.
- Only use certified cable entries and sealing plugs. The metal cable entries, extensions and sealing plugs supplied meet this requirement.

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.

Medium temperature

Minimum medium temperature

T_m = −40 °C

Maximum medium temperature

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

Compact version

NOTICE

In case of heating, risk of overheating.

- ▶ On devices with Heating jacket the corresponding temperature tables for isolated sensor, are to be observed.
- ▶ Make sure that the heating medium, may not exceeded the maximum specified medium temperature of the exact used temperature classes of the device.

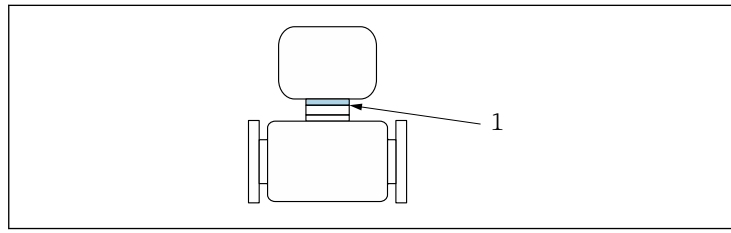
Maximum medium temperature with or without thermal insulation according to Endress+Hauser specifications

DN	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8...50	50	–	–	130	130	150	150
	60	–	–	100	130	150	150
80	60	–	–	110	135	150	150

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:

→ 10



1 Position of reference point for temperature measurement

1 Reference point

Reference temperature T_{ref}

T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
–	–	67	68	69	69

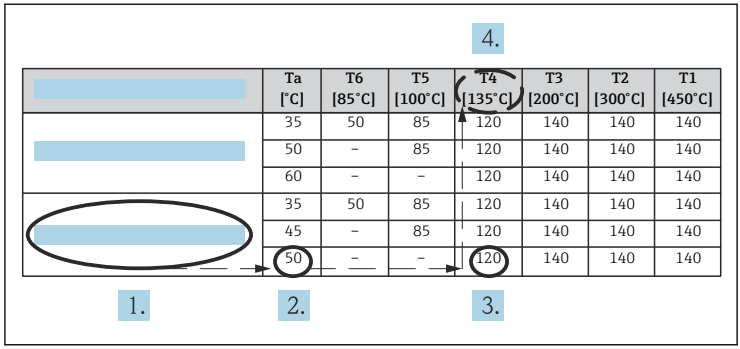
Explosion hazards arising from gas and dust

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

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2 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 °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 °C ≤ 120 °C → T4.
4. 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.

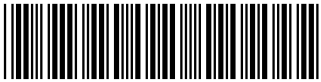
Safety-related values

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 = 8 mH C_0 = 500 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 µH 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 µH 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 = 8 mH C_0 = 500 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 = 10 mH C_0 = 900 µF L_0/R_0 = 1.2 mH/Ω



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