

Safety Instructions

Promass 300

EAC: Zone 2



Promass 300

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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	FOUNDATION Fieldbus	PROFIBUS PA	PROFIBUS DP
Promass A 300 (8A3B)	BA01482D	BA01515D	BA01504D	–
Promass E 300	BA01484D	BA01517D	BA01506D	BA01855D
Promass F 300	BA01485D	BA01518D	BA01507D	BA01850D
Promass H 300	BA01486D	BA01519D	BA01508D	BA01858D
Promass I 300	BA01487D	BA01520D	BA01509D	BA01859D
Promass O 300	BA01488D	BA01521D	BA01510D	BA01860D
Promass P 300	BA01489D	BA01522D	BA01511D	BA01861D
Promass Q 300	BA01490D	BA01523D	BA01512D	BA01862D
Promass S 300	BA01491D	BA01524D	BA01513D	BA01863D
Promass X 300	BA01492D	BA01525D	BA01514D	BA01864D

Measuring instrument	Documentation code			
	Modbus RS485	EtherNet/IP	PROFINET	PROFINET mit Ethernet-APL
Promass A 300 (8A3B)	BA01493D	BA01699D	BA01736D	–
Promass E 300	BA01495D	BA01727D	BA01738D	BA02110D
Promass F 300	BA01496D	BA01728D	BA01739D	BA01739D
Promass H 300	BA01497D	BA01729D	BA01740D	BA02111D
Promass I 300	BA01498D	BA01730D	BA01741D	BA02112D
Promass O 300	BA01499D	BA01731D	BA01742D	BA02113D
Promass P 300	BA01500D	BA01732D	BA01743D	BA02114D
Promass Q 300	BA01501D	BA01733D	BA01744D	BA02116D

Measuring instrument	Documentation code			
	Modbus RS485	EtherNet/IP	PROFINET	PROFINET mit Ethernet-APL
Promass S 300	BA01502D	BA01734D	BA01745D	BA02117D
Promass X 300	BA01503D	BA01735D	BA01746D	BA02118D

Additional documentation

Contents	Document type	Documentation code
Remote display and operating module DKX001	Special documentation	SD01763D
	Safety Instructions 2Ex ec IIC T6 Gc	XA01665D
Explosion Protection	Brochure	CP00021Z/11
Ethernet-APL Installation Drawing	Installation Drawing	HE_01622

Please note the documentation associated with the device.

Manufacturer's certificates

Measuring instruments meet the fundamental health and safety requirements for the design and construction of devices and protective systems intended for use in potentially explosive atmospheres in accordance with TR CU 012/2011.

Certification body

LLP "T-Standard"

Certificate number

EA9C KZ 7500525.01.01.01551

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

- GOCT 31610.0-2019 (IEC 60079-0:2017)
- GOCT 31610.7-2017 (IEC 60079-7:2015)
- GOCT 31610.15-2014 (IEC 60079-15:2010)

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*...
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

* = 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 ¹⁾
2	Sensor	A, E, F, H, I, O, P, Q, S, X ²⁾	Sensor type
3	Transmitter	3	Transmitter type: 4-wire, compact version

Position	Order code for	Option selected	Description
4	Generation index	B, C	Platform generation
5, 6	Nominal diameter	Examples: 02, 04, 40, 50, 1H, 3E ^{3) 4)}	Nominal diameter of sensor

- 1) For Promass Q: Coriolis flow and density meter
- 2) For replacement transmitter only: X
- 3) For the exact specification of the nominal diameter, see nameplate
- 4) For replacement transmitter only: XX

Basic specifications

Position 1, 2 Order code for "Approval" Option selected	Position 4, 5 Order code for "Output, input 1" Option selected	Type of protection	
		Transmitter	Sensor
GS, BS	BA, BB, GA, LA, MA, MB, NA, RA, RB, SA	2Ex ec nC IIC T5...T1 Gc X	2Ex ec IIC T5...T1 Gc X 2Ex ec nC IIC T5...T1 Gc X ¹⁾
	HA, MC, RC, TA	2Ex ec nC [ic] IIC T5...T1 Gc X	

- 1) The marking 2Ex ec nC is only applicable for sensor versions without purge connection or rupture disk. (see "Optional specifications").

Position	Order code for	Option selected	Description
4, 5	Output, input 1	BA	4-20mA HART
		GA	PROFIBUS PA
		HA	PROFIBUS PA Ex-i
		LA	PROFIBUS DP
		MA	Modbus RS485
		MB	Modbus TCP with Ethernet-APL
		MC	Modbus TCP with Ethernet-APL Ex i
		NA	EtherNet/IP 2-port switch integrated
		RA	PROFINET IO 2-port switch integrated
		RB	PROFINET with Ethernet-APL
		RC	PROFINET with Ethernet-APL Ex i
		SA	FOUNDATION Fieldbus
TA	FOUNDATION Fieldbus Ex-i		
6	Output, input 2	A	W/o
		B	4-20mA

Position	Order code for	Option selected	Description
		C	4-20mA Ex-i passive
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		G	Pulse/frequency/switch output Ex-i passive
		H	Relay
		I	4-20mA input
		J	Status input
7	Output, input 3	A	W/o
		B	4-20mA
		C	4-20mA Ex-i passive
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		G	Pulse/frequency/switch output Ex-i passive
		H	Relay
		I	4-20mA input
		J	Status input
8	Display; Operation	A	W/o; via communication
		F	4-line, illuminated; touch control
		G	4-line, illuminated; touch control + WLAN
		M	Without; prepared for remote display DKX001 ¹⁾
		O	Separate, with remote display DKX001 ¹⁾ , 4-line, illuminated; 10 m / 30 ft cable; touch control
9	Housing	A	Alu, coated
		B	Stainless, hygienic
		L	Cast, stainless
11, 12	Meas. Tube Mat., Wetted Parts Surface	LA	Stainl. steel, cryogenic -196°C/-320°F
17, 18	Device Model	A1	1
		A2	2

1) DKX001 is separately approved.

Optional specifications


ID	Order code for	Option selected	Description
Cx	Sensor option	CA	Rupture disk
Cx	Sensor option	CH	Purge connection
Px	Enclosed accessories	P8	Wireless antenna, wide area (external WLAN antenna) ¹⁾

1) The external WLAN antenna is available with the order code for "Accessory Enclosed", option P8.

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. ΓOCT IEC 60079-14-2013)
- 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.
- 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).

Safety instructions: Installation

- In the case of a horizontal orientation and the order code for "Housing", option B "Stainless, hygienic": install the transmitter at the side of or below the sensor.
For more information on the orientation, see the Operating Instructions for the device →  4
- The following applies for devices with order code for "Housing", Option B "Stainless, hygienic": Thermal insulation is not allowed.
- Continuous service temperature of the connecting cable:
 - 40 to +80 °C; but at least according to the operating temperature range of the application plus allowance for 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 ΓOCT IEC 60079-14-2013.

- When the measuring device is connected, attention must be paid to the type of protection at the transmitter.
- Turning the transmitter housing
 - Loosen both hexagon socket screws until the transmitter housing can be turned.
 - Turn transmitter housing to desired position (mechanically limited); if necessary turn 270° in other direction.
 - Tighten both hexagon socket screws with a maximum of 7 Nm.
- 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.

Ex ec type of protection


- In potentially explosive atmospheres: Do not disconnect the electrical connection of the power supply circuit when energized.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- Only use certified cable entries or sealing plugs.
- Equipment in type of protection Ex ec, shall be installed using a transient protection not exceeding 140% of the peak rated voltage value at the power supply terminals and IO terminals.
- For measuring devices with order code "Housing", option B "Stainless, hygienic":
 - To close the connection compartment cover, first hand-tight the cover and then tighten it further 45° (corresponds to 15 Nm).
 - In combination with order code "Display; Operation", option F or G "4-line illum.". Prevent electrostatic charge. Clean only with moist cloth.

Optional external WLAN antenna

- Connect the antenna bushing H337 to the transmitter housing and tighten by hand.
- Use only external antennas supplied by Endress+Hauser.
- Connect antenna or antenna cable with plug-in connector type N (MIL-STD-348) to antenna bushing H337.

Intrinsic safety

Observe the guidelines for interconnecting intrinsically safe circuits (e.g. GOCT IEC 60079-14-2013 , proof of intrinsic safety).

- 
 - When using the remote display and operating module DKX001 the internal display and operating module must be removed.
 - When using the separate approved, remote display and operating module DKX001, only use the following variants: Basic specification of the remote display and operating module DKX001, order code "Approval", option GS, BS

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.
- The antenna bushing H337 of the external antenna must be integrated into the potential equalization system. This is the case if the sensor is connected in accordance with the regulations via the coupling.

Temperature tables

Ambient temperature

Minimum ambient temperature

$$T_{a, \min} = -40 \text{ }^{\circ}\text{C}$$

Maximum ambient temperature

$T_{a, \max} = +60 \text{ }^{\circ}\text{C}$ depending on the medium temperature and temperature class.

Medium temperature

Minimum medium temperature

- Promass A, F, H, I, P, Q, S, X:
 $T_{m, \min} = -50 \text{ }^{\circ}\text{C}$
- Promass E, O:
 $T_{m, \min} = -40 \text{ }^{\circ}\text{C}$
- Promass F, Q with cryogenic temperature version (order code for "Measuring tube material", option LA):
 $T_{m, \min} = -196 \text{ }^{\circ}\text{C}$

Maximum medium temperature

- $T_{m, \max}$ for T5...T1 depending on the maximum ambient temperature $T_{a, \max}$.
- () = The maximum permitted medium temperatures in brackets only apply if the sensor is installed in such a way that the transmitter is not mounted above the sensor and free convection can occur on all sides.

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 without thermal insulation according to Endress+Hauser specifications

*Promass A (8A3B**-*..., 8A3C**-*...)*

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1 to 4	205	50	–	90 ^{1) 2)}	130	170 ³⁾	205	205
		60	–	–	130	170 ³⁾	205	205

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 3) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C

Promass E

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8 to 15	150	50	–	80 ^{1) 2)}	115 ³⁾	150	150	150
		55	–	–	115 ³⁾	150	150	150
		60	–	–	(115 ³⁾)	(140 ⁴⁾)	(150)	(150)
25 to 80	150	50	–	80 ^{1) 2)}	95 ³⁾	140 ⁴⁾	150	150
		55	–	–	95 ³⁾	140 ⁴⁾	150	150
		60	–	–	(95 ³⁾)	(140 ⁴⁾)	(150)	(150)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 4) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 150 °C

Promass F

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
08 to 15	150	50	–	80 ^{2) 3)}	115 ⁴⁾	150	150	150
		60	–	–	115 ⁴⁾	150	150	150
	150 ⁵⁾	50	–	80 ^{2) 3)}	100	150	150	150
		55	–	–	100	150	150	150
		60	–	–	100	150	150	150
	240	50	–	80 ^{2) 3)}	115 ⁴⁾	170 ⁶⁾	240	240
		55	–	–	115 ⁴⁾	170 ⁶⁾	240	240
		60	–	–	115 ⁴⁾	170	170 (240)	170 (240)
	25 to 80	150	50	–	60 ^{2) 3)}	95 ⁴⁾	150	150
60			–	–	95 ⁴⁾	150	150	150
150 ⁵⁾		50	–	60 ^{2) 3)}	95	150	150	150
		55	–	–	95	150	150	150
		60	–	–	95	150	150	150
240		50	–	60 ^{2) 3)}	95 ⁴⁾	160 ⁶⁾	240	240
		55	–	–	95 ⁴⁾	160 ⁶⁾	240	240
		60	–	–	95 ⁴⁾	150 ⁷⁾	170 (240)	170 (240)
15, 25, 50 to 250		350	50	–	85 ^{2) 3)}	120 ⁴⁾	185 ⁶⁾	280 ⁸⁾
	60		–	–	120 ⁴⁾	185 ⁶⁾	280 ⁸⁾	350
100 to 250	150	50	–	60 ^{2) 3)}	95 ⁴⁾	150	150	150
		60	–	–	95 ⁴⁾	150	150	150
	150 ⁵⁾	50	–	60 ^{2) 3)}	95	150	150	150
		60	–	–	95	150	150	150
	240	50	–	60 ^{2) 3)}	95 ⁴⁾	160 ⁶⁾	240	240

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		55	-	-	95 ⁴⁾	160 ⁶⁾	240	240
		60	-	-	95 ⁴⁾	160 ⁷⁾	170 (240)	170 (240)

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 4) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 5) Cryogenic temperature version: T_m = -196 to 150 °C
- 6) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C
- 7) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 170 °C
- 8) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 290 °C

Promass H

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	-	80 ²⁾	115 ³⁾	150	150	150
		60	-	-	115 ³⁾	150	150	150
8	205	50	-	80 ²⁾	115 ³⁾	165 ⁴⁾	205	205
		60	-	-	115 ³⁾	165 ⁴⁾	205	205
15 to 50	150	50	-	60 ²⁾	95 ³⁾	130 ⁵⁾	150	150
		60	-	-	95 ³⁾	130 ⁵⁾	150	150
15 to 50	205	50	-	60 ²⁾	95 ³⁾	130 ⁴⁾	205	205
		60	-	-	95 ³⁾	130 ⁴⁾	205	205

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 4) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C
- 5) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 150 °C

Promass I

DN	$T_{m, \max}$ range [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8 to 80	150	50	–	60 ¹⁾²⁾	95 ³⁾	150	150	150
		55	–	–	95 ³⁾	150	150	150
		60	–	–	(95 ³⁾)	(150)	(150)	(150)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 95$ °C
- 2) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: $T_a = T_a - 3$ K
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 130$ °C

Promass O

DN	$T_{m, \max}$ range [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
80 to 250	205	50	–	60 ¹⁾	95 ²⁾	160 ³⁾	205	205
		55	–	–	95 ²⁾	160 ³⁾	205	205
		60	–	–	95 ²⁾	160 ⁴⁾	180 (205)	180 (205)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 95$ °C
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 130$ °C
- 3) The following applies for sensors with type of protection 2Ex ec nC: $T_m = 195$ °C
- 4) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 180$ °C

Promass P

DN	$T_{m, \max}$ range ¹⁾ [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	–	80 ²⁾³⁾	115 ⁴⁾	150	150	150
		60	–	–	115 ⁴⁾	150	150	150
	205	50	–	80 ²⁾³⁾	115 ⁴⁾	170 ⁵⁾	205	205
		60	–	–	115 ⁴⁾	170 ⁵⁾	205	205
15 to 50	150	50	–	60 ²⁾³⁾	95 ⁴⁾	150	150	150
		60	–	–	95 ⁴⁾	150	150	150

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
	205	50	-	60 ^{2) 3)}	95 ⁴⁾	160 ⁵⁾	205	205
		60	-	-	95 ⁴⁾	160 ⁵⁾	205	205

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 4) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 5) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C

Promass Q

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25 to 250	205	50	-	60 ^{2) 3)}	95 ⁴⁾	160 ⁵⁾	205	205
		60	-	-	95 ⁴⁾	160 ⁵⁾	205	205
25 to 250	150 ⁶⁾	50	-	60 ^{2) 3)}	95 ⁴⁾	150	150	150
		60	-	-	95 ⁴⁾	150	150	150

- 1) Maximaler Temperaturbereich siehe Typenschild
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 4) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 5) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C
- 6) Cryogenic temperature version: T_m = -196 to 150 °C

Promass S

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	-	80 ^{1) 2)}	115 ³⁾	150	150	150
		60	-	-	115 ³⁾	150	150	150
15 to 50	150	50	-	60 ^{1) 2)}	95 ³⁾	150	150	150
		60	-	-	95 ³⁾	150	150	150

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: T_a = T_a - 3 K
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C

Promass X

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
350	180	50	–	60 ¹⁾	95 ²⁾	160 ³⁾	180	180
		55	–	–	95 ²⁾	160 ³⁾	180	180
		60	–	–	(95 ²⁾)	(160 ³⁾)	(180)	(180)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 180 °C

Maximum medium temperature with thermal insulation according to Endress+Hauser specifications

NOTICE

The following applies for devices with order code for "Housing", Option B "Stainless, hygienic":

- Thermal insulation is not allowed.



For information on the thermal insulation of the device, see the "Thermal insulation" section of the "Operating instructions" document.

Promass A (8A3B**-*..., 8A3C**-*...)

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
1 to 4	205	50	-	90 ¹⁾	130	170 ²⁾	205	205
		55	-	-	(130)	(170 ²⁾)	(205)	(205)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C

Promass E

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8 to 15	150	50	-	80 ¹⁾	115 ²⁾	150	150	150
		55	-	-	(115 ²⁾)	(140 ³⁾)	(150)	(150)
25 to 80	150	50	-	60 ¹⁾	95 ²⁾	140 ³⁾	150	150
		55	-	-	(95 ²⁾)	(140 ³⁾)	(150)	(150)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 150 °C

Promass F

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
08 to 15	150	50	-	80 ²⁾	115 ³⁾	150	150	150
		55	-	-	(115 ³⁾)	(150)	(150)	(150)
	150 ⁴⁾	50	-	80	100	150	150	150

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
	240	55	–	–	100	150	150	150
		50	–	80 ²⁾	115 ³⁾	170 ⁵⁾	240	240
		55	–	–	(115 ³⁾)	(170 ⁵⁾)	(240)	(240)
25 to 80	150	50	–	60 ²⁾	95 ³⁾	150	150	150
		55	–	–	(95 ³⁾)	(150)	(150)	(150)
	150 ⁴⁾	50	–	60 ²⁾	95	150	150	150
		55	–	–	95	150	150	150
	240	50	–	60 ²⁾	95 ³⁾	160 ⁵⁾	240	240
		55	–	–	(95 ³⁾)	(160 ⁵⁾)	(240)	(240)
15, 25, 50 to 250	350	50	–	85 ²⁾	120 ³⁾	185 ⁵⁾	280 ⁶⁾	350
		60	–	–	120 ³⁾	185 ⁵⁾	280 ⁶⁾	350
100 to 250	150	50	–	60 ²⁾	95 ³⁾	150	150	150
		55	–	–	(95 ³⁾)	(150)	(150)	(150)
	150 ⁴⁾	50	–	60 ²⁾	95	150	150	150
		55	–	–	95	150	150	150
	240	50	–	60 ²⁾	95 ³⁾	160 ⁵⁾	240	240
		55	–	–	(95 ³⁾)	(160 ⁵⁾)	(240)	(240)

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 4) Cryogenic temperature version: T_m = -196 to 150 °C
- 5) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C
- 6) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 290 °C

Promass H

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	–	80 ²⁾	115 ³⁾	150	150	150
		55	–	–	(115 ³⁾)	(150)	(150)	(150)
8	205	50	–	80 ²⁾	115 ³⁾	165 ⁴⁾	205	205
		55	–	–	(115 ³⁾)	(165 ⁴⁾)	(205)	(205)
15 to 50	150	50	–	60 ²⁾	95 ³⁾	130 ⁵⁾	150	150

DN	$T_{m, \max \text{ range}}^1$ [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		55	-	-	(95 ³⁾)	(130 ⁵⁾)	(150)	(150)
15 to 50	205	50	-	60 ²⁾	95 ³⁾	130 ⁴⁾	205	205
		55	-	-	(95 ³⁾)	(130 ⁴⁾)	(205)	(205)

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 95^\circ\text{C}$
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 130^\circ\text{C}$
- 4) The following applies for sensors with type of protection 2Ex ec nC: $T_m = 195^\circ\text{C}$
- 5) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 150^\circ\text{C}$

Promass I

DN	$T_{m, \max \text{ range}}$ [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8 to 80	150	50	-	60 ¹⁾	95 ²⁾	150	150	150
		60	-	-	(95 ²⁾)	(150)	(150)	(150)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 95^\circ\text{C}$
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 130^\circ\text{C}$

Promass O

DN	$T_{m, \max \text{ range}}$ [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
80 to 250	205	50	-	60 ¹⁾	95 ²⁾	160 ³⁾	205	205
		55	-	-	(95 ²⁾)	(160 ³⁾)	(205)	(205)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 95^\circ\text{C}$
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: $T_m = 130^\circ\text{C}$
- 3) The following applies for sensors with type of protection 2Ex ec nC: $T_m = 195^\circ\text{C}$

Promass P

DN	$T_{m, \max \text{ range}}^1$ [°C]	$T_{a, \max}$ [°C]	$T_{m, \max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	-	80 ²⁾	115 ³⁾	150	150	150
		55	-	-	(115 ³⁾)	(150)	(150)	(150)
	205	50	-	80 ²⁾	115 ³⁾	170 ⁴⁾	205	205

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		55	–	–	(115 ³⁾)	(170 ⁴⁾)	(205)	(205)
15 to 50	150	50	–	60 ²⁾	95 ³⁾	150	150	150
		55	–	–	95 ³⁾	150	150	150
		60	–	–	(95 ³⁾)	(150)	(150)	(150)
	205	50	–	60 ²⁾	95 ³⁾	160 ⁴⁾	205	205
		55	–	–	95 ³⁾	160 ⁴⁾	205	205
		60	–	–	(95 ³⁾)	(160 ⁴⁾)	(205)	(205)

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 4) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C

Promass Q

DN	T _{m, max range} ¹⁾ [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25 to 250	205	50	–	60 ²⁾	95 ³⁾	160 ⁴⁾	205	205
		55	–	(40)	(95)	(160)	(205)	(205)
25 to 250	150 ⁵⁾	50	–	60 ²⁾	95 ³⁾	150	150	150
		55	–	(40)	(95)	(150)	(150)	(150)

- 1) Maximum temperature range, see nameplate
- 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
- 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
- 4) The following applies for sensors with type of protection 2Ex ec nC: T_m = 195 °C
- 5) Cryogenic temperature version: T_m = -196 to 150 °C

Promass S

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	–	80 ¹⁾	115 ²⁾	150	150	150
		55	–	–	(115 ²⁾)	(150)	(150)	(150)
15 to 50	150	50	–	60 ¹⁾	95 ²⁾	150	150	150

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		55	-	-	95 ²⁾	150	150	150
		60	-	-	(95 ²⁾)	(150)	(150)	(150)

- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C

Promass X

DN	T _{m, max range} [°C]	T _{a, max} [°C]	T _{m, max} [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
350	180	50	-	60 ¹⁾	95 ²⁾	160 ³⁾	180	180
		55	-	-	(95 ²⁾)	(160 ³⁾)	(180)	(180)


- 1) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 95 °C
 2) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 130 °C
 3) The following applies for sensors with type of protection 2Ex ec nC gilt: T_m = 180 °C

With thermal insulation without Endress+Hauser specifications

NOTICE

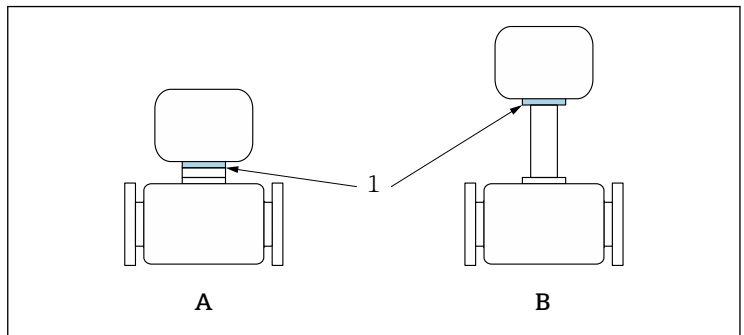
The following applies for devices with order code for "Housing", Option B "Stainless, hygienic":

- ▶ Thermal insulation is not allowed.


 For information on the thermal insulation of the device, see the "Thermal insulation" section of the "Operating instructions" document .

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

→  18



A0031198

 1 *Position of reference point for temperature measurement*

A *Standard version*

B *Extended temperature version, cryogenic temperature version, high-temperature version*

1 *Reference point (T_{ref})*

Reference temperature T_{ref}

T_m [°C]					
T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
-	63	72	75	77	77

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.

Terminal assignment

Transmitter: supply voltage, input/outputs

HART

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (+)	27 (-)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

FOUNDATION Fieldbus

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (A)	27 (B)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

PROFIBUS DP

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (B)	27 (A)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

PROFIBUS PA

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (B)	27 (A)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

Modbus RS485

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (B)	27 (A)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

Modbus TCP with Ethernet-APL

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (+)	27 (-)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

PROFINET

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	PROFINET (RJ45 connector)		24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

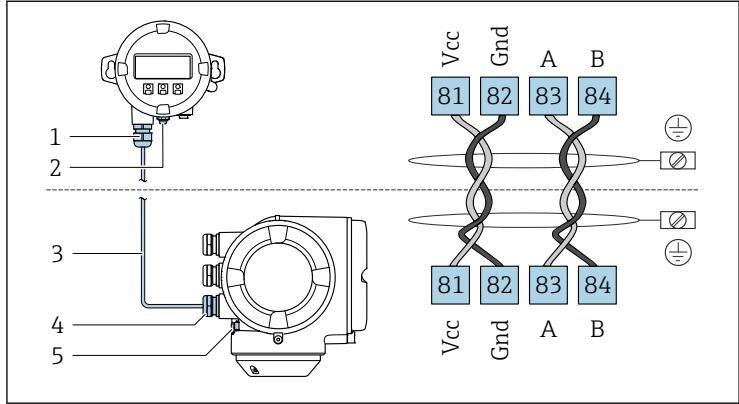
PROFINET with Ethernet-APL

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (+)	27 (-)	24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

EtherNet/IP

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	EtherNet/IP (RJ45 connector)		24 (+)	25 (-)	22 (+)	23 (-)
Device-specific terminal assignment: adhesive label in terminal cover.							

Remote display and operating module DKX001



A0027518

- 1 Remote display and operating module DKX001
- 2 Protective earth (PE)
- 3 Connecting cable
- 4 Measuring device
- 5 Protective earth (PE)

Safety-related values

Order code "Output; input 1"	Output type	Safety-related values "Output; input 1"	
		26 (+)	27 (-)
Option BA	Current output 4 to 20 mA HART	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	
Option GA	PROFIBUS PA	$U_N = 32 V_{DC}$ $U_M = 250 V_{AC}$	
Option LA	PROFIBUS DP	$U_N = 32 V_{DC}$ $U_M = 250 V_{AC}$	
Option MA	Modbus RS485	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	
Option MB	Modbus TCP with Ethernet-APL	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	
Option SA	FOUNDATION Fieldbus	$U_N = 32 V_{DC}$ $U_M = 250 V_{AC}$	
Option NA	EtherNet/IP	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	

Order code "Output; input 1"	Output type	Safety-related values "Output; input 1"	
		26 (+)	27 (-)
Option RA	PROFINET	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	
Option RB	PROFINET with Ethernet-APL	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$	

Order code "Output; input 2"; "Output; input 3"	Output type	Safety-related values			
		Output; input 2		Output; input 3	
		24 (+)	25 (-)	22 (+)	23 (-)
Option B	Current output 4 to 20 mA	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			
Option D	User-configurable input/output	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			
Option E	Pulse/frequency/ switch output	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			
Option F	Double pulse output	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			
Option H	Relay output	$U_N = 30 V_{DC}$ $I_N = 100 mA_{DC}/500 mA_{AC}$ $U_M = 250 V_{AC}$			
Option I	Current input 4 to 20 mA	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			
Option J	Status input	$U_N = 30 V_{DC}$ $U_M = 250 V_{AC}$			

Intrinsically safe values

Order code for "Output; input 1"	Output type	Intrinsically safe values "Output; input 1"	
		26 (+)	27 (-)
Option HA	PROFIBUS PA Ex i (STANDARD + FISCO)	$U_i = 32 \text{ V}$ $I_i = 570 \text{ mA}$ $P_i = 8.5 \text{ W}$ $L_i = 10 \text{ } \mu\text{H}$ $C_i = 5 \text{ nF}$	
Option MC	Modbus TCP with Ethernet-APL Ex i	2-WISE power load, APL port profile SLAC¹⁾ Ex ic $U_i = 17.5 \text{ V}$ $I_i = 380 \text{ mA}$ $P_i = 5.32 \text{ W}$ $L_i = 10 \text{ } \mu\text{H}$ $C_i = 5 \text{ nF}$ Cable specifications according to 2-WISE: $R_c = 15 \text{ to } 150 \text{ } \Omega/\text{km}$ $L_c = 0.4 \text{ to } 1 \text{ mH/km}$ $C_c = 45 \text{ to } 200 \text{ nF/km}$ $C_c = C_c \text{ line/line} + 0,5 C_c \text{ line/screen}$, if both lines are floating, or $C_c = C_c \text{ line/line} + C_c \text{ line/screen}$, if the screen is connected to one line Length of cable (not including cable stubs): $\leq 200 \text{ m (656.2)}$ Length of cable stubs: $\leq 1 \text{ m (3.3 ft)}$	
Option RC	PROFINET with Ethernet-APL Ex i		
Option TA	FOUNDATION Fieldbus Ex i (STANDARD + FISCO)	$U_i = 32 \text{ V}$ $I_i = 570 \text{ mA}$ $P_i = 8.5 \text{ W}$ $L_i = 10 \text{ } \mu\text{H}$ $C_i = 5 \text{ nF}$	

1) For further options see Ethernet-APL Installation Drawing HE_01622.

Order code for "Output; input 2"; "Output; input 3"	Output type	Intrinsically safe values			
		Output; input 2		Output; input 3	
		24 (+)	25 (-)	22 (+)	23 (-)
Option C	Current output 4 to 20 mA Ex i passive	$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1.25 \text{ W}$ $L_i = 0$ $C_i = 0$			
Option G	Pulse/frequency/ switch output Ex i passive	$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1.25 \text{ W}$ $L_i = 0$ $C_i = 0$			

Remote display DKX001

Basic specification, position 1, 2 Approval	Terminal assignment	Basic specification, position 8 Display; operation Option O
Option GS, BS	81, 82, 83, 84	U _n = 3.3 V I _n = 150 mA



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