Safety Instructions
Proline Promass 500

JPN: Zone 1
       Zone 0/1
       Zone 21

cml Ex

Endress+Hauser

People for Process Automation

Proline Promass 500

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About this document

ℹ 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 500 (8A5B)	BA01526D	BA01559D	BA01548D	–
Promass A 500 (8A5C)	BA01817D	BA01883D	BA01869D	BA01870D
Promass E 500	BA01528D	BA01561D	BA01550D	BA01872D
Promass F 500	BA01529D	BA01562D	BA01551D	BA01873D
Promass H 500	BA01530D	BA01563D	BA01552D	BA01874D
Promass I 500	BA01531D	BA01564D	BA01553D	BA01875D
Promass O 500	BA01532D	BA01565D	BA01554D	BA01876D
Promass P 500	BA01533D	BA01566D	BA01555D	BA01877D
Promass Q 500	BA01534D	BA01567D	BA01556D	BA01878D
Promass S 500	BA01535D	BA01568D	BA01557D	BA01879D
Promass X 500	BA01536D	BA01569D	BA01558D	BA01880D

Measuring instrument	Documentation code				
	Modbus RS485	Modbus over Ethernet-APL	EtherNet/IP	PROFINET	PROFINET over Ethernet-APL
Promass A 500 (8A5B)	BA01537D	–	BA01747D	BA01758D	–
Promass A 500 (8A5C)	BA01884D	BA02412D	BA01885D	BA01886D	BA02121D
Promass E 500	BA01539D	BA02414D	BA01749D	BA01760D	BA02124D
Promass F 500	BA01540D	BA02415D	BA01750D	BA01761D	BA02119D
Promass H 500	BA01541D	BA02416D	BA01751D	BA01762D	BA02125D
Promass I 500	BA01542D	BA02417D	BA01752D	BA01763D	BA02126D
Promass O 500	BA01543D	BA02418D	BA01753D	BA01764D	BA02127D

Measuring instrument	Documentation code				
	Modbus RS485	Modbus over Ethernet-APL	EtherNet/IP	PROFINET	PROFINET over Ethernet-APL
Promass P 500	BA01544D	BA02419D	BA01754D	BA01765D	BA02128D
Promass Q 500	BA01545D	BA02420D	BA01755D	BA01766D	BA02129D
Promass S 500	BA01546D	BA02421D	BA01756D	BA01767D	BA02130D
Promass X 500	BA01547D	BA02423D	BA01757D	BA01768D	BA02131D

Additional documentation

Contents	Document type	Documentation code
Explosion Protection	Brochure	CP00021Z/11
Ethernet-APL Installation Drawing	Installation Drawing	HE_01622

Please note the documentation associated with the device.

Certificates and declarations

JPN Type Examination Certificate

Certificate number:

- CML 17JPN2348X (Proline 500 – digital)
- CML 17JPN2347X (Proline 500)

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
- JNIOSH-TR-46-9
- IEC 60079-26

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.
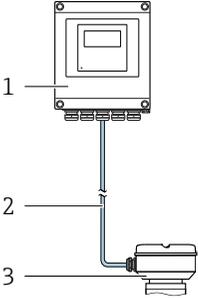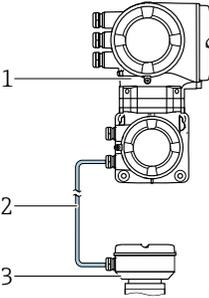
Optional specifications

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	Selected option	Description
1	Instrument family	8	Coriolis flowmeter
2	Sensor	A, E, F, H, I, O, P, Q, S, X [1]	Sensor type
3	Transmitter	5	Transmitter type: 4-wire, remote version
4	Generation index	B, C	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

Proline 500 – digital	Proline 500
Order code for "Integrated ISEM Electronic", option **A** "Sensor"	Order code for "Integrated ISEM Electronic", option **B** "Transmitter"
1 Transmitter *2 Connecting cable* *3 Sensor connection housing with integrated ISEM*	*1 Transmitter with integrated ISEM* *2 Connecting cable* *3 Sensor connection housing*

Basic specifications

Position 1, 2 Order code for "Approval" Selected option	Position 10 Order code for "Integrated ISEM electronics" Selected option	Type of protection	
		Transmitter	Sensor
JC	B	Ex db ia [ia Ga] IIB T6...T5 Gb Ex tb [ia Da] IIIC T85℃ Db [1]	Ex ia IIB T6...T1 Ga/Gb (Sensor connection housing) [2] Ex ia tb IIIC T** ℃ Db (Sensor connection housing) [1] Ex ia IIB T6...T1 Ga/Gb (Sensor) [2] Ex ia tb IIIC T** ℃ Db (Sensor) [1]
JD	B	Ex db ia [ia Ga] IIC T6...T5 Gb Ex tb [ia Da] IIIC T85℃ Db [1]	Ex ia IIC T6...T1 Ga/Gb (Sensor connection housing) [2] Ex ia tb IIIC T** ℃ Db (Sensor connection housing) [1] Ex ia IIC T6...T1 Ga/Gb (Sensor) [2] Ex ia tb IIIC T** ℃ Db (Sensor) [1]

Position 1, 2 Order code for "Approval" Selected option	Position 10 Order code for "Integrated ISEM electronics" Selected option	Type of protection	
		Transmitter	Sensor
JI [3]	A	[Ex ia] IIC [Ex ia] IIIC [1]	Ex ia IIB T6...T1 Ga/Gb (Sensor connection housing) [2] Ex ia tb IIIC T** °C Db (Sensor connection housing) [1] Ex ia IIB T6...T1 Ga/Gb (Sensor) [2] Ex ia tb IIIC T** °C Db (Sensor) [1]
JJ [3]	A	[Ex ia] IIC [Ex ia] IIIC [1]	Ex ia IIC T6...T1 Ga/Gb (Sensor connection housing) [2] Ex ia tb IIIC T** °C Db (Sensor connection housing) [1] Ex ia IIC T6...T1 Ga/Gb (Sensor) [2] Ex ia tb IIIC T** °C Db (Sensor) [1]

1)   The markings may be applied depending on users' applications.
2)   Sensors Promass A DN 1, Promass H DN 8 to 50, Promass I DN 8 to 80 are only suitable for equipment protection level EPL Gb.
3)   Transmitter is located in the safe area (non-hazardous area) with output markings.

Position	Order code for	Selected option	Description
4, 5 [1]	Output; input 1	BA	4-20mA HART
		CA	4-20mA Ex-i passive
		CC	4-20mA HART Ex-i active
		GA	PROFIBUS PA
		HA	PROFIBUS PA Ex-i
		LA	PROFIBUS DP
		MA	Modbus RS485
		MB	Modbus TCP over Ethernet-APL/SPE, 10Mbit/s
		MC	Modbus TCP over Ethernet-APL, Ex-i, 10Mbit/s
		NA	EtherNet/IP 2-port switch integrated
		RA	PROFINET IO 2-port switch integrated
		RB	PROFINET over Ethernet-APL/SPE, 10Mbit/s
		RC	PROFINET over Ethernet-APL, Ex-i, 10Mbit/s
		SA	FOUNDATION Fieldbus
		TA	FOUNDATION Fieldbus Ex-i
6 [2]	Output; input 2	A	W/o
		B	4-20mA
		C	4-20mA Ex-i passive

Position	Order code for	Selected option	Description
		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 [2]	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 [2]	Output; input 4 [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
		G	Pulse/frequency/switch output Ex-i passive
		H	Relay
		I	4-20mA input
		J	Status input
9 [2]	Display; Operation	F	4-line, illuminated; touch control
		G	4-line, illuminated; touch control + WLAN
10 [2]	Integrated ISEM Electronic	A	Sensor
		B	Transmitter
11 [2]	Transmitter Housing	A	Alu, coated
		D	Polycarbonate
		L	Cast, stainless

Position	Order code for	Selected option	Description
12 [2]	Sensor junction Housing	A	Alu, coated
		B	Stainless
		L	Cast, stainless
15, 16	Meas. Tube Mat., Wetted Parts Surface	LA	Stainl. steel, cryogenic -196°C/-320°F
21, 22 [4]	Device Model	A1	1
		A2	2

1) For sensor only, "XX" is described
2) For sensor only, "X" is described
3) The order code "Output; input 4" is only available for the Proline 500 – digital transmitter.
4) For model code 8A5C**-...A1 or O8A5C**-...A1, the replacement transmitter type 8X5BXX-...A2 or O8X5BXX-...A2 is assigned.

Optional specifications

ID	Order code for	Selected option	Description
Cx	Sensor option	CA	Rupture disk
Cx	Sensor option	CG	Extended neck for insulation
Cx	Sensor option	CH	Purge connection
Jx	Test, certificate	JP	Ambient temperature transmitter −50 °C
Jx	Test, certificate	JQ	Ambient temperature, transmitter−50 °C Ambient temperature, sensor−60 °C

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.
- Use the device only in media where the wetted materials are known to be suitable.
- 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.

- An additional assessment must be conducted to confirm that the device is suitable for installation in hybrid mixtures (explosive gas and dust occurring simultaneously).
- Only open the cover of the Ex db transmitter housing 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
- 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).
- Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, cleaning or maintaining:
  - For external non-metallic surfaces, e.g. housing, attached additional plates, RFID tag.
  - For attached external metallic parts that are not integrated into the local potential equalization system, e.g. nameplate tag, RFID tag.
  - Do not use in areas where the devices/electronic housing are exposed to highly charge-generating processes, pneumatically conveyed dusts and/or charge spraying in an electrostatic coating process.
  - Do no rub surfaces dry. Clean only with moist cloth.
  - Information on electrostatic hazards and how to minimize the generation of static electricity can be found in the technical specification IEC/TS 60079-32-1.

Safety instructions: Installation	**General installation instructions**

General installation instructions

- Continuous service temperature of the connecting cable: −40 to +85 ℃ (−50 to +85 ℃ for optional specification, ID Jx (Test, certificate) = JP) (−60 to +85 ℃ for optional specification, ID Jx (Test, certificate) = JQ); 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).
- The following applies when installing the transmitter with an Ex db connection compartment:
  Only use separately certified cable glands, sealing plugs and thread adapters (Ex db IIC) that are suitable for operating temperatures from −40 to +85 ℃ and for IP 66/67.
  The mounted metal thread extensions and sealing plugs are tested and certified as part of the devices for the type of protection Ex db IIC. The thread extension or the sealing plug labeled as follows for identification purposes:
  - Md: M20 x 1.5
  - d or NPTd: NPT ½"
  - Gd: G ½"
- The following cable glands approved by an Ex certification body may be installed on the devices with order code "Approval", option JC, JD (for details, contact our service center):
  - Ex d, Ex t approved cable glands, e.g. EXTC-16MG
  - Ex d approved cable glands, e.g. KXBF-20·16
- Yellow cap attached to the cable glands is a transportation 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 (M20 x 1.5).
- Information on our service center: Service Desk, 5-70-3 Nisshin-cho, Fuchu-shi, Tokyo-to
  Tel: 042-314-1911
  Fax: 042-314-1951
- When the measuring device is connected, attention must be paid to the type of protection at the transmitter.
- For devices with order code "Sensor connection housing", option B:
  To maintain the required degree of ingress protection, ensure that the cover seal of the sensor connection housing is flat and free of bends or distortions before securing the cover. Replace any damaged or non-flat seals prior to reassembly.
- For the device with order code "Output; Input 1", option MC:
  - When using Port 1 (terminal 26/27) as a 2-WISE power load APL port with the SLAA profile, Port 2 (RJ45) must not be used for Modbus TCP.
  - Parallel operation of Port 1 (terminal 26/27) and Port 2 (RJ45) is not permitted.

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 the device is energized.

Use of cable glands, sealing plugs and thread adapters

- Only use Ex certified cable glands, sealing plugs and thread adapters that are suitable for the intended application (see nameplates).
- Plastic sealing plugs are mounted to cable entries and metallic thread extensions for temporary protection during transport and storage. These must be replaced with suitable Ex certified cable entry devices for permanent use.
- The mounted metallic thread extensions and sealing plugs are tested and certified as part of the device. These meet the device's specific requirements.
- Supplied Ex cable glands are separately certified and meet the device's specific requirements.
- All unused cable entries must be closed with suitable Ex certified sealing plugs.
- Observe selection criteria for Ex cable entry devices as per JNIOSH-TR-NO.44.

Intrinsic safety

- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. JNIOSH-TR-NO.44).
- The device's intrinsically safe input/output circuits are rated Ex ia IIC Ga. When connected to certified intrinsically safe apparatus with an Ex ib IIC Gb or Ex ib IIB Gb rating, the level of protection of the overall system becomes Ex ib IIC Gb or Ex ib IIB Gb , respectively.
- Proline 500 - digital (Order code for "Integrated ISEM electronics", option A)
  The connecting cables between the transmitter and sensor must meet the following requirements:
  - Group IIC: $L_{cable}/R_{cable} \leq 0.0089$ mH/Ω or $L_{cable} \leq 26$ µH and $C_{cable} \leq 760$ nF
  - Group IIB: $L_{cable}/R_{cable} \leq 0.0356$ mH/Ω or $L_{cable} \leq 104$ µH and $C_{cable} \leq 4.2$ µF
- Proline 500 (Order code for "Integrated ISEM electronics", option B)
  Connecting cables between the transmitter and sensor with a maximum length of 120 m must meet the following requirements:
  - Maximum cable capacitance C_{cable}: 0.5 nF/m
  - Maximum cable inductance L_{cable}: 0.5 µH/m
- The supplied connecting cable meets all the above requirements.

Potential equalization

- The device must be connected to the potential equalization system using designated protective ground terminals.
- It is also possible to integrate the device into the potential equalization system through a pipe system, provided that the pipe system meets the grounding requirements of applicable national regulations.

Safety instructions: EPL Ga (Zone 0)

For sensors with EPL Ga/Gb (Zone 0/1), the EPL Ga (Zone 0) is only permitted in the measuring tube.

Safety instructions: EPL Db (Zone 21)

- The enclosure may only be opened for brief maintenance or inspection activities where the area is confirmed to be free of combustible dust. Suitable precautions must be taken during this time to prevent dust entering the electronic compartment.
- Only use separately certified cable glands, sealing plugs and thread adapters (Ex tb IIIC) which are suitable for operating temperatures from −40 to +85 ℃ and for IP 66/67.
  The mounted metallic thread extensions and metallic sealing plugs are tested and certified as part of the devices for the type of protection Ex tb IIIC.
- Cable routing shall be arranged so that the cables are not exposed to friction effects and static buildup due to the passage of dust. Precautions shall be taken to prevent the build-up of static an surfaces of cables.

Temperature tables Proline 500 - digital

Order code for "Integrated ISEM electronics", option A

NOTICE

In case of heating, risk of overheating.

▶ On devices with Heating jacket the corresponding temperature tables for devices with thermal insulation, 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.

Minimum ambient temperature

- $T_{a, min} = -40$ ℃
- *Optional specification, ID Jx (Test, Certificate) = JP*
  $T_{a, min} = -50$ ℃ depending on the selected device variant (see nameplate)

Maximum ambient temperature

$T_{a, max}$ = +60 °C depending on temperature class, maximum medium temperature and device-specific features. See the corresponding temperature tables.

Transmitter: Non-hazardous area

Transmitter housing material	$T_{a, max}$ [°C]			
	Non-hazardous area [1]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]
Aluminum	60	–	45	60
Polycarbonate	60	–	–	–

1) The transmitter is located in the non-hazardous area

Minimum medium temperature

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

Maximum medium temperature without thermal insulation

*Promass A (8A5B**-*...)*

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…4	205	35	60	95	130	150	205	205
		50	–	95	130	150	205	205
		60	–	–	130	150	205	205

*Promass A (8A5C**-*...)*

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…4	205	35	55	85	130	150	205	205
		50	–	95	130	150	205	205

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	–	–	130	150	205	205
		60	–	–	130	150	190	190

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…50	150	35	40	60	130	130	150	150
		50	–	60	130	130	150	150
		60	–	–	130	130	150	150
80	150	35	40	60	110	150	150	150
		50	–	60	110	150	150	150
		60	–	–	110	150	150	150

Promass F

DN	T_{m, max range} [°C] [1]	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…50	150	35	40	65	130	150	150	150
		50	–	65	130	150	150	150
		60	–	–	130	130	130	130
	150 [2]	35	40	65	130	150	150	150
		50	–	65	130	150	150	150
		60	–	–	130	150	150	150
	240	35	40	65	130	160	240	240
		50	–	65	130	160	240	240
		60	–	–	130	160	240	240
15…25	350	35	40	80	130	175	275	350
		50	–	80	130	175	275	350
		60	–	–	130	175	240 (275)	240 (350)
80…250	150	35	40	65	110	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]
		50	–	65	110	150	150	150
		60	–	–	110	130	130	130
	150 [2]	35	40	65	110	150	150	150
		50	–	65	110	150	150	150
		60	–	–	110	150	150	150
	240	35	40	65	110	170	240	240
		50	–	65	110	170	240	240
		60	–	–	110	170	240	240
50...250	350	35	40	80	120	175	275	350
		50	–	80	120	175	275	350
		60	–	–	120	175	240 (275)	240 (350)

1)   Maximum temperature range, see nameplate
2)   Cryogenic temperature version: T_m = –196 to 150 °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	35	40	65	100	150	150	150
		50	–	65	100	150	150	150
		60	–	–	100	150	150	150
	205	35	40	65	100	160	205	205
		50	–	65	100	160	205	205
		60	–	–	100	160	205	205
15...50	150	35	40	65	115	150	150	150
		50	–	65	115	150	150	150
		60	–	–	115	150	150	150
	205	35	40	65	115	180	205	205
		50	–	65	115	180	205	205
		60	–	–	115	180	205	205

1)   Maximum temperature range, see nameplate

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...80	150	35	45	70	115	140	140	150
		50	–	70	115	140	140	150
		55	–	–	115	140	140	150
		60	–	–	115	140	140	140

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 ... 250	205	35	45	65	110	170	205	205
		50	–	65	110	170	205	205
		60	–	–	110	170	205	205

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	35	45	65	100	150	150	150
		50	–	65	100	150	150	150
		60	–	–	100	150	150	150
	205	35	45	65	100	160	205	205
		50	–	65	100	160	205	205
		60	–	–	100	160	205	205
15...50	150	35	45	65	110	150	150	150
		50	–	65	110	150	150	150
		60	–	–	110	150	150	150
	205	35	45	65	110	180	205	205
		50	–	65	110	180	205	205
		60	–	–	110	180	205	205

1) Maximum temperature range, see nameplate

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 … 250	205	35	45	65	100	160	205	205
		50	–	65	100	160	205	205
		60	–	–	100	160	205	205
	150 [2]	35	45	65	100	150	150	150
		50	–	65	100	150	150	150
		60	–	–	100	150	150	150

1)   Maximum temperature range, see nameplate
2)   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	35	45	65	100	150	150	150
		50	–	65	100	150	150	150
		60	–	–	100	150	150	150
15…50	150	35	45	65	110	150	150	150
		50	–	65	110	150	150	150
		60	–	–	110	150	150	150

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	35	45	65	110	170	180	180
		50	–	65	110	170	180	180
		60	–	–	110	170	180	180

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

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

Promass A (8A5B**-*..., 8A5C**-*...)

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	35	40	90	90	150	150	150
		40	–	90	90	150	150	150
		45	–	–	90	150	150	150
		50	–	–	90	120	120	120

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 50	150	35	40	55	130	150	150	150
		50	–	55	130	150	150	150
80		35	40	55	110	150	150	150
		50	–	55	110	150	150	150

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 50	150	35	40	60	130	130	130	130
		45	–	60	130	130	130	130
		50	–	–	130	130	130	130
	150 [2)]	35	40	60	130	150	150	150
		45	–	60	130	150	150	150
		50	–	–	130	150	150	150
	240	35	40	60	130	160	240	240
		45	–	60	130	160	240	240
		50	–	–	130	160	240	240

DN	$T_{m, \text{max range}}$ [1] [°C]	$T_{a, \text{max}}$ [°C]	$T_{m, \text{max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
15 to 25	350	35	40	80	130	175	275	350
		50	–	80	130	175	275	350
		60	–	–	130	175	240 (275)	240 (350)
80 to 250	150	35	40	60	110	130	130	130
		45	–	60	110	130	130	130
		50	–	–	110	130	130	130
	150 [2]	35	40	60	110	150	150	150
		45	–	60	110	150	150	150
		50	–	–	110	150	150	150
	240	35	40	60	110	170	240	240
		45	–	60	110	170	240	240
		50	–	–	110	170	240	240
50 to 250	350	35	40	80	120	175	275	350
		50	–	80	120	175	275	350
		60	–	–	120	175	240 (275)	240 (350)

1)   Maximum temperature range, see nameplate
2)   Cryogenic temperature version: $T_m = -196$ to 150 °C

Promass H

DN	$T_{m, \text{max range}}$ [1] [°C]	$T_{a, \text{max}}$ [°C]	$T_{m, \text{max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	35	40	65	100	150	150	150
		45	–	65	100	150	150	150
		55	–	–	100	150	150	150
	205	35	40	65	100	160	205	205
		45	–	65	100	160	205	205
		55	–	–	100	160	205	205
15 to 50	150	35	40	65	115	150	150	150
		45	–	65	115	150	150	150
		55	–	–	115	150	150	150

DN	$T_{m,\,max\,range}$ [°C] [1]	$T_{a,\,max}$ [°C]	$T_{m,\,max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
	205	35	40	65	115	180	205	205
		45	–	65	115	180	205	205
		55	–	–	115	180	205	205

1)   Maximum temperature range, see nameplate

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	35	45	70	90	150	150	150
		45	–	70	90	150	150	150
		50	–	–	90	120	120	–

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	35	40	55	110	170	205	205
		50	–	55	110	170	205	205

Promass P

DN	$T_{m,\,max\,range}$ [°C] [1]	$T_{a,\,max}$ [°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	35	40	55	100	150	150	150
		45	–	55	100	150	150	150
		50	–	–	100	120	120	120
	205	35	40	55	100	160	205	205
		50	–	55	100	160	205	205
		55	–	–	100	160	205	205
15 to 50	150	35	40	55	110	150	150	150
		45	–	55	110	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]
		50	–	–	110	120	120	120
	205	35	40	55	100	180	205	205
		50	–	55	100	180	205	205
		55	–	–	100	180	205	205

1)   Maximum temperature range, see nameplate

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	35	40	55	100	160	205	205
		50	–	55	100	160	205	205
25 to 250	150 [2]	35	40	55	100	150	150	150
		50	–	55	100	150	150	150

1)   Maximum temperature range, see nameplate
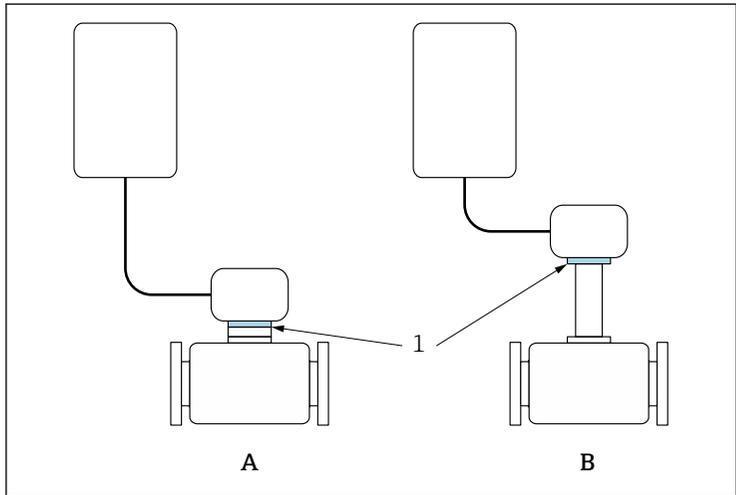2)   Cryogenic temperature version: $T_m = -196$ to 150 °C

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	35	40	55	100	150	150	150
		45	–	55	100	150	150	150
		50	–	–	100	120	120	120
15 to 50	150	35	40	55	110	150	150	150
		45	–	55	110	150	150	150
		50	–	–	110	120	120	120

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	35	40	55	120	170	180	180
		50	–	55	120	170	180	180
		55	–	–	120	170	180	180

Maximum medium temperature for devices with thermal insulation NOT in accordance with 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.

⧆ *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}

T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
45	64	82	82	85	85

Temperature tables Proline 500

Order code for "Integrated ISEM electronics", option B "Transmitter"

> **NOTICE**
>
> **In case of heating, risk of overheating.**
> ▶ On devices with Heating jacket the corresponding temperature tables for devices with thermal insulation, 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.

Minimum ambient temperature

- $T_{a, min}$ = −40 °C
- *Optional specification, ID Jx (Test, Certificate) = JP*
  $T_{a, min}$ = −50 °C depending on the selected device variant (see nameplate)

Maximum ambient temperature

$T_{a, max}$ = +60 °C depending on temperature class, maximum medium temperature and device-specific features. See the corresponding temperature tables.

Transmitter: Zone 1, Zone 21

$T_{a, max}$ [°C]	
T6 [85 °C]	T5 [100 °C]
55	60

Minimum medium temperature

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

Maximum medium temperature without thermal insulation

Promass A (8A5B**-*…)

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…4	205	60	60	95	130	150	205	205

Promass A (8A5C**-*...)

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...4	205	55	55	95	130	150	205	205
		60	–	95	130	150	205	205

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...50	150	50	50	100	130	130	150	150
		60	–	100	130	130	150	150
80	150	60	60	75	110	150	150	150

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...15	150	55	50	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	55	50	95	130	150	150	150
		60	–	95	130	150	150	150
	240	55	50	95	130	160	240	240
		60	–	95	130	160	240	240
15...25	350	60	70	95	130	175	265	350
25...40	150	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	240	55	55	95	130	160	240	240
		60	–	95	130	160	240	240
50	150	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	60	60	95	130	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	60	60	95	130	170	240	240
80...250	150	55	55	75	110	150	150	150
		60	–	75	110	150	150	150
	150 [2]	60	60	75	110	150	150	150
	240	60	60	75	110	170	240	240
50...250	350	60	70	85	120	175	265	350

1) Maximum temperature range, see nameplate
2) Cryogenic temperature version: T_m = –196 to 150 °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	50	65	100	150	150	150
		60	–	65	100	150	150	150
	205	50	50	65	100	160	205	205
		60	–	65	100	160	205	205
15...50	150	60	60	75	115	150	150	150
	205	60	60	75	115	180	205	205

1) Maximum temperature range, see nameplate

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, 15, 15FB, 25	150	60	60	95	130	150	150	150
25FB, 40, 40FB, 50, 50FB, 80	150	60	70	85	120	150	150	150
FB = Full bore								

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 … 250	205	60	60	75	110	170	205	205

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	45	45	65	100	150	150	150
		60	–	65	100	150	150	150
	205	45	45	65	100	160	205	205
		60	–	65	100	160	205	205
15…40	150	50	50	75	115	150	150	150
		60	–	75	115	150	150	150
	205	50	50	75	115	180	205	205
		60	–	75	115	180	205	205
50	150	60	60	75	115	150	150	150
	205	60	60	75	115	180	205	205

1)   Maximum temperature range, see nameplate

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 … 250	205	60	55	75	110	160	205	205
	150 [2]	60	55	75	110	150	150	150

1)   Maximum temperature range, see nameplate
2)   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	45	45	65	100	150	150	150
		60	–	65	100	150	150	150
15...40		50	50	75	115	150	150	150
		60	–	75	115	150	150	150
50		60	60	75	115	150	150	150

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	60	70	90	120	170	180	180

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

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

Promass A (8A5B**-*...)

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	60	95	130	150	(180)	(180)
		60	60	95	130	150	150	150

Promass A (8A5C**-*...)

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	60	95	130	150	(180)	(180)
		55	55	95	130	150	150	150
		60	–	95	130	150	150	150

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 50	150	50	50	100	130	130	150	150
		60	–	100	130	130	150	150
80	150	60	60	75	110	150	150	150

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	55	50	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	55	50	95	130	150	150	150
		60	–	95	130	150	150	150

DN	$T_{m, \text{max range}}$ [1] [°C]	$T_{a, \text{max}}$ [°C]	$T_{m, \text{max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
	240	55	50	95	130	160	240	240
		60	–	95	130	160	240	240
15 to 25	350	60	70	95	130	175	265	350
25 to 40	150	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	240	55	55	95	130	160	240	240
		60	–	95	130	160	240	240
50	150	55	55	95	130	150	150	150
		60	–	95	130	150	150	150
	150 [2]	60	60	95	130	150	150	150
	240	60	60	95	130	170	240	240
80 to 250	150	55	55	75	110	150	150	150
		60	–	75	110	150	150	150
	150 [2]	60	60	95	130	150	150	150
	240	60	60	75	110	170	240	240
50 to 250	350	60	70	85	120	175	265	350

1) Maximum temperature range, see nameplate
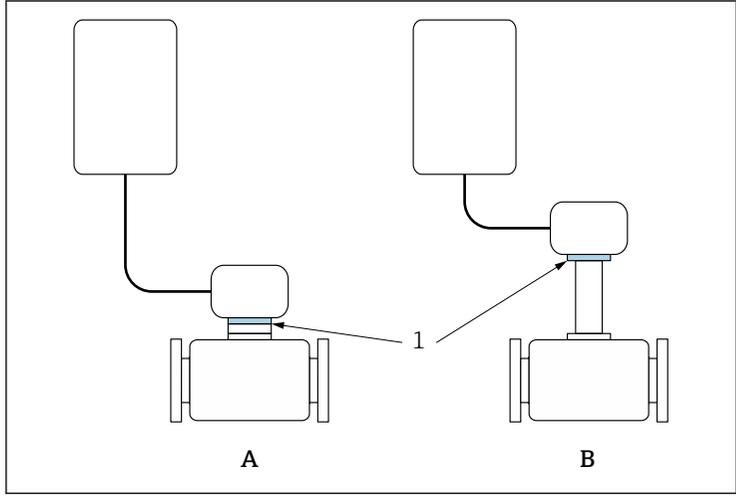2) Cryogenic temperature version: T_m = −196 to 150 °C

Promass H

DN	$T_{m, \text{max range}}$ [1] [°C]	$T_{a, \text{max}}$ [°C]	$T_{m, \text{max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	50	50	65	100	150	150	150
		60	–	65	100	150	150	150
	205	50	50	65	100	160	205	205
		60	–	65	100	160	205	205
15 to 50	150	60	60	75	115	150	150	150
	205	60	60	75	115	180	205	205

1) Maximum temperature range, see nameplate

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, 15, 15FB, 25	150	60	60	95	130	150	150	150
25FB, 40, 40FB, 50, 50FB, 80			70	85	120	150	150	150
FB = Full bore								

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	60	60	75	110	170	205	205

Promass P

DN	T_{m, max range} [°C] [1]	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	45	45	65	100	150	150	150
		60	–	65	100	150	150	150
	205	45	45	65	100	160	205	205
		60	–	65	100	160	205	205
15 to 40	150	50	50	75	115	150	150	150
		60	–	75	115	150	150	150
	205	50	50	75	115	180	205	205
		60	–	75	115	180	205	205
50	150	60	60	75	115	150	150	150
	205	60	60	75	115	180	205	205

1)   Maximum temperature range, see nameplate

Promass Q

DN	$T_{m,\text{ max range}}$ [1)] [°C]	$T_{a,\text{ max}}$ [°C]	$T_{m,\text{ max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25 to 250	205	60	55	75	110	160	205	205
	150 [2)]	60	55	75	110	150	150	150

1) Maximum temperature range, see nameplate
2) Cryogenic temperature version: $T_m = -196$ to $150\,°C$

Promass S

DN	$T_{m,\text{ max range}}$ [°C]	$T_{a,\text{ max}}$ [°C]	$T_{m,\text{ max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
8	150	45	45	65	100	150	150	150
		60	–	65	100	150	150	150
15 to 40	150	50	50	75	115	150	150	150
		60	–	75	115	150	150	150
50	150	60	60	75	115	150	150	150

Promass X

DN	$T_{m,\text{ max range}}$ [°C]	$T_{a,\text{ max}}$ [°C]	$T_{m,\text{ max}}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
350	180	60	70	90	120	170	180	180

Maximum medium temperature for devices with thermal insulation NOT in accordance with Endress+Hauser specifications

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

🔲 2   *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}

T6 [85 ℃]	T5 [100 ℃]	T4 [135 ℃]	T3 [200 ℃]	T2 [300 ℃]	T1 [450 ℃]
63	72	84	91	91	91

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 $T_{a, max}$ and the maximum medium temperature $T_{m, max}$.
- In the case of dust: Determine the maximum surface temperature as a function of the maximum ambient temperature $T_{a, max}$ and the maximum medium temperature $T_{m, max}$.

Example
- Measured maximum ambient temperature: $T_{a, max}$ = 47 ℃
- Measured maximum medium temperature: $T_{m, max}$ = 108 ℃

Endress+Hauser

4.

	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

1.   2.   3.

A0031223

🖾 *3   Procedure for determining the temperature class and surface temperature*

1. Select device (optional).

2. In the column for the maximum ambient temperature $T_{a,\,max}$ select the temperature that is immediately greater than or equal to the maximum ambient temperature $T_{a,\,max}$ that is present.
   ↳ $T_{a,\,max}$ = 50 °C.
   The row showing the maximum medium temperature is determined.

3. Select the maximum medium temperature $T_{m,max}$ of this row, which is immediately greater than or equal to the maximum medium temperature $T_{m,\,max}$ 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.

Terminal assignment

Transmitter: supply voltage, input/outputs

HART

Supply voltage		Input/output 1 (port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2)
1 (+)	2 (−)	26 (+)	27 (−)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Input/output only available for Proline 500 - digital.

FOUNDATION fieldbus

Supply voltage		Input/output 1 (port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2)
1 (+)	2 (−)	26 (A)	27 (B)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Input/output only available for Proline 500 - digital.

PROFIBUS DP

Supply voltage		Input/output 1 (port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2)
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Input/output only available for Proline 500 - digital.

PROFIBUS PA

Supply voltage		Input/output 1 (port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2)
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Input/output only available for Proline 500 - digital.

Modbus RS485

Supply voltage		Input/output 1 (port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2)
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Input/output only available for Proline 500 - digital.

Modbus TCP

Supply voltage		Input/output 1 (Port 1 [1])		Input/output 2		Input/output 3		Input/output 4 [2]		Service interface (Port 2) [1]
1 (+)	2 (−)	26 (+)	27 (-)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (-)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   For Modbus TCP communication, either port 1 OR port 2 can be used.
2)   Input/output only available for Proline 500 - digital.

PROFINET

Supply voltage		Input/output 1 (Port 1) [1]		Input/output 2		Input/output 3		Input/output 4 [2]		Service interface (Port 2) [1]
1 (+)	2 (−)	RJ45		24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

1)   Port can be used for communication or as a service interface (CDI-RJ45).
2)   Input/output only available for Proline 500 - digital.

PROFINET over Ethernet-APL

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Input/output 4 [1]		Service interface (Port 2 [2])
1 (+)	2 (−)	26 (+)	27 (−)	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.						

[1]   Input/output only available for Proline 500 - digital.
[2]   No PROFINET communication available on port 2

Ethernet/IP

Supply voltage		Input/output 1 (Port 1) [1]	Input/output 2		Input/output 3		Input/output 4 [2]		Service interface (Port 2) [1]
1 (+)	2 (−)	RJ45	24 (+)	25 (−)	22 (+)	23 (−)	20 (+)	21 (−)	CDI-RJ45
			Device-specific terminal assignment: adhesive label in terminal cover.						

[1]   Port can be used for communication or as a service interface (CDI-RJ45).
[2]   Input/output only available for Proline 500 - digital.

Safety-related values

Order code for "Output; input 1"	Output type	Safety-related values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option **BA**	Current output 4-20 mA HART	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **GA**	PROFIBUS PA	$U_N = 32\ V_{DC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **LA**	PROFIBUS DP	$U_N = 5\ V$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **MA**	Modbus RS485	$U_N = 5\ V$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **MB**	Modbus TCP over Ethernet-APL 10 Mbit/s, SPE 10 Mbit/s, Ethernet 100 Mbit/s	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **NA**	EtherNet/IP	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option **RA**	PROFINET	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$

Order code for "Output; input 1"	Output type	Safety-related values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option RB	PROFINET over Ethernet-APL/SPE, 10Mbit/s	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$
Option SA	FOUNDATION Fieldbus	$U_N = 32\ V_{DC}$ $U_M = 250\ V_{AC}$	$U_N = 3.3\ V_{AC}$ $U_M = 250\ V_{AC}$

Order code for "Output; input 2" "Output; input 3" "Output; input 4"	Output type	Safety-related values		
		Output; input 2	Output; input 3	Output; input 4
Option B	Current output 4-20 mA	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$		
Option D	Configurable I/O initial setting off	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$		
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 4-20 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 (Port 1)	Service interface (Port 2)
Option CA	Current output 4-20mA HART Ex-i passive	**Ex ic** **Ex ia** [1] $U_i = 30$ V $I_i = 100$ mA $P_i = 1.25$ W $L_i = 0$ µH $C_i = 6$ nF	**Ex ia** [1] $U_i = 10$ V $I_i = $ n. a. $P_i = $ n. a. $L_i = 0$ µH $C_i = 200$ nF
		$U_i = 30$ V $I_i = 100$ mA $P_i = 1.25$ W $L_i = 0$ µH $C_i = 6$ nF	Non-intrinsically safe [2]
Option CC	Current output 4-20mA HART Ex-i active	**Ex ia** [1] $U_0 = 21.8$ V $I_0 = 90$ mA $P_0 = 491$ mW $L_0 = 4.1$ mH(IIC)/15 mH(IIB) $C_0 = 160$ nF(IIC)/1 160 nF(IIB) $U_i = 30$ V $I_i = 10$ mA $P_i = 0.3$ W $L_i = 5$ µH $C_i = 6$ nF	**Ex ia** [1] $U_i = 10$ V $I_i = $ n. a. $P_i = $ n. a. $L_i = 0$ µH $C_i = 200$ nF
		$U_0 = 21.8$ V $I_0 = 90$ mA $P_i = 491$ mW $L_0 = 9$ mH(IIC)/39 mH(IIB) $C_0 = 600$ nF(IIC)/4 000 nF(IIB) $U_i = 30$ V $I_i = 10$ mA $P_i = 0.3$ W $L_i = 5$ µH $C_i = 6$ nF	Non-intrinsically safe [2]
Option HA	PROFIBUS PA Ex i (STANDARD + FISCO)	**Ex ia** [1] $U_i = 30$ V $I_i = 570$ mA $P_i = 8.5$ W $L_i = 10$ µH $C_i = 5$ nF	**Ex ia** [1] $U_i = 10$ V $I_i = $ n. a. $P_i = $ n. a. $L_i = 0$ µH $C_i = 200$ nF
			Non-intrinsically safe [2]

Order code for "Output; input 1"	Output type	Intrinsically safe values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option MC	Modbus TCP over Ethernet-APL, Ex-i, 10Mbit/s	**2-WISE power load, APL port profile SLAA** [3] **Ex ia** [1] U_i = 17.5 V I_i = 380 mA P_i = 5.32 W L_i = 10 µH C_i = 5 nF **Cable specifications according to 2-WISE:** R_c = 15 to 150 Ω/km L_c = 0.4 to 1 mH/km C_c = 45 to 200 nF/km C_c = C_c line/line + 0,5 C_c line/screen, if both lines are floating, or C_c = C_c line/line + C_c line/screen, if the screen is connected to one line Length of cable (not including cable stubs): ≤ 200 m (656.2 ft) Length of cable stubs: ≤1 m (3.3 ft)	**Ex ia** [1] U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
		2-WISE power load, APL port profile SLAC [3] U_i = 17.5 V I_i = 380 mA P_i = 5.32 W L_i = 10 µH C_i = 5 nF **Cable specifications according to 2-WISE:** R_c = 15 to 150 Ω/km L_c = 0.4 to 1 mH/km C_c = 45 to 200 nF/km C_c = C_c line/line + 0,5 C_c line/screen, if both lines are floating, or C_c = C_c line/line + C_c line/screen, if the screen is connected to one line Length of cable (not including cable stubs): ≤ 200 m (656.2 ft) Length of cable stubs: ≤1 m (3.3 ft)	Non-intrinsically safe [2]

Order code for "Output; input 1"	Output type	Intrinsically safe values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option RC	PROFINET over Ethernet-APL, Ex-i, 10Mbit/s	**2-WISE power load, APL port profile SLAA** [3] **Ex ia** [1] U_i = 17.5 V I_i = 380 mA P_i = 5.32 W L_i = 10 µH C_i = 5 nF **Cable specifications according to 2-WISE:** R_c = 15 to 150 Ω/km L_c = 0.4 to 1 mH/km C_c = 45 to 200 nF/km C_c = C_c line/line + 0,5 C_c line/screen, if both lines are floating, or C_c = C_c line/line + C_c line/screen, if the screen is connected to one line Length of cable (not including cable stubs): ≤ 200 m (656.2 ft) Length of cable stubs: ≤1 m (3.3 ft)	**Ex ia** [1] U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
		2-WISE power load, APL port profile SLAC [3] U_i = 17.5 V I_i = 380 mA P_i = 5.32 W L_i = 10 µH C_i = 5 nF **Cable specifications according to 2-WISE:** R_c = 15 to 150 Ω/km L_c = 0.4 to 1 mH/km C_c = 45 to 200 nF/km C_c = C_c line/line + 0,5 C_c line/screen, if both lines are floating, or C_c = C_c line/line + C_c line/screen, if the screen is connected to one line Length of cable (not including cable stubs): ≤ 200 m (656.2 ft) Length of cable stubs: ≤1 m (3.3 ft)	Non-intrinsically safe [2]
Option TA	FOUNDATION Fieldbus Ex i (STANDARD + FISCO)	**Ex ia** [1] U_i = 30 V I_i = 570 mA P_i = 8.5 W L_i = 10 µH C_i = 5 nF	**Ex ia** [1] U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
			Non-intrinsically safe [2]

1)   Only for the order code for "Approval", option JC, JD
2)   Connection to or operation with Service interface (Port 2) is not permitted in potentially explosive atmospheres.
3)   For further options see Ethernet-APL Installation Drawing HE_01622.

Order code for "Output; input 2" "Output; input 3" "Output; input 4"	Output type	Intrinsically safe values		
		Output; input 2	Output; input 3	Output; input 4
Option C	Current output 4-20mA Ex-i passive	U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0		
Option G	Pulse/frequency/switch output Ex-i passive	U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0		

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