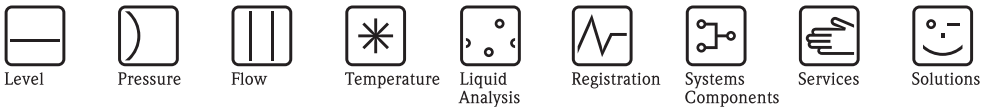


Safety Instructions

Proline Promass 83, 84

NEPSI Zone 1, Zone 21

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

- BA00059D, Proline Promass 83 HART
- BA00063D, Proline Promass 83 PROFIBBUS DP/PA
- BA00065D, Proline Promass 83 FOUNDATION Fieldbus
- BA00107D, Proline Promass 83 Modbus RS485
- BA00109D, Proline Promass 84 HART
- BA00129D, Proline Promass 84 Modbus RS485

Contents

XA00122D/06/EN/15.17
71351411

Endress+Hauser

People for Process Automation

General warnings

- For installation, use and maintenance of the flow meter, the instruction manual and the following standards shall be observed:
  - GB50257-2014 "Code for construction and acceptance of electric device for explosive atmospheres and fire hazard electrical equipment installation engineering"
  - GB3836.13-2013 "Explosive atmospheres – Part 13: Equipment repair, overhaul and reclamation"
  - GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres – Part 15: Electrical installations in hazardous area (other than mines)"
  - GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation (other than mines)"
  - GB3836.18-2010 "Explosive atmospheres – Part 18: Intrinsically safe system".
  - GB15577-2007: Safety regulations for dust explosion prevention and protection" (Only if installed in dust hazardous areas.)
  - GB12476.2-2010 "Electrical apparatus for use in the presence of combustible dust – Part 2: Selection and installation". (Only if installed in dust hazardous areas.)
- Any maintenance shall be done after power off or the area known to be non-hazardous.
- The flow meter shall not be modified in order to ensure the explosion protection performance of the equipment. Any change may impair safety.
- Installation, connection to the electricity supply, commissioning and maintenance of the devices must be carried out by qualified specialists trained to work on Ex-rated devices.
- Compliance with all of the technical data of the device (see nameplate) is mandatory.
- Open the device only when it is de-energized (and after a delay of at least 10 minutes following shutdown of the power supply) or in non-hazardous (classified) locations.
- It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.
- Opening the transmitter housing and the connection housing of the remote version is only permitted for a brief time. During this time, ensure that no dust or water enters the housing.
- To guarantee resistance to dust and water, the transmitter housing, the connection housing of the remote version and the cable entries must be tightly sealed.
- Use of the devices is restricted to mediums against which the process-wetted materials are adequately resistant.
- The suitability of the device in the event of simultaneous occurrence of gas-air and dust-air mixtures requires an additional assessment.

Special conditions

The device must be integrated into the potential equalization system. Potential must be equalized along the intrinsically safe sensor circuits.
Further information is provided in the "Potential equalization" section → 11.

Installation instructions

- For terminals No. 20 to No. 27 of the transmitter, only devices with ratings $U_m \leq 260$ V and $I_m \leq 500$ mA are allowed to be connected (does not apply to intrinsically safe circuits).
- The measuring device must only be used in the permitted temperature class.
  The values of the individual temperature classes can be found in the temperature tables: → 6.
- For Promass F, O and X sensors Zone 0 is permitted in the measuring pipe.
  Device version:
  - Promass 8*F**-******1/2/3/4/5/6*****
  - Promass 8*O**-******1/2/4/6*****
  - Promass 8*X**-******1/2/4/6*****
- The following applies when using the terminal compartment in type of protection "flameproof/Ex d":
  Only cable entries and cable glands, which are approved by NEPSI in accordance with GB3836.1-2010 and GB3836.2-2010 and which are suitable for an operating temperature of up to 80 °C, they shall be used.
- The following applies when using the terminal compartment in type of protection "increased safety/Ex e":
  Only cable entries, cable glands and blanking plugs, which are approved by NEPSI in accordance with GB3836.1-2000 and GB3836.3-2000 and which are suitable for an operating temperature of up to 80 °C and for an ingress protection of IP 67, they shall be used. The cables must be installed in such a way, that they are fixed in place in order to ensure adequate strain relief.
- Suitable cables and suitable, certified cable glands, cable entries and blanking plugs must be used for measuring devices operated at temperatures below –20 °C.
- The cable entries and openings not used must be sealed tight with suitable components.
- If the active intrinsically safe communication circuits (input/output option F, G, R, S, T, U; terminals 26/27 resp. 24/25) are fed into areas that require 1D or 2D apparatus, the connected apparatus must be tested and certified accordingly.

Installation instructions (continued)

- In Zone 0, potentially explosive vapor/air mixtures may only occur under atmospheric conditions. If no potentially explosive mixtures are present, or if additional protective measures have been taken, the devices may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.

Caution!
The explosion group for the measuring device can be IIC. However, it is reduced to IIB if the permitted, external capacitance/inductance for the intrinsically safe communication circuits is increased (→ 15).

- Turning the local display:
  the screw cap has to be removed before the local display can be turned, and this must be done with the device de-energized (and after a delay of at least 10 minutes following shutdown of the power supply).

Turning the transmitter housing

1. Unscrew the grub screw.
2. Rotate the transmitter housing cautiously clockwise until the end stop (end of the thread).
3. Rotate the transmitter housing counter-clockwise (max. 360°) in the wanted position.
4. Tighten the grub screw again.

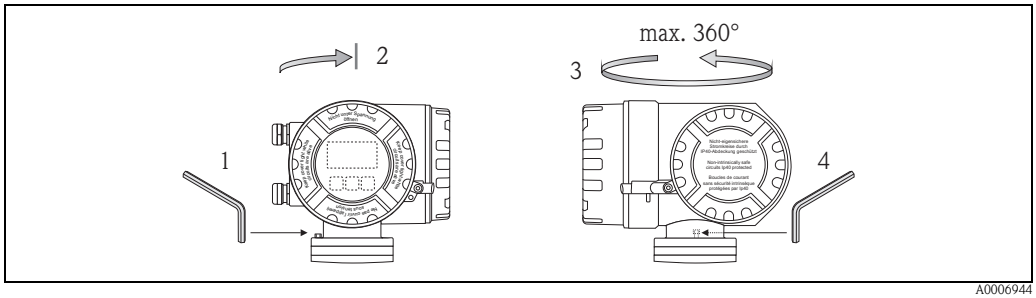


Fig. 1: Turning the transmitter housing

COC certificates of conformity

COC certificates of conformity

By affixing the certification number the product conforms with the following standards:

- GB3836.1/2/3/4/20 - 2010
- GB12476.1/5 - 2013, GB12476.4 - 2010

Certification numbers:

- GYJ16.1472X

Inspection body

NEPSI, National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation

Description of measuring system

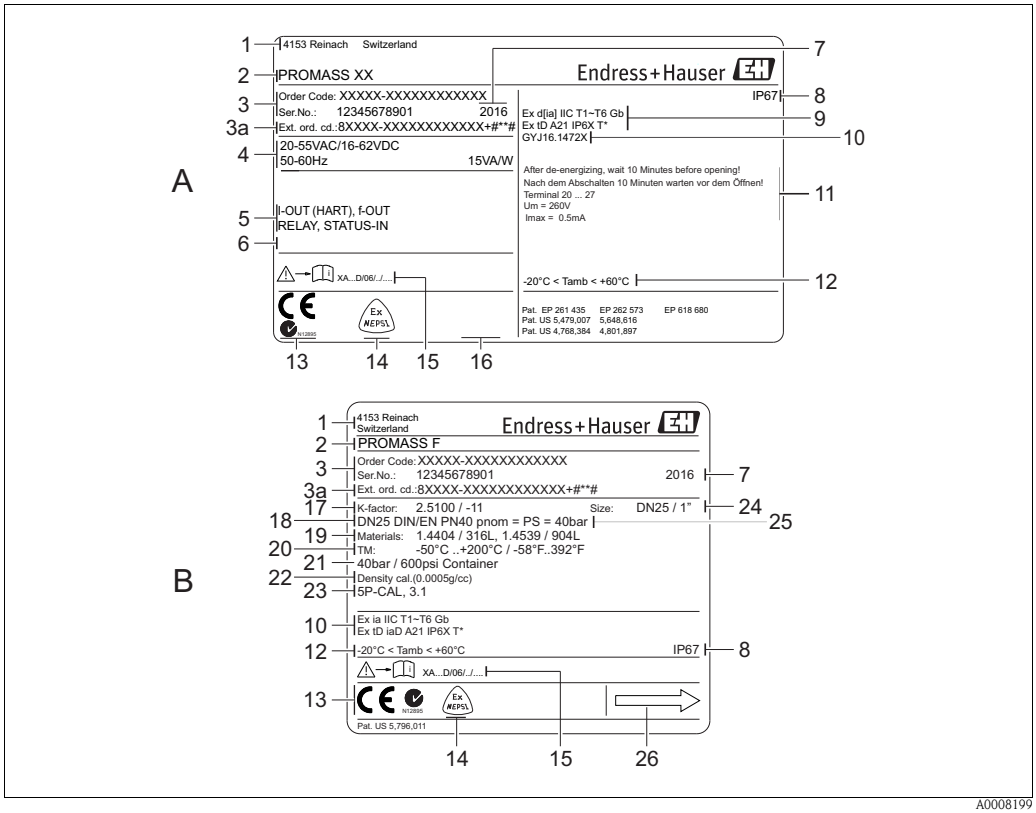
The measuring system consists of transmitters and sensors.

Two versions are available:

- Compact version: transmitters and sensors form a mechanical unit.
- Remote version: transmitters and sensors are installed separately and connected to each other via a connecting cable.

Nameplates

The nameplates, which are mounted in a clearly visible position on the transmitter and sensor, contain all of the relevant information about the measuring system.



A0008199

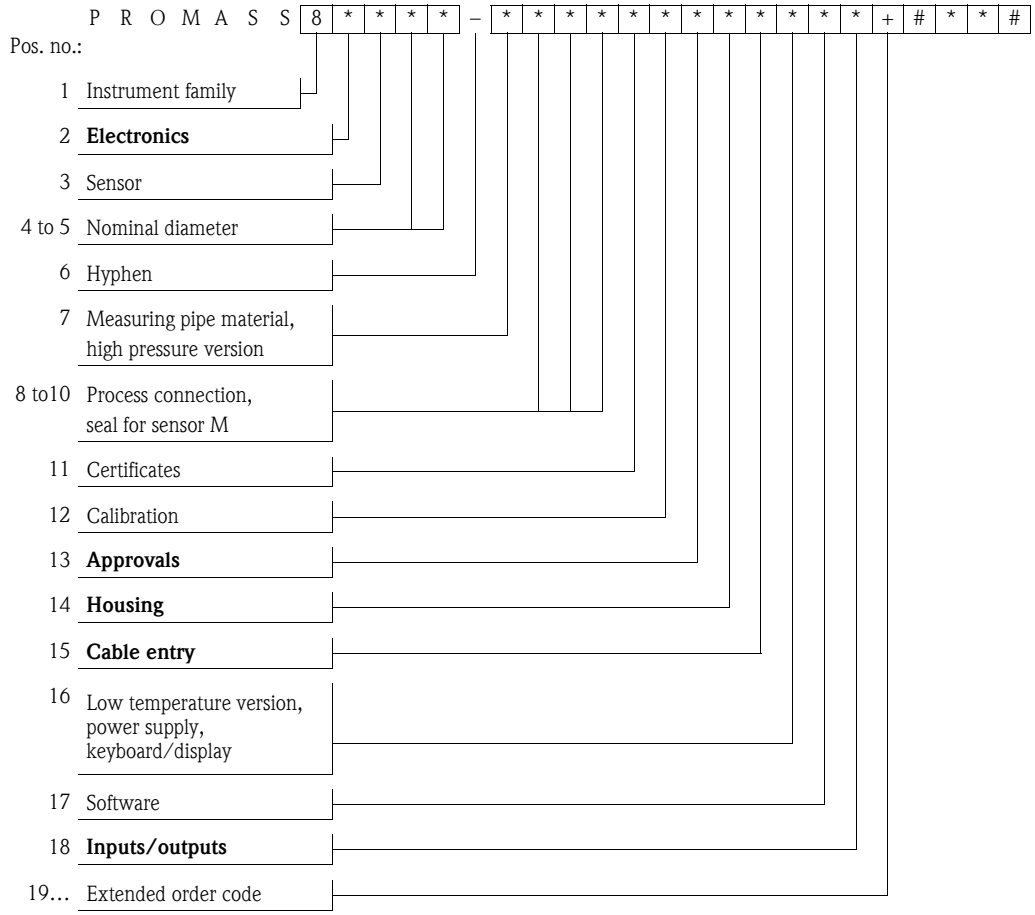
Fig. 1: Example for nameplates of a transmitter and of a sensor

A Transmitter nameplate
B Sensor nameplate

1 Production site
2 Transmitter or sensor type
3 Order code and serial number
3a Extended order code
4 Power supply, frequency and power consumption
5 Available inputs/outputs
6 Space for additional information on special products
7 Year of manufacture
8 Type of enclosure protection
9 Type of protection
10 Number of the NEPSI certificate of conformity
11 Space for notes, e.g. delays, etc. (only if necessary)
12 Ambient temperature range
13 C-Tick symbol
14 NEPSI Symbol
15 Associated Ex documentation
16 Space for other approval specifications and certificates, e.g. PROFIBUS, etc. (only if present)
17 Calibration factor/zero point
18 Nominal diameter/nominal pressure
19 Materials in contact with the medium
20 Fluid temperature range
21 Secondary containment pressure range
22 Density accuracy
23 Additional information, e.g. 5P-CAL = 5-point calibration, 3.1B = 3.1 B certificate for wetted material
24 Device nominal diameter
25 Nominal pressure
26 Direction of flow

Type code

The type code describes the exact design and the equipment of the measuring system.
It can be read on the nameplate of the transmitter and sensor and is structured as follows:



Electronics (Pos. no. 2 in type code)

*	Transmitter	Type of explosion protection
3	Promass 83	■ Transmitter electronics: [Ex ia] IIC/IIB ■ Transmitter housing: Ex d IIC or Ex de IIC
4	Promass 84	

Approvals (Pos. no. 13 in type code)

*	Type of explosion protection			
	Transmitter			Sensor
	Remote	Compact Ex ia	Compact non-instrinsically safe	
K, M	Ex d[ia Ga] IIC T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex d[ia Ga] IIC T1~T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex d[ia] IIC T1~T6 Gb Ex tD A21 IP6X T*	Ex ia IIC T1~T6 Gb Ex tD iaD A21 IP6X T*
L	Ex d[ia Ga] IIB T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex d[ia Ga] IIB T1~T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex d[ia] IIB T1~T6 Gb Ex tD A21 IP6X T*	Ex ia IIB T1~T6 Gb Ex tD iaD A21 IP6X T*
S, Q	Ex de[ia Ga] IIC T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex de[ia Ga] IIC T1~T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex de[ia] IIC T1~T6 Gb Ex tD A21 IP6X T*	Ex ia IIC T1~T6 Gb Ex tD iaD A21 IP6X T*
T	Ex de[ia Ga] IIB T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex de[ia Ga] IIB T1~T6 Gb Ex tD [iaD 20] A21 IP6X T*	Ex de[ia] IIB T1~T6 Gb Ex tD A21 IP6X T*	Ex ia IIB T1~T6 Gb Ex tD iaD A21 IP6X T*

Housing (Pos. no. 14 in type code)

*	Type	Min. ambient temperature $T_{a\ min}$
A, L	Compact	–20 °C
1, 4, M, N		–40 °C
E, F, J, K, U	Remote	–20 °C
7, 8, V, W		–40 °C

Cable entry (Pos. no. 15 in type code)

*	Thread form
A	M20 × 1.5
B	14 NPT 1/2"
C	G 1/2"

Inputs/outputs (Pos. no. 18 in type code)

*	Type of protection
A, B, C, D, E, H, J, K, L, M, N, P, Q, V, W, 0, 1, 2, 3, 4, 5, 6, 7	Non-intrinsically safe
F, G, R, S, T, U	Ex ia

✎ Note!
For a detailed explanation of these values, regarding the available outputs and inputs, as well as a description of the associated terminal assignments and connection data: → 🖹 13 onwards.

Temperature table compact version

Max. medium temperature [°C] for T1 ~ T6 in relation to the maximum ambient temperature T_a

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*A**-…	1 to 4	+60	60	95	130	150	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*E**-…	8 to 15	+50	–	100	130	140	140	140
	25 to 50		50	100	130	140	140	140
	8 to 50	+60	–	100	130	140	140	140
	80		60	75	110	140	140	140

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*F**-…	8 to 40	+50	55	95	130	150 (170)	(200)	(200)
	50		60	95	130	150 (170)	(200)	(200)
	80 to 250		60	75	110	150 (170)	(200)	(200)
	8 to 40	+60	55	95	100	100	100	100
	50		60	95	100	100	100	100
	80 to 250		60	75	100	100	100	100

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*F**-1… Promass 8*F**-2… Promass 8*F**-3… Promass 8*F**-4…	25, 50, 80	+60	65	80	(110)	(175)	(265)	(350)

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*H**-…	8	+50	50	65	100	160	200	200
	15 to 50		60	75	115	180	200	200
	8	+60	50	65	100	160	(200)	(200)
	15 to 50		60	75	115	160 (180)	(200)	(200)

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*I**-…	8 to 15	+50	60	95	130	150	150	150
	15 FB, 25							
	25 FB		70	85	120	150	150	150
	40, 40 FB							
	50, 50 FB							
	80							
	8 to 15	+60	60	95	130	(150)	(150)	(150)
	15 FB, 25							
	25 FB		70	85	120	(150)	(150)	(150)
	40, 40 FB							
	50, 50 FB							
	80							

FB = Full bore (Promass I: DN 15 FB, DN 25 FB, DN 40 FB, DN 50 FB)

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*M**-…	8 to 15	+50	55	95	130	150	150	150
	25 to 40		60	95	130	150	150	150
	50		65	95	130	150	150	150
	80		65	80	110	150	150	150
	8 to 15	+60	55	95	100	100	100	100
	25 to 40		60	95	100	100	100	100
	50		65	95	100	100	100	100
	80		65	80	100	100	100	100

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*P**-… Promass 8*S**-…	8	+50	–	65	100	160	200	200
	15 to 25		50	75	115	180	200	200
	40		55	75	115	180	200	200
	50		60	75	110	180	200	200
	8	+60	–	65	100	160	(200)	(200)
	15 to 40		–	75	115	160 (180)	(200)	(200)
	50		60	75	110	160 (180)	(200)	(200)

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*O**-…	80 to 150	+50	60	75	110	150 (170)	(200)	(200)
	80 to 150	+60	60	75	100	100	100	100

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*X**-…	350	+50	60	75	110	150 (170)	(200)	(200)
	350	+60	60	75	100	100	100	100

( ) = These maximum permissible medium temperatures apply only when the transmitter is installed in such a way that it is not above the sensor and there is free convection on all sides.

The minimum **medium temperature** is –50 °C for Promass A/F/H/I/M/P/S/O/X, and –40 °C for Promass E.

The minimum **ambient temperature** T_a for Promass 83/84 A/E/F/H/I/M/P/S/O/X is –20 °C. A version for **ambient temperatures** T_a up to –40 °C is optionally available.

Temperature table remote version

Sensor

Max. medium temperature [°C] for T1 ~ T6 in relation to the maximum ambient temperature T_a

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*A**-…	1 to 4	+60	60	95	130	150	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*E**-…	8 to 50	+60	–	100	130	140	140	140
	80		60	75	110	140	140	140

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*F**-…	8 to 50	+60	55	95	130	160	200	200
	80 to 250		60	75	110	170	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*F**-1… Promass 8*F**-2… Promass 8*F**-3… Promass 8*F**-4…	25, 50, 80	+60	65	80	110	175	265	350

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*H**-…	8	+60	50	65	100	160	200	200
	15 to 50		60	75	115	180	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*I**-…	8 to 15	+60	60	95	130	150	150	150
	15 FB, 25							
	25 FB		70	85	120	150	150	150
	40, 40 FB							
	50, 50 FB							
	80							

FB = Full bore

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*M**-…	8 to 15	+60	55	95	130	150	150	150
	25 to 40		60	95	130	150	150	150
	50		65	95	130	150	150	150
	80		65	80	110	150	150	150

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*P**-… Promass 8*S**-…	8	+50	–	65	100	160	200	200
	15 to 25		50	75	115	180	200	200
	40		55	75	115	180	200	200
	8	+60	–	65	100	160	200	200
	15 to 40		–	75	115	180	200	200
	50		60	75	110	180	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*O**-…	80 to 150	+60	60	75	110	170	200	200

	DN [mm]	T_a [°C]	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Promass 8*X**-…	350	+60	60	75	110	170	200	200

The minimum **medium temperature** is –50 °C for Promass A/F/H/I/M/P/S/O/X, and –40 °C for Promass E.
The minimum **ambient temperature** for Promass A/E/F/H/I/M/P/S/O/X is –40 °C.

Transmitter

The remote version transmitter has a T6 temperature class rating when installed in the Ex d housing for operation at **ambient temperatures** up to T_a = 60 °C. The maximum ambient temperature range is –20 to +60 °C. A version for **ambient temperatures** T_a up to –40 °C is optionally available.

Gas and dust explosion protection

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 ambient temperature T_a and the 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 of the maximum surface temperature for explosion hazards arising from dust

Device: Promass 83 F, compact version, DN 80
Maximum ambient temperature: T_a = 60 °C
Maximum medium temperature: T_m = 98 °C

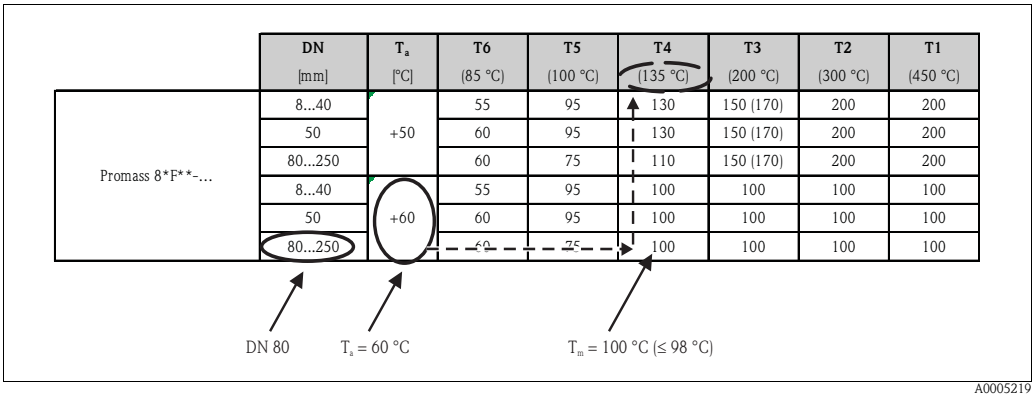


Fig. 2: Procedure for calculating the max. surface temperature

1. Select the device (Promass 83 F), nominal diameter (DN 80) and ambient temperature T_a (60 °C) in the associated temperature table (compact version).
   The row showing the maximum medium temperature is determined.
2. Select the maximum medium temperature T_m (98 °C), which is smaller than or equal to the maximum medium temperature of a cell.
   The column with the temperature class for gas is determined (98°C ≤ 100°C → T4).
3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature: T4 = 135 °C = maximum surface temperature for dust.

Design of measuring system

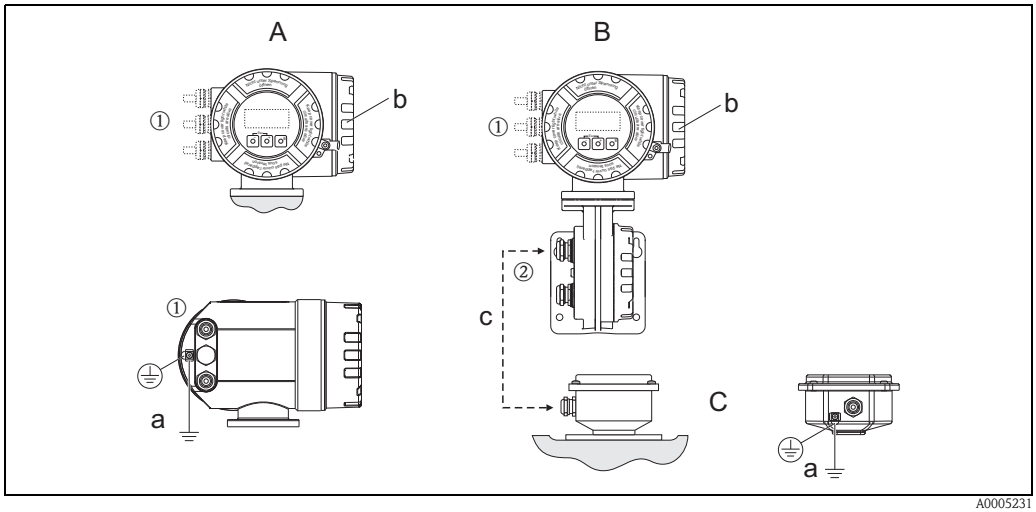


Fig. 3: Design of the measuring system, compact/remote version

A Transmitter housing (compact version)
B Transmitter housing on connection housing, remote version
C Sensor connection housing, remote version

a Screw terminal for connecting to the potential equalization
b Connection compartment cover
c Connecting cable remote version
① and ② see following section "Cable entries"

✎ Note!
Connection of remote version connecting cable → 🖹 12

Cable entries

- ① for connection compartment (Ex d version): power supply cable and cable of the communication circuit → Choice of thread for cable entries M20 × 1.5, ½" NPT or G ½".

  Make sure that the Ex d cable glands/entries are secured to prevent working loose and that the seals are installed immediately adjacent to the housing.
- ① for connection compartment (Ex e version): power supply cable and cable of the communication circuit → Choice of cable gland M20 × 1.5 or thread for cable entries ½" NPT or G ½".
  The cables must be installed such that they are fixed in place. Adequate strain relief must be ensured.
- ② for remote version connecting cable:
  → Choice of cable gland M20 × 1.5 or thread for cable entries ½" NPT or G ½"

⚠ Warning!
When using cable glands M20 × 1.5:
- Only approved cable glands may be used (→ 🖹 2 "Installation instructions").
- The cable glands must be very leak-tight.

Cable specification

You can find information about the cable specification in the associated Operating Instructions.

Potential equalization

- The transmitter (compact and remote version) is to be securely connected to the potential equalization system using the screw terminal on the outside of the transmitter housing. Alternatively, the transmitter of the compact version as of serial number 4Axxxxxx000 can be connected to the potential equalization system via the pipeline if a ground connection via the pipeline according to regulations can be assured.
- When using the remote version, the connection housing of the sensor must be grounded via the external screw terminal. Alternatively, the sensor can be integrated into the potential equalization via the pipeline as long as the pipeline provides a ground connection conforming to regulations.

✎ Note!
Further information about potential equalization, shielding and grounding can be found in the associated Operating Instructions.

Potential equalization with shield grounded at both sides for fieldbus version

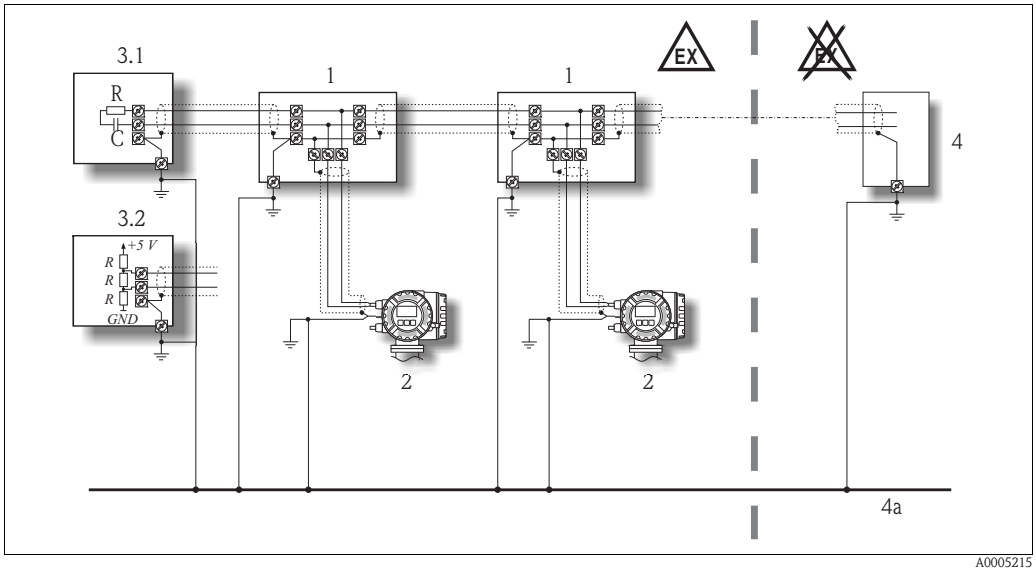


Fig. 4: Example for connecting potential equalization lines
1 Distributor/T-Box
2 Bus devices for potentially explosive atmospheres
3.1 Bus terminator PROFIBUS PA and FOUNDATION Fieldbus
3.2 Bus terminator PROFIBUS DP and Modbus RS485
4 Bus supply unit or automation system
4a Potential equalization line is fed out into the safe area

✎ Note!
The length of the spur must be observed.

Connection of remote version connecting cable

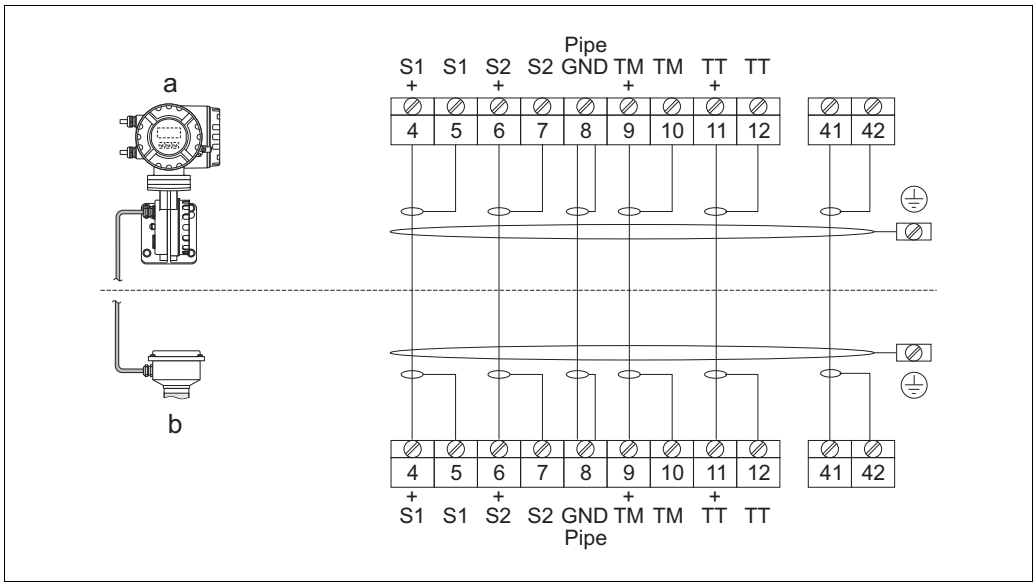


Fig. 5: Connection of remote version connecting cable

a Wall-mount housing: NEPSI Zone 1

b Remote version, flanged version

Wire colors (colour code according to DIN 47100)

→ Terminal No.: 4/5 = gray; 6/7 = green; 8 = yellow; 9/10 = pink; 11/12 = white; 41/42 = brown

Terminal assignment and connection data

The connection of the remote version, between the sensor and the transmitter, has Ex i explosion protection.

The maximum cable length between transmitter and sensor must not exceed 120 m.

Caution!

Only preterminated connecting cables supplied by Endress+Hauser may be used.

Electrical connection

Connection compartment

Transmitter housing compact/remote version (terminal assignment, connection data → 13 ff.)

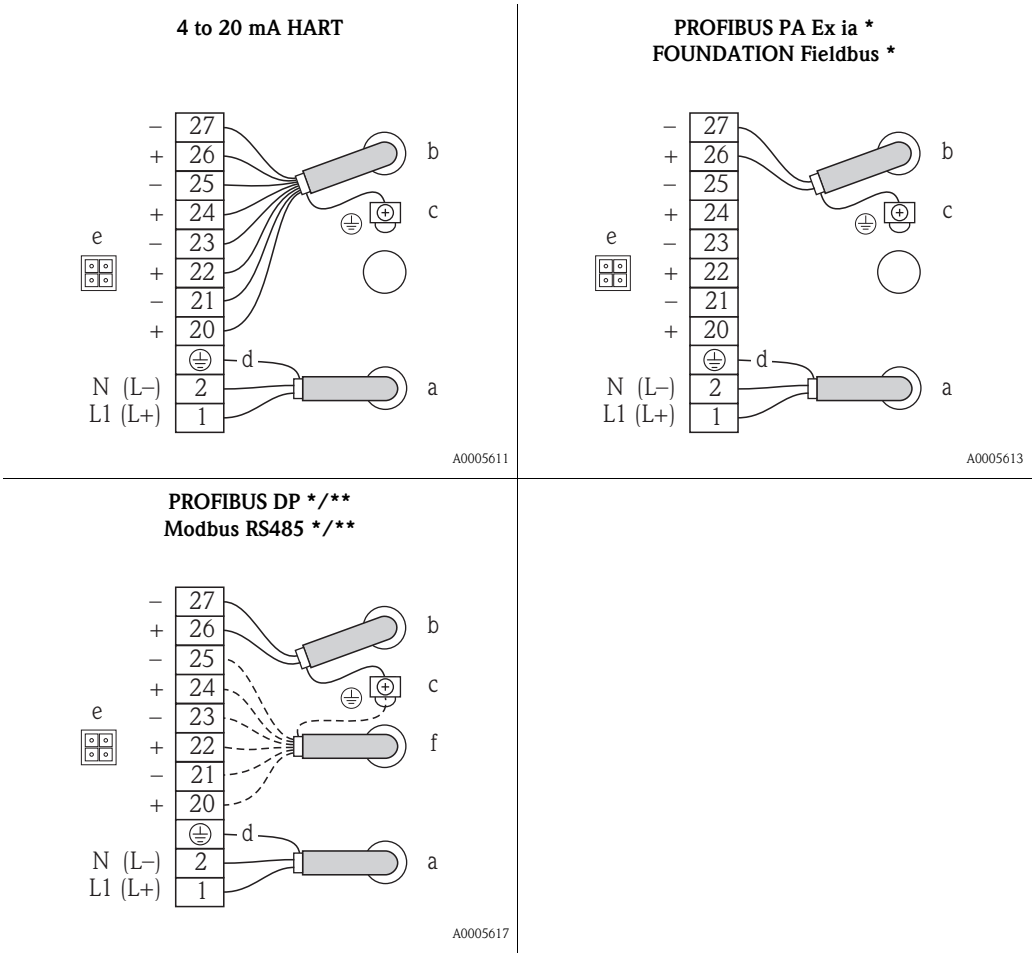


Fig. 6: Electrical connections

**) Fixed communication boards (permanent assignment)*

***) Flexible communication boards*

a Power supply cable (terminal assignment, connection data → 13)

b Signal cable (terminal assignment, connection data → 14)

c Ground terminal for signal cable shield / fieldbus cable / RS485 line

d Ground terminal for protective ground

e Service adapter for connecting service interface FXA 193 (Fieldcheck, FieldCare)

f Further connections:
*– PROFIBUS DP *: Cable for external termination, optional (terminal assignment, connection data → 13)*
*– PROFIBUS DP **/ Modbus RS485 */**: Signal cable (terminal assignment, connection data → 14)*

Terminal assignment and connection data, power supply

Terminal assignment and connection data

All transmitters	1 L (+)	2 N (–)	⏚
Designation	Supply voltage		Protective earth
Functional values	AC: U = 85 to 260 V; AC: U = 20 to 55 V DC: U = 16 to 62 V Power consumption: 15 VA / 15 W		Caution! Observe the grounding concepts of the system!
Intrinsically safe circuit	no		
U_m	260 V AC		

Terminal assignment and connection data for signal circuits (intrinsically safe circuits)

✎ Note!
The following tables contain values/specifications, which are dependent on the type code (type of measuring device). Please compare the following type code to the one shown on the nameplate of your measuring device. For a graphic representation of the electrical connections: → 🖹 13.

The communication circuits, option F and G, they meet all requirements for a FISCO Field Device (GB3836.19-2010).

Terminal assignment of transmitter 83***-**********F+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		–		PROFIBUS PA passive	
							PA +	PA –
Electric circuit	–		–		–		Ex ia	
Safety-related values	–		–		–		U_i	30 V DC
							I_i	600 mA
							P_i	8.5 W
							L_i	≤ 10 µH
							C_i	≤ 5 nF
							FISCO	Field device
Functional values	–		–		–		galvanically isolated,	
							U_{Bus}	9 to 32 V DC
							I_{Bus}	11 mA
							IEC 61158-2 (MBP)	

Terminal assignment of transmitter 83***-**********G+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		–		FOUNDATION Fieldbus passive	
							FF +	FF –
Electric circuit	–		–		–		Ex ia	
Safety-related values	–		–		–		U_i	30 V DC
							I_i	600 mA
							P_i	8.5 W
							L_i	≤ 10 µH
							C_i	≤ 5 nF
							FISCO	Field device
Functional values	–		–		–		galvanically isolated,	
							U_{Bus}	9 to 32 V DC
							I_{Bus}	12 mA
							IEC 61158-2 (MBP)	

Terminal assignment and connection data for signal circuits (intrinsically safe circuits) (continued)

Terminal assignment of transmitter 83***-**********R+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		Current output, active		Current output HART, active	
Electric circuit	–		–		Ex ia		Ex ia	
Safety-related values	–		–		U_o 21.8 V DC I_o 90 mA P_o 491 mW L_o IIC/IIB 4.1 mH/15 mH C_o IIC/IIB 160 nF/1160 nF [1] L_o IIC/IIB 2 mH/10 mH [1] C_o IIC/IIB 80 nF/300 nF U_i 30 V DC [2] I_i 10 mA [2] P_i 0.3 W [2] L_i negligible C_i 6 nF		U_o 21.8 V DC I_o 90 mA P_o 491 mW L_o IIC/IIB 4.1 mH/15 mH C_o IIC/IIB 160 nF/1160 nF [1] L_o IIC/IIB 2 mH/10 mH [1] C_o IIC/IIB 80 nF/300 nF U_i 30 V DC [2] I_i 10 mA [2] P_i 0.3 W [2] L_i negligible C_i 6 nF	
Functional values	–		–		galvanically isolated, active: 0/4 to 20 mA R_L < 400 Ω R_L HART ≥ 250 Ω		galvanically isolated, active: 0/4 to 20 mA R_L < 400 Ω R_L HART ≥ 250 Ω	

[1] Permitted values in the event of simultaneous occurrence of concentrated inductances and capacitances.
[2] The interconnection must be assessed according to the valid construction provisions.

Terminal assignment of transmitter 83/84***-**********S+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		Pulse/frequency output, passive		Current output HART, active	
Electric circuit	–		–		Ex ia		Ex ia	
Safety-related values	–		–		U_i 30 V DC I_i 500 mA P_i 600 mW L_i negligible C_i 6 nF		U_o 21.8 V DC I_o 90 mA P_o 491 mW L_o IIC/IIB 4.1 mH/15 mH C_o IIC/IIB 160 nF/1160 nF [1] L_o IIC/IIB 2 mH/10 mH [1] C_o IIC/IIB 80 nF/300 nF U_i 30 V DC [2] I_i 10 mA [2] P_i 0.3 W [2] L_i negligible C_i 6 nF	
Functional values	–		–		galvanically isolated, passive: 30 V DC / 250 mA Open Collector Full scale frequency 2 to 5000 Hz		galvanically isolated, active: 0/4 to 20 mA R_L < 400 Ω R_L HART ≥ 250 Ω	

[1] Permitted values in the event of simultaneous occurrence of concentrated inductances and capacitances.
[2] The interconnection must be assessed according to the valid construction provisions.

Terminal assignment and connection data for signal circuits (intrinsically safe circuits) (continued)

Terminal assignment of transmitter 83/84***-**********T+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		Pulse/frequency output, passive		Current output HART, passive	
Electric circuit	–		–		Ex ia		Ex ia	
Safety-related values	–		–		U_i 30 V DC I_i 500 mA P_i 600 mW L_i negligible C_i 6 nF		U_i 30 V DC I_i 100 mA P_i 1.25 W L_i negligible C_i 6 nF	
Functional values	–		–		galvanically isolated, passive: 30 V DC / 250 mA Open Collector Full scale frequency 2 to 5000 Hz		galvanically isolated, passive: 4 to 20 mA voltage drop ≤ 9 V $R_L < [(V_{p.\ supply} - 9\ V) \div 25\ mA]$	

Terminal assignment of transmitter 83***-**********U+#**#

Transmitter	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Assignment	–		–		Current output passive		Current output HART, passive	
Electric circuit	–		–		Ex ia		Ex ia	
Safety-related values	–		–		U_i 30 V DC I_i 100 mA P_i 1.25 W L_i negligible C_i 6 nF		U_i 30 V DC I_i 100 mA P_i 1.25 W L_i negligible C_i 6 nF	
Functional values	–		–		galvanically isolated, passive: 4 to 20 mA voltage drop ≤ 9 V $R_L < [(V_{p.\ supply} - 9\ V) \div 25\ mA]$		galvanically isolated, passive: 4 to 20 mA voltage drop ≤ 9 V $R_L < [(V_{p.\ supply} - 9\ V) \div 25\ mA]$	

Terminal assignment and connection data for signal circuits (non-intrinsically safe circuits)

✎ Note!
The following tables contain values/specifications, which are dependent on the type code (type of measuring device). Please compare the following type code to the one shown on the nameplate of your measuring device. For a graphic representation of the electrical connections: → 🖹 13.

Terminal assignment

Order characteristic "Inputs/outputs"	Terminal no. (inputs/outputs)							
	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
Non-convertible communication boards (fixed assignment)								
A	–		–		Pulse/frequency output		Current output HART	
B	Relay output 2		Relay output 1		Pulse/frequency output		Current output HART	
J	–		–		External termination +5 V	DGND	PROFIBUS DP [1] B	A
K	–		–		–		FOUNDATION Fieldbus FF +	FF –
Q	–		–		Status input		Modbus RS485 [1] B	A
Convertible communication boards								
C	Relay output 2		Relay output 1		Pulse/frequency output		Current output HART	
D	Status input		Relay output		Pulse/frequency output		Current output HART	
E	Status input		Relay output		Current output 2		Current output 1 HART	
L	Status input		Relay output 2		Relay output 1		Current output HART	
M	Status input		Pulse/frequency output 2		Pulse/frequency output 1		Current output HART	
N	Current output		Pulse/frequency output		Status input		Modbus RS485 [1] B	A
P	Current output		Pulse/frequency output		Status input		PROFIBUS DP [1] B	A
V	Relay output 2		Relay output 1		Status input		PROFIBUS DP [1] B	A
W	Relay output		Current output 3		Current output 2		Current output 1 HART	
0	Status input		Current output 3		Current output 2		Current output 1 HART	
1	Relay output		Pulse/frequency output 2		Pulse/frequency output 1		Current output HART	
2	Relay output		Current output 2		Pulse/frequency output		Current output 1 HART	
3	Current input		Relay output		Current output 2		Current output 1 HART	
4	Current input		Relay output		Pulse/frequency output		Current output HART	
5	Status input		Current input		Pulse/frequency output		Current output HART	
6	Status input		Current input		Current output 2		Current output HART	
7	Relay output 2		Relay output 1		Status input		Modbus RS485 [1] B	A

Safety-related and functional values of signal circuits → 🖹 *18*

[1] *PROFIBUS DP, Modbus RS485:*
– Terminal 26 (+) → B (RxD/TxD-P)
– Terminal 27 (–) → A (RxD/TxD-N)

Safety-related and functional values of signal circuits

Signal circuits	Functional values	Safety-related values
Current output HART	galvanically isolated, active/passive can be selected: ■ active: 0/4 to 20 mA R_L < 700 Ω, R_L HART ≥ 250 Ω ■ passive: 4 to 20 mA V_s = 18 to 30 V DC, R_i ≥ 150 Ω	intrinsically safe = no U_m = 260 V I_m = 500 mA
Current output	galvanically isolated, active/passive can be selected: ■ active: 0/4 to 20 mA R_L < 700 Ω ■ passive: 4 to 20 mA V_s = 18 to 30 V DC, R_i ≥ 150 Ω	
Pulse/frequency output	galvanically isolated, active/passive can be selected: ■ active: 24 V DC / 25 mA (max. 250 mA during 20 ms) R_L > 100 Ω ■ passive: 30 V DC / 250 mA Open Collector Full scale frequency 2 to 10000 Hz (f_{max} = 12500 Hz)	
Relay output	galvanically isolated, max. 30 V AC / 500 mA max. 60 V DC / 100 mA	
Current input	galvanically isolated, active/passive can be selected: ■ active: 4 to 20 mA R_i ≤ 150 Ω U_{out} = 24 V DC, short-circuit proof ■ passive: 0/4 to 20 mA R_i < 150 Ω U_{max} = 30 V DC	
Status input Promass 83: options "Inputs/outputs" D, L, M Promass 84: options "Inputs/outputs" D, M	galvanically isolated, 3 to 30 V DC R_i = 5 kΩ	
Status input Promass 83: options "Inputs/outputs" N, P, Q, V, 7	galvanically isolated, Independent of polarity, 3 to 30 V DC R_i = 3 kΩ	
PROFIBUS DP	galvanically isolated, RS485 as per Standard EIA/TIA-485	
PROFIBUS DP, external termination	galvanically isolated, RS485 as per Standard EIA/TIA-485 Terminal 24: +5 V Terminal 25: DGND	
FOUNDATION Fieldbus	galvanically isolated, U_{Bus} = 9 to 32 V DC I_{Bus} = 12 mA IEC 61158-2 (MBP)	
Modbus RS485	galvanically isolated, RS485 as per Standard EIA/TIA-485	

Service adapter

The service adapter is only used for connecting service interfaces approved by Endress+Hauser.

⚠ Warning!
It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.

Device fuse

⚠ Warning!
Use only fuses of the following types; the fuses are installed on the power supply board:

- Voltage 20 to 55 V AC / 16 to 62 V DC:
  fuse 2.0 A slow-blow, disconnect capacity 1500 A
  (Schurter, 0001.2503 or Wickmann, Standard Type 181 2.0 A)
- Voltage 85 to 260 V AC:
  fuse 0.8 A slow-blow, disconnect capacity 1500 A
  (Schurter, 0001.2507 or Wickmann, Standard Type 181 0.8 A)

Technical Data

Dimensions

Please refer to the respective Technical Information for these dimensions:

- Promass 80A, 83A → TI00054D
- Promass 80E, 83E → TI00061D
- Promass 80F, 83F → TI00101D
- Promass 80H, 83H → TI00074D
- Promass 80I, 83I → TI00075D
- Promass 80P, 83P → TI00078D
- Promass 80S, 83S → TI00076D
- Promass 83O → TI00112D
- Promass 83X → TI00110D
- Promass 84A → TI00068D
- Promass 84F → TI00103D
- Promass 84O → TI00116D
- Promass 84X → TI00111D

Weight

Weight

- The weight of the Ex d version is approx. 2 kg greater than that of the standard version.
- The weight of the Ex d version in stainless steel is approx. 9 kg greater than that of the standard version.

www.endress.com/worldwide

Endress+Hauser

People for Process Automation

XA00122D/06/EN/15.17
71351411
FM+SGML 9.0