



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Safety Instructions

Proline Promass 83/84

Division 1

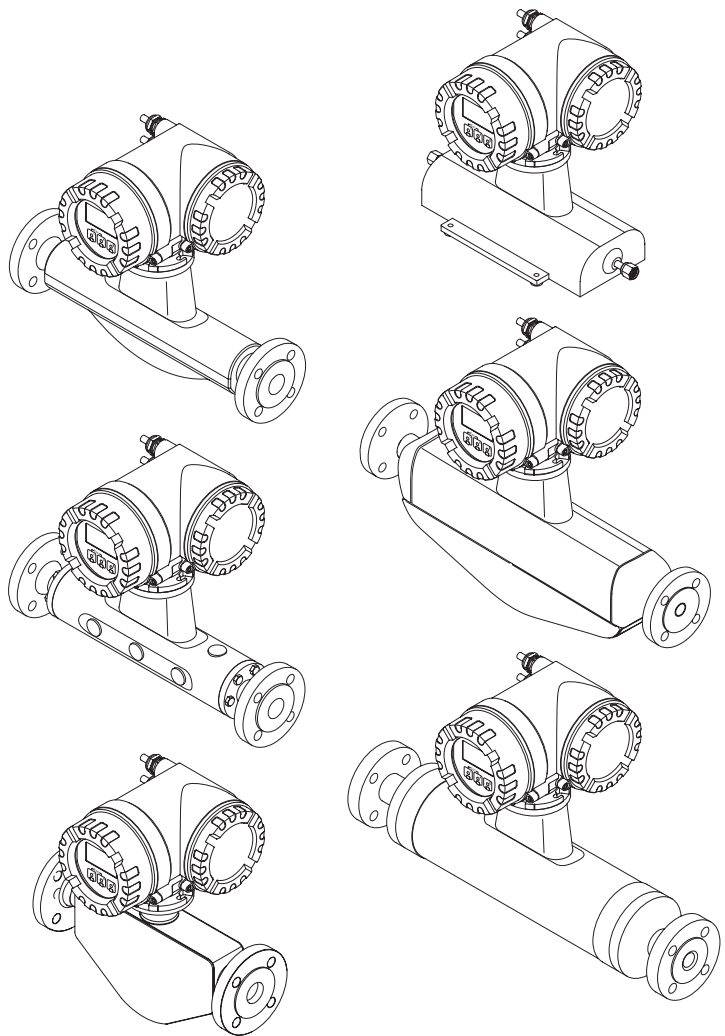
Ex documentation



Ex documentation for the Operating Instructions according to
FACTORY MUTUAL standards → **Page 3**



Ex documentation for the Operating Instructions according to
CANADIAN STANDARDS ASSOCIATION → **Page 19**



Examples for markings according to FM and CSA:



Temperature Class

Maximum surface temperature		
T1	842 °F	450 °C
T2	572 °F	300 °C
T2A	536 °F	280 °C
T2B	500 °F	260 °C
T2C	446 °F	230 °C
T2D	419 °F	215 °C
T3	392 °F	200 °C
T3A	356 °F	180 °C
T3B	329 °F	165 °C
T3C	320 °F	160 °C
T4	275 °F	135 °C
T4A	248 °F	120 °C
T5	212 °F	100 °C
T6	185 °F	85 °C

Factory Mutual

Type of Protection

XP	Explosionproof
IS	Intrinsically Safe Apparatus
AIS	Associated Apparatus with Intrinsically Safe Connections
ANI	Associated Nonincendive Field Wiring Apparatus
PX,PY,PZ	Pressurized
APX,APY,APZ	Associated Pressurization Systems/Components
NI	Nonincendive
DIP	Dust-Ignitionproof
S	Special Protection

Class

I	Class I (Gas)
II	Class II (Dust)
III	Class III (Fibre)

Division

1	Division 1
2	Division 2

Group

FM / NEC	Gases, vapours and dust examples	Min. ignition temperature [μJ]
A	Acetylene, carbon disulfide (Class I)	0.02
B	Hydrogen, ethyl nitrate (Class I)	0.02
C	Ethylene, isoprene (Class I)	0.06
D	Acetone, ethane, benzene, ethanoic acid, gasolines, diesel oil, aircraft fuel, methane, heating oil, crude oil, hexane, ether (Class I)	0.18
E	Metallic powder (Class II)	
F	Coal dust (Class II)	
G	Mill dust (Class II)	
	Textile fibres (Class III)	

Example: **XP / I / 1 / ABCD**


Temperature Class

Maximum surface temperature		
T1	450 °C	842 °F
T2	300 °C	572 °F
T2A	280 °C	536 °F
T2B	260 °C	500 °F
T2C	230 °C	446 °F
T2D	215 °C	419 °F
T3	200 °C	392 °F
T3A	180 °C	356 °F
T3B	165 °C	329 °F
T3C	160 °C	320 °F
T4	135 °C	275 °F
T4A	120 °C	248 °F
T5	100 °C	212 °F
T6	85 °C	185 °F

Canadian Standards Association

Class

I	Class I (Gas)
II	Class II (Dust)
III	Class III (Fibre)

Division

1	Division 1
2	Division 2

Group

CSC / NEC	Gases, vapours and dust examples	Min. ignition temperature [μJ]
A	Acetylene, carbon disulfide (Class I)	0.02
B	Hydrogen, ethyl nitrate (Class I)	0.02
C	Ethylene, isoprene (Class I)	0.06
D	Acetone, ethane, benzene (Class I)	0.18
E	Metallic powder (Class II)	
F	Coal dust (Class II)	
G	Mill dust (Class II)	
	Textile fibres (Class III)	

Type of Protection

Explosionproof
Intrinsically Safe Apparatus
Associated Apparatus with Intrinsically Safe Connections
Associated Nonincendive Field Wiring Apparatus
Pressurized
Associated Pressurization Systems/Components
Nonincendive
Dust-Ignitionproof
Special Protection

Example: **Class I, Division 1, Group ABCD**



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Safety Instructions

Proline Promass 83/84

Division 1

Ex documentation

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

- BA059D, Operating Instruction, Proline Promass 83
- BA109D, Operating Instruction, Proline Promass 84

Contents

Measuring system compact version	4
Measuring system remote version	5
Temperature tables compact version	6
Temperature tables sensor remote version	6
Approvals	7
Notified body	9
Special conditions	9
General warnings	9
Electrical connections	10
Connection of remote version connecting cable	14
Service adapter	15
Device fuse	15
Cable entries	15
Cable specifications	15
Technical data	15
Device identification	16
Control drawings	17

Measuring system compact version

Hazardous area		
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	Safe area
F F (HT) M A H E I ④		 A0001261 ⑤
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	Safe area
Hazardous area		
Transmitter Promass 83/84: - Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits - Sensor: intrinsically safe Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG - Promass F; DN 3/8"...2" - Promass F*; (HT) High temperature; DN 1", DN 2" - Promass M; DN 3/8"...2" - Promass E*; DN 3/8"...2" - Promass A; DN 1/24"...1/8" - Promass H*; DN 3/8"...1 1/2" - Promass I*; DN 3/8"...1 1/2" * not Proline Promass 84 Ambient-/fluid temperature ranges and temperature class see Page 6. ① = Cable entries, for number reference see Page 15. ④ = Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ⑤ = Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) F (HT) = Promass F high-temperature version or Transmitter Promass 83/84: - Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits - Sensor: intrinsically safe Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG - Promass F; DN 3"...10" - Promass F*; (HT) High temperature; DN 3" - Promass M; DN 3" - Promass H*; DN 2" - Promass I*; DN 2", DN 1 1/2" FB (full bore) * not Proline Promass 84 Optionally, a version for Groups A and B is available. Ambient-/fluid temperature ranges and temperature class see Page 6. ① = Cable entries, for number reference see Page 15. ④ = Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ⑤ = Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) F (HT) = Promass F high-temperature version		

Measuring system remote version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
Division 1 / Zone 0 / Zone 1 Division 2 / Zone 2 Safe area		
Transmitter Promass 83/84:		Transmitter Promass 83/84:
- Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits - Sensor: intrinsically safe Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG - Promass F*; DN 3/8"...2" - Promass F*; (HT) High temperature; DN 1", DN 2" - Promass M; DN 3/8"...2" - Promass E*; DN 3/8"...2" - Promass A; DN 1/24"...1/8" - Promass H*; DN 3/8"...1 1/2" - Promass I*; DN 3/8"...1 1/2"		- Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits - Sensor: intrinsically safe Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG - Promass F*; DN 3"...10" - Promass F*; (HT) High temperature; DN 3" - Promass M; DN 3" - Promass H*; DN 2" - Promass I*; DN 2", DN 1 1/2" FB (full bore)
* not Proline Promass 84		* not Proline Promass 84
- Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor. - Ambient-/fluid temperature ranges and temperature class see Page 6. ①, ②, ③= Cable entries, for number reference see Page 15. ④= Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ⑤= Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) ⑥= transmitter Promass 83/84 - F (LN) = Promass F Long-neck version (Remote version for heating) - F (HT) = Promass F high-temperature version		- Optionally, a version for Groups A and B is available. - Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor. - Ambient-/fluid temperature ranges and temperature class see Page 6. ①, ②, ③= Cable entries, for number reference see Page 15. ④= Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ⑤= Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) ⑥= transmitter Promass 83/84 - F (LN) = Promass F Long-neck version (Remote version for heating) - F (HT) = Promass F high-temperature version

A0001254

Temperature tables compact version

Max. medium temperature [°F] (at T _a = 113 °F)		T6 185 °F	T5 212 °F	T4A 248 °F	T4 275 °F	T3A 356 °F	T2C 446 °F	T2B 500 °F	T1 842 °F
Promass E	DN 3/8"...2"	113	212	248	257	257	257	257	257

Max. medium temperature [°F] (at T _a = 122 °F)		T6 185 °F	T5 212 °F	T4A 248 °F	T4 275 °F	T3A 356 °F	T2C 446 °F	T2B 500 °F	T1 842 °F
Promass F	DN 3/8"...1 1/2"	131	158	185	212	302	365*	392*	392*
Promass F	DN 2"...10"	140	158	185	221	302	365*	392*	392*
Promass I	DN 3/8"...1", 1/2" FB	140	203	203	230	302	302	302	302
Promass I	DN 1 1/2"...2", 1" FB, 1 1/2" FB	158	185	221	248	302	302	302	302
Promass M	DN 3/8"...3"	122	140	185	221	302	302	302	302
Promass E	DN 1"...2"	122	212	248	257	257	257	257	257
Promass H	DN 3/8"	122	149	185	212	284	365	392	392
Promass H	DN 1/2"...2"	140	167	212	239	320	392	392	392

Max. medium temperature [°F] (at T _a = 140 °F)		T6 185 °F	T5 212 °F	T4A 248 °F	T4 275 °F	T3A 356 °F	T2C 446 °F	T2B 500 °F	T1 842 °F
Promass A	DN 1/24"...1/8"	140	203	239	266	284	392	392	392
Promass F	DN 3/8"...1 1/2"	131	158	185	212	302*	365*	392*	392*
Promass F	DN 2"...10"	140	158	185	212	302*	365*	392*	392*
Promass F, HT	DN 1", 2", 3"	158	185	212	239*	320*	401*	455*	662*
Promass I	DN 3/8"...1", 1/2" FB	140	203	203	230	302*	302*	302*	302*
Promass I	DN 1 1/2"...2", 1" FB, 1 1/2" FB	158	185	221	248	302*	302*	302*	302*
Promass M	DN 3/8"...3"	–	140	185	212	212	212	212	212
Promass E	DN 3/8"...2"	–	212	248	257	257	257	257	257
Promass H	DN 3/8"	122	149	185	212	284	365*	392*	392*
Promass H	DN 1/2"...2"	140	167	212	239	320	392*	392	392*

* The maximum permissible fluid temperatures apply only when the transmitter is installed in such a way that it is not above the sensor and heat can be removed freely by convection in all directions.

- The minimum **fluid temperature** is –58 °F for Promass A/F/I/M/H, and –40 °F for Promass E.
- The minimum **ambient temperature** is –4 °F. A version for ambient temperatures up to –40 °F is optionally available.

Temperature tables sensor remote version

Max. medium temperature [°F] (at T _a = 113 °F)		T6 185 °F	T5 212 °F	T4A 248 °F	T4 275 °F	T3A 356 °F	T2C 446 °F	T2B 500 °F	T1 842 °F
Promass E	DN 3/8"...2"	113	212	248	257	257	257	257	257

Max. medium temperature [°F] (at T _a = 140 °F)		T6 185 °F	T5 212 °F	T4A 248 °F	T4 275 °F	T3A 356 °F	T2C 446 °F	T2B 500 °F	T1 842 °F
Promass A	DN 1/24"...1/8"	140	203	239	266	284	392	392	392
Promass F	DN 3/8"...1 1/2"	131	158	185	212	302	365	392	392
Promass F	DN 2"...10"	140	158	185	221	302	365	392	392
Promass F, HT	DN 1", 2", 3"	158	185	212	239	320	401	455	662
Promass I	DN 3/8"...1", 1/2" FB	140	203	203	230	302	302	302	302
Promass I	DN 1 1/2"...2", 1" FB, 1 1/2" FB	158	185	221	248	302	302	302	302
Promass M	DN 3/8"...3"	122	140	185	221	212	302	302	302
Promass E	DN 3/8"...2"	–	212	248	257	257	257	257	257
Promass H	DN 3/8"	122	149	185	212	284	365	392	392
Promass H	DN 1/2"...2"	140	167	212	239	320	392	392	392

- The minimum **fluid temperature** is –58 °F for Promass A/F/I/M/H, and –40 °F for Promass E.
- The minimum **ambient temperature** is –40 °F.

Transmitter

- The Promass 83/84 (remote version) transmitter has a T6 temperature class rating when installed in the EEx d housing for operation at ambient temperatures up to T_a = 140 °F.
- The minimum **ambient temperature** is –4 °F. A version for ambient temperatures up to –40 °F is optionally available.

Note!

At the specified medium temperatures, the equipment is not subjected to temperatures impermissible for the temperature class in question.

Approvals

Nr. / Approval type	Description
J.I.3009083 (Special notes, see Page 9)	for the electric flow measuring system Proline Promass 83/84 Identification: see below

Compact version

P r o m a s s 8 3 * * * _ * * * * * * * * * *		
A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay¹⁾ D = current HART, frequency, relay, status input¹⁾ E = current HART, current, relay, status input¹⁾ L = current HART, 2 x relay, status input¹⁾ M = current HART, 2 x frequency, status input¹⁾ R = current HART (IS) active, current (IS) active S = current HART (IS) active, frequency (IS) T = current HART (IS) passive, frequency (IS) U = current HART (IS) passive, current (IS) passive W = current HART, 2 x current, relay¹⁾ 0 = current HART, 2 x current, status input¹⁾ 2 = current HART, frequency, current, relay¹⁾ 3 = current HART, current, relay, current input¹⁾ 4 = current HART, frequency, relay, current input¹⁾ 5 = current HART, frequency, current input, status input¹⁾ 6 = current HART, current, current input, status input¹⁾		
Promass 83 A	DN 1/24"...1/8"	XP-IS-DIP I, II, III/1/ABCDEFG
Promass 83 F	DN 3/8"...2"	
Promass 83 F (HT)	DN 1", 2"	
Promass 83 I	DN 3/8"...1 1/2"	
Promass 83 M	DN 3/8"...2"	
Promass 83 E	DN 3/8"...2"	
Promass 83 H	DN 3/8"...1 1/2"	
Promass 83 F	DN 3"...10"	XP-IS-DIP I, II, III/1/CDEFG
Promass 83 F (HT)	DN 3"	(Optionally, a version for Groups A and B is available)
Promass 83 I	DN 2", DN 1 1/2" FB	
Promass 83 M	DN 3"	
Promass 83 H	DN 2"	
¹⁾ convertible module		

P r o m a s s 8 4 * * * _ * * * * * * * * * *		
M = current HART, 2 x frequency, status input		
Promass A	DN 1/24"...1/8"	XP-IS-DIP I, II, III/1/ABCDEFG
Promass F	DN 3/8"...2"	
Promass M	DN 3/8"...2"	
Promass F	DN 3"...10"	XP-IS-DIP I, II, III/1/CDEFG
Promass M	DN 3"	(Optionally, a version for Groups A and B is available)

Remote version

P r o m a s s 8 3 * * * - * * * * * * * * * *		
A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay¹⁾ D = current HART, frequency, relay, status input¹⁾ E = current HART, current, relay, status input¹⁾ L = current HART, 2 x relay, status input¹⁾ M = current HART, 2 x frequency, status input¹⁾ R = current HART (IS) active, current (IS) active S = current HART (IS) active, frequency (IS) T = current HART (IS) passive, frequency (IS) U = current HART (IS) passive, current (IS) passive W = current HART, 2 x current, relay¹⁾ 0 = current HART, 2 x current, status input¹⁾ 2 = current HART, frequency, current, relay¹⁾ 3 = current HART, current, relay, current input¹⁾ 4 = current HART, frequency, relay, current input¹⁾ 5 = current HART, frequency, current input, status input¹⁾ 6 = current HART, current, current input, status input¹⁾		
Transmitter		
Promass 83	XP-IS-DIP I, II, III/1/ABCDEFGF XP-IS-DIP I, II, III/1/CDEFG	or
Sensor		
Promass A	DN 1/24"...1/8"	XP-IS-DIP I, II, III/1/ABCDEFGF
Promass F	DN 3/8"...2"	
Promass F (HT)	DN 1", 2"	
Promass I	DN 3/8"...1 1/2"	
Promass M	DN 3/8"...2"	
Promass E	DN 3/8"...2"	
Promass H	DN 3/8"...1 1/2"	
Promass F	DN 3"...10"	XP-IS-DIP I, II, III/1/CDEFG
Promass F (HT)	DN 3"	(Optionally, a version for Groups A and B is available)
Promass I	DN 2", DN 1 1/2" FB	
Promass M	DN 3"	
Promass H	DN 2"	
¹⁾ convertible module		

P r o m a s s 8 4 * * * - * * * * * * * * * *		
M = current HART, 2 x frequency, status input		
Transmitter		
Promass 84	XP-IS-DIP I, II, III/1/ABCDEFGF XP-IS-DIP I, II, III/1/CDEFG	or
Sensor		
Promass A	DN 1/24"...1/8"	XP-IS-DIP I, II, III/1/ABCDEFGF
Promass M	DN 3/8"...2"	
Promass F	DN 3/8"...2"	
Promass F	DN 3"...10"	XP-IS-DIP I, II, III/1/CDEFG
Promass M	DN 3"	(Optionally, a version for Groups A and B is available)

Notified body	The measuring system was tested for approval by the following named entity: FM Global Technologies LLC
Special conditions	1. The flowmeter must be integrated into the potential equalisation system. Potential must be equalized along the intrinsically safe sensor circuits. 2. Control room equipment shall not use or generate more than 250 V rms. 3. Ratings for devices connected to terminals Nos. 26 to 27 of the Promass 83 transmitter must not exceed $U_m = 250$ V and $I_m = 500$ mA: it is impermissible to connect devices with higher ratings to these terminals (Does not apply to Promass 83***_*****R/S/T/U with intrinsically safe output circuits).  Caution! 4. Use supply wires suitable for 41 °F above ambient temperature, but at least for 176 °F. 5. Class II Group G: The surface temperature of the apparatus cannot exceed 329 °F. The user must limit the process temperature for Group G to 284 °F. 6. Transmitter enclosure G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignition proof for Cl. II, III Div. 1 Groups E, F, G. Seal not required. 7. Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Group A, B, C, D, E, F, G except Promass M DN 3" (sensor version Group C-D) Promass I DN 2" (sensor version Group C-D) Promass F DN 3"/4"/6"/10" (sensor version Group C-D) Promass H DN 2" (sensor version Group C-D) which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G. (optionally, a version for Groups A and B is available). 8. It is not permissible to connect the service adapter in explosive atmospheres. 9. Install per National Electrical Code. Install intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the explosionproof integrity of the enclosure.  Warning! 10. Substitution of components may impair intrinsic safety.

General warnings	 Warning! ■ 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 national regulations relating to the installation of devices in potentially explosive atmospheres is mandatory, if such regulations exist. ■ Open the device only when it is de-energized (and after a delay of at least 10 minutes following shutdown of the power supply). ■ The housing of the Ex-rated transmitter can be turned in 90° steps. Whereas the non-Ex version has a bayonet adapter, however, the Ex version has a thread. Recesses for centering the worm screw are provided to prevent inadvertent movement of the transmitter housing. It is permissible to turn the transmitter housing through a maximum of 180° during operation (in either direction), without compromising explosion protection. After turning the housing the worm screw must be tightened again. ■ 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). Be sure that the device is closed properly, before connecting it to power again.
-------------------------	---

Electrical connections

Power supply

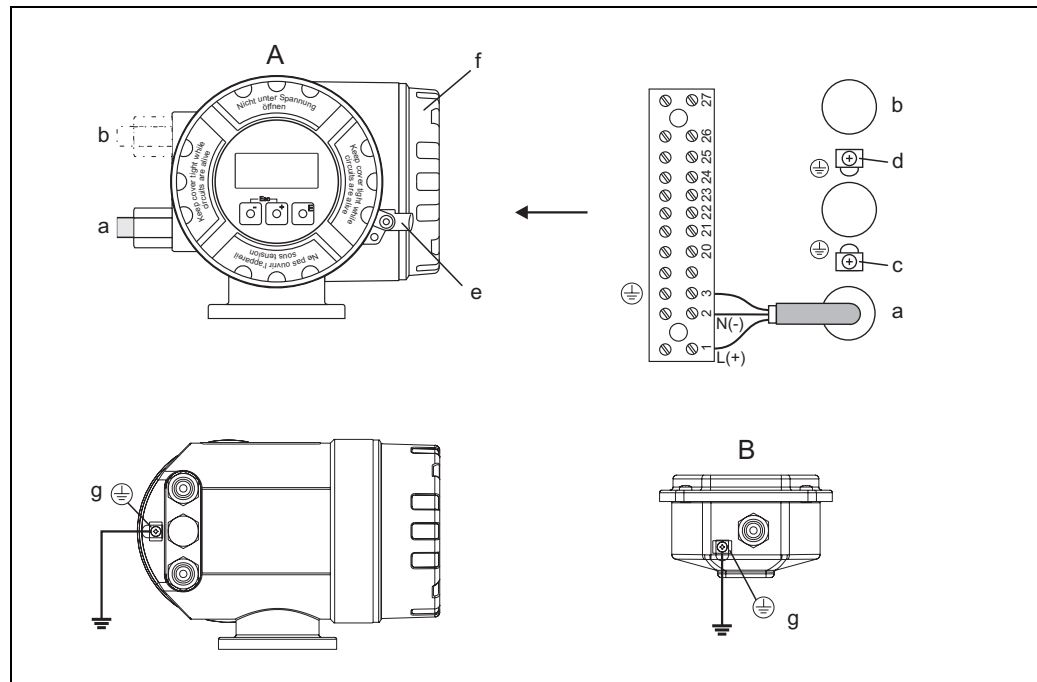


Fig. 1: Ground terminal for potential equalisation

A0001299

A Transmitter housing (compact or remote version), front view

B Connection housing of remote version

a Power supply cable

b Input/output circuit cable (see Fig. 2)

c Ground terminal for protective earth

d Ground terminal for signal cable shield (see Fig. 2)

e Securing clamp

f Connection compartment cover

g Screw terminal for connecting to potential equalisation



Caution!

- 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.
- With the remote version, the sensor's wiring compartment housing is to be grounded using the external screw terminal. Alternatively, the sensor can be connected to the potential equalization system via the pipeline when a ground connection according to regulations can be assured.

The table below contains the values that are identical for all versions, irrespective of the type code:

Terminals	1 L (+)	2 N (-)	3
Designation	Power supply (Fig. 1: a)		Protective earth
Functional Values	AC: U = 85...260 V or AC: U = 20...55 V or DC: U = 16...62 V Power consumption: 15 VA / 15 W		Caution! Follow ground network requirements for facility!
Intrinsically circuit	no		
U _m =	260 V AC		

Input/output circuit

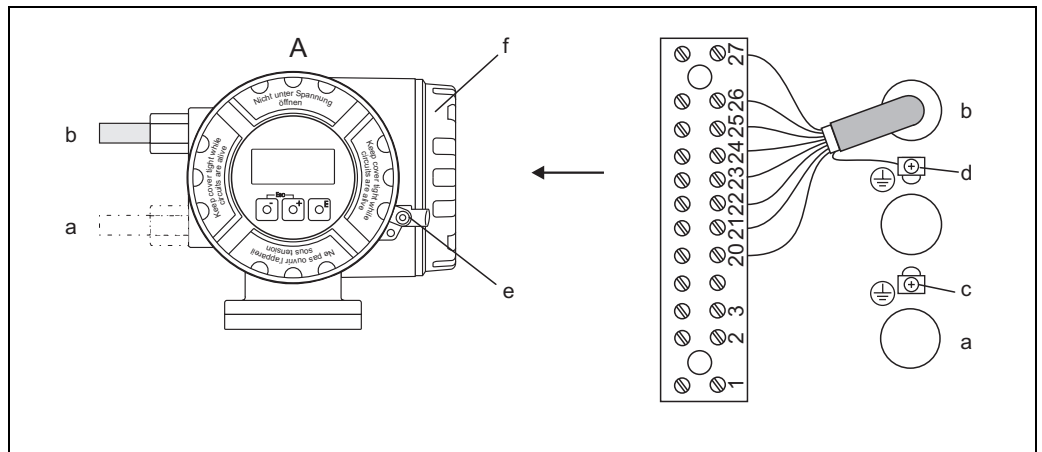


Fig. 2: Input/output circuit

A Transmitter housing (compact or remote version), front view

a Power supply cable (see Fig. 1)

b Input/output circuit cable

c Ground terminal for protective earth (see Fig. 1)

d Ground terminal for signal cable shield

e Securing clamp

f Connection compartment cover

Note!

The table below contains the values which depend on the type code (type of device). Always remember to compare the type code in the table with the code on the nameplate of your device.

Terminal assignment of input/output circuits with an intrinsically safe circuit

Transmitter Promass 83***-*****R

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***-*****R	—		—		Current output active		Current output active HART	
Safety-related relevant values								
Intrinsically safe circuit	—		—		Ex ia		Ex ia	
U _o =	—		—		21.8 V DC		21.8 V DC	
I _o =	—		—		90 mA		90 mA	
P _o =	—		—		490 mW		490 mW	
L _o IIC/IIB =	—		—		4.1 mH / 15 mH		4.1 mH / 15 mH	
C _o IIC/IIB =	—		—		150 nF / 1160 nF		150 nF / 1160 nF	
¹⁾ L _o IIC/IIB =	—		—		2 mH / 10 mH		2 mH / 10 mH	
¹⁾ C _o IIC/IIB =	—		—		80 nF / 300 nF		80 nF / 300 nF	
U _i =	—		—		30 V ²⁾		30 V ²⁾	
I _i =	—		—		10 mA ²⁾		10 mA ²⁾	
P _i =	—		—		0.3 W ²⁾		0.3 W ²⁾	
L _i =	—		—		negligible		negligible	
C _i =	—		—		6 nF		6 nF	
Functional values								
	—		—		active: 0/4...20 mA R _L < 400 Ω		active: 0/4...20 mA R _L HART ≥ 250 Ω	
¹⁾ Permissible values for simultaneous occurrence of concentrated inductances and capacitances. ²⁾ The circuitry must comply with the applicable regulations for electrical installations.								

Transmitter Promass 83***_*****S

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****S	–		–		Pulse/frequency output		Current output HART	
<i>Safety-related relevant values</i>								
Intrinsically safe circuit	–		–		Ex ia		Ex ia	
U ₀ =	–		–				21.8 V DC	
I ₀ =	–		–				90 mA	
P ₀ =	–		–				490 mW	
L ₀ IIC/IIB =	–		–				4.1 mH / 15 mH	
C ₀ IIC/IIB =	–		–				150 nF / 1160 nF	
¹⁾ L ₀ IIC/IIB =	–		–				2 mH / 10 mH	
¹⁾ C ₀ IIC/IIB =	–		–				80 nF / 300 nF	
U _i =	–		–		30 V DC		30 V DC ²⁾	
I _i =	–		–		300 mA		10 mA ²⁾	
P _i =	–		–		600 mW		0.3 W ²⁾	
L _i =	–		–		negligible		negligible	
C _i =	–		–		6 nF		6 nF	
<i>Functional values</i>								
	–		–		f = 0...5000 Hz passive: 30 V DC/250 mA		active: 0/4...20 mA R _L ≥ 250 Ω	
¹⁾ Permissible values for simultaneous occurrence of concentrated inductances and capacitances. ²⁾ The circuitry must comply with the applicable regulations for electrical installations.								

Transmitter Promass 83***_*****T

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****T	–		–		Pulse/frequency output		Current output HART	
<i>Safety-related relevant values</i>								
Intrinsically safe circuit	–		–		Ex ia		Ex ia	
U _i =	–		–		30 V DC		30 V DC	
I _i =	–		–		300 mA		100 mA	
P _i =	–		–		600 mW		1.25 W	
L _i =	–		–		negligible		negligible	
C _i =	–		–		6 nF		6 nF	
<i>Functional values</i>								
	–		–		f = 0...5000 Hz passive: 30 V DC/250 mA		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$	

Transmitter Promass 83***_*****U

Type code	20 (+)	21 (–)	22 (+)	23 (–)	24 (+)	25 (–)	26 (+)	27 (–)
83***_*****U	–		–		Current output passive		Current output passive HART	
Safety-related relevant values								
Intrinsically safe circuit	–		–		Ex ia		Ex ia	
U _i =	–		–		30 V DC		30 V DC	
I _i =	–		–		100 mA		100 mA	
P _i =	–		–		1.25 W		1.25 W	
L _i =	–		–		negligible		negligible	
C _i =	–		–		6 nF		6 nF	
Functional values								
	–		–		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$	

Terminal assignment of input/output circuits without an intrinsically safe circuit

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****A					Frequency output		Current output HART	
83***_*****B	Relay		Relay		Frequency output		Current output HART	
83***_*****C	Relay 2		Relay 1		Frequency output		Current output HART	
83***_*****D	Status input		Relay		Current output 2		Current output 1 HART	
83***_*****E	Status input		Relay		Current output 2		Current output 1 HART	
83***_*****L	Status input		Relay 2		Relay 1		Current output HART	
83***_*****M	Status input		Frequency output 2		Frequency output 1		Current output HART	
84***_*****M	Status input		Frequency output 2		Frequency output 1		Current output HART	
83***_*****W	Relay		Current output 3		Current output 2		Current output 1 HART	
83***_*****0	Status input		Current output 3		Current output 2		Current output 1 HART	
83***_*****2	Relay		Current output 2		Frequency output		Current output 1 HART	
83***_*****3	Current input		Relay		Current output 2		Current output 1 HART	
83***_*****4	Current input		Relay		Frequency output		Current output HART	
83***_*****5	Status input		Current input		Frequency output		Current output HART	
83***_*****6	Status input		Current input		Current output 2		Current output 1 HART	
Safety-related relevant values								
Intrinsically safe circuit		No						
U _m		260 V AC						
I _m		500 mA						
Functional values → see following Table								

Functional values of input/output circuits without an intrinsically safe circuit

Input/output circuit	Functional values
Current output HART	Active/passive selectable, galvanically isolated, time constant selectable (0.05...100 s), full scale value selectable, temperature coefficient: typically 0.005% o.r./°C, resolution: 0.5 μ A - active: 0/4...20 mA, $R_L \geq 250 \Omega$ - passive: 4...20 mA; supply voltage V_S 18...30 V DC; $R_i \geq 150 \Omega$
Current output	Active/passive selectable, galvanically isolated, time constant selectable (0.05...100 s), full scale value selectable, temperature coefficient: typically 0.005% o.r./°C, resolution: 0.5 μ A - active: 0/4...20 mA, $R_L < 700 \Omega$ - passive: 4...20 mA; supply voltage V_S 18...30 V DC; $R_i \geq 150 \Omega$
Impuls/Frequency output	galvanically isolated - active: 24 V DC, 25 mA (max. 250 mA during 20 ms); $R_L > 100 \Omega$ - passive: Open Collector, 30 V DC, 250 mA Frequency output Full scale frequency: 0...10000 Hz ($f_{max} = 12500$ Hz) (at Promass 84: 0...5000 Hz) on/off ratio 1:1; pulse width max. 2 s Pulse output pulse value and pulse polarity selectable pulse width configurable (0,05...2000 ms)
Relay 1	Normally open (NO or make) contact galvanically isolated max. 30 V / 0.5 A AC; 60 V / 0.1 A DC
Relay 2	Normally closed (NC or break) contact galvanically isolated max. 30 V / 0.5 A AC; 60 V / 0.1 A DC
Current input	Active/passive selectable, galvanically isolated, resolution: 2 μ A - active: 4...20 mA, $R_i \leq 150 \Omega$, $U_{out} = 24$ V DC, short-circuit proof - passive: 0/4...20 mA, $R_i \leq 150 \Omega$, $U_{max} = 30$ V DC
Status input	galvanically isolated $U = 3...30$ V DC; $R_i = 5$ k Ω

Connection of remote version connecting cable

Connection between sensor and transmitter:

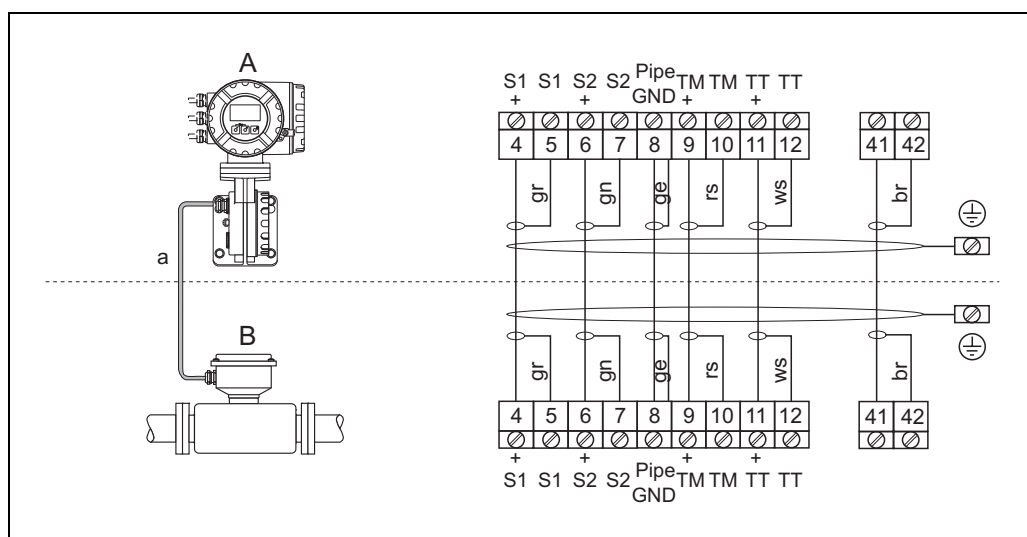


Fig. 3: Connection cable (remote version)

A0001331

- A Transmitter remote version
B Compartment housing remote version
a sensor cable

Service adapter

The service adapter is exclusively for connection to Endress+Hauser approved service interfaces.

⚠ Warning!

It is not permissible to connect the service adapter in explosive atmospheres.

Device fuse

⚠ Warning!

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

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

Cable entries

Number reference for Figures on Page 4 and Page 5:

①	Cable entries for the transmitter terminal compartment (XP version) power supply / bus cable: (Promass 83/84***_*****N/P*****) Choice of thread for cable entries, 1/2" NPT. Make sure that the XP cable glands/entries are secured to prevent working loose.
②, ③	Cable entries for the transmitter terminal compartment (remote version) sensor cable connection: Choice of thread for cable entry, 1/2" NPT.

Cable specifications

The sensor cable connection between sensor and transmitter has an IS type of protection rating.



Caution!

Use only the cable sets supplied by Endress+Hauser.

Technical data

Dimensions wall-mount housing

- The dimensions of the Ex-transmitter housing (remote version) can be seen in the following illustration. The dimensions of the Ex-transmitter housing in the compact version are also contained in this.
- The dimensions of the transmitter correspond to the standard versions. Please find these dimensions in the Technical Information.
- Weight + approx. 4.4 lbs more than the standard version (see Technical Information)

🔧 Note!

Applicable "Technical Information":

- Promass 80/83 A → TI054D
- Promass 80/83 E → TI061D
- Promass 80/83 F, M → TI053D
- Promass 80/83 I, H → TI052D

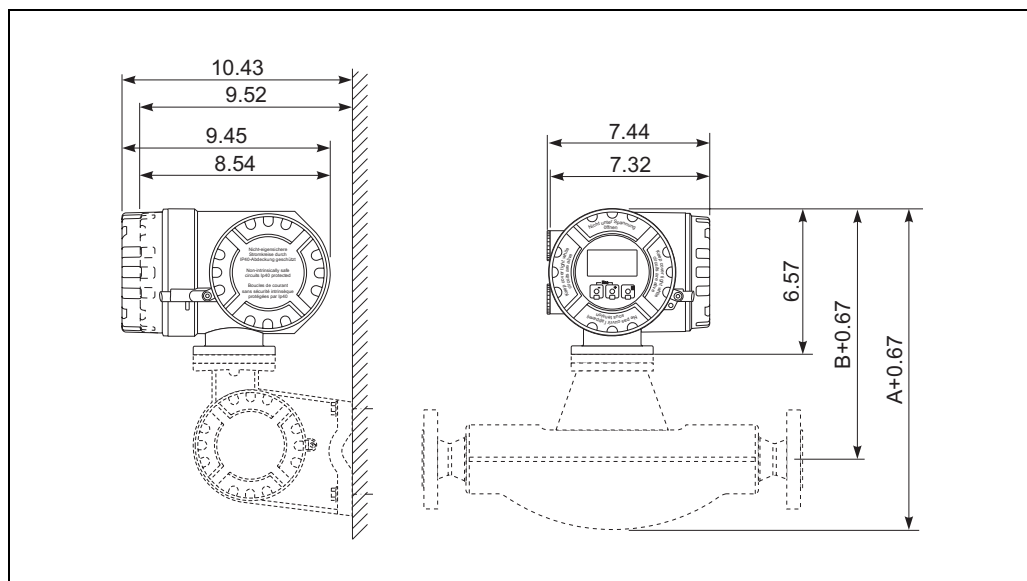
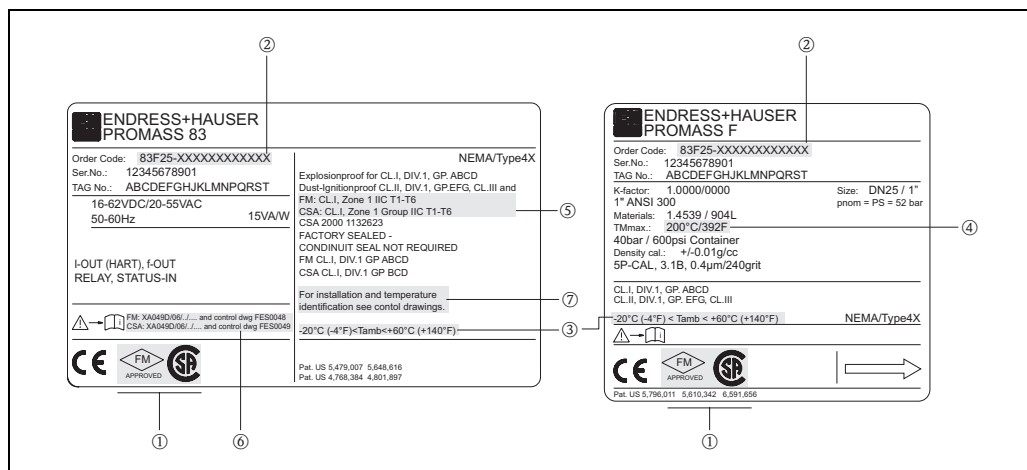


Fig. 4: Dimensions of the Ex-transmitter housing

A0001336

Device identification

Promass 83/84 transmitter and A/F/I/M/E/H sensor



A0001345

Fig. 5: Nameplate of transmitter and nameplate of sensor (example)

- 1 Label of the notified body: Factory Mutual Research
- 2 Type code
- 3 Ambient temperature range
- 4 Maximum medium temperature
- 5 Type of protection and explosion group for the measuring system
- 6 Applicable Ex documentation
- 7 Warning

Control drawings

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the FACTORY MUTUAL standard.

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 Groups IIC and Class II and III Division 1 Groups EFG

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Notes:

- Control room equipment shall not use or generate more than 250 V rms.
- Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176 °F.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329 °F. The user must limit the process temperature for Group G to 140 °C.
- Transmitter enclosure PROline G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II, III Div. 1 Groups E, F, G
- Transmitter enclosure PROline G02 is factory sealed for use in Cl. I Div. 1 Groups A, B, C, D. Means that a conduit seal is not required within 18 inches (450mm) of the enclosure.
- Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Groups A, B, C, D, E, F, G except limited versions of
PROMASS M DN80 (sensor version Group C-D)
PROMASS I DN50 (sensor version Group C-D)
PROMASS F DN80/100/150/250 (sensor version Group C-D)
PROMASS H DN50 (sensor version Group C-D)
which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G
- The minimum medium temperature is -50 °C
- Install all intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure

Temperature table

	max. medium temperature [°C]								
	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1
Ta = 45 °C: PROMASS E DN8/15/25/40/50	45	100	120	125	125	125	125	125	125
Ta = 50 °C: PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50	50 55 60 60 70 50 60	60 70 70 85 85 65 75	85 85 85 95 105 85 100	105 100 105 110 120 100 115	150 150 150 150 150 140 160	150 185* 185* 150 150 185 200	150 200* 200* 150 150 200 200	150 200* 200* 150 150 200 200	150 200* 200* 150 150 200 200
Ta = 60 °C: PROMASS A DN1/2/4 PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50 PROMASS E DN8/15/25/40/50 PROMASS F(HT) DN25/50/80	60 --- 55 60 60 70 50 60 --- 70	95 60 70 70 85 85 65 75 100 85	115 85 85 85 105 105 100 100 120 100	130 100 100 100 120 120 100 115 125 115*	140 100 150* 150* 150* 150* 140 160 125 160*	200 200 185* 185* 150* 150* 185* 200* 125 205*	200 100 200* 200* 150* 150* 200* 200* 125 235*	200 100 200* 200* 150* 150* 200* 200* 125 275*	200 100 200* 200* 150* 150* 200* 200* 125 350*

* Device shall not be installed in such way that the transmitter enclosure is located above the sensor.

Tm min. is -40 °C for Promass E Ta min. is -20 °C
Tm min. is -50 °C for Promass A/F/H/M Ta min. is -20 °C

Communication Options

Communication Options	Control Drawing
I/O option = F, H, J	see FES 0048 - 0001
I/O option = G, K	see FES 0048 - 0002
I/O option = S, T	see FES 0048 - 0004
I/O option = R, U	see FES 0048 - 0005

FM Control Drawing Div. 1 / Zone 1
Class I Zone 1
Compact Version
PROMASS 40 / 8. A / F / I / M / H / E

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

FES0048 F 1/2

F06-8xMBxxZZ-01-xx-xx-en-001

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 Groups IIC and Class II and III Division 1 Groups EFG

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Notes:

- Control room equipment shall not use or generate more than 250 V rms.
- Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176 °F.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329 °F. The user must limit the process temperature for Group G to 140 °C.
- Transmitter enclosure PROline G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II, III Div. 1 Groups E, F, G
- Transmitter enclosure PROline G02 is factory sealed for use in Cl. I Div. 1 Groups A, B, C, D. Means that a conduit seal is not required within 18 inches (450mm) of the enclosure.
- Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Group A, B, C, D, E, F, G except a limited version of
PROMASS M DN80 (sensor version Group C-D)
PROMASS I DN50 (sensor version Group C-D)
PROMASS F DN80/100/150/250 (sensor version Group C-D)
PROMASS H DN50 (sensor version Group C-D)
which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G
- Allowed cable glands: NPT 1/2", G 1/2", M20x1.5 or PG13.5
- A sensor which was connected to a Promass 60/63/64 transmitter can also be installed to a Promass 8. transmitter. For this case this control drawing is relevant for safe use, except the minimum ambient temperature which is limited to -20 °C
- Install all intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure

Temperature table

	max. medium temperature [°C]								
	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1
Ta = 45 °C PROMASS E DN25/40/50	45	100	120	125	125	125	125	125	125
Ta = 60 °C PROMASS A DN1/2/4 PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50 PROMASS E DN8/15/25/40/50 PROMASS F(HT) DN25/50/80	60 50 55 60 60 70 50 60 --- 70	95 60 70 70 85 85 65 75 100 85	115 85 85 85 105 105 100 100 120 100	130 105 100 100 120 120 100 115 125 115*	140 150 150 150 150 150 140 160 125 160*	200 150 185 185 150 150 185 200 125 205*	200 150 200 200 150 150 200 200 125 235*	200 150 200 200 150 150 200 200 125 275*	200 150 200 200 150 150 200 200 125 350*

The ambient temperature is -20 °C ... +60 °C for the transmitter and -40 °C ... +60 °C for the sensor

The minimum medium temperature is -50 °C. A special version of Promass A/F/H is suitable for medium temperatures down to -20 °C.

The minimum medium temperature for Promass E is limited to -40 °C.

FM Control Drawing Div. 1 / Zone 1
Class I Zone 1
Remote Version
PROMASS 40 / 8. A / F / I / M / H / E

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

FES0048 F 2/2

F06-8xMBxxZZ-01-xx-xx-en-002

NON HAZARDOUS LOCATION

ENTITY APPROVED Barrier
 V_{oc} Barrier I_{sc} Barrier
 C_a Barrier L_a Barrier

ENTITY APPROVED Supply
 $V_{max} = 30V$
 $P_{max} = 600mW$

HAZARDOUS LOCATION
 Cl. I, Zone 1 IIC
 Cl. I, II, III Div. 1 Group A,B,C,D,E,F,G or
 Cl. I Div. 2 Group A,B,C,D, and Cl.I,II,III Div.1 Group E,F,G

IS - HART
 IS - Passive frequency
 Power Supply

Notes:
 1) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80 °C / 176 °F
Intrinsically safe signal output:
 2) Install all intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure
WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
 4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROMASS 8 *******T**
PROMASS 40 *******T**
Terminals: 26, 27 (HART current output):
 Passive intrinsically safe circuit:

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	100 mA	1.25 W	6 nF	negligible

Connect to entity approved Barrier with
 V_{oc}, V_i or $U_o \leq V_{max} / U_i$
 I_{sc}, I_i or $I_o \leq I_{max} / I_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_a$ Barrier Or C_o Barrier – 6 nF
 $L_{cable} \leq L_a$ Barrier Or L_o Barrier

Terminals 24, 25 (Passive intrinsically safe circuit):

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	300 mA	600mW	6 nF	0

Entity approved apparatus must meet the following requirements:
 V_{oc}, V_i or $U_o \leq V_{max}$ P_{max} or $P_o \leq P_{max} / P_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_a (C_o) - 6nF$ $L_{cable} \leq L_a (L_o)$

Active:

V_{oc} / U_o	I_{sc} / I_o	P_{max} / P_o	C_a / C_o	L_a / L_o
21.8 V	90 mA	490 mW	0.15 μF	4.1 mH

Cable parameters for Intrinsic Safety:
 $C_{cable} \leq 0.15 \mu F$ if V_{oc} (of Barrier) $\leq 21.8 V$
 $C_{cable} \leq C_a$ Barrier – 6 nF if V_{oc} (of Barrier) $\geq 21.8 V$
 $L_{cable} \leq 4.1 mH$

Terminals 24, 25 (Passive intrinsically safe circuit):

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	300 mA	600mW	6 nF	0

Entity approved supply must meet the following requirements:
 V_{oc}, V_i or $U_o \leq V_{max}$ P_{max} or $P_o \leq P_{max} / P_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_a (C_o) - 6nF$ $L_{cable} \leq L_a (L_o)$

Aenderungen:

	A	B	C	D	E
16.05.01 / Bn	F	27.04.04/MDI			
17.12.01/MDI	G				
07.06.02/MDI	H				
29.10.02/MDI	J				
06.06.03/UD	K				

Alle gesetzlichen Urheberrechte vorbehalten.
 Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.

Ersetzt durch:
 Ersteller: FES / ID 1090
 File: M:ZEICHNUNG\FES0048\F040323.doc

FM CONTROL DRAWING Cl.1, Div. 1
PROMASS 40 / 8. A / F / I / M / H / E
 Entity concept Commodul HART IS (Option S/T)

Massstab: Gezeichnet: 06.10.00 Bn
 Geprüft: Ex-geprüft: 27.04.04 MDI
 Gesehen:

FES0048-0004 F

Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach

F06-8xMBxxZZ-01-xx-xx-en-006

NON HAZARDOUS LOCATION

ENTITY APPROVED Barrier
 V_{oc} Barrier I_{sc} Barrier
 C_a Barrier L_a Barrier

ENTITY APPROVED Supply
 $V_{max} = 30V$
 $P_{max} = 600mW$

HAZARDOUS LOCATION
 Cl. I, Zone 1 IIC
 Cl. I, II, III Div. 1 Group A,B,C,D,E,F,G or
 Cl. I Div. 2 Group A,B,C,D, and Cl.I,II,III Div.1 Group E,F,G

IS - HART
 IS - Current Output
 Power Supply

Notes:
 2) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80 °C / 176 °F
Intrinsically safe signal output:
 2) Install all intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure
WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
 4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROMASS 8 *******U**
PROMASS 40 *******U**
Terminals: 26, 27 (HART current output)
Terminals: 24, 25 (current output)

Passive:

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	100 mA	1.25 W	6 nF	negligible

Connect to entity approved Barrier with
 V_{oc}, V_i or $U_o \leq V_{max} / U_i$
 I_{sc}, I_i or $I_o \leq I_{max} / I_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_a$ Barrier Or C_o Barrier – 6 nF
 $L_{cable} \leq L_a$ Barrier Or L_o Barrier

Active:

V_{oc} / U_o	I_{sc} / I_o	P_{max} / P_o	C_a / C_o	L_a / L_o
21.8 V	90 mA	490 mW	0.15 μF	4.1 mH

Cable parameters for Intrinsic Safety:
 $C_{cable} \leq 0.15 \mu F$ if V_{oc} (of Barrier) $\leq 21.8 V$
 $C_{cable} \leq C_a$ Barrier – 6 nF if V_{oc} (of Barrier) $\geq 21.8 V$
 $L_{cable} \leq 4.1 mH$

Aenderungen:

	A	B	C	D	E
16.05.01 / Bn	F	27.04.04/MDI			
17.12.01/MDI	G				
07.06.02/MDI	H				
29.10.02/MDI	J				
06.06.03/UD	K				

Alle gesetzlichen Urheberrechte vorbehalten.
 Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.

Ersetzt durch:
 Ersteller: FES / ID 1090
 File: M:ZEICHNUNG\FES0048\F040323.doc

FM CONTROL DRAWING Cl.1, Div. 1
PROMASS 40 / 8. A / F / I / M / H / E
 Entity concept Commodul HART IS (Option R/U)

Massstab: Gezeichnet: 06.10.00 Bn
 Geprüft: Ex-geprüft: 27.04.04 MDI
 Gesehen:

FES0048-0005 F

Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach

F06-8xMBxxZZ-01-xx-xx-en-007



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Safety Instructions

Proline Promass 83/84

Division 1

Ex documentation

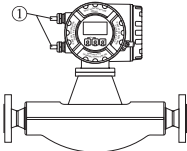
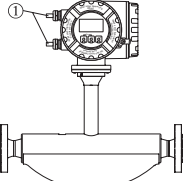
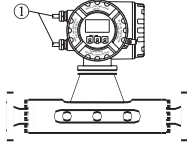
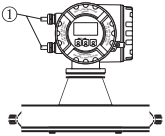
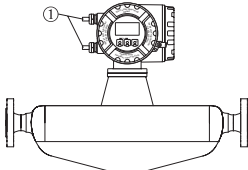
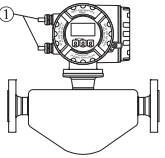
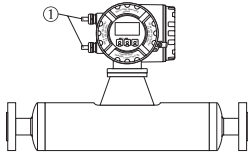
This documentation is an integral part of the following Operating Instructions:

- BA059D, Operating Instruction, Proline Promass 83
- BA109D, Operating Instruction, Proline Promass 84

Contents

Measuring system compact version	20
Measuring system remote version	21
Temperature tables compact version	22
Temperature tables sensor remote version	22
Approvals	23
Notified body	25
Special conditions	25
General warnings	25
Electrical connections	26
Connection of remote version connecting cable	30
Service adapter	31
Device fuse	31
Cable entries	31
Cable specifications	31
Technical data	31
Device identification	32
Control drawings	33

Measuring system compact version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
 F  F (HT)  M  A  H  E  I  ④		
Division 1 / Zone 0 / Zone 1 Hazardous area Transmitter Promass 83/84: or Transmitter Promass 83/84: - Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits - Sensor: intrinsically safe Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG - Promass F; DN 8...50 - Promass F*; (HT) High temperature; DN 25, DN 50 - Promass M; DN 8...50 - Promass E*; DN 8...40 - Promass A; DN 1...4 - Promass H*; DN 8...40 - Promass I*; DN 8...40 * not Proline Promass 84 - Ambient-/fluid temperature ranges and temperature class see Page 22. ① = Cable entries, for number reference see Page 31. ④ = Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ⑤ = Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) - F (HT) = Promass F high-temperature version	Division 2 / Zone 2	Safe area  ⑤

A0001261

Measuring system remote version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
Division 1 / Zone 0 / Zone 1 Division 2 / Zone 2		Safe area
Division 1 / Zone 0 / Zone 1 Division 2 / Zone 2		Safe area
Transmitter Promass 83/84: ■ Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits ■ Sensor: intrinsically safe Cl. I Div. 1 Groups ABCD or Cl. I Zone 1 Group IIC and Cl. II and III Div. 1 Groups EFG – Promass F; DN 8...50 – Promass F*; (HT) High temperature; DN 25, DN 50 – Promass M; DN 8...50 – Promass E*; DN 8...40 – Promass A; DN 1...4 – Promass H*; DN 8...40 – Promass I*; DN 8...40 * not Proline Promass 84 ■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor. ■ Ambient-/fluid temperature ranges and temperature class see Page 22. ■ ①, ②, ③= Cable entries, for number reference see Page 31. ■ ④= Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ■ ⑤= Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) ■ ⑥= transmitter Promass 83/84 ■ F (LN) = Promass F Long-neck version (Remote version for heating) ■ F (HT) = Promass F high-temperature version Transmitter Promass 83/84: ■ Housing: explosionproof (use only cable entry 1/2" NPT) for use in Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG Electronics, associated apparatus: provides intrinsically safe sensor circuits ■ Sensor: intrinsically safe Cl. I Div. 1 Groups CD or Cl. I Zone 1 Group IIB and Cl. II and III Div. 1 Groups EFG – Promass F; DN 80...250 – Promass F*; (HT) High temperature; DN 80 – Promass M; DN 80 – Promass H*; DN 50 – Promass I*; DN 50, DN 40 FB (full bore) * not Proline Promass 84 ■ Optionally, a version for Groups A and B is available. ■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor. ■ Ambient-/fluid temperature ranges and temperature class see Page 22. ■ ①, ②, ③= Cable entries, for number reference see Page 31. ■ ④= Operation via HART handheld DXR 375 (Ex version, only for intrinsically safe current circuits) ■ ⑤= Operation via HART handheld DXR 375 (Ex version, only for non-intrinsically safe current circuits) ■ ⑥= transmitter Promass 83/84 ■ F (LN) = Promass F Long-neck version (Remote version for heating) ■ F (HT) = Promass F high-temperature version		

A0001254

Temperature tables compact version

Max. medium temperature [°C] (at T _a = 45 °C)		T6 85 °C	T5 100 °C	T4A 120 °C	T4 135 °C	T3A 180 °C	T2C 230 °C	T2B 260 °C	T1 450 °C
Promass E	DN 8...50	45	100	120	125	125	125	125	125

Max. medium temperature [°C] (at T _a = 50 °C)		T6 85 °C	T5 100 °C	T4A 120 °C	T4 135 °C	T3A 180 °C	T2C 230 °C	T2B 260 °C	T1 450 °C
Promass F	DN 8...40	55	70	85	100	150	185*	200*	200*
Promass F	DN 50...250	60	70	85	105	150	185*	200*	200*
Promass I	DN 8...25, 15 FB	60	95	95	110	150	150	150	150
Promass I	DN 40...50, 25 FB, 40 FB	70	85	105	120	150	150	150	150
Promass M	DN 8...80	50	60	85	105	150	150	150	150
Promass E	DN 25...50	50	100	120	125	125	125	125	125
Promass H	DN 8	50	65	85	100	140	185	200	200
Promass H	DN 15...50	60	75	100	115	160	200	200	200

Max. medium temperature [°C] (at T _a = 60 °C)		T6 85 °C	T5 100 °C	T4A 120 °C	T4 135 °C	T3A 180 °C	T2C 230 °C	T2B 260 °C	T1 450 °C
Promass A	DN 1...4	60	95	115	130	140	200	200	200
Promass F	DN 8...40	55	70	85	100	150*	185*	200*	200*
Promass F	DN 50...250	60	70	85	100	150*	185*	200*	200*
Promass F, HT	DN 25, 50, 80	70	85	100	115*	160*	205*	235*	350*
Promass I	DN 8...25, 15 FB	60	95	95	110	150*	150*	150*	150*
Promass I	DN 40...50, 25 FB, 40 FB	70	85	105	120	150*	150*	150*	150*
Promass M	DN 8...80	–	60	85	100	100	100	100	100
Promass E	DN 25...50	–	100	120	125	125	125	125	125
Promass H	DN 8	50	65	85	100	140	185*	200*	200*
Promass H	DN 15...50	60	75	100	115	160	200*	200*	200*

* The maximum permissible fluid temperatures apply only when the transmitter is installed in such a way that it is not above the sensor and heat can be removed freely by convection in all directions.

- The minimum **fluid temperature** is –50 °C for Promass A/F/I/M/H, and –40 °C for Promass E.
- The minimum **ambient temperature** is –20 °C. A version for ambient temperatures up to –40 °C is optionally available.

Temperature tables sensor remote version

Max. medium temperature [°C] (at T _a = 45 °C)		T6 85 °C	T5 100 °C	T4A 120 °C	T4 135 °C	T3A 180 °C	T2C 230 °C	T2B 260 °C	T1 450 °C
Promass E	DN 8...50	45	100	120	125	125	125	125	125

Max. medium temperature [°C] (at T _a = 60 °C)		T6 85 °C	T5 100 °C	T4A 120 °C	T4 135 °C	T3A 180 °C	T2C 230 °C	T2B 260 °C	T1 450 °C
Promass A	DN 1...4	60	95	115	130	140	200	200	200
Promass F	DN 8...40	55	70	85	100	150	185	200	200
Promass F	DN 50...250	60	70	85	105	150	185	200	200
Promass F, HT	DN 25, 50, 80	70	85	100	115	160	205	235	350
Promass I	DN 8...25, 15 FB	60	95	95	110	150	150	150	150
Promass I	DN 40...50, 25 FB, 40 FB	70	85	105	120	150	150	150	150
Promass M	DN 8...80	50	60	85	105	150	150	150	150
Promass E	DN 25...50	–	100	120	125	125	125	125	125
Promass H	DN 8	50	65	85	100	140	185	200	200
Promass H	DN 15...50	60	75	100	115	160	200	200	200

- The minimum **fluid temperature** is –50 °C for Promass A/F/I/M/H, and –40 °C for Promass E.
- The minimum **ambient temperature** is –40 °C.

Transmitter

- The Promass 83/84 (remote version) transmitter has a T6 temperature class rating when installed in the EEx d housing for operation at ambient temperatures up to T_a = 60 °C.
- The minimum **ambient temperature** is –20 °C. A version for ambient temperatures up to –40 °C is optionally available.

Note!

At the specified medium temperatures, the equipment is not subjected to temperatures impermissible for the temperature class in question.

Approvals

Nr. / Approval type	Description
160686-1132623 (Special notes, see Page 25)	for the electric flow measuring system Proline Promass 83/84 Identification: see below

Compact version

P r o m a s s 8 3 * * * _ * * * * * * * * * *		
A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay¹⁾ D = current HART, frequency, relay, status input¹⁾ E = current HART, current, relay, status input¹⁾ L = current HART, 2 x relay, status input¹⁾ M = current HART, 2 x frequency, status input¹⁾ R = current HART (Ex ia) active, current (Ex ia) active S = current HART (Ex ia) active, frequency (Ex ia) T = current HART (Ex ia) passive, frequency (Ex ia) U = current HART (Ex ia) passive, current (Ex ia) passive W = current HART, 2 x current, relay¹⁾ 0 = current HART, 2 x current, status input¹⁾ 2 = current HART, frequency, current, relay¹⁾ 3 = current HART, current, relay, current input¹⁾ 4 = current HART, frequency, relay, current input¹⁾ 5 = current HART, frequency, current input, status input¹⁾ 6 = current HART, current, current input, status input¹⁾		
Promass 83 A	DN 1...4	XP-IS-DIP I, II, III/1/ABCDEFG
Promass 83 F	DN 8...50	
Promass 83 F (HT)	DN 25, 50	
Promass 83 F (HT)	DN 25, 50	
Promass 83 M	DN 8...50	
Promass 83 E	DN 8...50	
Promass 83 H	DN 8...40	
Promass 83 F	DN 80...250	XP-IS-DIP I, II, III/1/CDEFG
Promass 83 F (HT)	DN 80	(Optionally, a version for Groups A and B is available)
Promass 83 I	DN 50, DN 40 FB	
Promass 83 M	DN 80	
Promass 83 H	DN 50	
¹⁾ convertible module		

P r o m a s s 8 4 * * * _ * * * * * * * * * *		
M = current HART, 2 x frequency, status input		
Promass A	DN 1...4	XP-IS-DIP I, II, III/1/ABCDEFG
Promass F	DN 8...50	
Promass M	DN 8...50	
Promass F	DN 80...250	XP-IS-DIP I, II, III/1/CDEFG
Promass M	DN 80	(Optionally, a version for Groups A and B is available)

Remote version

P r o m a s s 8 3 * * * - * * * * * * * * * *		
A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay¹⁾ D = current HART, frequency, relay, status input¹⁾ E = current HART, current, relay, status input¹⁾ L = current HART, 2 x relay, status input¹⁾ M = current HART, 2 x frequency, status input¹⁾ R = current HART (Ex ia) active, current (Ex ia) active S = current HART (Ex ia) active, frequency (Ex ia) T = current HART (Ex ia) passive, frequency (Ex ia) U = current HART (Ex ia) passive, current (Ex ia) passive W = current HART, 2 x current, relay¹⁾ 0 = current HART, 2 x current, status input¹⁾ 2 = current HART, frequency, current, relay¹⁾ 3 = current HART, current, relay, current input¹⁾ 4 = current HART, frequency, relay, current input¹⁾ 5 = current HART, frequency, current input, status input¹⁾ 6 = current HART, current, current input, status input¹⁾		
Transmitter		
Promass 83	XP-IS-DIP I, II, III/1/ABCDEFGF XP-IS-DIP I, II, III/1/CDEFG	or
Sensor		
Promass A	DN 1...4	XP-IS-DIP I, II, III/1/ABCDEFGF
Promass F	DN 8...50	
Promass F (HT)	DN 25, 50	
Promass I	DN 8...40	
Promass M	DN 8...50	
Promass E	DN 8...50	
Promass H	DN 8...40	
Promass F	DN 80...250	XP-IS-DIP I, II, III/1/CDEFG
Promass F (HT)	DN 80	(Optionally, a version for Groups A and B is available)
Promass I	DN 50, DN 40 FB	
Promass M	DN 80	
Promass H	DN 50	
¹⁾ convertible module		

P r o m a s s 8 4 * * * - * * * * * * * * * *		
M = current HART, 2 x frequency, status input		
Transmitter		
Promass 84	XP-IS-DIP I, II, III/1/ABCDEFGF XP-IS-DIP I, II, III/1/CDEFG	or
Sensor		
Promass A	DN 1...4	XP-IS-DIP I, II, III/1/ABCDEFGF
Promass M	DN 8...50	
Promass F	DN 8...50	
Promass F	DN 80...250	XP-IS-DIP I, II, III/1/CDEFG
Promass M	DN 80	(Optionally, a version for Groups A and B is available)

Notified body

The measuring system was tested for approval by the following named entity:
CSA (Canadian Standards Association)

Special conditions

1. The flowmeter must be integrated into the potential equalisation system. Potential must be equalized along the intrinsically safe sensor circuits.
2. Control room equipment shall not use or generate more than 250 V rms.
3. Ratings for devices connected to terminals Nos. 26 to 27 of the Promass 83 transmitter must not exceed $U_m = 250$ V and $I_m = 500$ mA: it is impermissible to connect devices with higher ratings to these terminals (Does not apply to Promass 83***_*****F with intrinsically safe output circuits).

**Caution!**

4. Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C.
5. Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C. The user must limit the process temperature for Group G to 140 °C.
6. Transmitter enclosure G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignition proof for Cl. II, III Div. 1 Groups E, F, G. Seal not required for Groups B, C and D.
7. Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Group A, B, C, D, E, F, G except
Promass M DN 80 (sensor version Group C-D)
Promass I DN 50 (sensor version Group C-D)
Promass F DN 80/100/150/250 (sensor version Group C-D)
Promass H DN 50 (sensor version Group C-D)
which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G.
(optionally, a version for Groups A and B is available)
8. It is not permissible to connect the service adapter in explosive atmospheres.
9. Install per Canadian Electrical Code. Install intrinsically safe circuits per CEC Part I, Section 18, Appendix F, respecting the explosion-proof integrity of the housing.

 Warning!

10. Substitution of components may impair intrinsic safety.

General warnings
 Warning!

- 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 national regulations relating to the installation of devices in potentially explosive atmospheres is mandatory, if such regulations exist.
- Open the device only when it is de-energized (and after a delay of at least 10 minutes following shutdown of the power supply).
- The housing of the Ex-rated transmitter can be turned in 90° steps. Whereas the non-Ex version has a bayonet adapter, however, the Ex version has a thread. Recesses for centering the worm screw are provided to prevent inadvertent movement of the transmitter housing. It is permissible to turn the transmitter housing through a maximum of 180° during operation (in either direction), without compromising explosion protection. After turning the housing the worm screw must be tightened again.
- 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). Be sure that the device is closed properly, before connecting it to power again.

Electrical connections

Power supply

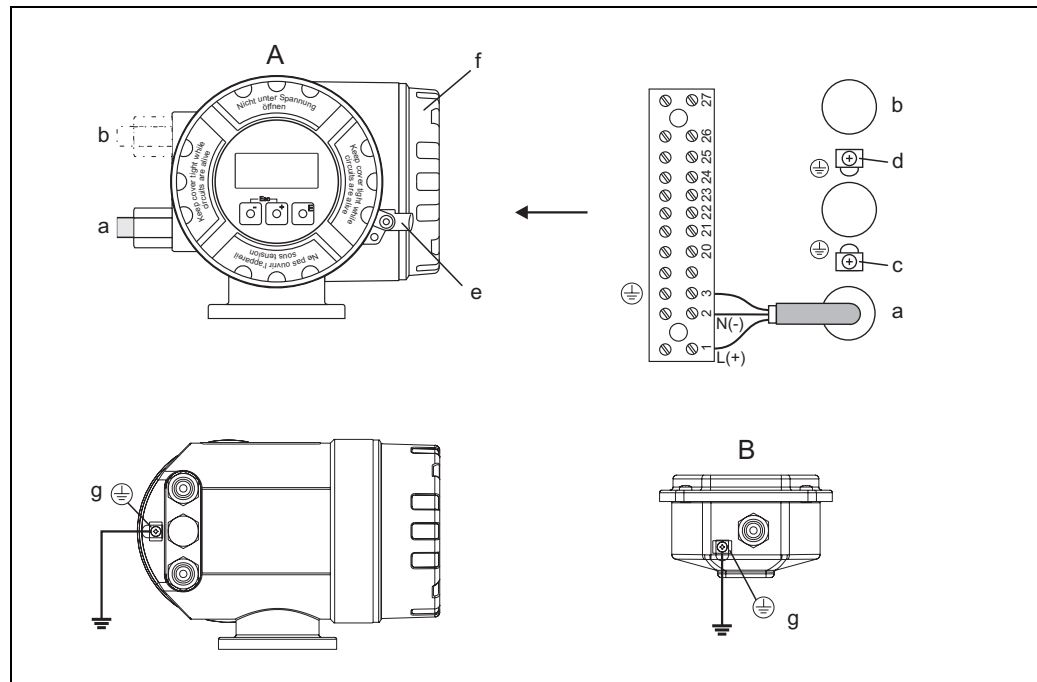


Fig. 6: Ground terminal for potential equalisation

A0001299

A Transmitter housing (compact or remote version), front view

B Connection housing of remote version

a Power supply cable

b Input/output circuit cable (see Fig. 7)

c Ground terminal for protective earth

d Ground terminal for signal cable shield (see Fig. 7)

e Securing clamp

f Connection compartment cover

g Screw terminal for connecting to potential equalisation



Caution!

- 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.
- With the remote version, the sensor's wiring compartment housing is to be grounded using the external screw terminal. Alternatively, the sensor can be connected to the potential equalization system via the pipeline when a ground connection according to regulations can be assured.

The table below contains the values that are identical for all versions, irrespective of the type code:

Terminals	1 L (+)	2 N (-)	3
Designation	Power supply (Fig. 6: a)		Protective earth
Functional Values	AC: U = 85...260 V or AC: U = 20...55 V or DC: U = 16...62 V Power consumption: 15 VA / 15 W		Caution! Follow ground network requirements for facility!
Intrinsically circuit	no		
U _m =	260 V AC		

Input/output circuit

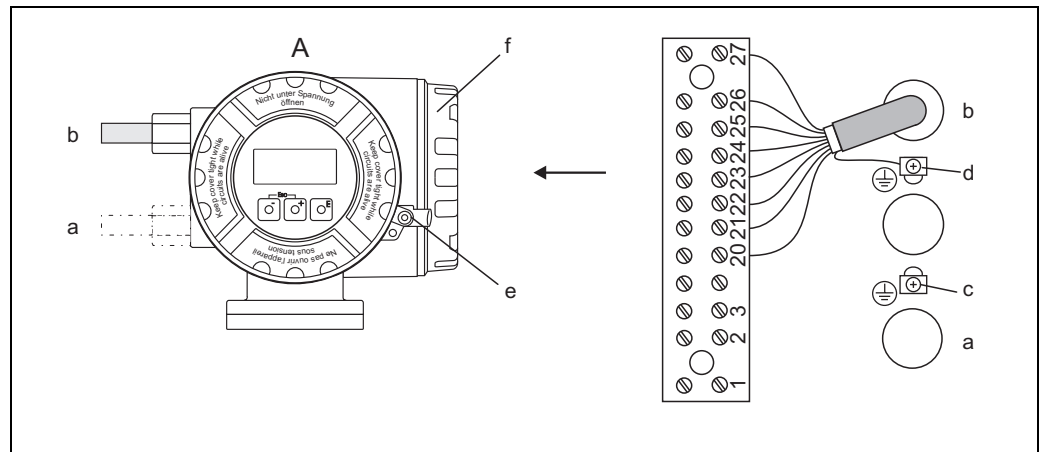


Fig. 7: Input/output circuit

A0001298

A Transmitter housing (compact or remote version), front view

a Power supply cable (see Fig. 6)

b Input/output circuit cable

c Ground terminal for protective earth (see Fig. 6)

d Ground terminal for signal cable shield

e Securing clamp

f Connection compartment cover

Note!

The table below contains the values which depend on the type code (type of device). Always remember to compare the type code in the table with the code on the nameplate of your device.

Terminal assignment of input/output circuits with an intrinsically safe circuit

Transmitter Promass 83***_*****R

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****R	—		—		Current output active		Current output active HART	
Safety-related relevant values								
Intrinsically safe circuit	—		—		Ex ia		Ex ia	
U _o =	—		—		21.8 V DC		21.8 V DC	
I _o =	—		—		90 mA		90 mA	
P _o =	—		—		490 mW		490 mW	
L _o IIC/IIB =	—		—		4.1 mH / 15 mH		4.1 mH / 15 mH	
C _o IIC/IIB =	—		—		150 nF / 1160 nF		150 nF / 1160 nF	
¹⁾ L _o IIC/IIB =	—		—		2 mH / 10 mH		2 mH / 10 mH	
¹⁾ C _o IIC/IIB =	—		—		80 nF / 300 nF		80 nF / 300 nF	
U _i =	—		—		30 V ²⁾		30 V ²⁾	
I _i =	—		—		10 mA ²⁾		10 mA ²⁾	
P _i =	—		—		0.3 W ²⁾		0.3 W ²⁾	
L _i =	—		—		negligible		negligible	
C _i =	—		—		6 nF		6 nF	
Functional values								
	—		—		active: 0/4...20 mA R _L < 400 Ω		active: 0/4...20 mA R _L HART ≥ 250 Ω	
¹⁾ Permissible values for simultaneous occurrence of concentrated inductances and capacitances. ²⁾ The circuitry must comply with the applicable regulations for electrical installations.								

Transmitter Promass 83***_*****S

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****S	–		–		Pulse/frequency output		Current output HART	
<i>Safety-related relevant values</i>								
Intrinsically safe circuit	–		–		Ex ia		Ex ia	
U ₀ =	–		–				21.8 V DC	
I ₀ =	–		–				90 mA	
P ₀ =	–		–				490 mW	
L ₀ IIC/IIB =	–		–				4.1 mH / 15 mH	
C ₀ IIC/IIB =	–		–				150 nF / 1160 nF	
¹⁾ L ₀ IIC/IIB =	–		–				2 mH / 10 mH	
¹⁾ C ₀ IIC/IIB =	–		–				80 nF / 300 nF	
U _i =	–		–		30 V DC		30 V DC ²⁾	
I _i =	–		–		300 mA		10 mA ²⁾	
P _i =	–		–		600 mW		0.3 W ²⁾	
L _i =	–		–		negligible		negligible	
C _i =	–		–		6 nF		6 nF	
<i>Functional values</i>								
	–		–		f = 0...5000 Hz passive: 30 V DC/250 mA		active: 0/4...20 mA R _L ≥ 250 Ω	
¹⁾ Permissible values for simultaneous occurrence of concentrated inductances and capacitances. ²⁾ The circuitry must comply with the applicable regulations for electrical installations.								

Transmitter Promass 83***_*****T

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****T	–		–		Pulse/frequency output		Current output HART	
<i>Safety-related relevant values</i>								
Intrinsically safe circuit	–		–		Ex ia		Ex ia	
U _i =	–		–		30 V DC		30 V DC	
I _i =	–		–		300 mA		100 mA	
P _i =	–		–		600 mW		1.25 W	
L _i =	–		–		negligible		negligible	
C _i =	–		–		6 nF		6 nF	
<i>Functional values</i>								
	–		–		f = 0...5000 Hz passive: 30 V DC/250 mA		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$	

Transmitter Promass 83***_*****U

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****U	—		—		Current output passive		Current output passive HART	
Safety-related relevant values								
Intrinsically safe circuit	—		—		Ex ia		Ex ia	
U _i =	—		—		30 V DC		30 V DC	
I _i =	—		—		100 mA		100 mA	
P _i =	—		—		1.25 W		1.25 W	
L _i =	—		—		negligible		negligible	
C _i =	—		—		6 nF		6 nF	
Functional values								
	—		—		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{\text{supply}} - 9 \text{ V}}{25 \text{ mA}}$	

Terminal assignment of input/output circuits without an intrinsically safe circuit

Type code	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****A					Frequency output		Current output HART	
83***_*****B	Relay		Relay		Frequency output		Current output HART	
83***_*****C	Relay 2		Relay 1		Frequency output		Current output HART	
83***_*****D	Status input		Relay		Current output 2		Current output 1 HART	
83***_*****E	Status input		Relay		Current output 2		Current output 1 HART	
83***_*****L	Status input		Relay 2		Relay 1		Current output HART	
83***_*****M	Status input		Frequency output 2		Frequency output 1		Current output HART	
84***_*****M	Status input		Frequency output 2		Frequency output 1		Current output HART	
83***_*****W	Relay		Current output 3		Current output 2		Current output 1 HART	
83***_*****0	Status input		Current output 3		Current output 2		Current output 1 HART	
83***_*****2	Relay		Current output 2		Frequency output		Current output 1 HART	
83***_*****3	Current input		Relay		Current output 2		Current output 1 HART	
83***_*****4	Current input		Relay		Frequency output		Current output HART	
83***_*****5	Status input		Current input		Frequency output		Current output HART	
83***_*****6	Status input		Current input		Current output 2		Current output 1 HART	
Safety-related relevant values								
Intrinsically safe circuit		No						
U _m		260 V AC						
I _m		500 mA						
Functional values → see following Table								

Functional values of input/output circuits without an intrinsically safe circuit

Input/output circuit	Functional values
Current output HART	Active/passive selectable, galvanically isolated, time constant selectable (0.05...100 s), full scale value selectable, temperature coefficient: typically 0.005% o.r./°C, resolution: 0.5 μ A - active: 0/4...20 mA, $R_L \geq 250 \Omega$ - passive: 4...20 mA; supply voltage V_S 18...30 V DC; $R_i \geq 150 \Omega$
Current output	Active/passive selectable, galvanically isolated, time constant selectable (0.05...100 s), full scale value selectable, temperature coefficient: typically 0.005% o.r./°C, resolution: 0.5 μ A - active: 0/4...20 mA, $R_L < 700 \Omega$ - passive: 4...20 mA; supply voltage V_S 18...30 V DC; $R_i \geq 150 \Omega$
Impuls/Frequency output	galvanically isolated - active: 24 V DC, 25 mA (max. 250 mA during 20 ms); $R_L > 100 \Omega$ - passive: Open Collector, 30 V DC, 250 mA Frequency output Full scale frequency: 0...10000 Hz ($f_{max} = 12500$ Hz) (at Promass 84: 0...5000 Hz) on/off ratio 1:1; pulse width max. 2 s Pulse output pulse value and pulse polarity selectable pulse width configurable (0,05...2000 ms)
Relay 1	Normally open (NO or make) contact galvanically isolated max. 30 V / 0.5 A AC; 60 V / 0.1 A DC
Relay 2	Normally closed (NC or break) contact galvanically isolated max. 30 V / 0.5 A AC; 60 V / 0.1 A DC
Current input	Active/passive selectable, galvanically isolated, resolution: 2 μ A - active: 4...20 mA, $R_i \leq 150 \Omega$, $U_{out} = 24$ V DC, short-circuit proof - passive: 0/4...20 mA, $R_i \leq 150 \Omega$, $U_{max} = 30$ V DC
Status input	galvanically isolated $U = 3...30$ V DC; $R_i = 5$ k Ω

Connection of remote version connecting cable

Connection between sensor and transmitter:

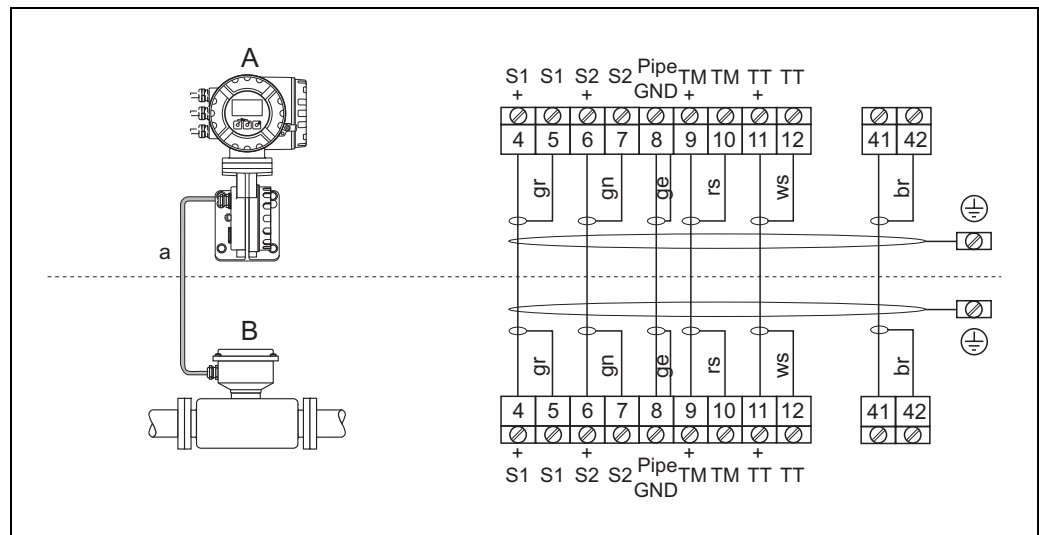


Fig. 8: Connection cable (remote version)

A0001331

- A Transmitter remote version
- B Compartment housing remote version
- a sensor cable

Service adapter

The service adapter is exclusively for connection to Endress+Hauser approved service interfaces.

⚠ Warning!

It is not permissible to connect the service adapter in explosive atmospheres.

Device fuse

⚠ Warning!

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

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

Cable entries

Number reference for Figures on Page 23 and Page 24:

①	Cable entries for the transmitter terminal compartment (XP version) power supply / bus cable: (Promass 83/84***_*****N/P*****) Choice of thread for cable entries, 1/2" NPT. Make sure that the XP cable glands/entries are secured to prevent working loose and that the seals are installed immediately adjacent to the housing, if required.
②, ③	Cable entries for the transmitter terminal compartment (remote version) sensor cable connection: Choice of thread for cable entry, 1/2" NPT.

Cable specifications

The sensor cable connection between sensor and transmitter has an IS type of protection rating.



Caution!

Use only the cable sets supplied by Endress+Hauser.

Technical data

Dimensions

- The dimensions of the Ex-transmitter housing (remote version) can be seen in the following illustration. The dimensions of the Ex-transmitter housing in the compact version are also contained in this.
- The dimensions of the transmitter correspond to the standard versions.
Please find these dimensions in the Technical Information.
- Weight + approx. 2 kg more than the standard version (see Technical Information).

🔧 Note!

Applicable "Technical Information":

- Promass 80/83 A → TI054D
- Promass 80/83 E → TI061D
- Promass 80/83 F, M → TI053D

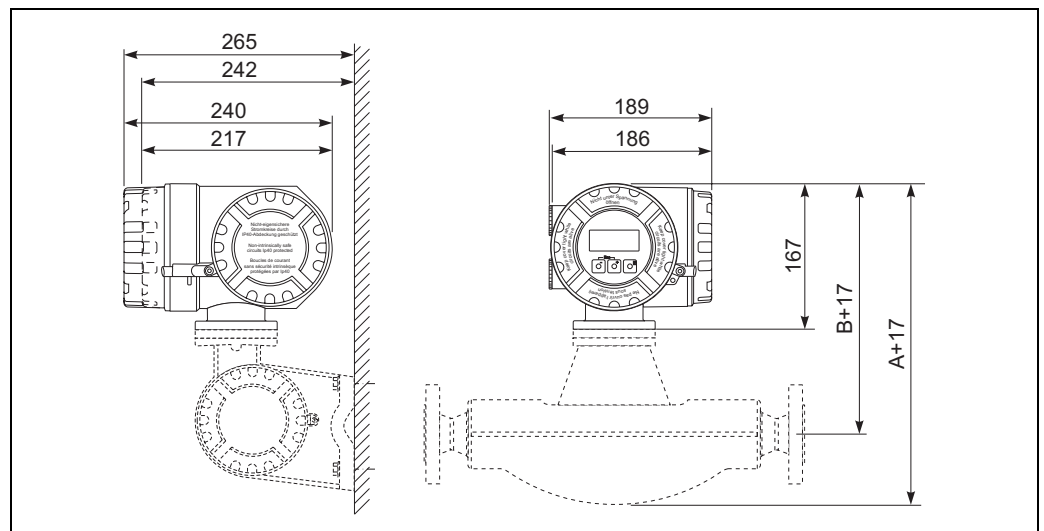


Fig. 9: Dimensions of the Ex-transmitter housing

A0001333

Device identification

Promss 83/84 transmitter and A/F/I/M/E/H sensor

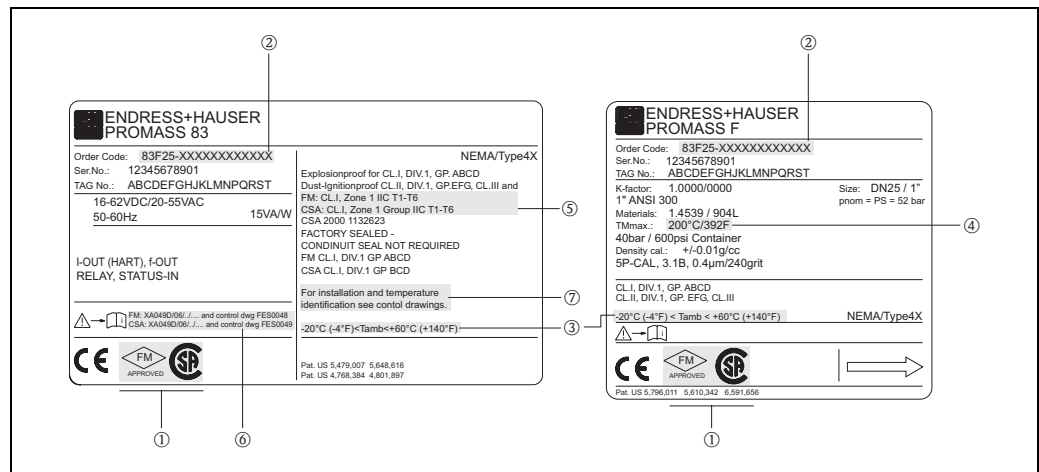


Fig. 10: Nameplate of transmitter and nameplate of sensor (example Promass 83)

A0001345

- 1 Label of the notified body: Factory Mutual Research
- 2 Type code
- 3 Ambient temperature range
- 4 Maximum medium temperature
- 5 Type of protection and explosion group for the measuring system
- 6 Applicable Ex documentation
- 7 Warning

Control drawings

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the CSA (Canadian Standards Association).

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 Groups IIC and Class II and III Division 1 Groups EFG

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Notes:

- Control room equipment shall not use or generate more than 250 V rms.
- Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176 °F.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329 °F. The user must limit the process temperature for Group G to 140 °C.
- Transmitter enclosure PROline G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II, III Div. 1 Groups E, F, G.
- Transmitter enclosure PROline G02 is factory sealed for use in Cl. I Div. 1 Groups B, C, D. Means that a conduit seal is not required within 18 inches (450mm) of the enclosure.
- Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Group A, B, C, D, E, F, G except limited versions of:
 PROMASS M DN80 (sensor version Group C-D)
 PROMASS I DN50 (sensor version Group C-D)
 PROMASS F DN80/100/150/250 (sensor version Group C-D)
 PROMASS H DN50 (sensor version Group C-D)
 which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G.
 The minimum medium temperature is -50 °C.
- Install all Intrinsically Safe Circuits per Canadian Electrical Code Part I Section 18 and Appendix F.

Temperature table

	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1
Ta = 45 °C: PROMASS E DN8/15/25/40/50	45	100	120	125	125	125	125	125	125
Ta = 50 °C: PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50	50 55 60 60 70 50 60	60 70 85 95 105 65 75	85 85 85 95 105 85 100	105 100 105 110 120 100 115	150 150 185* 150 150 140 160	185* 200* 200* 150* 150* 185* 205*	200* 200* 200* 150* 150* 200* 235*	200* 200* 200* 150* 150* 200* 275*	200* 200* 200* 150* 150* 200* 350*
Ta = 60 °C: PROMASS A DN1/2/4 PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50 PROMASS E DN8/15/25/40/50 PROMASS F(HT) DN25/50/80	60 55 60 60 70 70 50 60 100 70	95 60 70 70 95 85 65 75 120 85	115 85 85 85 110 105 85 100 120 100	130 100 100 100 110 120 100 115 125 115	140 100 185* 185* 150* 150* 140 160 125 160*	200 100 185* 200* 150* 150* 185* 200* 125 205*	200 100 200* 200* 150* 150* 200* 200* 125 235*	200 100 200* 200* 150* 150* 200* 200* 125 275*	

* Device shall not be installed in such way that the transmitter enclosure is located above the sensor.

Tm min. is -40 °C for Promass E
Tm min. is -50 °C for Promass A/F/H/I/M

Ta min. is -20 °C
Ta min. is -20 °C

Communication Options
 I/O option = F, H, J
 I/O option = G, K
 I/O option = S, T
 I/O option = R, U

Control Drawing
 see FES 0049-0001
 see FES 0049-0002
 see FES 0049-0004
 see FES 0049-0005

CSA Control Drawing Div. 1 / Zone 1
 Class I Zone 1
 Compact Version
 PROMASS 40 / 8. A / F / I / M / H / E

Massstab
 Gezeichnet 09.10.00 Bn
 Geprüft
 Ex-geprüft 27.04.04 MDI
 Gesehen

FES0049 E 1/2

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

F06-8xMBxxZZ-01-xx-xx-en-011

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 Groups IIC and Class II and III Division 1 Groups EFG

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Notes:

- Control room equipment shall not use or generate more than 250 V rms.
- Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176 °F.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329 °F. The user must limit the process temperature for Group G to 140 °C.
- Transmitter enclosure PROline G02 explosionproof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II, III Div. 1 Groups E, F, G.
- Transmitter enclosure PROline G02 is factory sealed for use in Cl. I Div. 1 Groups B, C, D. Means that a conduit seal is not required within 18 inches (450mm) of the enclosure.
- Sensor circuits intrinsically safe for Cl. I, II, III Div. 1 Group A, B, C, D, E, F, G except a limited version of:
 PROMASS M DN80 (sensor version Group C-D)
 PROMASS I DN50 (sensor version Group C-D)
 PROMASS F DN80/100/150/250 (sensor version Group C-D)
 PROMASS H DN50 (sensor version Group C-D)
 which are only suitable for Cl. I, II, III Div. 1 Group C, D, E, F, G.
 Allowed cable glands: NPT 1/2", G 1/2", M20x1.5 or PG13.5
- A sensor which was connected to a Promass 50/63/64 trans-mitter can also be installed to a Promass 8. transmitter. For this case this control drawing is relevant for safe use, except the minimum ambient temperature which is limited to -20 °C.
- Install all Intrinsically Safe Circuits per Canadian Electrical Code Part I Section 18 and Appendix F.

Temperature table

	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1
Ta = 45 °C PROMASS E DN25/40/50	45	100	120	125	125	125	125	125	125
Ta = 60 °C PROMASS A DN1/2/4 PROMASS M DN8/15/25/40/50/80 PROMASS F DN8/15/25/40 PROMASS F DN50/80/100/150/250 PROMASS I DN8/15/16/25 PROMASS I DN26/40/41/50 PROMASS H DN8 PROMASS H DN15/25/40/50 PROMASS E DN8/15/25/40/50 PROMASS F(HT) DN25/50/80	60 50 55 60 60 70 50 60 100 70	95 60 70 70 95 85 65 75 120 85	115 85 85 85 110 105 85 100 120 100	130 100 100 100 110 120 100 115 125 115	140 100 185 185 150 150 140 160 125 160	200 100 185 200 150 150 185 200 125 205	200 100 200 200 150 150 200 200 125 235	200 100 200 200 150 150 200 200 125 275	

The ambient temperature is -20 °C ... +60 °C for the transmitter and -40 °C ... +60 °C for the sensor

The minimum medium temperature is -50 °C. A special version of Promass A/F/H is suitable for medium temperatures down to -200 °C. The minimum medium temperature for Promass E is limited to -40 °C

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

CSA Control Drawing Div. 1 / Zone 1
 Class I Zone 1
 Remote Version
 PROMASS 40 / 8. A / F / I / M / H / E

Massstab
 Gezeichnet 09.10.00 Bn
 Geprüft
 Ex-geprüft 27.04.04 MDI
 Gesehen

FES0049 E 2/2

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

F06-8xMBxxZZ-01-xx-xx-en-012

NON HAZARDOUS LOCATION

CSA Certified Barrier or Associated Apparatus
 V_{cc} / U_o Barrier
 I_{sc} / I_o Barrier
 C_c / C_o Barrier
 L_s / L_o Barrier

CSA Certified Barrier or Associated Apparatus
 $V_{max} = 30V$
 $P_{max} = 600mW$

HAZARDOUS LOCATION

Class I Zone 1 IIC
 Cl. I, II, III Div. 1 Group A,B,C,D,E,F,G or
 Cl. I Div. 2 Group A,B,C,D, and Cl.I,II,III Div.1 Group E,F,G

IS - HART
 IS - Passive frequency
 Power Supply

Notes:

- 1) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80 °C / 176 °F
- 2) **Intrinsically safe signal output:**
 Install all intrinsically safe circuits per Canadian Electrical Code respecting the Explosionproof Integrity of the enclosure
- 3) **WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**
- 4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROMASS 8 **.....T
 PROMASS 40** **.....T**

Terminals: 26, 27 (HART current output):
 Passive intrinsically safe circuit:

V_{oc} / U_o	I_{sc} / I_o	P_{max} / P_o	C_c / C_o	L_s / L_o
21.8 V	90 mA	490 mW	0.15 µF	4.1 mH

Cable parameters for Intrinsic Safety:
 $C_{cable} \leq 0.15 \mu F$ if V_{oc} / U_o (of Barrier) $\leq 21.8 V$
 $C_{cable} \leq C_c / C_o$ Barrier - 6 nF if V_{oc} / U_o (of Barrier) $\geq 21.8 V$
 $L_{cable} \leq 4.1 mH$

Terminals 24, 25 (Passive intrinsically safe circuit):

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	100 mA	1.25 W	6 nF	negligible

Connect to entity approved Barrier with
 V_{oc} or $U_o \leq V_{max} / U_i$
 I_{sc} or $I_o \leq I_{max} / I_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_c$ Barrier or C_o Barrier - 6 nF
 $L_{cable} \leq L_s$ Barrier or L_o Barrier

Terminals 24, 25 (Passive intrinsically safe circuit):

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	300 mA	600mW	6 nF	0

Entity approved apparatus must meet the following requirements:
 V_{oc} or $U_o \leq V_{max}$ P_{max} or $P_o \leq P_{max} / P_i$
 Cable parameters for Intrinsic Safety:
 $C_{cable} \leq C_c (C_o) - 6 nF$ $L_{cable} \leq L_s (L_o)$

CSA CONTROL DRAWING Cl.1, Div. 1
 PROMASS 40 / 8. A / F / I / M / H / E
 Entity concept Commodul HART IS (Option S/T)

Anderungen:		Alle gesetzlichen Urheberrechte vorbehalten.		Ersetzt durch:	
A	27.11.01 / MDI	F		Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.	
B	07.06.02 / MDI	G		Ersetzt für:	
C	29.10.02 / MDI	H		Ersteller: FES / ID 1089	
D	09.06.03 / MDI	J		File: M:\ZEICHNUNG\FES0049\E040323csa.doc	
E	27.04.04 / MDI	K			

Massstab		Gezeichnet		Geprüft		Ex-geprüft		Gesehen	
		09.10.00		Bn					
						27.04.04		MDI	

FES0049-0004 E

F06-8xMBxxZZ-01-xx-xx-en-016

ION HAZARDOUS LOCATION

CSA Certified Barrier or Associated Apparatus
 V_{cc} / U_o Barrier
 I_{sc} / I_o Barrier
 C_c / C_o Barrier
 L_s / L_o Barrier

CSA Certified Barrier or Associated Apparatus
 $V_{max} = 30V$
 $P_{max} = 600mW$

HAZARDOUS LOCATION

Class I Zone 1 IIC
 Cl. I, II, III Div. 1 Group A,B,C,D,E,F,G or
 Cl. I Div. 2 Group A,B,C,D, and Cl.I,II,III Div.1 Group E,F,I

IS - HART
 IS - Current Output
 Power Supply

Notes:

- 2) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80 °C / 176 °F
- 2) **Intrinsically safe signal output:**
 Install all intrinsically safe circuits per Canadian Electrical Code respecting the Explosionproof Integrity of the enclosure
- 3) **WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**
- 4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROMASS 8 **.....R
 PROMASS 40** **.....R**

Terminals: 26, 27 (HART current output)
Terminals 24, 25 (current output):

Active:

V_{oc} / U_o	I_{sc} / I_o	P_{max} / P_o	C_c / C_o	L_s / L_o
21.8 V	90 mA	490 mW	0.15 µF	4.1 mH

Cable parameters for Intrinsic Safety:
 $C_{cable} \leq 0.15 \mu F$ if V_{oc} / U_o (of Barrier) $\leq 21.8 V$
 $C_{cable} \leq C_c / C_o$ Barrier - 6 nF if V_{oc} / U_o (of Barrier) $\geq 21.8 V$
 $L_{cable} \leq 4.1 mH$

CSA CONTROL DRAWING Cl.1, Div. 1
 PROMASS 40 / 8. A / F / I / M / H / E
 Entity concept Commodul HART IS (Option R/U)

Anderungen:		Alle gesetzlichen Urheberrechte vorbehalten.		Ersetzt durch:	
A	27.11.01 / MDI	F		Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.	
B	07.06.02 / MDI	G		Ersetzt für:	
C	29.10.02 / MDI	H		Ersteller: FES / ID 1089	
D	09.06.03 / MDI	J		File: M:\ZEICHNUNG\FES0049\E040323csa.doc	
E	27.04.04 / MDI	K			

Massstab		Gezeichnet		Geprüft		Ex-geprüft		Gesehen	
		09.10.00		Bn					
						27.04.04		MDI	

FES0049-0005 E

F06-8xMBxxZZ-01-xx-xx-en-017

www.endress.com/worldwide

Endress+Hauser 
People for Process Automation
