



Level



Pressure



Flow



Temperature



Liquid  
Analysis



Registration



Systems  
Components



Services



Solutions

## Safety Instructions

# Proline Promass 83 MODBUS RS485

Division 1

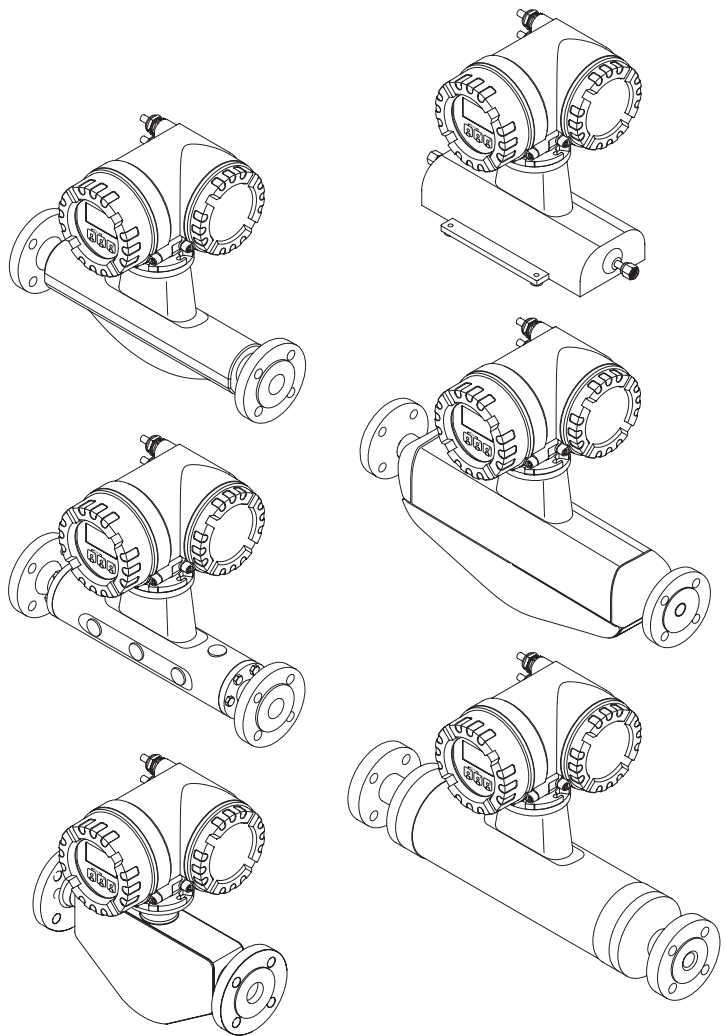
Ex documentation



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 15**



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

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

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)	



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

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

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			



Level



Pressure



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Temperature



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Services



Solutions

## Safety Instructions

# Proline Promass 83 MODBUS RS485

## Division 1



## Ex documentation

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

- BA107D, Promass 83 MODBUS RS485, Coriolis Mass Flow Measuring System

### Table of Contents FM

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 .....	7
Special conditions .....	8
General warnings .....	8
Electrical connections .....	9
Connection cable remote version .....	11
Service adapter .....	11
Device fuse .....	11
Cable entries .....	11
Technical data .....	12
Device identification .....	12
Control drawings .....	13

## Measuring system compact version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
<p>F</p> <p>F (HT)</p> <p>M</p> <p>A</p> <p>H</p> <p>E</p> <p>I</p>		
Division 1 / Zone 0 / Zone 1		Division 2 / Zone 2
Hazardous area		Safe area
<b>Transmitter Promass 83 MODBUS RS485:</b>		<b>Transmitter Promass 83 MODBUS RS485:</b>
<ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass A; DN 1/24"...1/8"</li> <li>– Promass F; DN 3/8"...2"</li> <li>– Promass F (HT); High temperature; DN 1", DN 2"</li> <li>– Promass I; DN 3/8"...1 1/2"</li> <li>– Promass M; DN 3/8"...2"</li> <li>– Promass E; DN 3/8"...2"</li> <li>– Promass H; DN 3/8"...1 1/2"</li> </ul> </li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 6.</li> <li>■ ① = Cable entries, for number reference see Page 11.</li> <li>■ F (HT) = Promass F high-temperature version.</li> </ul>		<ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass F; DN 3"...10"</li> <li>– Promass F (HT); High temperature; DN 3"</li> <li>– Promass M; DN 3"</li> <li>– Promass H; DN 2"</li> <li>– Promass I; DN 2", DN 1 1/2" FB (full bore)</li> </ul> </li> <li>■ Optionally, a version for Groups A and B is available.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 6.</li> <li>■ ① = Cable entries, for number reference see Page 11.</li> <li>■ F (HT) = Promass F high-temperature version.</li> </ul>

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Measuring system remote version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
<p style="text-align: center;"><b>Division 1 / Zone 0 / Zone 1</b></p>		<p style="text-align: center;"><b>Division 2 / Zone 2</b></p>
Hazardous area		Safe area
<p><b>Transmitter Promass 83 MODBUS RS485:</b></p> <p style="text-align: center;">or</p> <p><b>Transmitter Promass 83 MODBUS RS485:</b></p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass A; DN 1/24"...1/8"</li> <li>– Promass F; DN 3/8"...2"</li> <li>– Promass F; (HT) High temperature; DN 1", DN 2"</li> <li>– Promass I; DN 3/8"...1 1/2"</li> <li>– Promass M; DN 3/8"...2"</li> <li>– Promass E; DN 3/8"...2"</li> <li>– Promass H; DN 3/8"...1 1/2"</li> </ul> </li> <li>■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 6.</li> <li>■ ①, ②, ③ = Cable entries, for number reference see Page 11.</li> <li>■ ④ = transmitter Promass 83</li> <li>■ F (LN) = Promass F Long-neck version (Remote version for heating)</li> <li>■ F (HT) = Promass F high-temperature version</li> </ul>		<ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass F; DN 3"...10"</li> <li>– Promass F; (HT) High temperature; DN 3"</li> <li>– Promass M; DN 3"</li> <li>– Promass H; DN 2"</li> <li>– Promass I; DN 2", DN 1 1/2" FB (full bore)</li> </ul> </li> <li>■ Optionally, a version for Groups A and B is available.</li> <li>■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 6.</li> <li>■ ①, ②, ③ = Cable entries, for number reference see Page 11.</li> <li>■ ④ = transmitter Promass 83</li> <li>■ F (LN) = Promass F Long-neck version (Remote version for heating)</li> <li>■ F (HT) = Promass F high-temperature version</li> </ul>

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**Temperature tables  
compact version**

Max. medium temperature [°F] (at $T_a = 113\text{ °F}$ )		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 $T_a = 122\text{ °F}$ )		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 $T_a = 140\text{ °F}$ )		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  $-58\text{ °F}$  for Promass A/F/I/M/H, and  $-40\text{ °F}$  for Promass E.
- The minimum **ambient temperature** is  $-4\text{ °F}$ . A version for ambient temperatures up to  $-40\text{ °F}$  is optionally available.

**Temperature tables sensor  
remote version**

Max. medium temperature [°F] (at $T_a = 113\text{ °F}$ )		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 $T_a = 140\text{ °F}$ )		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  $-58\text{ °F}$  for Promass A/F/I/M/H, and  $-40\text{ °F}$  for Promass E.
- The minimum **ambient temperature** is  $-40\text{ °F}$ .

**Transmitter**

- The Promass 83 (remote version) transmitter has a T6 temperature class rating when installed in the EEx d housing for operation at ambient temperatures up to  $T_a = 140\text{ °F}$ .
- The minimum **ambient temperature** is  $-4\text{ °F}$ . A version for ambient temperatures up to  $-40\text{ °F}$  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
<b>J.I.3009083</b>  (Special notes, see Page 8)	for the electric flow measuring system Proline Promass 83 MODBUS RS485  Identification: see below

**Compact version**

P r o m a s s 8 3 * * * - * * * * * * * * * *		
Q = MODBUS RS485 7 = MODBUS RS485 (2 Relay output, Status input) N = MODBUS RS485 (Frequency output, Current output, Status input)		
Promass 83 A	DN 1/24"...1/8"	<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b>
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"	
<hr/>		
Promass 83 F	DN 3"...10"	<b>XP-IS-DIP I, II, III/1/CDEFG</b>
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"	

**Remote version**

P r o m a s s 8 3 * * * - * * * * * * * * * *		
Q = MODBUS RS485 7 = MODBUS RS485 (2 Relay output, Status input) N = MODBUS RS485 (Frequency output, Current output, Status input)		
<b>Transmitter</b>		
Promass 83		<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b> or <b>XP-IS-DIP I, II, III/1/CDEFG</b>
<hr/>		
<b>Sensor</b>		
Promass A	DN 1/24"...1/8"	<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b>
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"	
<hr/>		
Promass F	DN 3"...10"	<b>XP-IS-DIP I, II, III/1/CDEFG</b>
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"	

**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 MODBUS RS485 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.



### 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

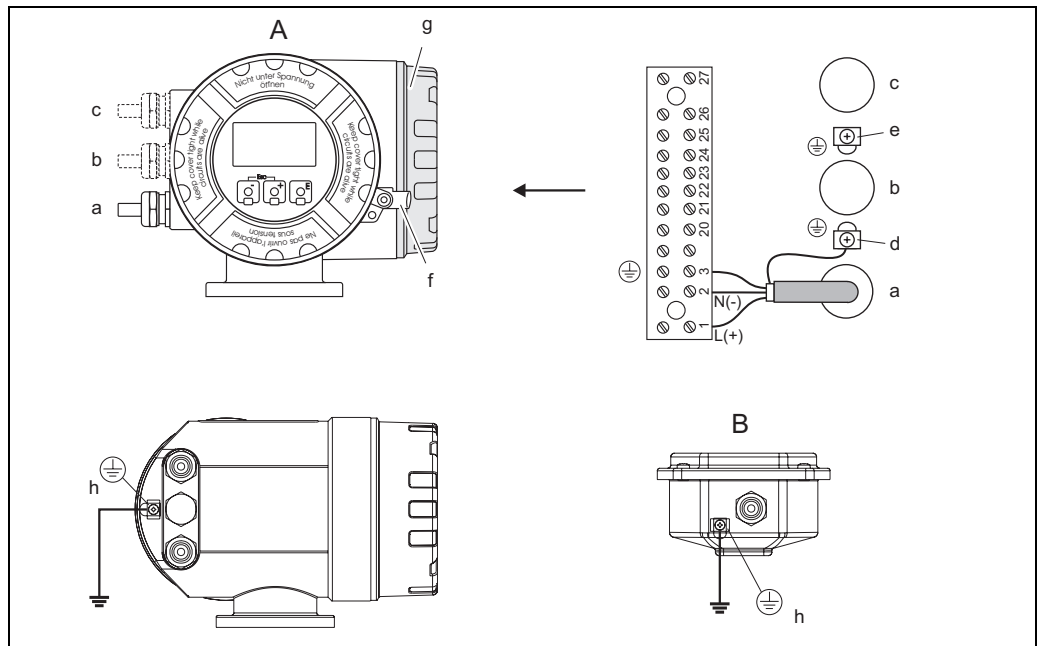


Fig. 1: Power supply and potential equalisation

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

B Connection housing of remote version

a Power supply cable

b Power supply cable for external termination (see Fig. 2)

c MODBUS RS485 bus cable (see Fig. 2)

d Ground terminal for protective earth

e Ground terminal for the power supply cable for external termination and the MODBUS RS485 bus cable

f Securing clamp

g Connection compartment cover

h Screw terminal for connecting to potential equalisation

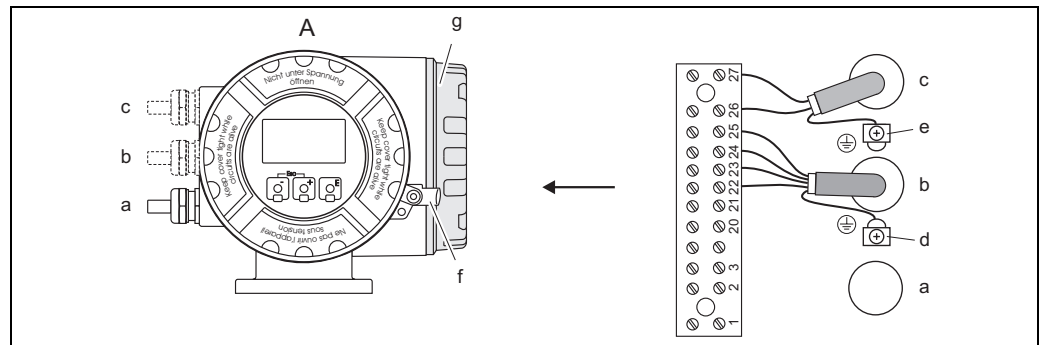


**Caution!**

- The transmitter (compact and remote version) is to be securely connected to the potential equalization system using either 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 the facility!
Intrinsically safe circuit	no		
U <sub>m</sub> =	260 V AC		

**Input/output circuit**


F06-x3xMBxZZ-04-06-08-xx-001

Fig. 2: Input/output circuit

A Transmitter housing (compact or remote version)

a Power supply cable (see Fig. 1)

b Power supply cable for external termination

c MODBUS RS485 bus cable

d Ground terminal for protective earth

e Ground terminal for the power supply cable for external termination and the MODBUS RS485 bus cable

f Securing clamp

g 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 according to the type code**

Type code Promass	Terminal assignment							
	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****Q	-		-		-		MODBUS RS485	
83***_*****7	Current output		Pulse/Freq. output		Status input		MODBUS RS485	
83***_*****N	Relay output 2		Relay output 1		Status input		MODBUS RS485	
Intrinsically safe circuit	no							
$U_m$	260 V AC							
$I_m$	500 mA							

**Functional values of the input/output circuit**

Input/output circuit	Functional values
MODBUS RS485	Operating voltage: $U_{BUS} = -7 \text{ bis } +12 \text{ V}$
Current output	galvanically isolated ■ active: 0/4...20 mA; $R_L$ max. 700 $\Omega$ ■ passive: 4...20 mA; supply voltage $V_S = 18...30 \text{ V DC}$ ; $R_i \geq 150 \Omega$
Pulse/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: 2...10000 Hz ( $f_{max} = 12500 \text{ Hz}$ ) 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 output 1	normally open (NO or make) contact galvanically isolated max. 30 V / 0,5 A AC; 60 V / 0,1 A DC
Relay output 2	Normally closed (NC or break) contact galvanically isolated max. 30 V / 0,5 A AC; 60 V / 0,1 A DC
Status input	galvanically isolated $U = 3...30 \text{ V DC}$ ; $R_i = 3 \text{ k}\Omega$

**Connection cable remote version**

Connexion between compartment housing and transmitter:

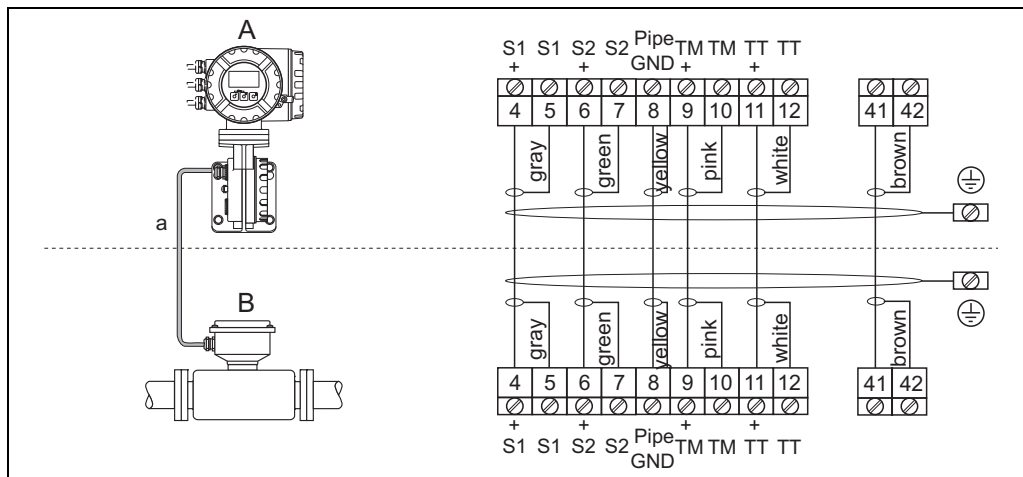


Fig. 3: Connection cable (remote version)  
 A Transmitter remote version  
 B Compartment housing remote version  
 a Sensor cable

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**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\*\*\*-\*\*\*\*\*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 Cable entries for the transmitter terminal compartment (remote version)
- ③ Sensor cable connection:  
 Choice of thread for cable entry, 1/2" NPT or G 1/2".

**🔧 Note!**

For the MODBUS RS485 option, is it advisable to use the system components (plug-and-sachet connection) from the Company BARTEC which is approved for use in Cl. I Division 1 areas.

Technical data

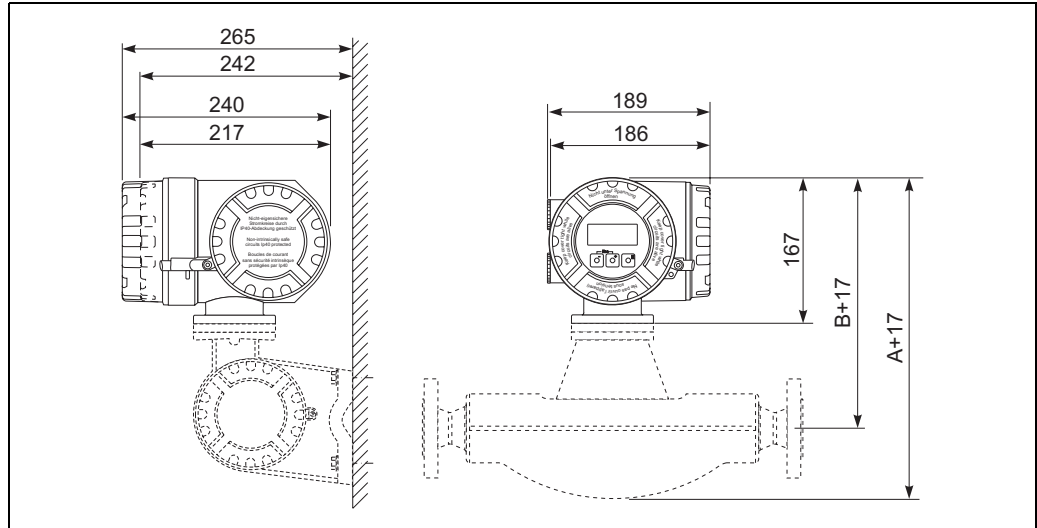
Dimensions

- 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. 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

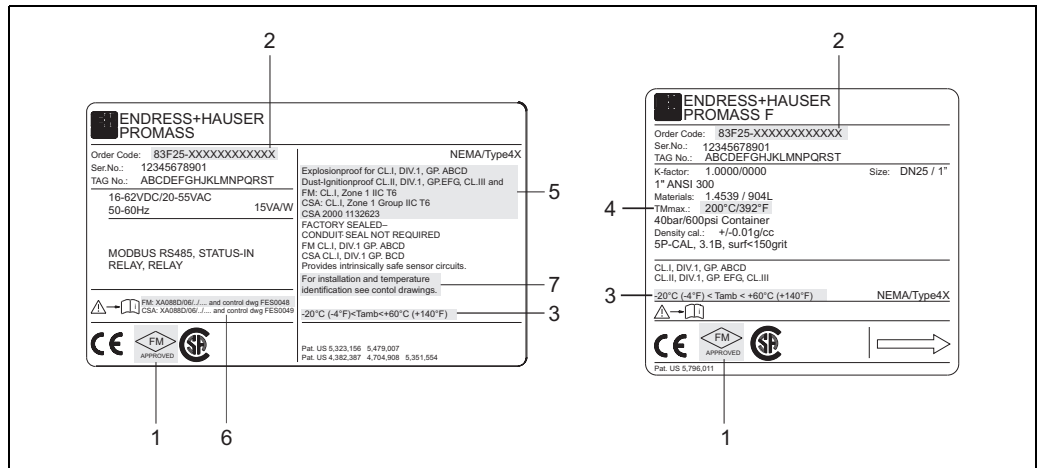


A0001333

Fig. 4: Dimensions of the Ex-transmitter housing

Device identification

Transmitter Promass 83 MODBUS RS485 and A/F/I/M/E/H sensor.



F06-83FMBxZZ-18-xx-xx-xx-000

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 standards.

### 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 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
<b>Ta = 45 °C:</b> PROMASS E DN8/15/25/40/50	45	100	120	125	125	125	125	125	125
<b>Ta = 50 °C:</b> 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	60	85	105	150	150	150	150	150
<b>Ta = 60 °C:</b> 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	95	115	130	140	200	200	200	200

*\* 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	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

Änderungen:	A 16.05.01 / Bn	F 27.04.04/MDI	Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.
FM Control Drawing Div. 1 / Zone 1 Class I Zone 1 Compact Version PROMASS 40 / 8. A / F / I / M / H / E			Ersteller: FES / ID 1090 FILE: M\ZEICHN\FES0048\F040323.doc Massstab: Gezeichnet 06.10.00 Bn Geprüft: Ex-geprüft 27.04.04 MDI Gesehen:
Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach			<b>FES0048 F</b> 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
<b>Ta = 45 °C</b> PROMASS E DN25/40/50	45	100	120	125	125	125	125	125	125
<b>Ta = 60 °C</b> 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	95	115	130	140	200	200	200	200

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.

Änderungen:	A 16.05.01 / Bn	F 27.04.04/MDI	Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.
FM Control Drawing Div. 1 / Zone 1 Class I Zone 1 Remote Version PROMASS 40 / 8. A / F / I / M / H / E			Ersteller: FES / ID 1090 FILE: M\ZEICHN\FES0048\F040323.doc Massstab: Gezeichnet 06.10.00 Bn Geprüft: Ex-geprüft 27.04.04 MDI Gesehen:
Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach			<b>FES0048 F</b> 2/2

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





Level



Pressure



Flow



Temperature



Liquid  
Analysis



Registration



Systems  
Components



Services



Solutions

## Safety Instructions

# Proline Promass 83 MODBUS RS485

## Division 1

### Ex documentation

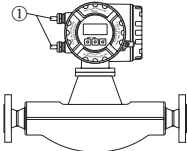
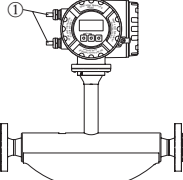

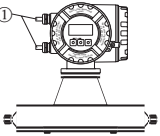
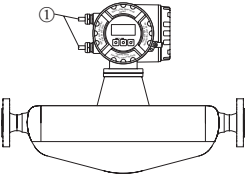
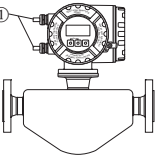
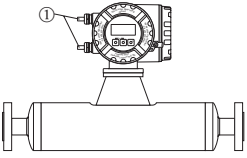
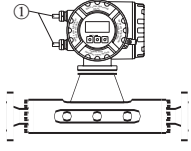

**This documentation is an integral part of the following Operating Instructions:**

- BA107D, Promass 83 MODBUS RS485, Coriolis Mass Flow Measuring System

### Table of Contents CSA

Measuring system compact version .....	16
Measuring system remote version .....	17
Temperature tables compact version .....	18
Temperature tables sensor remote version .....	18
Approvals .....	19
Notified body .....	19
Special conditions .....	20
General warnings .....	20
Electrical connections .....	21
Connection cable remote version .....	23
Service adapter .....	23
Device fuse .....	23
Cable entries .....	23
Technical data .....	24
Device identification .....	24
Control drawings .....	25

**Measuring system compact version**

Hazardous area		Safe area	
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2		
 <b>F</b>	 <b>F (HT)</b>		
 <b>A</b>	 <b>H</b>		
 <b>E</b>	 <b>I</b>		
 <b>M</b>			
<b>Division 1 / Zone 0 / Zone 1</b>			<b>Division 2 / Zone 2</b>
<b>Hazardous area</b>			<b>Safe area</b>
<p><b>Transmitter Promass 83 MODBUS RS485:</b></p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass A; DN 1...4</li> <li>– Promass F; DN 8...50</li> <li>– Promass F; (HT) High temperature; DN 25, DN 50</li> <li>– Promass I; DN 8...40</li> <li>– Promass M; DN 8...50</li> <li>– Promass E; DN 8...50</li> <li>– Promass H; DN 8...40</li> </ul> </li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 18.</li> <li>■ ① = Cable entries, for number reference see Page 23.</li> <li>■ F (HT) = Promass F high-temperature version.</li> </ul>			
<b>or</b>			
<p><b>Transmitter Promass 83 MODBUS RS485:</b></p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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                             <ul style="list-style-type: none"> <li>– Promass F; DN 80...250</li> <li>– Promass F; (HT) High temperature; DN 80</li> <li>– Promass M; DN 80</li> <li>– Promass H; DN 50</li> <li>– Promass I; DN 50, DN 40 FB (full bore)</li> </ul> </li> <li>■ Optionally, a version for Groups A and B is available.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 18.</li> <li>■ ① = Cable entries, for number reference see Page 23.</li> <li>■ F (HT) = Promass F high-temperature version.</li> </ul>			

A0001378



Measuring system remote version

Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
<p style="text-align: right;">A0001379</p>		
Hazardous area		Safe area
Division 1 / Zone 0 / Zone 1	Division 2 / Zone 2	
<p><b>Transmitter Promass 83 MODBUS RS485:</b> or <b>Transmitter Promass 83 MODBUS RS485:</b></p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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 <ul style="list-style-type: none"> <li>– Promass A; DN 1...4</li> <li>– Promass F; DN 8...50</li> <li>– Promass F; (HT) High temperature; DN 25, DN 50</li> <li>– Promass I; DN 8...40</li> <li>– Promass M; DN 8...50</li> <li>– Promass E; DN 8...50</li> <li>– Promass H; DN 8...40</li> </ul> </li> <li>■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 18.</li> <li>■ ①, ②, ③ = Cable entries, for number reference see Page 23.</li> <li>■ ④ = transmitter Promass 83</li> <li>■ F (LN) = Promass F Long-neck version (Remote version for heating)</li> <li>■ F (HT) = Promass F high-temperature version</li> </ul> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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 <ul style="list-style-type: none"> <li>– Promass F; DN 80...250</li> <li>– Promass F; (HT) High temperature; DN 80</li> <li>– Promass M; DN 80</li> <li>– Promass H; DN 50</li> <li>– Promass I; DN 50, DN 40 FB (full bore)</li> </ul> </li> <li>■ Optionally, a version for Groups A and B is available.</li> <li>■ Only the cables supplied by Endress+Hauser may be used between the transmitter and the sensor.</li> <li>■ Ambient-/fluid temperature ranges and temperature class see Page 18.</li> <li>■ ①, ②, ③ = Cable entries, for number reference see Page 23.</li> <li>■ ④ = transmitter Promass 83</li> <li>■ F (LN) = Promass F Long-neck version (Remote version for heating)</li> <li>■ F (HT) = Promass F high-temperature version</li> </ul>		

**Temperature tables  
compact version**

Max. medium temperature [°C] (at $T_a = 45\text{ °C}$ )		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 $T_a = 50\text{ °C}$ )		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 $T_a = 60\text{ °C}$ )		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  $-50\text{ °C}$  for Promass A/F/I/M/H, and  $-40\text{ °C}$  for Promass E.
- The minimum **ambient temperature** is  $-20\text{ °C}$ . A version for ambient temperatures up to  $-40\text{ °C}$  is optionally available.

**Temperature tables sensor  
remote version**

Max. medium temperature [°C] (at $T_a = 45\text{ °C}$ )		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 $T_a = 60\text{ °C}$ )		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  $-50\text{ °C}$  for Promass A/F/I/M/H, and  $-40\text{ °C}$  for Promass E.
- The minimum **ambient temperature** is  $-40\text{ °C}$ .

**Transmitter**

- The Promass 83 (remote version) transmitter has a T6 temperature class rating when installed in the EEx d housing for operation at ambient temperatures up to  $T_a = 60\text{ °C}$ .
- The minimum **ambient temperature** is  $-20\text{ °C}$ . A version for ambient temperatures up to  $-40\text{ °C}$  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
<b>160686-1132623</b>  (Special notes, see Page 20)	for the electric flow measuring system Proline Promass 83 MODBUS RS485  Identification: see below

**Compact version**

P r o m a s s 8 3 * * * - * * * * * * * * * * *		
Q = MODBUS RS485 7 = MODBUS RS485 (2 Relay output, Status input) N = MODBUS RS485 (Frequency output, Current output, Status input)		
Promass 83 A	DN 1...4	<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b>
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	
<hr/>		
Promass 83 F	DN 80...250	<b>XP-IS-DIP I, II, III/1/CDEFG</b>
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	

**Remote version**

P r o m a s s 8 3 * * * - * * * * * * * * * * *		
Q = MODBUS RS485 7 = MODBUS RS485 (2 Relay output, Status input) N = MODBUS RS485 (Frequency output, Current output, Status input)		
<b>Transmitter</b>		
Promass 83		<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b> or <b>XP-IS-DIP I, II, III/1/CDEFG</b>
<hr/>		
<b>Sensor</b>		
Promass A	DN 1...4	<b>XP-IS-DIP I, II, III/1/ABCDEFGF</b>
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	
<hr/>		
Promass F	DN 80...250	<b>XP-IS-DIP I, II, III/1/CDEFG</b>
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	

**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 MODBUS RS485 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.



### 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. For intrinsically safe circuits respect specially CEC Part I, Section 18, Appendix F, respecting the explosion-proof integrity of the housing.

### Warning!

10. Substitution of components may impair intrinsic safety.

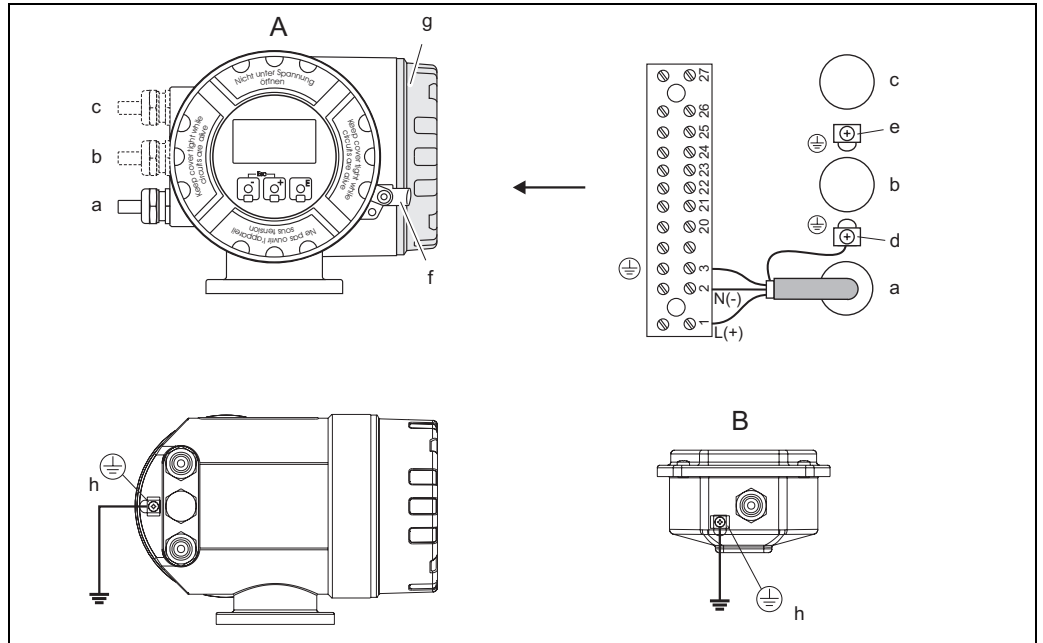
## General warnings

### 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



P06-x3xxxxZZ-04-06-08-xx-003

Fig. 1: Power supply and potential equalisation

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

B Connection housing of remote version

a Power supply cable

b Power supply cable for external termination (see Fig. 2)

c MODBUS RS485 bus cable (see Fig. 2)

d Ground terminal for protective earth

e Ground terminal for the power supply cable for external termination and the MODBUS RS485 bus cable

f Securing clamp

g Connection compartment cover

h Screw terminal for connecting to potential equalisation

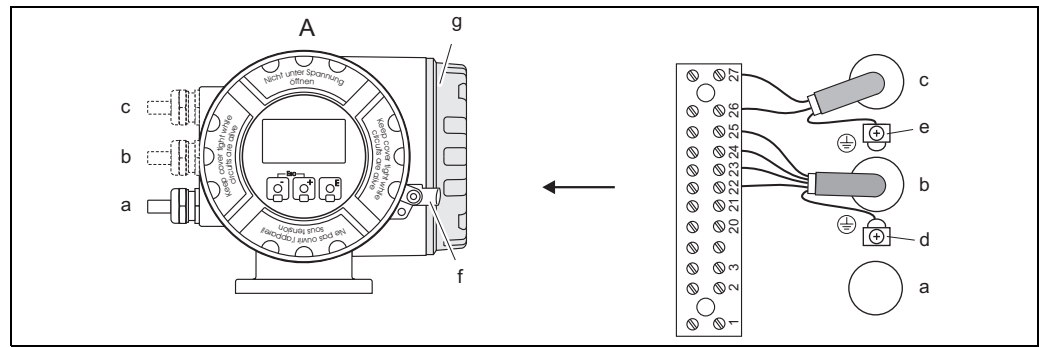


**Caution!**

- The transmitter (compact and remote version) is to be securely connected to the potential equalization system using either 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 the facility!
Intrinsically safe circuit	no		
U <sub>m</sub> =	260 V AC		

**Input/output circuit**


F06-x3xMBxZZ-04-06-08-xx-001

Fig. 2: Input/output circuit

A Transmitter housing (compact or remote version)

a Power supply cable (see Fig. 1)

b Power supply cable for external termination

c MODBUS RS485 bus cable

d Ground terminal for protective earth

e Ground terminal for the power supply cable for external termination and the MODBUS RS485 bus cable

f Securing clamp

g 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 according to the type code**

Type code Promass	Terminal assignment							
	20 (+)	21 (-)	22 (+)	23 (-)	24 (+)	25 (-)	26 (+)	27 (-)
83***_*****Q	-		-		-		MODBUS RS485	
83***_*****7	Current output		Pulse/Freq. output		Status input		MODBUS RS485	
83***_*****N	Relay output 2		Relay output 1		Status input		MODBUS RS485	
Intrinsically safe circuit	no							
$U_m$	260 V AC							
$I_m$	500 mA							

**Functional values of the input/output circuit**

Input/output circuit	Functional values
MODBUS RS485	Operating voltage: $U_{BUS} = -7 \text{ bis } +12 \text{ V}$
Current output	galvanically isolated <ul style="list-style-type: none"> <li>■ active: 0/4...20 mA; <math>R_L</math> max. 700 <math>\Omega</math></li> <li>■ passive: 4...20 mA; supply voltage <math>V_S = 18...30 \text{ V DC}</math>; <math>R_i \geq 150 \Omega</math></li> </ul>
Pulse/Frequency output	galvanically isolated <ul style="list-style-type: none"> <li>■ active: 24 V DC, 25 mA (max. 250 mA during 20 ms); <math>R_L &gt; 100 \Omega</math></li> <li>■ passive: Open Collector, 30 V DC, 250 mA</li> <li>■ Frequency output                             <ul style="list-style-type: none"> <li>Full scale frequency: 2...10000 Hz (<math>f_{max} = 12500 \text{ Hz}</math>)</li> <li>on/off ratio 1:1; pulse width max. 2 s</li> </ul> </li> <li>■ Pulse output                             <ul style="list-style-type: none"> <li>pulse value and pulse polarity selectable</li> <li>pulse width configurable (0,05...2000 ms)</li> </ul> </li> </ul>
Relay output 1	normally open (NO or make) contact galvanically isolated max. 30 V / 0,5 A AC; 60 V / 0,1 A DC
Relay output 2	Normally closed (NC or break) contact galvanically isolated max. 30 V / 0,5 A AC; 60 V / 0,1 A DC
Status input	galvanically isolated $U = 3...30 \text{ V DC}$ ; $R_i = 3 \text{ k}\Omega$

**Connection cable remote version**

Connction between compartment housing and transmitter:

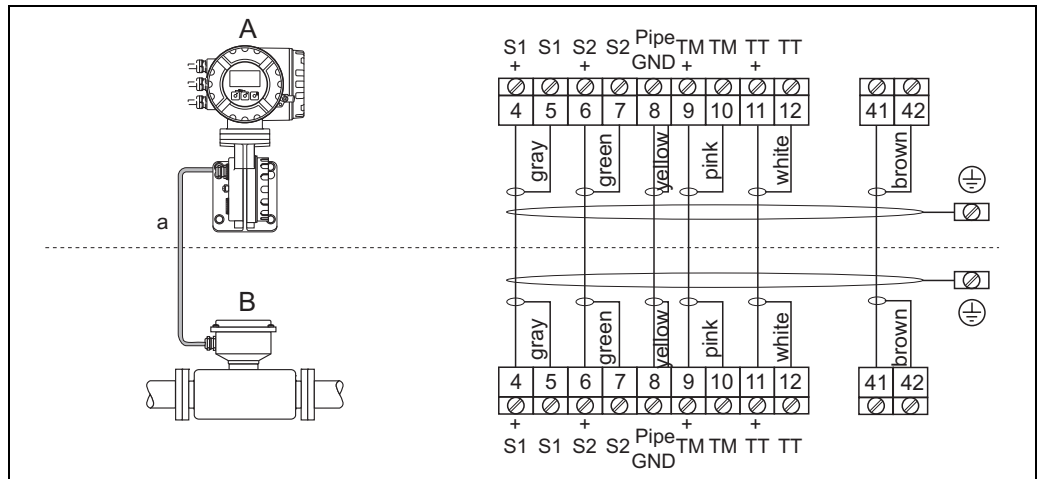


Fig. 3: Connection cable (remote version)  
 A Transmitter remote version  
 B Compartment housing remote version  
 a Sensor cable

A0001331-EN

**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 16 and Page 17:

- ① Cable entries for the transmitter terminal compartment (XP version)  
 power supply / bus cable: (Promass 83\*\*\*\_\*\*\*\*\*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 Cable entries for the transmitter terminal compartment (remote version)
- ③ Sensor cable connection:  
 Choice of thread for cable entry, 1/2" NPT or G 1/2".

**Note!**

For the MODBUS RS485 option, is it advisable to use the system components (plug-and-sachet connection) from the Company BARTEC which is approved for use in Cl. I Division 1 areas.

## 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. 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

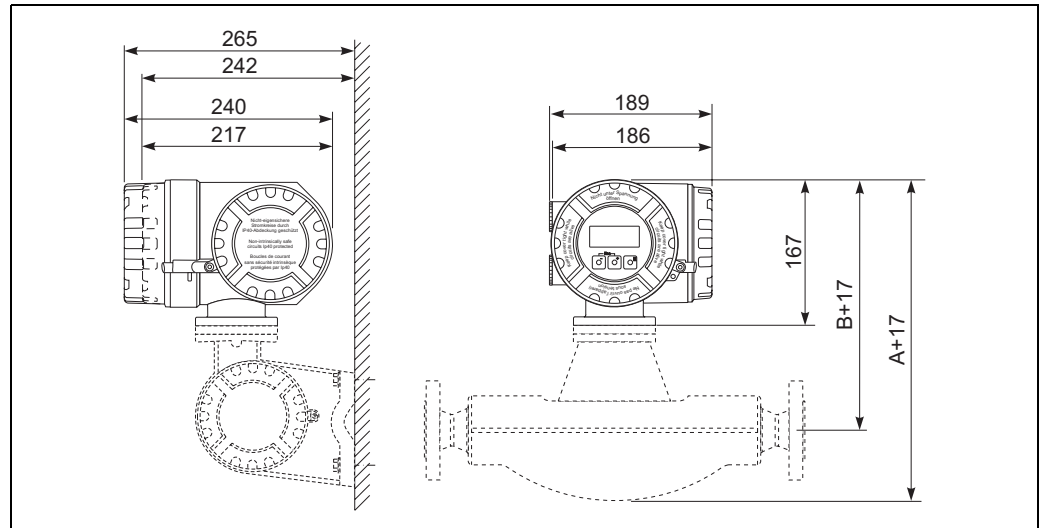


Fig. 6: Dimensions of the Ex-transmitter housing

A0001333

## Device identification

Transmitter Promass 83 MODBUS RS485 and A/F/I/M/E/H sensor.

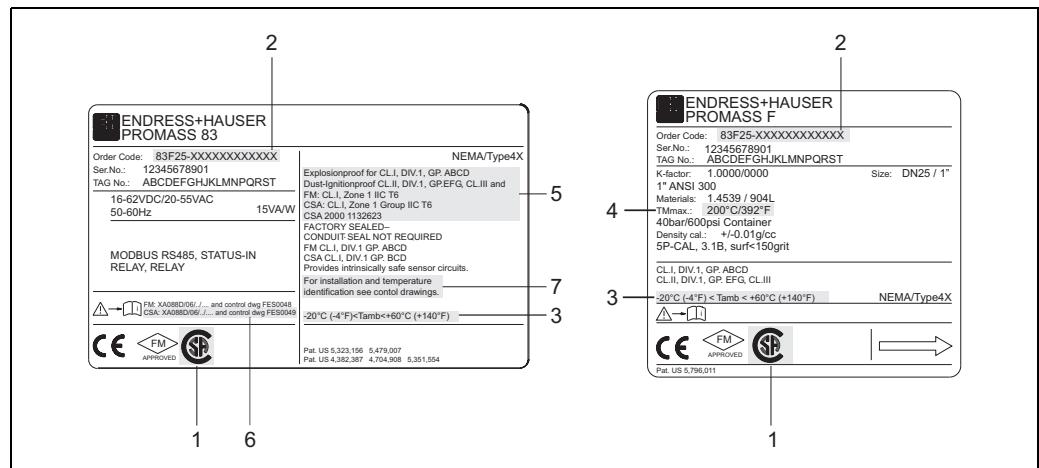


Fig. 7: Nameplate of transmitter and nameplate of sensor (example)

F06-83FMBxZ-18-xx-xx-xx-002

- 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

**Promass F**      **Promass F(HT)**      **Promass A**      **Promass H**

**Promass M**      **Promass I**      **Promass E**

**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	max. medium temperature [°C]									
	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1	
<b>Ta = 45 °C:</b> PROMASS E DN8/15/25/40/50	45	100	120	125	125	125	125	125	125	
<b>Ta = 50 °C:</b> 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 85 65 75	85 85 85 95 105 85 100	105 105 105 110 120 100 115	125 150 150 150 150 140 160	125 185* 185* 185* 185* 185* 200	150 200* 200* 150 150 200* 200	150 200* 200* 150 150 200* 200	150 200* 200* 150 150 200* 200	150 200* 200* 150 150 200* 200
<b>Ta = 60 °C:</b> 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 85 95 85 65 75 100 85	115 85 85 95 95 105 85 100 120 100	130 100 100 105* 150* 150* 140 115 125 115*	140 100 185* 185* 150* 150* 150* 160 160* 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*	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/I/M      Ta min. is -20 °C

Communication Options	Control Drawing
I/O option = F, H, J	see FES 0049-0001
I/O option = G, K	see FES 0049-0002
I/O option = S, T	see FES 0049-0004
I/O option = R, U	see FES 0049-0005

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

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
 Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach	FES0049 E      1/2

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

**Promass F(HT)**      **Promass F**      **Promass A**      **Promass I**      **Promass M**

**Promass H**      **Promass E**

**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 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 Canadian Electrical Code Part I Section 18 and Appendix F.

Temperature table	max. medium temperature [°C]								
	T6	T5	T4A	T4	T3A	T2C	T2B	T2	T1
<b>Ta = 45 °C</b> PROMASS E DN25/40/50	45	100	120	125	125	125	125	125	125
<b>Ta = 60 °C:</b> 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 85 95 85 65 75 100 85	115 85 85 95 95 105 85 100 120 100	130 105 105 105 110 120 100 115 120 115	140 150 150 150 150 150 140 160 160 205	200 150 185 185 185 185 185 200 200 125	200 150 185 200 185 150 150 200 200 235	200 150 185 200 150 150 185 200 200 275	200 150 185 200 150 150 200 200 125 350

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/I is suitable for medium temperatures down to -200 °C. The minimum medium temperature for Promass E is limited to -40 °C

Communication Options	Control Drawing
I/O option = F, H, J	see FES 0049-0001
I/O option = G, K	see FES 0049-0002
I/O option = S, T	see FES 0049-0004
I/O option = R, U	see FES 0049-0005

Änderungen: A 27.11.01 /MDI/ F B 07.06.02 /MDI/ G C 29.10.02 /MDI/ H D 09.06.03 /UD/ J E 27.04.04 /MDI/ K	Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.
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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
 Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach	FES0049 E      2/2

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

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