



Member of the FM Global Group

FM Approvals
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CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

PROMASS abc-defghiknop. Mass Flowmeter.

XP-IS-DIP / I,II,III / 1 / ABCDEFG / T*; XP-IS / I / 1 / IIC / T* - FES0048; Entity, FISCO; Type 4X

Special Conditions of Use:

1. For installation instructions and the Temperature Class (*) which applies to specific models, ambient temperatures (Ta), and process medium temperatures (Tmed), refer to Control Drawing FES0048.

Entity Parameters:

I/O option S and R HART Current Output or Current Output:

$V_{oc} = 21.8 \text{ V}$, $I_{sc} = 90 \text{ mA}$, $P_o = 0.49 \text{ W}$, $C_a = 150 \text{ nF}$, $L_a = 4.1 \text{ mH}$;

$V_{Max} = 30 \text{ V}$, $I_{Max} = 10 \text{ mA}$, $P_i = 0.3 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Option S and T Frequency Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 300 \text{ mA}$, $P_i = 0.6 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O option T and U HART Current Output or Current Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 100 \text{ mA}$, $P_i = 1.25 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Options F and G (Entity, FISCO):

$V_{Max} = 30 \text{ V}$, $I_{Max} = 600 \text{ mA}$, $P_i = 8.5 \text{ W}$, $C_i = 5 \text{ nF}$, $L_i = 10 \mu\text{H}$.

a = Type of electronic: 40, 80, 83 or 84.

b = Type of sensor: A (with h = N).

b = Type of sensor: E (with h = N or O; (c=80) with h = P)

b = Type of sensor: F [(c = 08, 15, 25, 40, 50, 80, 1H, 1F, 2F) with h = N or O; (c = 80, 1H, 1F, 2F) with h = P].

b = Type of sensor: I [(c = 08, 15, 16, 25, 26, 40, 41, 50, 51, 80) with h = N or O; (c = 41, 50, 51, 80) with h = P].

b = Type of sensor: M [(c = 08, 15, 25, 40, 50, 80) with h = N or O; (c = 80) with h = P].

b = Type of sensor: H [(c = 08, 15, 25, 40, 50) with h = N or O; (c = 50) with h = P].

b = Type of sensor: P [(c = 08, 15, 25, 40, 50) with h = N or O; (c = 50) with h = P].

b = Type of sensor: S [(c = 08, 15, 25, 40, 50) with h = N or O; (c = 50) with h = P].

b = Type of sensor: O [(c = 80, 1H, 1F, 2F) with h = N or O; (c = 80, 1H, 1F, 2F) with h = P]

b = Type of sensor: X. [(c = 3F) with h = N or O; (c = 3F) with h = P]

c = Size: 01, 02, 04, 08, 15, 16, 25, 26, 40, 41, 50, 51, 80, 1H, 1F, 2F, 3F, XX.

d = Material of tube/high pressure version: any single number or letter.

e = Process connection with sealing for Promass M: any triple number or letter (up to 400 bar).

f = Certifications/Treatments: any single number or letter.

- g = Calibration: any single number or letter.
- h = Approvals: N or O (Div. 1, GP A, B, C, D, E, F, G) or P (Div. 1, GP C, D, E, F, G).
- i = Version: A, E, F, J, K, L, M, N, U, V, W, 1, 4, 7 or 8.
- k = Cable gland: B or X.
- n = Version: 0, 1, 2, 3, 4, 5, 7, 8, 9, A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S or X.
- o = Software: any single number or letter.
- p = I/O's: A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
- ** = Option in two digits (none, two or multiple of two digits); any combination of number or letter
- +, # = Signs used as indicator for optional abbreviation of extended order code

AND

PROMASS abc-defghiknop+*#. Mass Flowmeter.**

NI-ANI/1/2/ABCD/T*; NI-ANI/2/IIC/T*; DIP/II,III/1/EFG/T*; Nonincendive Sensor Field Wires and Nonincendive Fieldbus Field Wires — FES0050; Type 4X

Nonincendive Fieldbus Field Wire Parameters:

V_{max} = 35V, C_i = 5nF, L_i = 10 μH

Special conditions of use:

1. For installation instructions and the Temperature Class (*) which applies to specific models, ambient temperatures (T_a), and process medium temperatures (T_{med}), refer to Control Drawing FES0050.

a = Type of electronic: 40, 80, 83 or 84

b = Type of sensor: A, E, F, H, I, M, P, S, O or X

c = Size: 01, 02, 04, 08, 15, 16, 25, 26, 40, 41, 50, 51, 80, 1H, 1F, 2F, 3F or XX

d = Material of tube/high pressure version: any single number or letter

e = Process connection with sealing for Promass M: any triple number or letter (up to the pressure of 400 bar)

f = Certifications/Treatments: any single number or letter

g = Calibration: any single number or letter

h = Approvals: R (Division 2)

i = Version: A, B, C, D, G, H, 1, 2, 3, 5, or 6

k = Cable gland: A, B, C, D, K, L, M, Q, R, S or X

n = Version: 0, 1, 2, 3, 4, 5, 7, 8, 9, A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S or X

o = Software: any single number or letter

p = I/O's: A, B, C, D, E, H, I, J, K, L, M, N, P, Q, V, W, X, 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9

** = Option in two digits (none, two or multiple of two digits); any combination of number or letter

+, # = Signs used as indicator for optional abbreviation of extended order code

AND

CNGmass DCI 8aFb-cdefghikno+###. Mass Flowmeter.

XP-IS-DIP / I,II,III / 1 / ABCDEFG / T*; XP-IS / I / 1 / IIC / T* - FES0182; Entity, FISCO; Type 4X

Special Conditions of Use:

1. For installation instructions and the Temperature Class (*) which applies to specific models, ambient temperatures (Ta), and process medium temperatures (Tmed), refer to Control Drawing FES0182.

Entity Parameters:

I/O option S and R HART Current Output or Current Output:

$V_{oc} = 21.8 \text{ V}$, $I_{sc} = 90 \text{ mA}$, $P_o = 0.49 \text{ W}$, $C_a = 150 \text{ nF}$, $L_a = 4.1 \text{ mH}$;

$V_{Max} = 30 \text{ V}$, $I_{Max} = 10 \text{ mA}$, $P_i = 0.3 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Option S and T Frequency Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 300 \text{ mA}$, $P_i = 0.6 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O option T and U HART Current Output or Current Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 100 \text{ mA}$, $P_i = 1.25 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Options F and G (Entity, FISCO):

$V_{Max} = 30 \text{ V}$, $I_{Max} = 600 \text{ mA}$, $P_i = 8.5 \text{ W}$, $C_i = 5 \text{ nF}$, $L_i = 10 \mu\text{H}$.

a = Version: any single number or letter.

b = Size: 08, 15, 25, XX.

c = Material of tube/high pressure version: any single number or letter.

d = Process connection: any triple number or letter (up to 400 bar).

e = Certifications/Treatments: any single number or letter.

f = Calibration: any single number or letter.

g = Approvals: M, N or 8 (Div. 1, GP A, B, C, D, E, F, G).

h = Version: A, E, F, J, K, L, M, N, U, V, W, 1, 4, 7 or 8.

i = Cable gland: B or X.

k = Version: 0, 1, 2, 3, 4, 5, 7, 8, 9, A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S or X.

n = Software: any single number or letter.

o = I/O's: A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.

** = Option in two digits (none, two or multiple of two digits); any combination of number or letter

+, # = Signs used as indicator for optional abbreviation of extended order code

AND

Cubemass DCI 8Cab-cdefghiknop+###. Mass Flowmeter.

XP-IS-DIP / I,II,III / 1 / ABCDEFG / T*; XP-IS / I / 1 / IIC / T* - FES0183; Entity, FISCO; Type 4X

Special Conditions of Use:

1. For installation instructions and the Temperature Class (*) which applies to specific models, ambient temperatures (Ta), and process medium temperatures (Tmed), refer to Control Drawing FES0183.

Entity Parameters:

I/O option S and R HART Current Output or Current Output:

$V_{oc} = 21.8 \text{ V}$, $I_{sc} = 90 \text{ mA}$, $P_o = 0.49 \text{ W}$, $C_a = 150 \text{ nF}$, $L_a = 4.1 \text{ mH}$;

$V_{Max} = 30 \text{ V}$, $I_{Max} = 10 \text{ mA}$, $P_i = 0.3 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Option S and T Frequency Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 300 \text{ mA}$, $P_i = 0.6 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O option T and U HART Current Output or Current Output:

$V_{Max} = 30 \text{ V}$, $I_{Max} = 100 \text{ mA}$, $P_i = 1.25 \text{ W}$, $C_i = 6 \text{ nF}$, $L_i = 0$.

I/O Options F and G (Entity, FISCO):

$V_{Max} = 30 \text{ V}$, $I_{Max} = 600 \text{ mA}$, $P_i = 8.5 \text{ W}$, $C_i = 5 \text{ nF}$, $L_i = 10 \mu\text{H}$.

a = Version: any single number or letter.
b = Size: 01, 02, 04, 06, XX.
c = Approvals: C3 or 84 (Div. 1, GP A, B, C, D, E, F, G).
d = I/O's: A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
e = Version: 0, 1, 2, 3, 4, 5, 7, 8, 9, A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S or X
f = Display/Operation: any single number or letter
g = Operating Language: any single number or letter.
h = Version: A, E, F, J, K, L, M, N, U, V, W, 1, 4, 7 or 8.
i = Cable gland: B or X.
k = Material of tube: any single number or letter.
n = Process connection: any single number or letter.
o = Secondary containment: any single number or letter.
p = Calibration/Treatment: any single number or letter.
** = Option in two digits (none, two or multiple of two digits); any combination of number or letter
+, # = Signs used as indicator for optional abbreviation of extended order code

Equipment Ratings:

Explosionproof for Class I Division 1, Group A, B, C and D and Class I, Zone 1, Group IIC; dust-ignitionproof for Classes II and III Division 1, Groups E, F and G hazardous (classified) outdoor (Type 4X) locations; sensor circuits and signal output circuits (p = I/O options F, G, R, S, T, U) intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G and Class I Zone 1 Groups IIC when installed in accordance with FM Control Drawing FES0048 (Promass) or FES00182 (CNGmass DCI) or FES0183 (Cubemass DCI)..

Nonincendive for Class I Division 2, Group A, B, C and D and Class I, Zone 2, Group IIC; dust-ignitionproof for Classes II and III Division 1, Group E, F and G hazardous (classified) outdoor (Type 4X) locations; sensor circuits nonincendive for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC. Nonincendive field wiring for Class I Division 2, Group A, B, C and D and Classes II and III Division 1, Group E, F and G hazardous (classified) locations when installed in accordance with FM Control Drawing FES0050 (Promass)..

FM Approved for:

Endress + Hauser Flowtec AG
Kaegenstrasse 7
CH-4153 Reinach, Switzerland



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This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3610	2010
Class 3611	2004
Class 3615	2006
Class 3810	2005
ANSI/NEMA 250	1991


Original Project ID: 3009083

Approval Granted: December 19, 2000

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
3012866	December 28, 2001		
3012691	May 7, 2002		
3015235	September 4, 2002		
3016669	February 21, 2003		
3021216	August 31, 2003		
050120	February 28, 2005		
050818	September 1, 2005		
3028484	November 20, 2006		
070130	July 25, 2007		
3030403	November 30, 2007		
070905	December 20, 2007		
071115	December 31, 2007		
3038437	June 9, 2010		
3042811	May 9, 2011		
3043873	September 21, 2011		
110930	<i>January 27, 2011</i>		

FM Approvals LLC

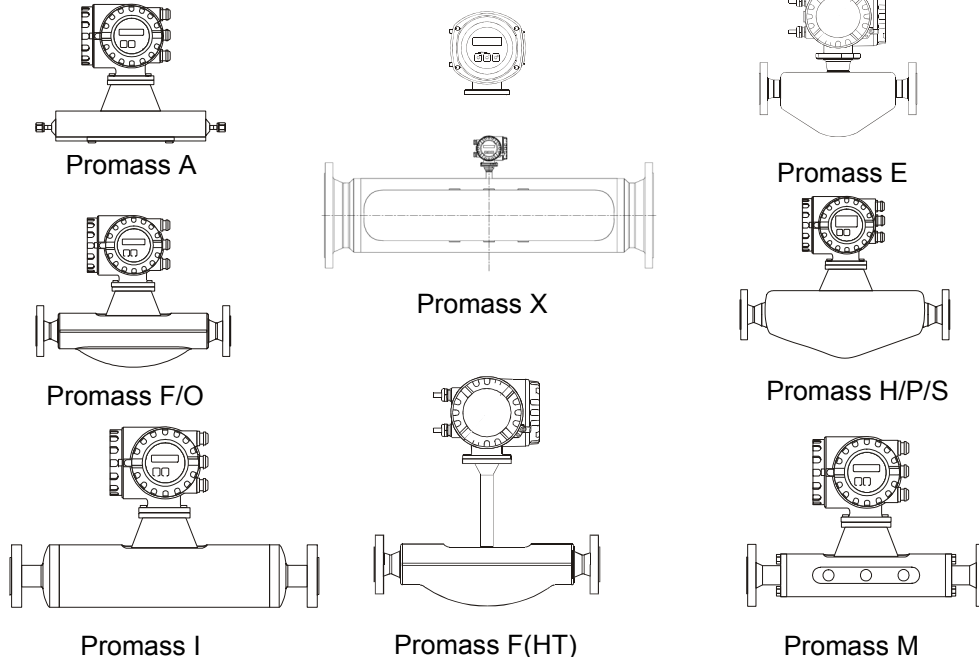

 Patrick Byrne
 Technical Team Manager

January 27, 2012
 Date

Hazardous Locations

Class I Div. 2 Groups ABCD or Class I Zone 2 Groups IIC
And Class II and III Division 1 Groups EFG

Transmitter Promass 40 / 8.
alternative stainless steel housing



Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X

NI / I / 2 / ABCD; DIP / II, III / 1 / EFG
Class I Zone 2 GP IIC

Temperature class for the compact version is T5 – T1

Range of medium temperature:

Promass A/F/F(HT)/H/O/P/S/X : -200°C ... +200°C / -328°F ... +392 °F
 Promass I/M : -50°C ... +150°C / -58 °F ... +302 °F
 Promass E : -40°C ... +140°C / -40 °F ... +257 °F

Range of ambient temperature : -40°C ... +60°C / -40 °F ... +140 °F


Temperature table	max. medium temperature					
	T6	T5	T4	T3	T2	T1
Ta = 60 °C						
Promass A/E/F/H/I/M/O/P/S/X	---	100°C	135°C	200°C	200°C	200°C
Promass F(HT)	---	100°C	135°C	200°C	300°C ^{*)}	350°C ^{*)}

^{*)} Device shall be installed in such a way, that the transmitter enclosure is not located above the sensor.

Notes:

- Control room equipment shall not use or generate more than 250V 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.
- Installation of Transmitter circuit wiring according to NEC using threaded conduit or other wiring methods in accordance with articles 500 to 510.
- Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- For Installation of Fieldbus communication circuits of Promass 4/8****_*****H /K+### see sheet 3.
- The following Sensors are Dual Seal devices in accordance with ANSI/ISA-12.27.01-2003: Promass A, F, F(HT), H, O, P, S and X. Promass E is a Dual Seal device if the optional rupture disk is present.

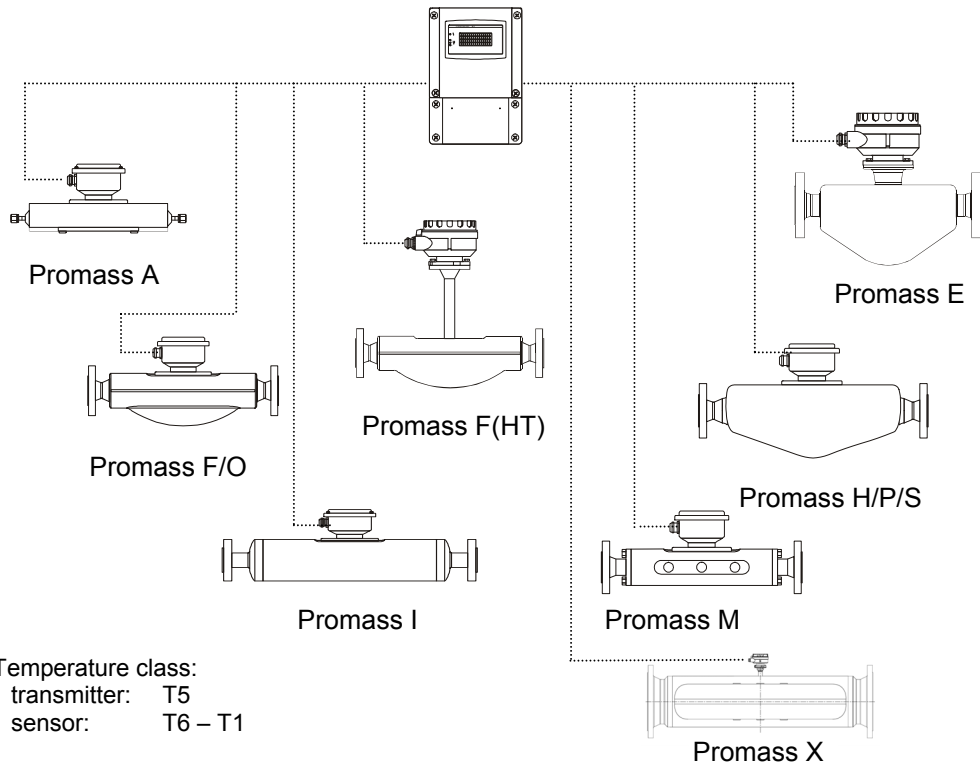
Options	Control Drawing
Promass 40/80/83/84 E DN80 (optional version)	see FES 0164

Aenderungen:	H	15.05.04/MDI	N	11.11.09/SCHK	Ersatz für: Ersteller: FES / ID 1090 FILE M:\ZEICHN\GES0050\PI\FES0050Q.doc												
	J	28.06.05/SCHK	O	08.02.11/KLI													
	K	15.08.06/BDA	P	23.05.11/SCHK													
	L	20.10.06/BDA	Q	08.08.12/BIF													
	M	05.09.07/BDA															
FM Control Drawing Class I Division 2 / Class I Zone 2 Compact version Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X					<table border="1"> <tr> <td>Gezeichnet</td> <td>09.10.00</td> <td>Bn</td> </tr> <tr> <td>Geprüft</td> <td></td> <td></td> </tr> <tr> <td>Ex-geprüft</td> <td>08.08.12</td> <td>BIF</td> </tr> <tr> <td>Gesehen</td> <td></td> <td></td> </tr> </table>	Gezeichnet	09.10.00	Bn	Geprüft			Ex-geprüft	08.08.12	BIF	Gesehen		
Gezeichnet	09.10.00	Bn															
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 Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach					FES0050Q												
					1/5												

Hazardous Locations

Class I Div. 2 Groups ABCD or Class I Zone 2 Groups IIC
and Class II and III Division 1 Groups EFG

Transmitter enclosure Promass 40 / 8.



Temperature class:
transmitter: T5
sensor: T6 – T1

Range of medium temperature:
Promass A/F/F(HT)/H/O/P/S/X : -200°C ... +200°C / -328 °F ... +392 °F
Promass I/M : -50°C ... +150°C / -58 °F ... +302 °F
Promass E : -40°C ... +125°C / -40 °F ... +140 °F

Range of ambient temperature: -40°C ... +60°C / -40 °F ... +140 °F

Temperature table:

Ta = 60 °C	max. medium temperature					
	T6	T5	T4	T3	T2	T1
Promass A/F/H/O/P/S/X	60°C	100°C	135°C	200°C	200°C	200°C
Promass I/M	60°C	100°C	135°C	150°C	150°C	150°C
Promass E	60°C	100°C	135°C	140°C	140°C	140°C
Promass F(HT)	70°C	100°C	135°C	200°C	300°C	350°C

PROMASS 40/80/83/84 A/E/F/H/I/M/O/P/S/X

NI / I / 2 / ABCD; DIP / II, III / 1 / EFG, Class I Zone 2 GP IIC


Notes:

- Control room equipment shall not use or generate more than 250V rms.
- Caution: Use 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.
- Installation of circuit wiring according to NEC using threaded conduit or other wiring methods in accordance with articles 500 to 510.
- Allowed cable glands for nonincendive field wiring: NPT ½", G ½" or M20x1.5
- Non-incendive field circuit wiring (ANI) when installed with a cable that has the following cable parameters: L_C = 500 µH per km and C_C = 500 nF per km. e.g. cable type 6LI9YCY-FCY 0.38 qmm or 6 LI9YFCY 0,38 qmm – FCY. The maximum allowed cable length is 120 m.
- Warning: Substitution of components may impair suitability for Class I, Div.2.
- On consideration of this control drawing a sensor which was connected to a transmitter of Promass 60/63/64 can also be installed with a Promass 80/83 transmitter.
- For Installation of Fieldbus communication circuits of Promass 4/8****.*****H /K+### see sheet 3.
- The following Sensors are Dual Seal devices in accordance with ANSI/ISA-12.27.01-2003:
Promass A, F, F(HT), H, O, P, S and X. Promass E is a Dual Seal device if the optional rupture disk is present.

Allocation for Sensor's to Gas Groups:

	ANI for Class I Division 2		
	Groups AB	Group C	Group D
Promass A DN 1 - 4		X	X
Promass F DN 8 - 50	X	X	X
Promass F/O DN 80/100/150/250		X	X
Promass I DN 8 - 15	X	X	X
Promass I DN 25 - 80		X	X
Promass M DN 8 - 50	X	X	X
Promass M DN 80		X	X
Promass H/P/S DN 8 - 40	X	X	X
Promass H/P/S DN 50		X	X
Promass E DN 8 - 80	X	X	X
Promass E DN 80		X	X
Promass X DN350		X	X

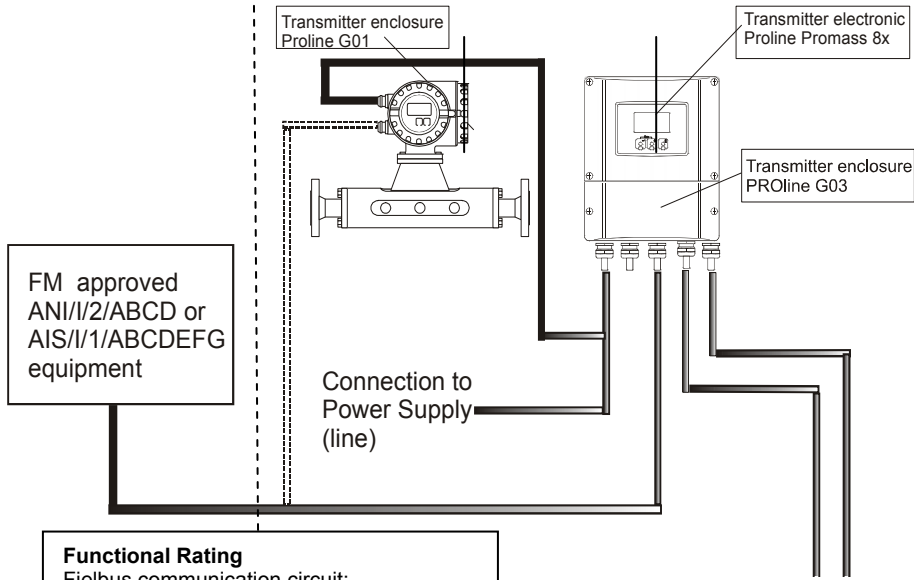
Sensors not suitable as ANI for Groups A, B may be installed in these groups, when conduit is used.

Aenderungen:	H	15.05.04/MDI	N	11.11.09/SCHK	Ersatz für: Ersteller: FES / ID 1090 FILE M:ZEICHN\FES0050\PI\FES0050Q.doc												
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	K	15.08.06/BDA	P	23.05.11/SCHK													
	L	20.10.06/BDA	Q	08.08.12/BIF													
	M	05.09.07/BDA															
FM Control Drawing Class I Division 2 / Class I Zone 2 Remote version Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X					<table border="1"> <tr> <td>Gezeichnet</td> <td>09.10.00</td> <td>Bn</td> </tr> <tr> <td>Geprüft</td> <td></td> <td></td> </tr> <tr> <td>Ex-geprüft</td> <td>08.08.12</td> <td>BIF</td> </tr> <tr> <td>Gesehen</td> <td></td> <td></td> </tr> </table>	Gezeichnet	09.10.00	Bn	Geprüft			Ex-geprüft	08.08.12	BIF	Gesehen		
Gezeichnet	09.10.00	Bn															
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 Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach					FES0050Q												
					2/5												

Promass 8**_*****H+###**
Non-Hazardous
Classified Location

Promass 8**_*****K+###**
Hazardous Classified Location
 Class I Div. 2 Groups ABCD or
 Class I Zone 2 Group IIC

Compact Version Remote Version

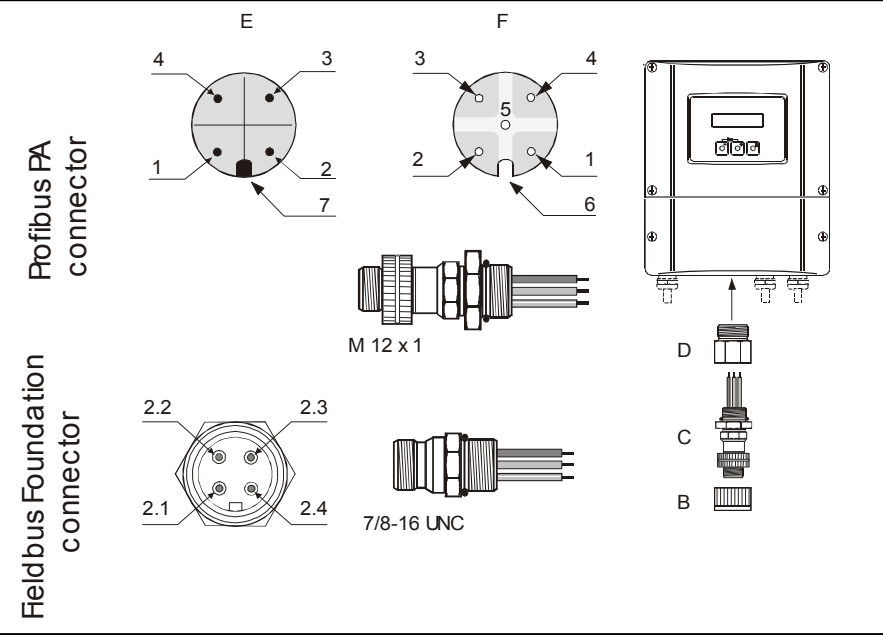


Functional Rating
 Fieldbus communication circuit:
 Terminals 26/27
 $U_{nom} = 9...32V$ $I_{nom} = 12mA$
 These ratings do not supersede Hazardous Location values.

Notes:

- Fieldbus cable connectors are suitable for Class I, Division 2, Groups A, B, C, D if connected to associated nonincendive field wiring or associated apparatus.
- The Nonincendive Field Wiring Circuit Concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus or associated apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when:
 $V_{max} \geq V_{oc}$ or V_t , $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$
 Fieldbus communication circuit Terminals 26/27 (current controlled circuit)
- For this current controlled circuit, the parameter I_{max} is not required and need not to be aligned with parameter I_{sc} and I_i of the associated non-incendive field wiring or associated apparatus.
- Fieldbus communication circuits Terminals (26/27) are suitable for connection according to Fieldbus Nonincendive Concept (FNICO) see sheet 4.

V_{max}	I_{max}	C_i	L_i
35V	See note 3	5nF	10 μ H



B = Protection cap for connector, C = Fieldbus connector, D = Thread adapter
 E = Connector on housing (male), F = Connector (female)

Pin assignment:

Profibus PA
 1 = Brown wire, PA+ (terminal 26)
 2 = Not connected
 3 = Blue wire, PA- (terminal 27)
 4 = Black wire, ground
 5 = Female connector not assigned
 6 = Positioning groove
 7 = Positioning key

Fieldbus Foundation
 2.1 = Brown wire, FF+ (terminal 26)
 2.2 = Blue wire, FF- (terminal 27)
 2.3 = Grey wire, ground
 2.4 = Not assigned

Änderungen:	H	15.05.04/MDI	N	11.11.09/SCHK
	J	28.06.05/SCHK	O	08.02.11/KLI
	K	15.08.06/BDA	P	23.05.11/SCHK
	L	20.10.06/BDA	Q	08.08.12/BIF
	M	05.09.07/BDA		

Ersatz für:
 Ersteller: FES / **ID 1090**
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FM Control Drawing Cl. I Div. 2 / Zone 2
Fieldbus communication circuits
Compact version / Remote version
Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X

Gezeichnet	09.10.00	Bn
Geprüft		
Ex-geprüft	08.08.12	BIF
Gesehen		



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

FES0050Q

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FNICO CONCEPT

The FNICO-concept allows interconnection of nonincendive apparatus to associated apparatus not specially examined in such combination. The criteria for interconnection is that the voltage (U_i or V_{max}) which nonincendive apparatus can receive and nonincendive, must be equal or greater than the voltage (U_o , V_{oc} or V_t) levels which can be delivered by the associated apparatus. In addition, the maximum unprotected capacitance (C_i) and inductance (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 μ H respectively.

In each segment only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system. The voltage U_o , V_{oc} or V_t of the associated apparatus has to be limited to the range of 14V to 24V. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except a leakage current of 50 μ A for each connected device. Separately powered equipment needs a galvanic isolation to assure that the nonincendive fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameter in the following range:

Loop Resistance R' : 15...150 Ohm/km
 Inductance per unit length L' : 0.4...1 mH/km
 Capacitance per unit length C' : 80...200 nF/km

$C' = C'_{line/line} + 0.5 C'_{line/screen}$, if both lines are floating, or
 $C' = C'_{line/line} + C'_{line/screen}$, if the screen is connected to one line

Length of trunk cable: ≤ 1000 m
 Length of spur cable: ≤ 30 m
 Length of splice: ≤ 1 m

At each end of the trunk cable an approved infallible line termination with following parameters is suitable:

$R = 90...100$ Ohm $C = 0...2.2$ μ F

One of the allowed terminations might already be integrated in the associated apparatus. The associated apparatus has to be installed within 30m from the end of the trunk cable. The number of passive apparatus connected to the bus segment is not limited due to NI reasons. If the above rules are respected, up to a total length of 1000 m (sum of trunk and all spur cables), the inductance and the capacitance of the cable will not impair the safety of the installation.

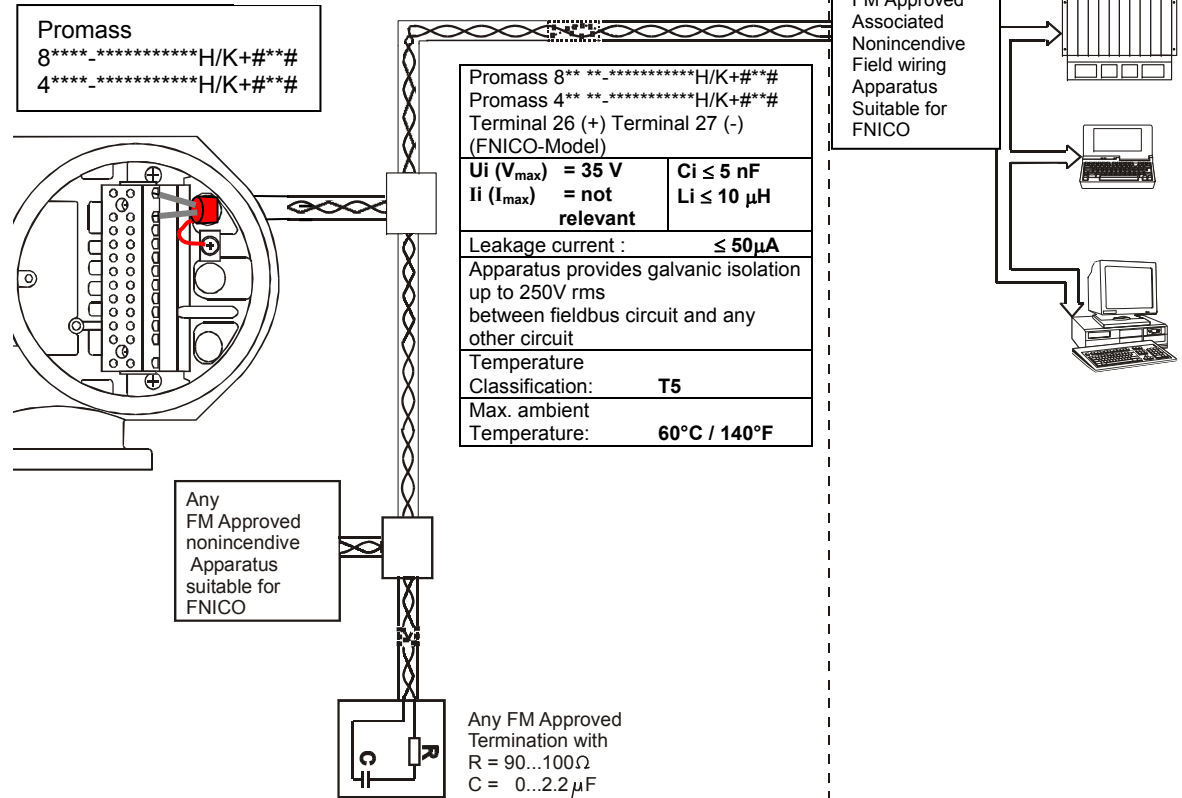
Notes:

1. FM approved apparatus with associated nonincendive field wiring apparatus or associated apparatus must be installed with manufacturers instructions.
2. Be aware of multiple earthing of the screen.
3. Caution: Use only supply wires suitable for 5°C above surrounding temperature.
4. The polarity for connection terminals 26 (+) and 27 (-) is of no importance due to an internal rectifier.

HAZARDOUS (CLASSIFIED) LOCATION

Class I, Division 2, Groups A,B,C,D
 Class II, Division 2, Groups E,F,G
 Class III, Division 2

NONHAZARDOUS LOCATION

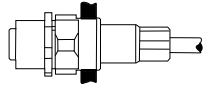


Änderungen:	H	15.05.04/MDI	N	11.11.09/SCHK	Ersatz für: Ersteller: FES / ID 1090 FILE M:\ZEICHN\G\FES0050\PI\FES0050Q.doc
	J	28.06.05/SCHK	O	08.02.11/KLI	
	K	15.08.06/BDA	P	23.05.11/SCHK	
	L	20.10.06/BDA	Q	08.08.12/BIF	
	M	05.09.07/BDA			

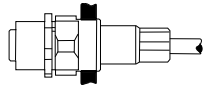
FM Control Drawing Div. 2 / Zone 2 PROFIBUS PA + Foundation Fieldbus FNICO Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X	Gezeichnet	09.10.00	Bn
	Geprüft		
	Ex-geprüft	08.08.12	BIF
	Gesehen		

1) Thread: M20x1.5, NPT 1/2", NPT 3/4" or G 1/2"

2) Approved / Certified receptacle for process wiring for Cl.I, Div. 2



3) Listed receptacle for process wiring (general purpose)



Notes:

1. Class I Division 2 Groups ABCD, Class II Division 1 Groups EFG and Class III

Flow meter with cable entry M20x1.5 thread, NPT1/2" thread, NPT 3/4" thread:

- Install all per National Electrical Code NEC and use supply wires suitable for 10 °C / 18 °F above ambient temperature.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329°F

2. Class I Division 2 Groups ABCD

Flow meter with FM approved receptacles (plug-in connector) suitable for Class I, Div. 2 installation:

- Install per National Electrical Code NEC
- Install tool secured guard on the connection to render the connection normally not arcing.

3. Class I Division 2 Groups ABCD:

Flowmeters with listed cable glands, pig tails or receptacles (plug in connector):

- The connector must not be removed when energized. Therefore the warning "Do not separate when energized" must be readable after installation.
- Install per National Electrical Code NEC

4. Non-hazardous classified areas:

All of the above described cable entries are suitable for installations in non-hazardous areas

- Install per National Electrical Code NEC

Component ratings:

- Wire at least AWG 28
- Dielectric strength of wire insulation at least 50 V
- Current rating of components at least 1 A
- Temperature range at least -40 °C ... +70 °C

Änderungen:	H	15.05.04/MDI	N	11.11.09/SCHK	Ersatz für: Ersteller: FES / ID 1090 FILE M:\ZEICHN\G\FES0050\PFES0050Q.doc
	J	28.06.05/SCHK	O	08.02.11/KLI	
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	L	20.10.06/BDA	Q	08.08.12/BIF	
	M	05.09.07/BDA			

FM Control Drawing Div. 2 / Zone 2
Cable entries

Promass 40/80/83/84 A/E/F/H/I/M/O/P/S/X

Gezeichnet	09.10.00	Bn
Geprüft		
Ex-geprüft	08.08.12	BIF
Gesehen		



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