



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:

9aP bb-cdefghiklmno+###. PROline PROSONIC FLOW Ultrasonic Flowmeter Transmitter.

XP-AIS-DIP / I,II,III / 1 / ABCDEFG / T*; XP-AIS / I / 1 / IIC / T*; - FES0059; Type 4X

I/O option R and S Current Output:

Voc = 21.8 V, Isc = 90 mA, Po = 0.49 W, Ca = 150 nF, La = 4.1 mH;

Vmax = 30 V, Imax = 10 mA, Pi = 300 mW, Ci = 6 nF, Li = 0.

I/O Option S and T Frequency Output:

Vmax = 30 V, Imax = 300 mA, Pi = 0.6 W, Ci = 6 nF, Li = 0.

I/O option T Current Output:

Vmax = 30 V, Imax = 100 mA, Pi = 1.25 W, Ci = 6 nF, Li = 0.

I/O option R Current Output:

Vmax = 30 V, Imax = 10 mA, Pi = 300 mW, Ci = 6 nF, Li = 0.

I/O option U Current Output:

Vmax = 30 V, Imax = 100 mA, Pi = 1.25 W, Ci = 6 nF, Li = 0.

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

Vmax = 30 V, Imax = 600 mA, Pi = 8.5 W, Ci = 5 nF, Li = 10 uH

a = Type of electronic: 0 or 3.

bb = Mounting type/number of channels: any two digit combination of number or letter.

c = Flow sensor type: any single number or letter.

d = Sensor holder: any single number or letter.

e = Installation set: any single number or letter.

f = Sensor cable: any single number or letter.

g = Sensor cable conduit adapter: any single number or letter.

h = Calibration: any single number or letter.

i = Approvals: N.

k = Protection type/version: any single number or letter except V, W, or 6 (remote version -20°C)

V (remote version stainless steel -40°C)

W (remote version stainless steel -20°C)

6 (remote version stainless steel -40°C)

l = Cable glands: A, B.

m = Display/Power supply/Operation: 0, 1, 2, 3, 4, 5, A, B, C, D or X.

n = Software: any single number or letter.

o = I/O's:

A, B, C, D, E, H, J, K, L, M, N, P, Q, V, W, X, 0, 2, 3, 4, 5, 6 or 7 = non IS

F = IS Profibus PA
 G = IS Foundation Fieldbus
 R = IS HART current output, active
 S = IS HART current output active, Frequency output passive
 T = IS HART current output passive, Frequency output passive
 U = IS HART current output passive

** = option in two digits (none, two or multiple of two digits); any combination of number or letter
 +, # = Signs used as indicators for optional abbreviations of extended order code.

Special Conditions of Use:

For installation instructions and the Temperature Class() which applies to specific models, ambient temperatures, and process medium Temperature (Tmed), refer to control drawing FES 0059.*

Equipment Ratings:

Explosionproof for Class I, Division 1, Group A, B, C and D and Class I, Zone 1, Group IIC; dust-ignitionproof for Class II and III Division 1, Groups E, F and G hazardous (classified) outdoor (Type 4X) locations; sensor circuits and signal output circuits (o = I/O options S, T, F, G) 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 FES0059.

AND

9aP bb-cdefghiklmno+*#. PROline PROSONIC FLOW Ultrasonic Sensor.**

IS-DIP / I,II,III / 1 / ABCDEFG / T*, IS / I / 1 / IIC / T*, -FES0059;

NI / I / 2 / ABCD / T6 to T1, Ta = 60°C, Tmed = 80°C to 170°C; Type 4X, Type 6P

a = Type of electronic: any single number or letter.

bb = Mounting type/number of channels: any two digit combination of number or letter.

c = Flow sensor type: any single number or letter.

d = Sensor holder: any single number or letter.

e = Installation set: any single number or letter.

f = Sensor cable: any single number or letter.

g = Sensor cable conduit adapter: any single number or letter.

h = Calibration: any single number or letter.

i = Approvals: N.

k = Protection type/version: any single number or letter.

l = Cable glands: any single number or letter.

m = Display/Power supply/Operation: any single number or letter.

n = Software: any single number or letter.

o = I/O's: 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 indicators for optional abbreviations of extended order code.

Special Conditions of Use:

For installation instructions and the Temperature Class() which applies to specific models, ambient temperatures, and process medium temperature (Tmed), refer to control drawing FES 0059.*

DDU 18-abcd. Prosonic Flow Sensor.

IS-DIP / I,II,III / 1 / ABCDEFG / T6 to T1, Ta = 60°C, Tmed = 80°C to 170°C; IS / I / 1 / IIC / T6 to T1;

NI / I / 2 / ABCD / T6, Ta = 60°C, Tmed = 80°C to 170°C; - FES0059; Type 6P

a = Type of sensor: any single number or letter.

b = Type of mounting: any single number or letter.

c = Sensor cable adapter: any single number or letter.

d = Sensor cable pre-fabricated: any single number or letter.

DDU 19-abcd. Prosonic Flow.

IS-DIP / I,II,III / 1 / ABCDEFG / T6 to T1, Ta = 60°C, Tmed = 80°C to 170°C; IS / I / 1 / IIC / T6toT1;
NI / I / 2 / ABCD / T6, Ta = 60°C, Tmed = 80°C to 170°C; – FES0059; Type 4X

- a = Type of sensor: any single number or letter.
- b = Type of mounting: any single number or letter.
- c = Sensor cable adapter: any single number or letter.
- d = Sensor cable pre-fabricated: any single number or letter.

Equipment Ratings:

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G and Class I, Zone 1, Group IIC;
dust-ignitionproof for Class II and III, Division 1, Groups E, F and G; nonincendive for Class I, Division 2,
Groups A, B, C and D and Class I, Zone 2, Group IIC hazardous (classified) outdoor (Type 4X or 6P
respectively) locations when installed in accordance with FM Control Drawing FES0059.

AND

9ab cc-defghiklmnop+###. PROline PROSONIC FLOW Ultrasonic Flowmeter Transmitter.

NI-ANI / I / 2 / ABCD / T5, Ta = 60°C; NI-ANI / I / 2 / IIC / T5, Ta = 60°C;
DIP / II,III / 1 / EFG / T6, Ta = 60°C – FES0063; Type 4X

- a = Type of electronic: 0 or 3.
- b = Type of sensor: C, P, U or W.
- cc = Mounting type/number of channels/Nominal diameter: any two digit combination of number or letter.
- d = Flow sensor type: any single number or letter.
- e = Sensor holder/measuring tube: any single number or letter.
- f = Installation set/process connection: any single number or letter.
- g = Sensor cable: any single number or letter.
- h = Sensor cable conduit adapter: any single number or letter.
- i = Calibration: any single number or letter.
- k = Approvals: R.
- l = Protection type/version: any single number or letter except 6 = Ta -20°C and for 6 = Ta -40°C
- m = Cable glands: A, B, C, K, L, M, X or 9.
- n = Display/Power supply/Operation: A, B, C, D, E, F, G, H, P, Q, R, S, 0, 1, 2, 3, 4, 5, 7, 8 or X.
- o = Software: any single number or letter.
- p = I/O's: A, B, C, D, E, H, J, K, L, M, N, P, Q, V, W, X, 0, 2, 3, 4, 5, 6 or 7.
- ** = option in two digits (none, two or multiple of two digits); any combination of number or letter
- +,# = Signs used as indicators for optional abbreviations of extended order code.

9ab cc-defghiklmnop+###. PROline PROSONIC FLOW Ultrasonic Sensor.

NI-ANI / I / 2 / ABCD / T6 to T1, Ta = 60°C, Tmed = 80°C; NI / I / 2 / IIC / T6 to T1, Ta = 60°C, Tmed = 80°C;
DIP / II,III / 1 / EFG / T6 to T1, Ta = 60°C, Tmed = 80°C; – FES0063, Type 4X, Type 6P

- a = Type of electronic: any single number or letter.
- b = Type of sensor: C, P, U or W.
- cc = Type of mounting/number of channels/ diameter:
 - Representing a clamp on version (Type 4X or 6P)
 - Representing an insertion version (Type 6P)
 - Representing a tube diameter (Type of sensor = C)

- d = Flow sensor type: any single number or letter.
- e = Sensor holder/measuring tube: any single number or letter.
- f = Installation set/process connection: any single number or letter.
- g = Sensor cable: any single number or letter.
- h = Sensor cable conduit adapter: any single number or letter.



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i = Calibration: any single number or letter.

k = Approvals: R. (Type of sensor = U; NI, Class I only), (Type of sensor = C, P or W; NI, Class I; DIP Class II, III; Type 4X, 6P)

l = Protection type/version: any single number or letter.

m = Cable glands: any single number or letter.

n = Display/Power supply/Operation: any single number or letter.

o = Software: any single number or letter.

p = I/O's: 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 indicators for optional abbreviations of extended order code.

Equipment Ratings:

Transmitter nonincendive for Class I, Division 2, Group A, B, C and D and Class I, Zone 2, Group IIC; dust-ignitionproof for Class II and III, Division 1, Groups E, F and G hazardous (classified) outdoor (Type 4X) locations; Sensor (Type = U) nonincendive for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC hazardous (classified) indoor locations; Sensor (Type = C, P or W) nonincendive for Class I Division 2, Groups A, B, C, and D and Class I, Zone 2, Group IIC; dust-

Dustignitionproof for Class II and III, Division 1, Groups E, F and G hazardous (classified) outdoor (Type 4X or 6P) locations when installed in accordance with FM Control Drawing FES0063

FM Approved for:

Endress + Hauser Flowtec AG
Kägenstraße 7
CH-4153 Reinach BL 1
Switzerland

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 3615	1989
Class 3611	1999
Class 3810	1989
Including Supplement #1	1995

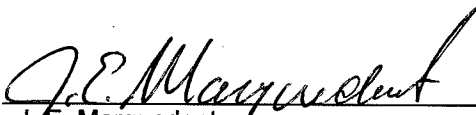
Original Project ID: 3010849

Approval Granted: May 31, 2001

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
3014812	August 26, 2002		
3015820	December 17, 2002		
030711	September 10 2003		
061106	August 15, 2007		
081124	January 26, 2009		
3041673	April 21, 2011		
10/07/11	November 22, 2011		

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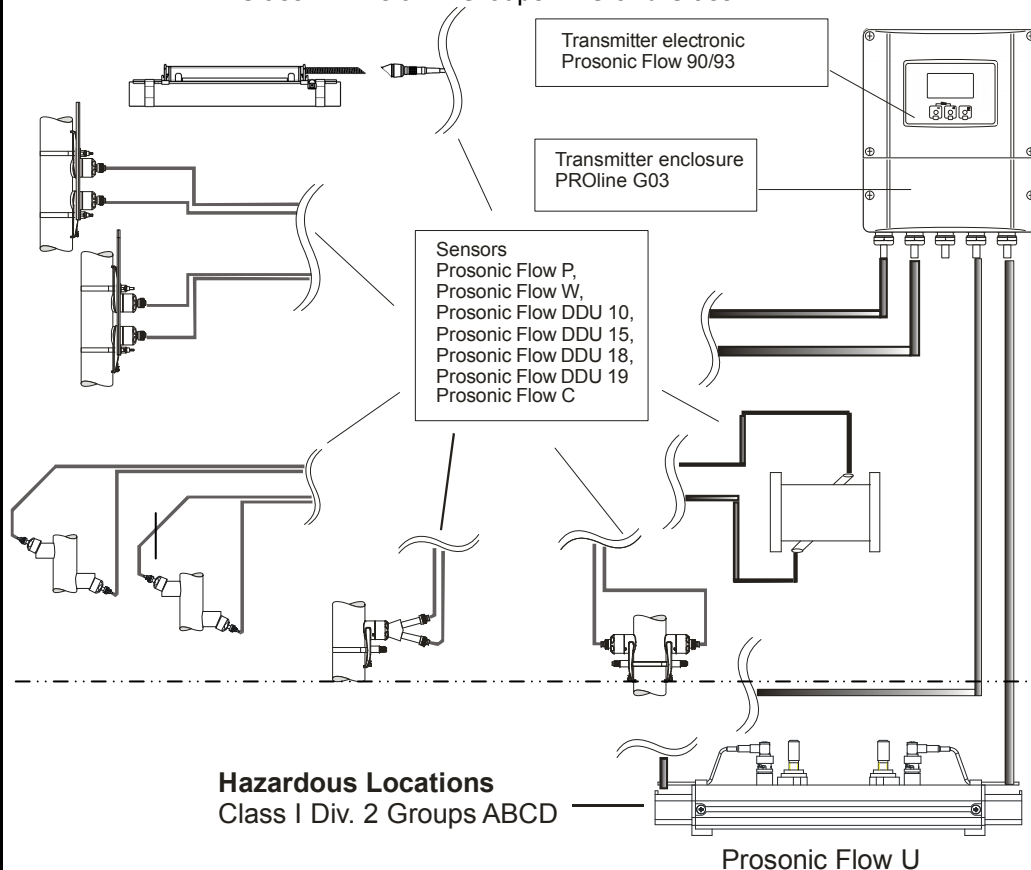

J.E. Marquedant
Group Manager, Electrical

22 November 2011
Date

Hazardous Locations

Class I Div. 2 Groups ABCD or Class I Zone 2 Groups IIC

Class II Division 1 Groups EFG and Class III



Hazardous Locations

Class I Div. 2 Groups ABCD

Prosonic Flow U

Temperature table

Sensors	maximum medium temperature in °C									
	T6	T5	T4A	T4	T3C	T3B	T3A	T3	T2	T1
at Ta = 60°C										
Pros. Flow 9*PA* - A*****	80	80	80	80	80	80	80	80	80	80
Pros. Flow 9*PA* - B*****	80	80	80	80	80	80	80	80	80	80
Pros. Flow 9*W** - *****	80	80	80	80	80	80	80	80	80	80
Pros. Flow DDU 10 - A*****	80	80	80	80	80	80	80	80	80	80
Pros. Flow DDU 10 - C*****	80	80	80	80	80	80	80	80	80	80
Pros. Flow DDU 15* - *****	80	80	80	80	80	80	80	80	80	80
Prosonic Flow DDU18-A****	80	80	80	80	80	80	80	80	80	80
Prosonic Flow DDU19-****	80	80	80	80	80	80	80	80	80	80
Prosonic Flow 9*U** - *****	80	80	80	80	80	80	80	80	80	80
at Ta = 60°C										
Pros. Flow 9*PA* - 1*****	80	95	100	100	100	100	100	100	100	100
Pros. Flow 9*PA* - 2*****	80	95	115	130	150	150	150	150	150	150
Pros. Flow 9*PA* - E*****	80	95	115	130	155	160	170	170	170	170
Pros. Flow 9*PA* - F*****	80	95	115	130	155	160	170	170	170	170
Pros. Flow DDU 10 - B*****	80	95	115	130	155	160	170	170	170	170
Pros. Flow DDU 10 - D*****	80	95	115	130	155	160	170	170	170	170
Prosonic Flow DDU18-B****	80	95	115	130	155	160	170	170	170	170

The Prosonic Flow C sensor consists of a calibrated measuring tube with Prosonic Flow W sensors mounted.

Temperature class sensor : T6 – T1

Range of ambient temperature: -40 °C ... +80°C / -40°F ... +180°F (depending version)

Minimum medium temperature: -40 °C. (depending version)

Transmitter :

Temperature class : T5

Range of ambient temperature: -40...+60°C (depending version)

Notes:

1. Installation of Transmitter circuit wiring according to NEC using threaded conduit or other wiring methods in accordance with articles 500 to 510.
2. Caution: Use supply wires suitable for 5°C above ambient temperature, but at least for 80°C / 176°F.
3. Class II Group G: The surface temperature of the apparatus cannot exceed 165°C / 329°F.
4. For Div. 2 installation of the sensor circuits nonincendive wiring might be used.
5. Sensor Circuits are non-incendive.
6. For installation of Fieldbus communication circuits of Proline Prosonic Flow 9****-***** H/K see sheet 2.

Aenderungen:

A	13.03.02/MDI	F	08.08.12/BIF
B	05.12.02/UD	G	
C	24.03.03/MDI	H	
D	19.05.04/PAM	J	
E	29.10.08/SCHK	K	

Ersteller: FES / ID 1102

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FM Control Drawing Class I Division 2
Class I Zone 2

PROSONIC FLOW 9.



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

Gezeichnet	10.03.01	UD
Geprüft		
Ex-geprüft	08.08.12	BIF
Gesehen		

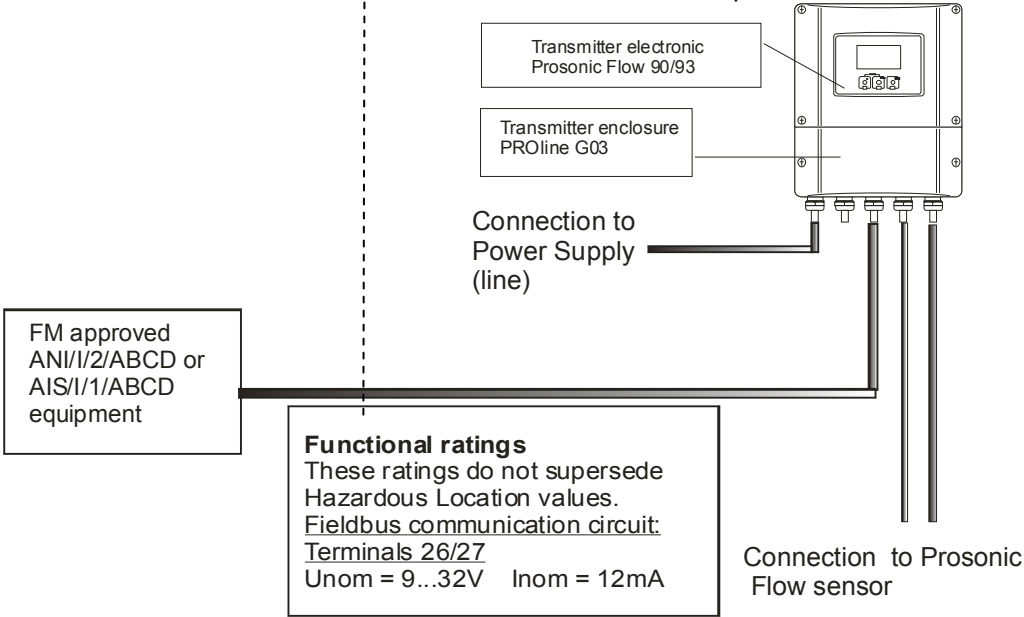
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Proline Prosonic Flow 9****_*****H
Proline Prosonic Flow 9****_*****K

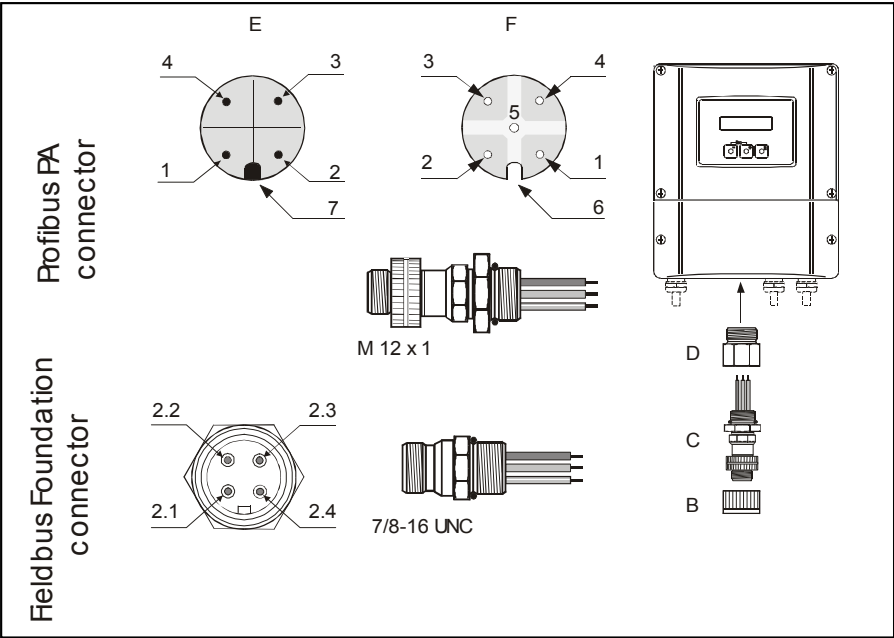
Non-Hazardous Classified
Location

Hazardous Classified Location
Class I Div. 2 Groups ABCD or
Class I Zone 2 Groups IIC



Notes:

1. Fieldbus cable connectors are suitable for Class I Div.2 Groups A, B, C, D if connected to associated nonincendive or associated intrinsically safe equipment.
2. 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)
3. For this current controlled circuit, the parameter I_{max} is not required and need not to be aligned with parameter I_{SC} and I_t of the associated non-incendive field wiring or associated apparatus.
4. Fieldbus communication circuits (terminals 26/27) are suitable for connection according to Fieldbus Nonincendive Concept (FNICO) see sheet 3.



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:	A	13.03.02/MDI	F	08.08.12/BIF	Ersteller: FES / ID 1102 FILE: m:\zeichnung\fes0063\el\FES0063E_081029.doc		
	B	05.12.02/UD	G				
	C	24.03.03/MDI	H				
	D	19.05.04/PAM	J				
	E	29.10.08/SCHK	K				
FM Control Drawing Class I Division 2 Fieldbus communication circuits PROSONIC FLOW 9.					Gezeichnet	10.03.01	UD
					Geprüft		
					Ex-geprüft	08.08.12	BIF
					Gesehen		
 Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach					FES0063 F 2/3		

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 remain nonincendive, must be equal or greater than the voltage (U_o , V_o 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_o 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

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

Length of trunk cable:	$\leq 1000 \text{ m}$
Length of spur cable:	$\leq 30 \text{ m}$
Length of splice:	$\leq 1 \text{ m}$

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

$$R = 90...100 \text{ Ohm} \quad C = 0...2.2 \text{ }\mu\text{F}$$

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.

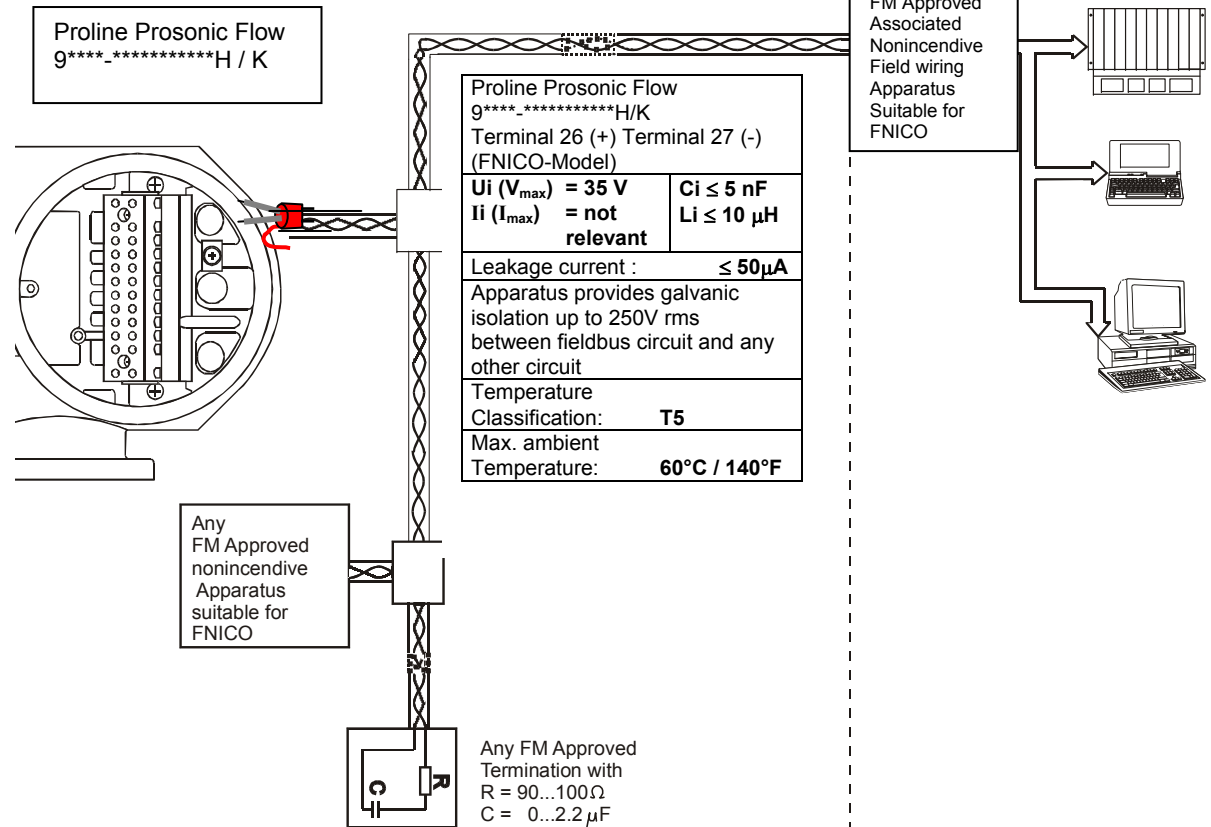
Notes:

1. Approved associated apparatus must be installed in accordance with manufacturers instructions.
2. Be aware of multiple earthing of the screen. The screen must be connected in accordance with ISA RP 12.06.01
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:

A	13.03.02/MDI	F	08.08.12/BIF
B	05.12.02/UD	G	
C	24.03.03/MDI	H	
D	19.05.04/PAM	J	
E	29.10.08/SCHK	K	

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

Ersatz für:

Ersteller: FES / **ID 1102**
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FM Control Drawing Class I Div. 2 / Zone 2
PROFIBUS PA + Foundation Fieldbus
FNICO
PROSONIC FLOW 9.

Massstab

Gezeichnet	10.03.01	UD
Geprüft		
Ex-geprüft	08.08.12	BIF
Gesehen		



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

FES0063 F

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