XA 061D/06/en/10.01
50100512
FM+SGML 6.0

PROline prosonic flow 93
Division 1

Ex documentation for the BA 070D and BA 071D operating instructions according to FACTORY MUTUAL standards

Ex documentation for the BA 070D and BA 071D operating instructions according to CANADIAN STANDARDS ASSOCIATION

Endress + Hauser

The Power of Know How

XA 061D/06/en/10.01
50100512
FM+SGML 6.0

PROline prosonic flow 93 Division 1

en

Ex documentation for the BA 070D and BA 071D operating instructions

according to FACTORY MUTUAL standards

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

Factory Mutual

Type of Protection

XP	Explosionproof
IS	Intrinsically Safe Apparatus
AIS	Associated Apparatus with Intrinsically Safe Connections
ANI	Nonincendive Field Wiring Circuit
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 dusts (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)	

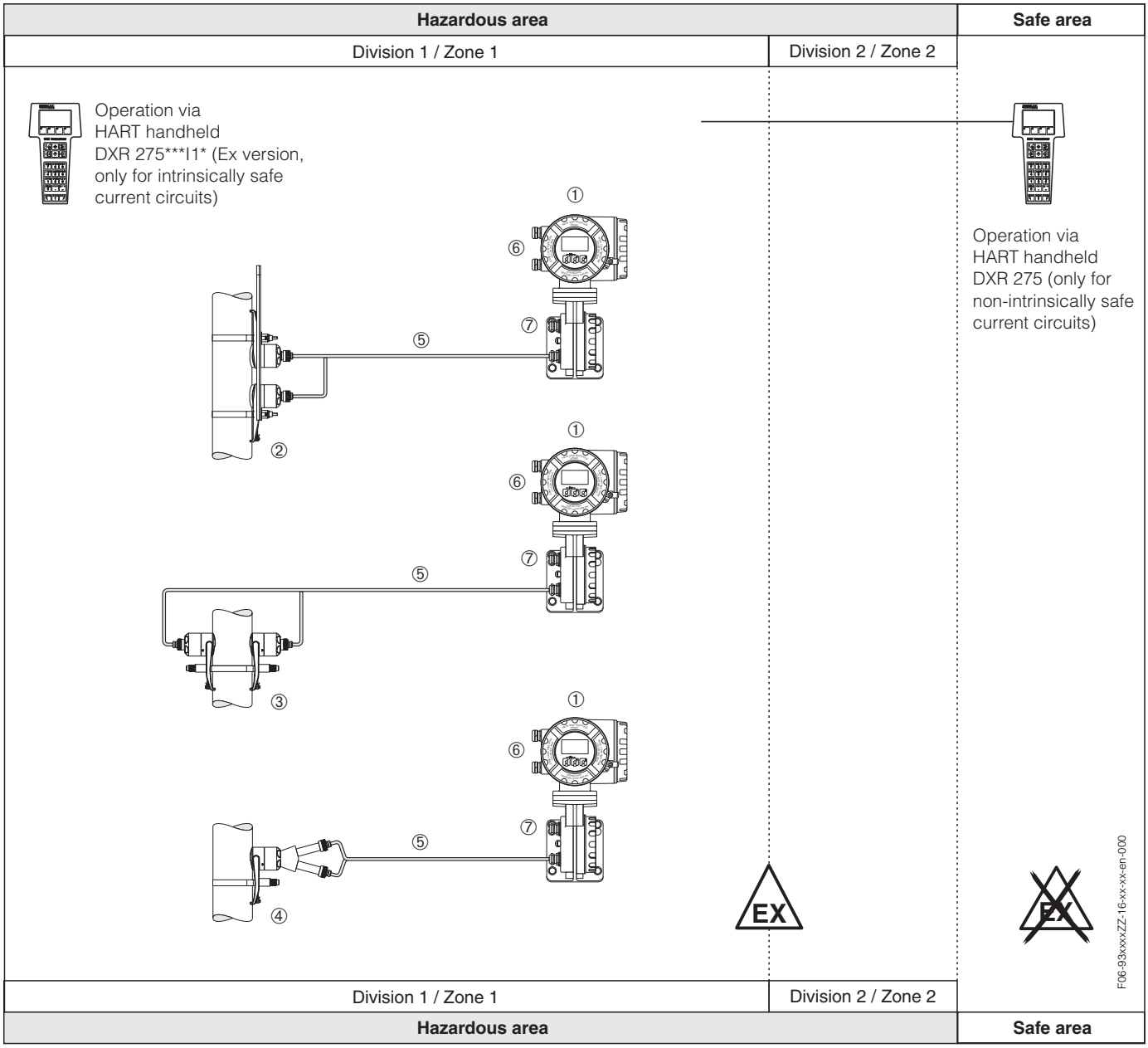
Temperature Class

FM 3611	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

FM

Endress+Hauser

The Power of Know How



① Ultrasonic transmitter Prosonic Flow 93 in:
XP-AIS-DIP / I,II,III / 1 / ABCDEFG / T6

PROline Explosionproof Enclosure

② Flow measuring sensors Prosonic Flow P (Clamp On) in:
IS-DIP / I,II,III / 1 / ABCDEFG / T6-T1
NEMA 6P

For ambient and medium temperature ranges, and temperature class, see Page 3.

③ Sensor velocity measuring sensors Prosonic Flow DDU 18 (Clamp On) in:
IS-DIP / I,II,III / 1 / ABCDEFG / T6-T1
NEMA 6P

④ Wall thickness measuring sensor Prosonic Flow DDU 19 (Clamp On) in:
IS-DIP / I,II,III / 1 / ABCDEFG / T6-T1
NEMA 4X

⑤ For safety reasons the max. cable length is 30 m.
For interconnection between transmitter and sensors only prefabricated Endress+Hauser cables shall be used.
Replace defective cables with new cables.

Interconnection of components ① and ⑤ with sensors ②, ③ or ④ as loop concept.

For number references ⑥ and ⑦ see on Page 11.

Temperature tables

Prosonic Flow**PA*-A/B*****N***** and Sound velocity measuring sensors DDU 18-A***

at T_a = 140 °F		Max. medium temperature [°F] in					
		T6	T5	T4	T3	T2	T1
SensorsPA*-A/B*****N*******	PVC cables	176	176	176	176	176	176
Sensors DDU 18-A***	PVC cables	176	176	176	176	176	176

The minimum medium temperature is –40 °F

Prosonic Flow**PA*-E/F*****N***** and Sound velocity measuring sensors DDU 18-B***

at T_a = 140 °F		Max. medium temperature [°F] in					
		T6	T5	T4	T3	T2	T1
SensorsPA*-E/F*****N*****	PTFE cables	176	203	266	338	338	338
Sensors DDU 18-B***	PTFE cables	176	203	266	338	338	338

The minimum medium temperature is 32 °F

Wall thickness measuring sensor DDU 19-A***

at T_a = 140 °F		Max. medium temperature [°F] in					
		T6	T5	T4	T3	T2	T1
Sensor DDU 19-A***	PVC or PTFE cables	176	176	176	176	176	176

The minimum medium temperature is –4 °F

Transmitter Prosonic Flow 93 P**-**********

The Prosonic Flow 93 transmitter has a T6 temperature class rating when installed in the PROline Explosionproof Enclosure for operation at ambient temperatures up to T_a = 140 °F.
The maximum ambient temperature range is –4...+140 °F.

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

Approvals

No. / approval type	Description
J.I. 3010849 (See Page 5 for notes on special conditions)	for the electric flow measuring system Prosonic Flow 93 P **Identification:** see below

Transmitter Prosonic Flow 93

Prosonic Flow 93 P**-******N****.	A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay, convertible module D = current HART, frequency, relay, status input, convertible module L = current HART, 2 x relay, status input, convertible modul M = current HART, 2 x frequency, status input, convertible module S = current HART (EEx i) active, frequency (EEx i) T = current HART (EEx i) passive, frequency (EEx i) W = current HART, 2 x current, relays, convertible module 2 = current HART, frequency, current, relays, convertible module
Prosonic Flow 93 P**-******N*****	**XP-AIS-DIP / I,II,III / 1 / ABCDEFG / T6**
Flow measuring sensors	
Prosonic Flow P	**IS-DIP / I,II,III / 1 / ABCDEFG / T6-T1**
Sound velocity measuring sensors	
Prosonic Flow DDU 18	**IS-DIP / I,II,III / 1 / ABCDEFG / T6-T1**
Wall thickness measuring sensor	
Prosonic Flow DDU 19	**IS-DIP / I,II,III / 1/ ABCDEFG / T6-T1**

Notified body

The Prosonic Flow measuring system was tested for approval by the following named entity:

FM: Factory Mutual Research

Special conditions

1. Install per National Electrical Code ANSI/NFPA 70. Install intrinsically safe I/O circuits per NEC and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure.

2. Control room equipment shall not use or generate more than 250 V rms.

3. The specified temperature class in conjunction with the ambient temperature and the medium temperature must be in compliance with the tables on Page 3.

Warning:

4. The transmitter must be grounded by means of a ground screw on the outside of the transmitter housing (see Fig. 1).

Caution:

5. Use supply wires suitable for 41 °F above ambient temperature, but at least for 176 °F.

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).

Electrical connections

Power supply connection

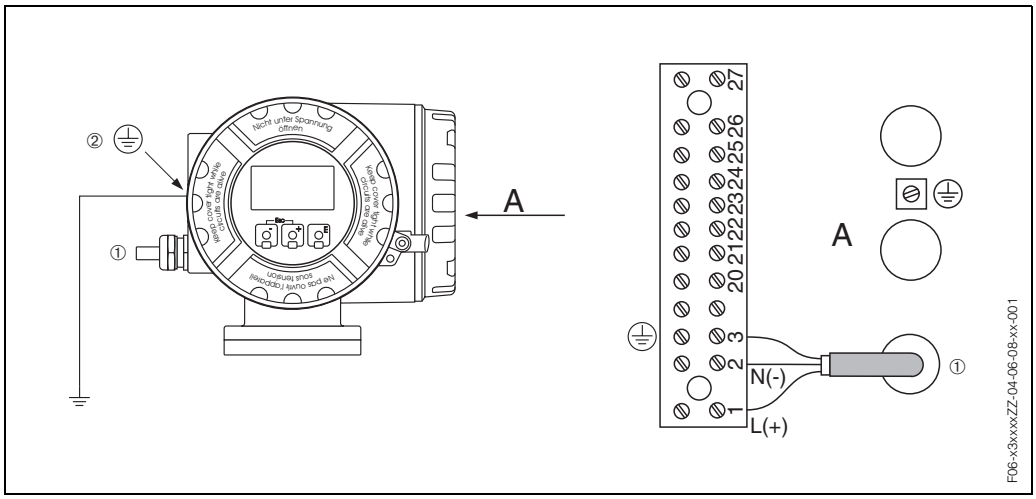


Fig. 1: *① = power supply cable*
② = ground terminal for potential equalisation
A = view A

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

Transmitter Prosonic Flow 93

Terminals	**1**	**2**	**3**
	L (+)	**N (–)**	
Designation	Power supply ①		Protective earth
Functional values	AC: U = 85...260 V or AC: U = 20...55 V or DC: U = 16...62 V Power consumption: 18 VA / 15 W		
Intrinsically safe circuit	no		
U_{max} =	260 V AC		

Input/output circuit

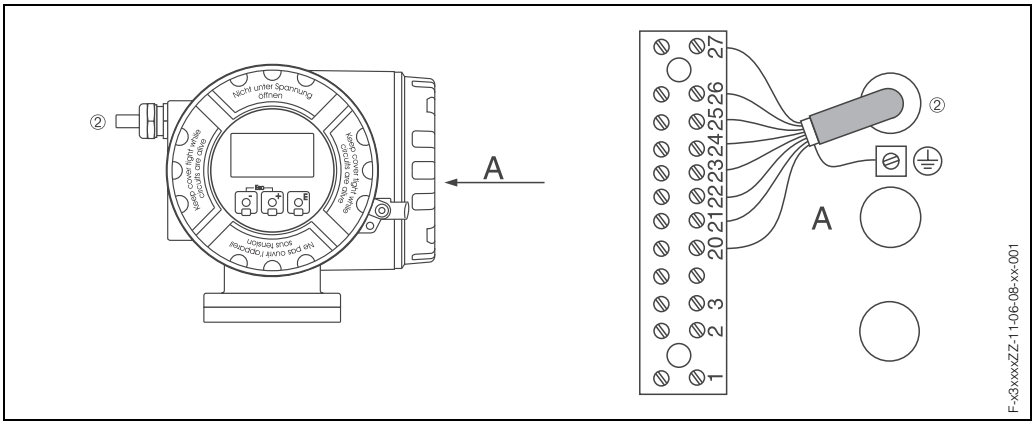


Fig. 2: *② = input/output circuit cable*
A = view A

Note:
The table below contains the values that are not identical for all versions, in other words 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.

Transmitter Prosonic Flow 93***-******N****A

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit					no		no	
U_{max} =					260 V AC		260 V AC	
I_{max} =					500 mA			

Transmitter Prosonic Flow 93***-******N****B

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****C

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****D

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****L

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Relay ②		Relay ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****M

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Pulse/frequency output ②		Pulse/frequency output ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****S

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 0...5000 Hz passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 400 Ω R_L HART ≥ 250 Ω	
Intrinsically safe circuit					Ex ia		Ex ia	
V_{oc}/U_o =							21.8 V DC	
I_{sc}/I_o =							90 mA	
P_{max}/P_o =							490 mW	
L_a/ L_o =							4.1 mH	
C_a/C_o =							0.15 µF	
V_{max}/U_i =					30 V DC		30 V DC	
I_{max}/I_i =					300 mA		10 mA	
P_{max}/P_i =					600 mW		0.3 W	
L_i =					0		0	
C_i =					6 nF		6 nF	

Transmitter Prosonic Flow 93***-******N****T

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 0...5000 Hz passive: 30 V DC/ 250 mA		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{supply} - 9\,V}{25\,mA}$	
Intrinsically safe circuit					Ex ia		Ex ia	
V_{max}/U_i=					30 V DC		30 V DC	
I_{max}/I_i =					300 mA		100 mA	
P_{max}/P_i =					600 mW		1.25 W	
L_i IIC =					0		0	
C_i IIC =					6 nF		6 nF	

Transmitter Prosonic Flow 93***-******N****W

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Current output ②		Current output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****2

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Current output ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

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, breaking 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, breaking capacity 1500 A
  (Schurter, 0001.2507 or Wickmann, Standard Type 181 0.8 A)

Cable entries

For number reference see the figure on Page 2.

⑥ *Cable entries for the transmitter terminal compartment (XP version)*
power supply / electric circuit cable: (Prosonic Flow 93)
Choice of thread for cable entries, ½" NPT.

⑦ *Cable entries for the transmitter terminal compartment*
sensor cable connection:
A special cable gland allows you to insert both sensor cables (per channel) into the connection compartment simultaneously.
Cable gland M20x1.5 for 2 x Ø 4 mm or threaded adapter ½" NPT, G ½".

Make sure that the XP cable entries are secured to prevent working loose.

Technical data

Differences in dimensions and weights due to the use of an XP housing:

- Height + 0.6 inch more than the standard version (see Operating Instructions)
- Weight + approx. 4.4 lbs more than the standard version (see Operating Instructions)

Device identification

Prosonic Flow 93 transmitter and P sensor

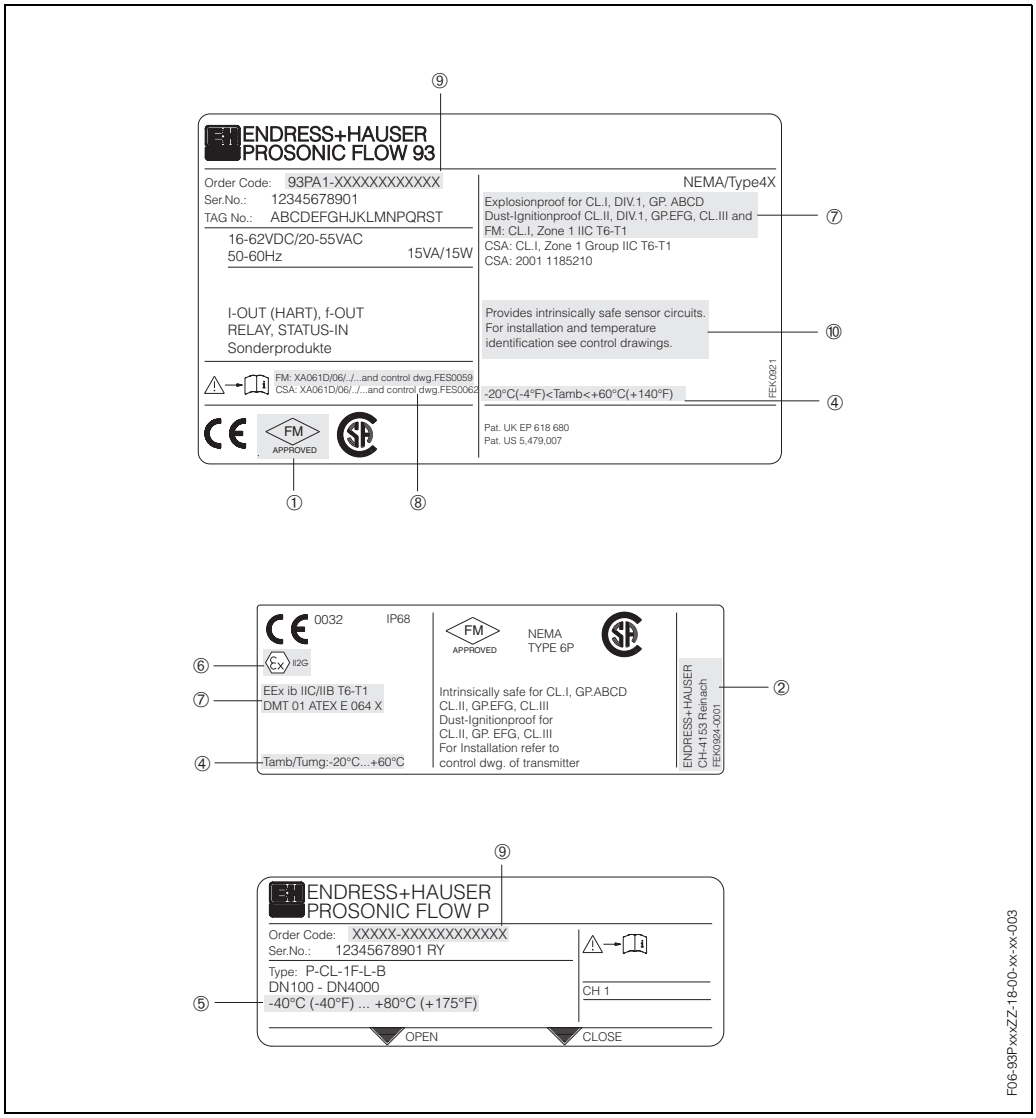


Fig. 3: Nameplate of transmitter and nameplate of sensor (example)

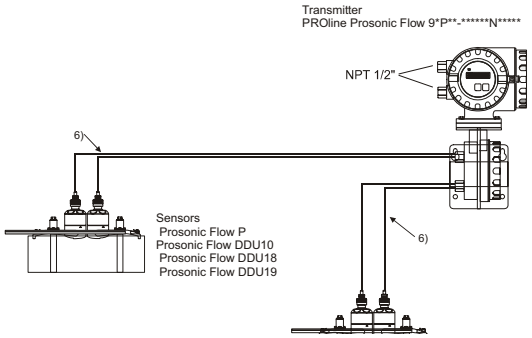
Key to nameplates (Figure 3)

No.	Meaning	No.	Meaning
①	Label of the notified body: Factory Mutual Research	⑥	Device group and device category to directive 94/9/EC
②	Place of manufacture	⑦	Type of protection and explosion group for the Prosonic Flow 93 transmitter
③	–	⑧	Applicable Ex documentation
④	Ambient temperature range	⑨	Type code
⑤	Maximum medium temperature	⑩	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 Division 1 Groups EFG and Class III



Notes:
1. Control room equipment shall not use or generate more than 250 V rms.
2. Install per NEC ANSI/NFPA 70. Install all intrinsically safe I/O cricuits per NEC and ISA RP 12.6 respecting the Explosion-proof Integrity of the enclosure.
3. Sensor circuits may be installed as intrinsically safe wiring per ISA RP 12.6 or in conduit in accordance with the NEC.
4. Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176°F.
5. 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 160°C.
6. Cable Type for all Sensors: Use only prefabricated Endress+Hauser Cable. For reasons of safety the maximum allowed cable length is 30 m per sensor .

Keine Änderungen ohne vorherige Factory Mutual Genehmigung

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
Prosonic Flow DDU 10 – A*****	80	80	80	80	80	80	80	80	80	80
Prosonic Flow DDU 10 – C*****	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-A***	80	80	80	80	80	80	80	80	80	80
at Ta = 60°C										
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
Prosonic Flow DDU 10 – B*****	80	95	115	130	155	160	170	170	170	170
Prosonic 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

Communication modules , I/O options

Communication options	Control Drawings
I/O option = F, H, J	see FES0059-0001
I/O option = G, K	see FES0059-0002
I/O option = G, T	see FES0059-0004

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Aenderungen:				Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugängig gemacht werden.	Ersteller: FES / **ID 1102** FILE: M:\ZEICHNG\Fes0059\010309c.doc
	A		F		
	B		G		
	C		H		
	D		J		
	E		K		

FM Control Drawing Class I Div. 1
Class I Zone 1

PROSONIC FLOW 9 . P

Massstab

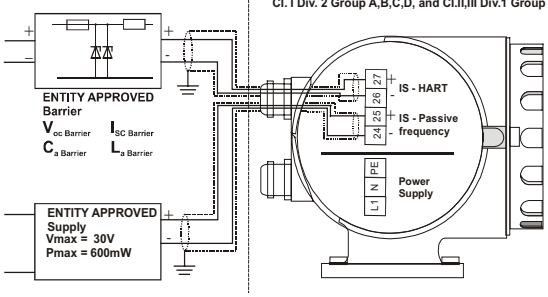
Gezeichnet	09.03.01	UD
Geprüft		
Ex-geprüft	09.03.01	UD
Gesehen		

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

FES0059

NON HAZARDOUS LOCATION

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



Type: PROSONIC FLOW 9*-**********T**
Terminals: 26, 27 (HART current output):
Passive intrinsically safe circuit:

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	100 mA	1.25 W	6 nF	0

Connect to entity approved Barrier with
V_{OC} , V_t or $U_O \leq V_{max}$ / U_i
I_{SC}, I_t or $I_o \leq I_{max}$ / I_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_{a\ Barrier}$ or $C_{o\ Barrier}$ – 6 nF
$L_{cable} \leq L_{a\ Barrier}$ or $L_{o\ Barrier}$

Terminals 24, 25 (Passive intrinsically safe circuit):

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

Entity approved apparatus must meet the follwoing requirements:
V_{OC} , V_t or $U_O \leq V_{max}$ P_{max} or $P_o \leq P_{max}$ / P_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_a$ (C_o) – 6 nF $L_{cable} \leq L_a$ (L_o)

Notes:
1) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80°C / 176°F

Intrinsically safe signal output:
2) Install all intrinsically safe cricuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure
3) **WARNING**: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROSONIC FLOW 9*-**********S**
Terminals: 26, 27 (HART current output):
Active intrinsically safe circuit:

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

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	10 mA	300 mW	6 nF	0

Cable parameters for Intrinsic Safety:
$C_{cable} \leq 0.15$ µF if V_{oc} (of Barrier) ≤ 21.8 V
$C_{cable} \leq C_{a\ Barrier} - 6$ nF if V_{oc} (of Barrier) ≥ 21.8 V
$L_{cable} \leq 4.1$ mH

Terminals 24, 25 (Passive intrinsically safe circuit):

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

Entity approved supply must meet the following requirements:
V_{OC}, V_t or $U_O \leq V_{max}$ P_{max} or $P_O \leq P_{max}$ / P_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_a$ (C_O) – 6nF $L_{cable} \leq L_a$ (L_O)

Keine Änderungen ohne vorherige Factory Mutual Genehmigung

Aenderungen:				Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugängig gemacht werden.	Ersetzt durch: Ersatz für: Ersteller: FES / **ID 1102** File: M:\ZEICHNG\Fes0059\010309c.doc
	A		F		
	B		G		
	C		H		
	D		J		
	E		K		

FM CONTROL DRAWING Class I, Div. 1
PROSONIC FLOW 9*
Entity concept Commodul HART IS

Massstab

Gezeichnet	09.03.01	UD
Geprüft		
Ex-geprüft	09.03.01	UD
Gesehen		

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

FES0059-0004

Supplementary documentation
TI 042D/06
TI 056D/06
TI 057D/06

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Germany
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Fax. (07621) 975 345

XA 061D/06/en/10.01
50100512
FM+SGML 6.0

PROline prosonic flow 93 Division 1

en

Ex documentation for the BA 070D and BA 071D operating instructions

according to CANADIAN STANDARDS ASSOCIATION

Example: **Class I, Division 1, Groups 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 dusts (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	Grain dust (Class II)	
	Textile fibres (Class III)	

Type of Protection

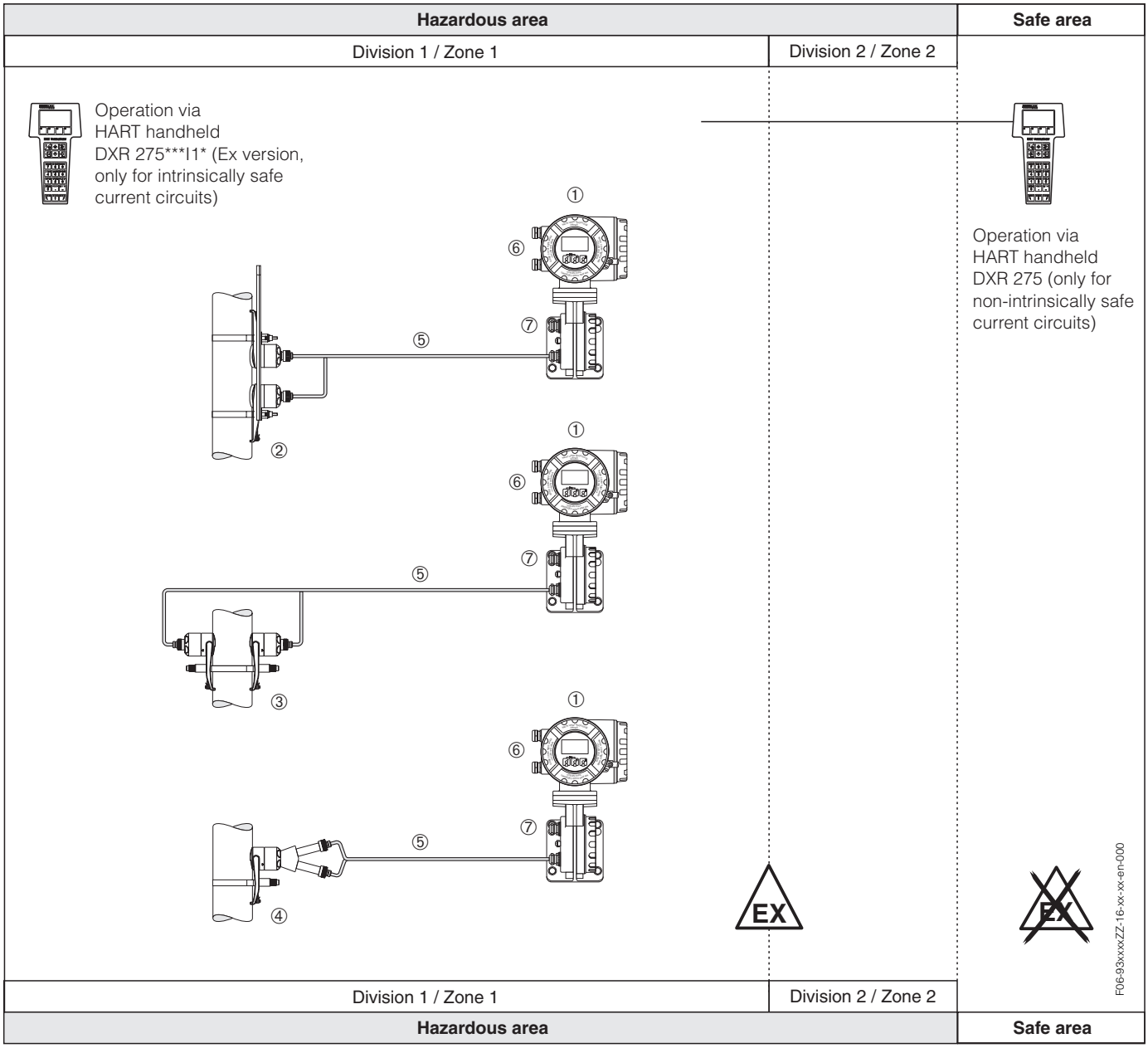
	Explosionproof
	Intrinsically Safe Apparatus
	Associated Apparatus with Intrinsically Safe Connections
	Nonincendive Field Wiring Circuit
	Pressurized
	Associated Pressurization Systems/Components
	Nonincendive
	Dust-Ignitionproof
	Special Protection

Temperature Class

CSA	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

Endress + Hauser

The Power of Know How



① Ultrasonic transmitter Prosonic Flow 93 in:
Explosionproof for Class I, Div. 1, GP. ABCD
Dust-Ignitionproof Class II, Div. 1, GP. EFG, Class III

PROline Explosionproof Enclosure

② Flow measuring sensors Prosonic Flow P (Clamp On) in:
Intrinsically safe for Class I, GP. ABCD
Class II, GP. EFG, Class III
Dust-Ignitionproof for Class II, GP. EFG, Class III
NEMA 6P

For ambient and medium temperature ranges, and temperature class, see Page 3.

③ Sensor velocity measuring sensors Prosonic Flow DDU 18 (Clamp On) in:
Intrinsically safe for Class I, GP. ABCD
Class II, GP. EFG; Class III
Dust-Ignitionproof for Class II, GP. EFG, Class III
NEMA 6P

④ Wall thickness measuring sensor Prosonic Flow DDU 19 (Clamp On) in:
Intrinsically safe for Class I, GP. ABCD
Class II, GP. EFG, Class III
Dust-Ignitionproof for Class II, GP. EFG, Class III
NEMA 4X

⑤ For safety reasons the max. cable length is 30 m.
For interconnection between transmitter and sensors only prefabricated Endress+Hauser cables shall be used.
Replace defective cables with new cables.

Interconnection of components ① and ⑤ with sensors ②, ③ or ④ as loop concept.

For number references ⑥ and ⑦ see on Page 11.

Temperature tables

Prosonic Flow**PA*-A/B*****N***** and Sound velocity measuring sensors DDU 18-A***

at T_a = 60 °C		Max. medium temperature [°C] in					
		T6	**T5**	**T4**	**T3**	**T2**	**T1**
SensorsPA*-A/B*****N*******	PVC cables	80	80	80	80	80	80
Sensors DDU 18-A***	PVC cables	80	80	80	80	80	80

The minimum medium temperature is –40 °C

Prosonic Flow**PA*-E/F*****N***** and Sound velocity measuring sensors DDU 18-B***

at T_a = 60 °C		Max. medium temperature [°C] in					
		T6	**T5**	**T4**	**T3**	**T2**	**T1**
SensorsPA*-E/F*****N*****	PTFE cables	80	95	130	170	170	170
Sensors DDU 18-B***	PTFE cables	80	95	130	170	170	170

The minimum medium temperature is 0 °C

Wall thickness measuring sensor DDU 19-A***

at T_a = 60 °C		Max. medium temperature [°C] in					
		T6	**T5**	**T4**	**T3**	**T2**	**T1**
Sensor DDU 19-A***	PVC or PTFE cables	80	80	80	80	80	80

The minimum medium temperature is –20 °C

Transmitter Prosonic Flow 93 P**-**********

The Prosonic Flow 93 transmitter has a T6 temperature class rating when installed in the PROline Explosionproof Enclosure for operation at ambient temperatures up to T_a = 60 °C.
The maximum ambient temperature range is –20...+60 °C.

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

Approvals

No. / approval type	Description
1185210 (See Page 5 for notes on special conditions)	for the electric flow measuring system Prosonic Flow 93 P **Identification:** see below

Transmitter Prosonic Flow 93

Prosonic Flow 93 P**-******N****.	A = current HART, frequency B = current HART, frequency, 2 x relay C = current HART, frequency, 2 x relay, convertible module D = current HART, frequency, relay, status input, convertible module L = current HART, 2 x relay, status input, convertible modul M = current HART, 2 x frequency, status input, convertible module S = current HART (Ex i) active, frequency (Ex i) T = current HART (Ex i) passive, frequency (Ex i) W = current HART, 2 x current, relays, convertible module 2 = current HART, frequency, current, relays, convertible module
Prosonic Flow 93 P**-******N*****	**Explosionproof for Class I, Div. 1, GP. ABCD** **Dust-Ignitionproof Class II, Div. 1, GP. EFG, Class III**
Flow measuring sensors	
Prosonic Flow P	**Intrinsically safe for Class I, GP. ABCD** **Class II, GP. EFG, Class III** **Dust-Ignitionproof for Class II, GP. EFG, Class III**
Sound velocity measuring sensors	
Prosonic Flow DDU 18	**Intrinsically safe for Class I, GP. ABCD** **Class II, GP. EFG, Class III** **Dust-Ignitionproof for Class II, GP. EFG, Class III**
Wall thickness measuring sensor	
Prosonic Flow DDU 19	**Intrinsically safe for Class I, GP. ABCD** **Class II, GP. EFG, Class III** **Dust-Ignitionproof for Class II, GP. EFG, Class III**

Notified body

The Prosonic Flow measuring system was tested for approval by the following named entity:

CSA: Canadian Standards Association

Special conditions

1. Install per Canadian Electrical Code. Install intrinsically safe I/O circuits per CEC and ISA RP 12.6 respecting the Explosionproof Integrity of the enclosure.

2. Control room equipment shall not use or generate more than 250 V rms.

3. The specified temperature class in conjunction with the ambient temperature and the medium temperature must be in compliance with the tables on Page 3.

Warning:

4. The transmitter must be grounded by means of a ground screw on the outside of the transmitter housing (see Fig. 1).

Caution:

5. Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C.

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).

Electrical connections

Power supply connection

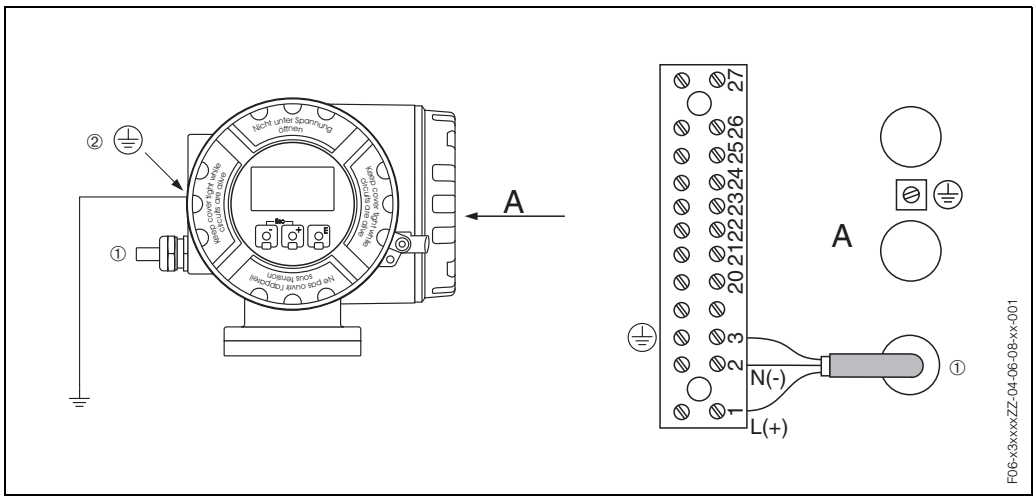


Fig. 1: *① = power supply cable*
② = ground terminal for potential equalisation
A = view A

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

Transmitter Prosonic Flow 93

Terminals	**1**	**2**	**3**
	L (+)	**N (–)**	
Designation	Power supply ①		Protective earth
Functional values	AC: U = 85...260 V or AC: U = 20...55 V or DC: U = 16...62 V Power consumption: 18 VA / 15 W		
Intrinsically safe circuit	no		
U_{max} =	260 V AC		

Input/output circuit

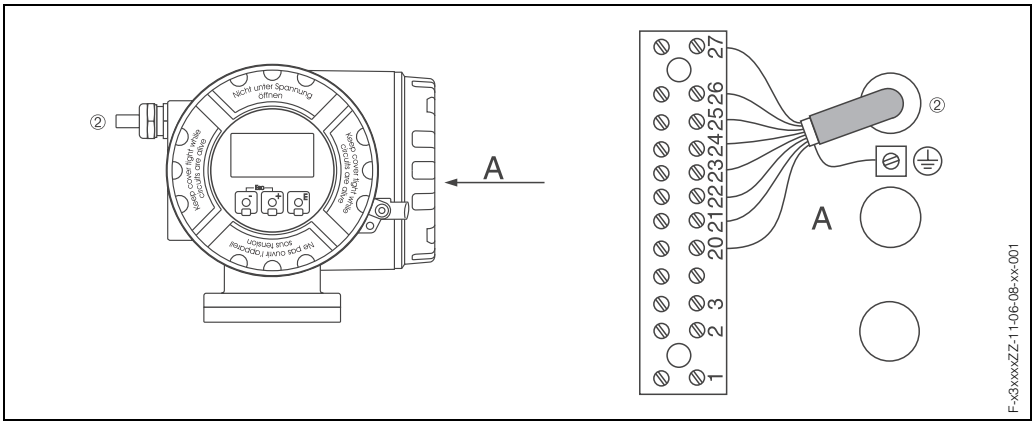


Fig. 2: *② = input/output circuit cable*
A = view A

Note:
The table below contains the values that are not identical for all versions, in other words 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.

Transmitter Prosonic Flow 93***-******N****A

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit					no		no	
U_{max} =					260 V AC		260 V AC	
I_{max} =					500 mA			

Transmitter Prosonic Flow 93***-******N****B

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****C

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****D

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Relay ②		Pulse/frequency output ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		42 V DC/100 mA or 30 V AC/500 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****L

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Relay ②		Relay ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		42 V DC/100 mA or 30 V AC/500 mA		42 V DC/100 mA or 30 V AC/500 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****M

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Status input ②		Pulse/frequency output ②		Pulse/frequency output ②		Current output HART ②	
Functional values	3...30 V DC R_i = 5 kΩ		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****S

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 0...5000 Hz passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 400 Ω R_L HART ≥ 250 Ω	
Intrinsically safe circuit					Ex ia		Ex ia	
V_{oc}/U_o =							21.8 V DC	
I_{sc}/I_o =							90 mA	
P_{max}/P_o =							490 mW	
L_a/ L_o =							4.1 mH	
C_a/C_o =							0.15 µF	
V_{max}/U_i =					30 V DC		30 V DC	
I_{max}/I_i =					300 mA		10 mA	
P_{max}/P_i =					600 mW		0.3 W	
L_i =					0		0	
C_i =					6 nF		6 nF	

Transmitter Prosonic Flow 93***-******N****T

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation					Pulse/frequency output ②		Current output HART ②	
Functional values					f = 0...5000 Hz passive: 30 V DC/ 250 mA		passive: 0/4...20 mA Voltage drop ≤ 9 V $R_L < \frac{V_{supply} - 9\,V}{25\,mA}$	
Intrinsically safe circuit					Ex ia		Ex ia	
V_{max}/U_i=					30 V DC		30 V DC	
I_{max}/I_i =					300 mA		100 mA	
P_{max}/P_i =					600 mW		1.25 W	
L_i IIC =					0		0	
C_i IIC =					6 nF		6 nF	

Transmitter Prosonic Flow 93***-******N****W

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Current output ②		Current output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

Transmitter Prosonic Flow 93***-******N****2

Terminals	20	21	22	23	24	25	26	27
	+	–	+	–	+	–	+	–
Designation	Relay ②		Current output ②		Pulse/frequency output ②		Current output HART ②	
Functional values	42 V DC/100 mA or 30 V AC/500 mA		0/4...20 mA active: R_L < 700 Ω passive: max. 30 V DC		f = 2...10000 Hz active: 24 V DC/25 mA (max. 250 mA/20 ms), R_L >100 Ω passive: 30 V DC/ 250 mA		active: 0/4...20 mA R_L < 700 Ω R_L HART ≥ 250 Ω passive: max. 30 V DC	
Intrinsically safe circuit	no		no		no		no	
U_{max} =	260 V AC		260 V AC		260 V AC		260 V AC	
I_{max} =	500 mA							

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, breaking 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, breaking capacity 1500 A
  (Schurter, 0001.2507 or Wickmann, Standard Type 181 0.8 A)

Cable entries

For number reference see the figure on Page 2.

⑥ *Cable entries for the transmitter terminal compartment (XP version)*
power supply / electric circuit cable: (Prosonic Flow 93)
Choice of thread for cable entries, ½" NPT.

⑦ *Cable entries for the transmitter terminal compartment*
sensor cable connection:
A special cable gland allows you to insert both sensor cables (per channel) into the connection compartment simultaneously.
Cable gland M20x1.5 for 2 x Ø 4 mm or threaded adapter ½" NPT, G ½".

Make sure that the XP cable entries are secured to prevent working loose.

Technical data

Differences in dimensions and weights due to the use of an XP housing:

- Height + 0.6 inch more than the standard version (see Operating Instructions)
- Weight + approx. 4.4 lbs more than the standard version (see Operating Instructions)

Device identification

Prosonic Flow 93 transmitter and P sensor

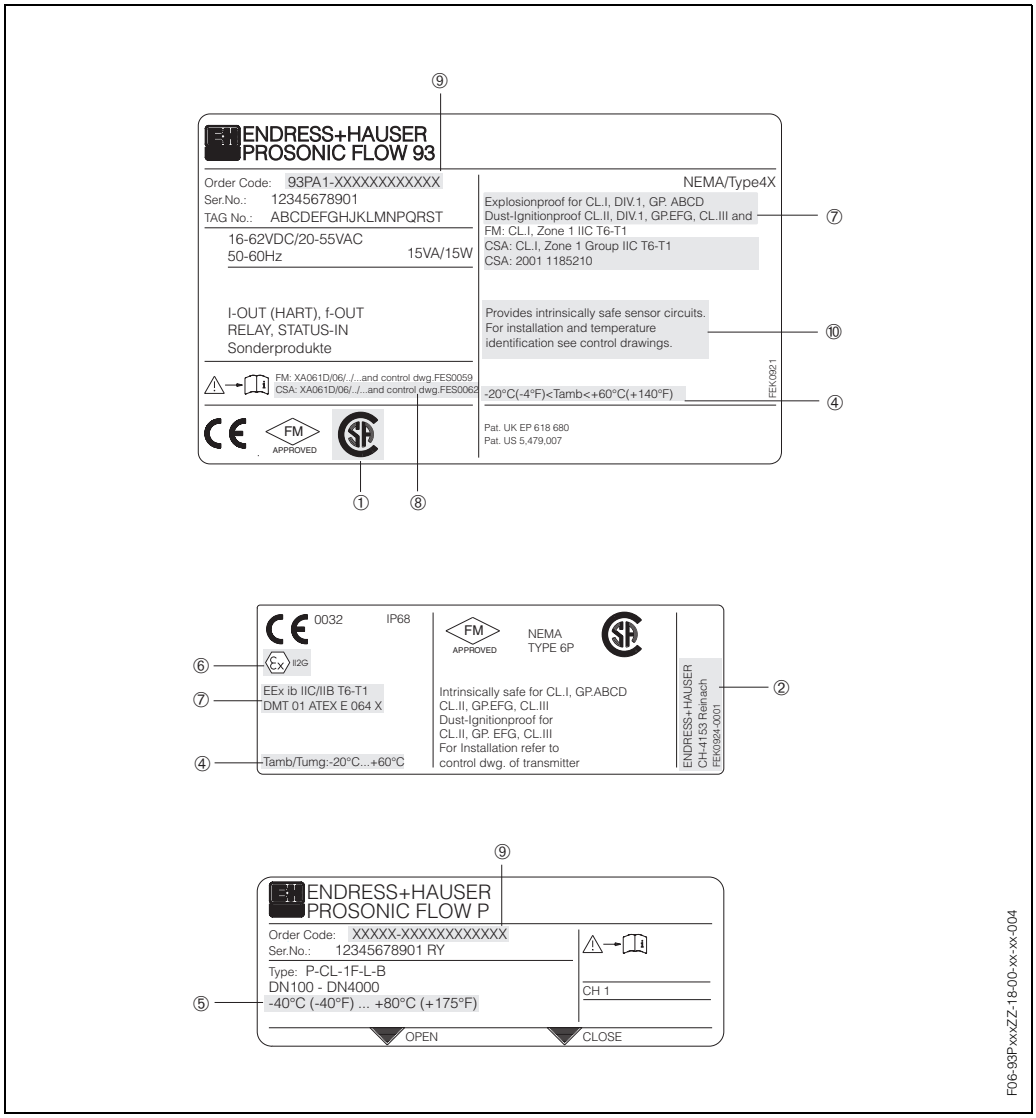


Fig. 3: Nameplate of transmitter and nameplate of sensor (example)

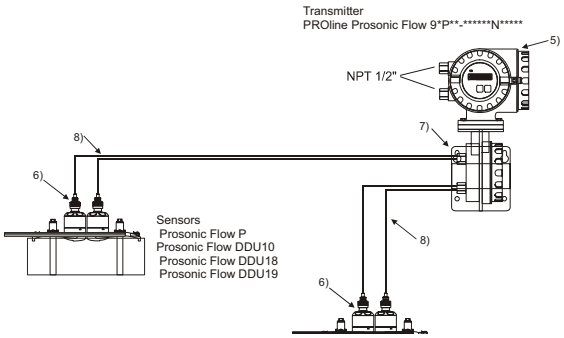
Key to nameplates (Figure 3)

No.	Meaning	No.	Meaning
①	Label of the notified body: Canadian Standards Association	⑥	Device group and device category to directive 94/9/EC
②	Place of manufacture	⑦	Type of protection and explosion group for the Prosonic Flow 93 transmitter
③	–	⑧	Applicable Ex documentation
④	Ambient temperature range	⑨	Type code
⑤	Maximum medium temperature	⑩	Warning

Control drawings

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the CADADIAN STANDARDS ASSOCIATION.

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



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
Prosonic Flow DDU 10 – A*****	80	80	80	80	80	80	80	80	80	80
Prosonic Flow DDU 10 – C*****	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-A***	80	80	80	80	80	80	80	80	80	80
at Ta = 60°C										
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
Prosonic Flow DDU 10 – B*****	80	95	115	130	155	160	170	170	170	170
Prosonic 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

Communication modules , I/O options

Communication options	Control Drawings
I/O option = F, H, J	see FES0062-0001
I/O option = G, K	see FES0062-0002
I/O option = S, T	see FES0062-0004

Notes:
1. Control room equipment shall not use or generate more than 250 V rms.
2. Wire per Canadian Electrical Code. Wire all intrinsically safe I/O circuits per CEC respecting the Explosionsproof Integrity of the enclosure.
3. Sensor circuits may be installed as intrinsically safe wiring or in conduit per CEC.
4. Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C / 176°F.
5. 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 160°C.
6. Cable Type for all Sensors: Use only prefabricated Endress+Hauser Cable. For reasons of safety, the maximum allowed cable length is 30 m per sensor.

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Aenderungen:				Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugängig gemacht werden.	Ersteller: FES / **ID 1100** FILE: M:\ZEICHNG\FES0062\010310c.doc
	A		F		
	B		G		
	C		H		
	D		J		
	E		K		

CSA Control Drawing Class I, Div. 1
Class I Zone 1

PROSONIC FLOW 9.

Massstab

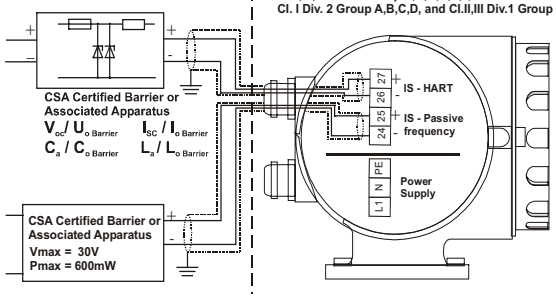
Gezeichnet	10.03.01	UD
Geprüft		
Ex-geprüft	10.03.01	UD
Gesehen		

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

FES0062

NON HAZARDOUS LOCATION

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



Notes:
1) Use supply wires suitable for 5 °C above surrounding ambient, but at least for 80°C / 176°F

Intrinsically safe signal output:
2) Install all intrinsically safe circuits per Canadian Electrical Code respecting the Explosionproof Integrity of the enclosure
3) **WARNING**: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4) Control room equipment may not use or generate more than 250 Vrms.

Type: PROSONIC FLOW 9*-**********S**
Terminals: 26, 27 (HART current output):
Active intrinsically safe circuit:

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

V_{max} / U_i	I_{max} / I_i	P_{max} / P_i	C_i	L_i
30 V	10 mA	300 mW	6 nF	0

Cable parameters for Intrinsic Safety:
$C_{cable} \leq 0.15$ µF if V_{oc} / U_o (of Barrier) ≤ 21.8 V
$C_{cable} \leq C_a$ / $C_{o\ Barrier} - 6$ nF if V_{oc} / U_o (of Barrier) ≥ 21.8 V
$L_{cable} \leq 4.1$ mH

Terminals 24, 25 (Passive intrinsically safe circuit):

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

Entity approved supply must meet the following requirements:
V_{OC} or $U_O \leq V_{max}$ / U_i P_{max} or $P_O \leq P_{max}$ / P_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_a$ (C_O) – 6nF $L_{cable} \leq L_a$ (L_O)

Type: PROSONIC FLOW 9*-**********T**
Terminals: 26, 27 (HART current output):
Passive intrinsically safe circuit:

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

Connect to entity approved Barrier with
V_{OC} or $U_O \leq V_{max}$ / U_i
I_{SC} or $I_o \leq I_{max}$ / I_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_{a\ Barrier}$ or $C_{o\ Barrier} - 6$ nF
$L_{cable} \leq L_{a\ Barrier}$ or $L_{o\ Barrier}$

Terminals 24, 25 (Passive intrinsically safe circuit):

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

Entity approved apparatus must meet the follwoing requirements:
V_{OC} or $U_O \leq V_{max}$ P_{max} or $P_o \leq P_{max}$ / P_i
Cable parameters for Intrinsic Safety:
$C_{cable} \leq C_a$ (C_o) – 6 nF $L_{cable} \leq L_a$ (L_o)

Aenderungen:				Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugängig gemacht werden.	Ersetzt durch: Ersatz für: Ersteller: FES / **ID 1100** File: M:\ZEICHNG\FES0062\010310c.doc
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	C		H		
	D		J		
	E		K		

CSA CONTROL DRAWING Cl.1, Div. 1
PROSONIC FLOW 9.
Entity concept Commodul HART IS

Massstab

Gezeichnet	10.03.01	UD
Geprüft		
Ex-geprüft	10.03.01	UD
Gesehen		

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

FES0062-0004

Supplementary documentation
TI 042D/06
TI 056D/06
TI 057D/06

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