Safety Instructions

Proline Prosonic Flow 92F

Ex i version

NEPSI Zone 1

This document is an integral part of the following Operating Instructions:
- BA00121D, Proline Prosonic Flow 92F HART
- BA00122D, Proline Prosonic Flow 92F PROFIBUS PA
- BA00128D, Proline Prosonic Flow 92F FOUNDATION Fieldbus

Content

Associated documentation

For an overview of the scope of the associated Technical Documentation, refer to the following::
- *Device Viewer:* (www.endress.com/deviceviewer): Enter serial number from nameplate.
- *Endress+Hauser Operations App:* Enter serial number from nameplate or scan matrix code on nameplate.

Additional documentation:

Document type	Contents	Documentation code
Brochure	Explosion Protection	CP00021Z/11

Please note the documentation associated with the device.

Manufacturer's certificates

NEPSI certificates of conformity

Certification numbers:

- GYJ21.1231X

Affixing the certificate number certifies conformity with the with the following standards:

- GB/T 3836.1 – 2021
- GB/T 3836.4 – 2021

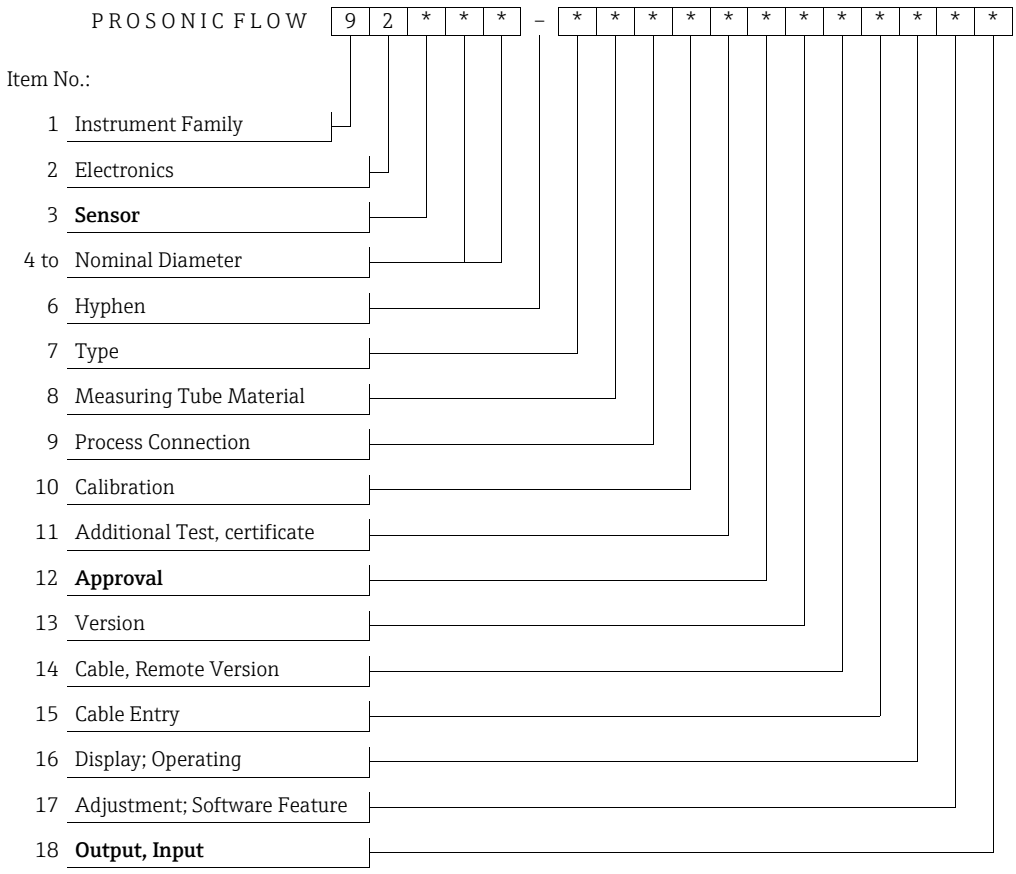
Description of the measuring system

The measuring system consists of a transmitter and a sensor. Two versions are available:
- Compact version: The transmitter and sensor form a mechanical unit.
- Remote version: The transmitter and sensor are mounted separate from one another and interconnected by means of a connecting cable.

Order code

The order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible.
Additional information on the nameplate is provided in the associated Operating Instructions.

Structure of the order code:



Sensor (Item No. 3 in order code)

*	Sensor
F	Sensor F
X	only transmitter (as spare part)

Approval (Item No. 12 in order code)

*	Housing/design	Explosion protection
S	Compact	Ex ia[ia Ga] IIC T* Gb
	Remote, transmitter	Ex ia[ia Ga] IIC T* Gb
	Remote, sensor	Ex ia IIC T* Gb

Output, input (Item No. 18 in order code)

*	Temperature marking (T*)
A, W	T1...T6
H, K	T1...T4

✎ Note!
A detailed explanation of these values with regard to the inputs and outputs available, as well as a description of the associated terminal assignments and connection data is provided on → 🖹 4 onwards.

General warnings

- For installation, use and maintenance of the flow meter, the instruction manual and the following standards shall be observed:
  - GB/T 3836.13-2021 "Explosive atmospheres- Part 13:Equipment repair,overhaul,reclamation and modification"
  - GB/T 3836.15-2017 "Explosive atmospheres- Part 15:Electrical installations design, selection and erection"
  - GB/T 3836.16-2022 "Explosive atmospheres- Part 16:Electrical installations inspection and maintenance"
  - GB/T 3836.18-2017 "Explosive atmospheres- Part 18:Intrinsically safe electrical systems"
  - GB50257-2014 "Code for construction and acceptance of electric equipment on fire and device for explosion hazard electrical installation engineering"
- Mounting, electrical installation, commissioning and maintenance of the devices may only be performed by technical staff trained in the area of explosion protection.
- Compliance with all of the technical data of the device (see nameplate) is mandatory.
- The device must be integrated into the potential equalization system. Potential must be equalized along the intrinsically safe sensor circuits. Further information can be found in the “Potential matching” chapter on → 🖹 4.

Installation instructions

- If the active intrinsically safe communication circuits are fed into areas that require zone 1 apparatus, the connected apparatus must be tested and certified accordingly.
- The cable entries and openings not used must be sealed tight with suitable components.
- The measuring device must only be used in the permitted temperature class.
  The values of the individual temperature classes can be found in the temperature tables on → 🖹 4.
- The manufacturer's specifications for all devices connected to the intrinsically safe circuits must be taken into consideration.
- To rotate the transmitter housing, please follow the same procedure as for non-Ex versions. The transmitter housing may also be rotated during operation.
- The continuous service temperature of the cable must correspond at least to the temperature range of −40 °C and up to +10 °C above the ambient temperature present (−40 °C to (T_a +10 °C)).
- If Prosonic Flow 92 devices are interconnected with certified intrinsically safe circuits of Category ib, explosion group IIC, the explosion protection changes from Ex ia to Ex ib IIC.
- The dielectric strength between the various intrinsically safe circuits must be at least 500 Vrms (affects outputs/inputs: Prosonic Flow 92****-**********A).
- The devices may only be used for fluids against which the wetted materials are sufficiently resistant.
- The service connector may not be connected in a potentially explosive atmosphere.

Compact version temperature table

Medium temperature range T_{med} [°C] depending on the device version (→ 🖹 2) and the ambient temperature range T_a:

	T_a [°C]	T_{med} T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
92F**-*****S*****A/W	−40 to +40	−40 to +80	−40 to +95	−40 to +130	−40 to +195	−40 to +200	−40 to +200
	−40 to +55	–					
	−40 to +60	–	–				
92F**-*****S*****H/K	−40 to +60	–	–	−40 to +130	−40 to +195	−40 to +200	−40 to +200

Remote version temperature table

Sensor

Medium temperature range T_{med} [°C] depending on the device version (→ 🖹 2) and the ambient temperature range T_a:

	T_a [°C]	T_{med} T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
92F**-*****S*****A/W	−40 to +60	−40 to +80	−40 to +95	−40 to +130	−40 to +195	−40 to +200	−40 to +200
	−40 to +80	–					
92F**-*****S*****H/K	−40 to +80	–	–	−40 to +130	−40 to +195	−40 to +200	−40 to +200

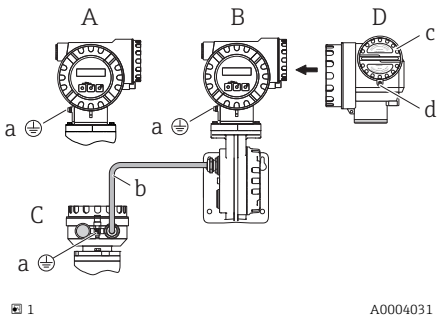
Transmitter

Ambient temperature range Ta [°C] depending on the device version (→ 🖹 2):

	T_{med} T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
92F**-*****S*****A/W	−40 to +40	−40 to +55	−40 to +80	−40 to +80	−40 to +80	−40 to +80
92F**-*****S*****H/K	–	–	−40 to +80	−40 to +80	−40 to +80	−40 to +80

Design of measuring system

Compact/remote version design



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A Transmitter housing (compact version)
B Transmitter housing (remote version)
C Sensor connection housing (remote version)
D Transmitter housing side view (compact/remote version)
a Screw terminal for connecting to potential matching system
b Remote version connecting cable → 🖹 5
c Terminal/electronics compartment cover: view section cable entries → 🖹 5
d Securing clamp

– Terminal assignment and connection data → 🖹 6

Potential matching

Caution!

- There must be potential matching along the circuits (inside and outside the hazardous area).
- The transmitter must be safely included in the potential matching system by means of the screw terminal on the outside of the transmitter housing or by means of the corresponding ground terminal in the connection compartment.
- Alternatively, the sensor and the transmitter (compact version) or the connection housing of the sensor can be included in the potential matching system by means of the pipeline if a ground connection, performed as per the specifications, is ensured.

Cable entries

Thread for cable entry M20x1.5 or ½"-NPT or G ½", as required.

Connecting cable specifications remote version

The sensor cable connection between the sensor and the transmitter has Ex ia explosion protection.

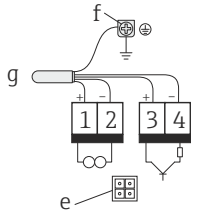
The maximum capacitance per unit length of the cable connection is 1mF/km.
The maximum inductance of the cable is 1 mH/km.

The cable supplied by Endress+Hauser (max. 30 m) complies with these values.

Electrical connections

Terminal/electronics compartment cover (terminal assignment, see tables below)

4...20 mA HART
(connection with a cable)



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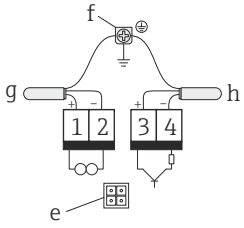
4...20 mA HART
(connection with two cables)



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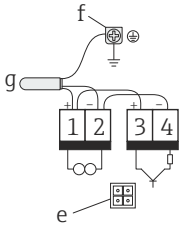
4...20 mA HART
(PFM connection)



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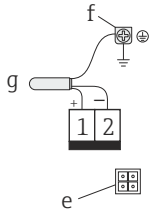
PROFIBUS PA



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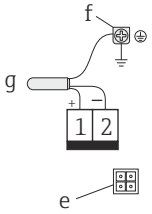
FOUNDATION Fieldbus



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e Service connector → 🖹 6

f HART ground terminal: if the potential matching is routed via the cable and if two cables are used, both cables must be connected to the potential matching system if a connection is not already established externally. PROFIBUS PA and FOUNDATION Fieldbus: between the stripped fieldbus cable and the ground terminal, the cable shielding must not exceed 5 mm in length

g HART (→ 2): cable for supply voltage and/or pulse output
HART (→ 3): cable for supply voltage
PFM (→ 4): Optional pulse/frequency output, can also be operated as a status output (not for PROFIBUS PA and FOUNDATION Fieldbus
PROFIBUS PA (→ 5): cable of input and output circuits
FOUNDATION Fieldbus (→ 6): cable of input and output circuits

h Optional pulse/frequency output, can also be operated as a status output (not for PROFIBUS PA and FOUNDATION Fieldbus)

✎ Note!
PFM output (pulse/frequency modulation): connection as illustrated in → 4 (only together with flow computer RMC or RMS 621).

Terminal assignment and connection data

The terminal assignment and the connection data for the supply voltage are identical for all devices, regardless of the device version (**order code**).

✎ Note!
A graphic illustration of the electrical connections is provided on → 🖹 5.

Terminal assignment / connection data

Terminals		**1 (+)**	**2 (–)**
Prosonic 92F**-**********W		Transmitter power supply / 4...20 mA HART	
Intrinsically safe circuit		Ex ia or Ex ib	
Safety related values	Ui	30 V	
	I_i	300 mA	
	P_i	1 W	
	L_i	negligible	
	C_i	5.28 nF	

Terminals		**1 (+)**	**2 (–)**	**3 (+)**	**4 (–)**
Prosonic 92F**-**********A		Transmitter power supply / 4...20 mA HART		Optional pulse/status output	
Intrinsically safe circuit		Ex ia or Ex ib		Ex ia or Ex ib	
Safety related values	Ui	30 V		30 V	
	I_i	300 mA		300 mA	
	P_i	1 W		1 W	
	L_i	negligible		negligible	
	C_i	5.25 nF		negligible	

Terminals		**1 (+)**	**2 (–)**
Prosonic 92F**-**********H		PROFIBUS PA	
Intrinsically safe circuit		Ex ia or Ex ib	
Safety related values	Ui	17.5 V	
	I_i	600 mA	
	P_i	8.5 W	
	L_i	≤ 10 mH	
	C_i	≤ 5 nF	

or

1 (+)	**2 (–)**
PROFIBUS PA	
Ex ia or Ex ib	
24 V	
250 mA	
1.2 W	
≤ 10 mH	
≤ 5 nF	

Terminals		**1 (+)**	**2 (–)**
Prosonic 92F**-**********K		FOUNDATION Fieldbus	
Intrinsically safe circuit		Ex ia or Ex ib	
Safety related values	Ui	17.5 V	
	I_i	600 mA	
	P_i	8.5 W	
	L_i	≤ 10 mH	
	C_i	≤ 5 nF	

or

1 (+)	**2 (–)**
FOUNDATION Fieldbus	
Ex ia or Ex ib	
24 V	
250 mA	
1.2 W	
≤ 10 mH	
≤ 5 nF	

Service connector

The service connector (for connection, see →🖻 2 to →🖻 6, e) is only used to connect service interfaces approved by Endress+Hauser.

⚠ Warning!
The service connector may not be connected in a potentially explosive atmosphere.

www.addresses.endress.com

Endress+Hauser

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