

Safety Instructions

Proline Prosonic Flow 92F

Ex d 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

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General warnings

- For installation, use and maintenance of the flow meter, the instruction manual and the following standards shall be observed:
 - GB50257-2014 "Code for construction and acceptance of electric device for explosive atmospheres and fire hazard electrical equipment installation engineering"
 - GB3836.13-2013 "Explosive atmospheres – Part 13: Equipment repair, overhaul and reclamation"
 - GB3836.15-2017 "Electrical apparatus for explosive gas atmospheres – Part 15: Electrical installations in hazardous area (other than mines)"
 - GB3836.16-2017 "Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation (other than mines)"
 - GB3836.18-2017 "Explosive atmospheres – Part 18: Intrinsically safe system"
- 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 connection compartment of the transmitter housing may only be opened when the unit is de-energized or if an explosive atmosphere is not present.

Special conditions

- The device must be integrated into the potential equalization system. Potential must be equalized along the intrinsically safe sensor circuits. Further information is provided in the "Potential equalization" section on → 6.
- The connection compartment Prosonic Flow 92**-*****K***** may only be opened in a Ex atmosphere when the device is de-energized (and after waiting 6 minutes after switching off the power supply).

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 → 5.
- 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 to $+10\text{ °C}$ above the ambient temperature present (-40 °C to $(T_a + 10\text{ °C})$).
- The devices may only be used for fluids against which the wetted materials are sufficiently resistant.
- Only use cable entries that have separate certification (Ex d IIC) which are suitable for an operating temperature up to 80 °C . When using conduit entries, the associated sealing facilities must be mounted directly to the housing.
- The service connector may not be connected in a potentially explosive atmosphere.

COC certificates of conformity

COC certificates of conformity

By affixing the certification number the product conforms with the following standards:

- GB3836.1 – 2010
- GB3836.2 – 2010
- GB3836.4 – 2010
- GB3836.20 – 2010

Certification numbers:

- GYJ21.1231X

Inspection body

NEPSI, National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation

Nameplates

The nameplates, which are provided on the transmitter and sensor in a manner in which they are clearly visible, contain all the relevant information on the measuring system.

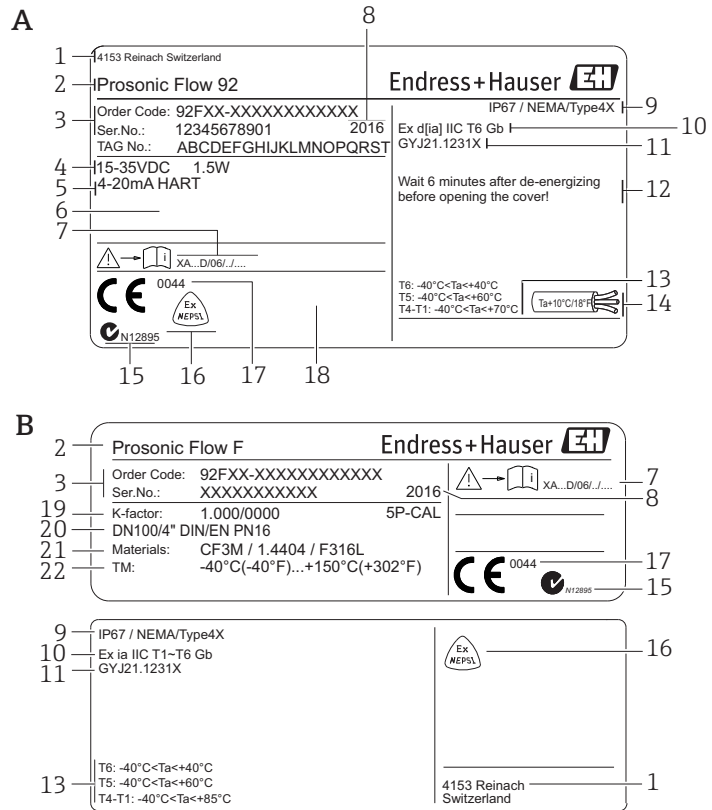


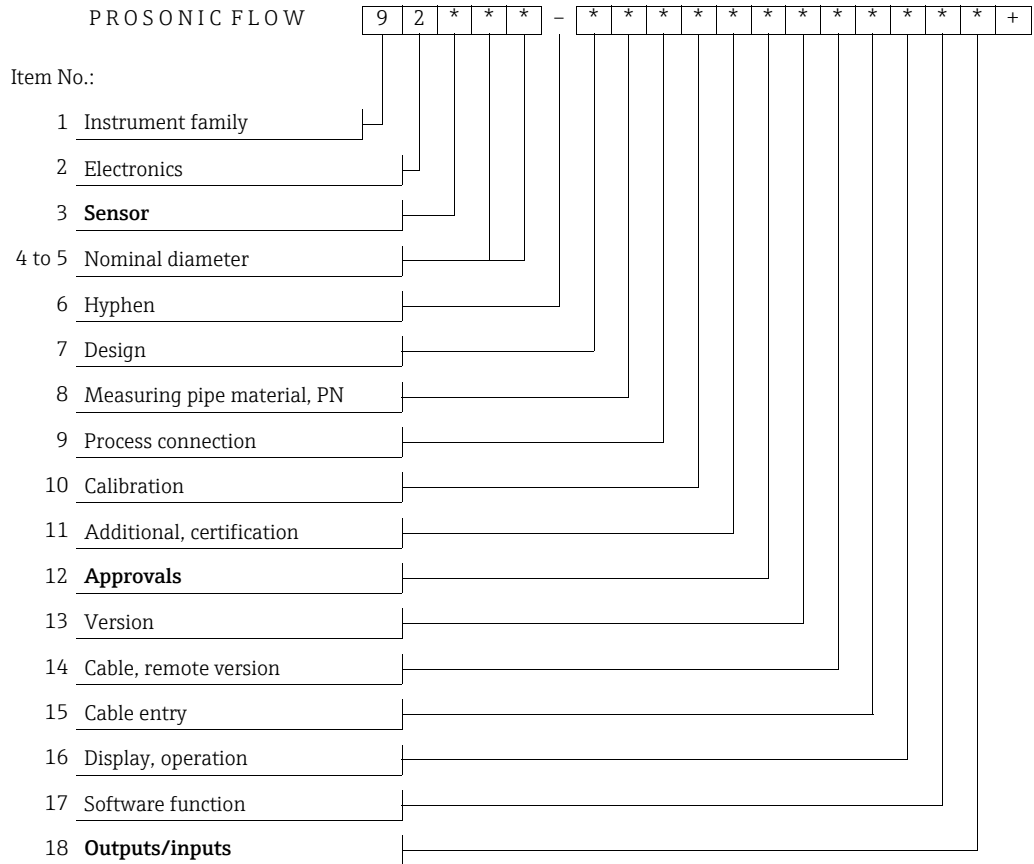
Fig. 1: Example for nameplates of a transmitter and of a sensor

- A Transmitter nameplate
- B Sensor nameplate
- 1 Production site
- 2 Transmitter or sensor type
- 3 Order code and serial number
- 4 Power supply, frequency and power consumption
- 5 Output
- 6 Additional specifications (only if present)
- 7 Associated Ex documentation
- 8 Year of manufacture
- 9 Type of housing protection
- 10 Identification of the type of protection, explosion group, temperature class, ingress protection
- 11 Number of the NEPSI certificate of conformity
- 12 Notes, e.g. delays, etc.
- 13 Ambient temperature range
- 14 Maximum cable temperature
- 15 C-Tick symbol
- 16 NEPSI Symbol
- 17 Notified body for quality assurance monitoring
- 18 Space for other approval specifications and certificates, e.g. PROFIBUS, etc. (only if present)
- 19 Calibration factor/zero point
- 20 Nominal diameter/nominal pressure
- 21 Material in contact with medium
- 22 Fluid temperature range

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Type code

The type code describes the exact design and the equipment of the measuring system. It can be read on the nameplate of the transmitter and sensor and is structured as follows:



Sensor version (Item No. 3 in type code)

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

Approvals (Item No. 12 in type code)

*	Housing/design	Approval	Explosion protection	Certificate number
K	Compact	Zone 1G	Ex d[ia] IIC T1-T* Gb	GYJ21.1231X
	Remote (transmitter)		Ex d[ia] IIC T* Gb	
	Remote (sensor)		Ex ia IIC T1-T* Gb	

T* = T6 or T4 (see table outputs/inputs → 4)

Outputs/inputs (Item No. 18 in type code)

*	Approval
A, W	T6 to T1
H, K	T4 to T1

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: → 5 onwards.

Compact version temperature table

Medium temperature range T_{med} [°C] depending on the device version (→ 4) 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**_*****K*****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**_*****K*****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 (→ 4) 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**_*****K*****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**_*****K*****H/K	-40 to +80	-	-	-40 to +130	-40 to +195	-40 to +200	-40 to +200

Transmitter

Ambient temperature range T_a [°C] depending on the device version (→ 4):

	T_{med}					
	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
92F**_*****K*****A/W	-40 to +40	-40 to +55	-40 to +60	-40 to +60	-40 to +60	-40 to +60
92F**_*****K*****H/K	-	-	-40 to +60	-40 to +60	-40 to +60	-40 to +60

Design of measuring system

Compact/remote version design

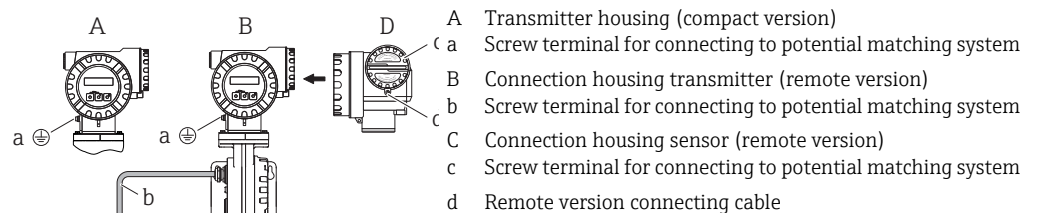


Fig. 2

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- Cable specifications, connecting cable → 6
- Cable entries → 5
- Terminal assignment and connection data → 6

Cable entries

Cable entries for the connection compartment (Ex d version):

Thread for cable entry M20 × 1.5 or ½"-NPT or G ½", as required. Ensure that the Ex d cable glands/entries are secured against self-locking and the associated seals are arranged directly on the housing.

Cable specifications, connecting cable

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 $1\mu\text{F}/\text{km}$. The maximum inductance of the cable is $1\text{ mH}/\text{km}$.

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

Potential equalization

 **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 (c) on the outside of the transmitter housing or by means of the corresponding ground terminal in the connection compartment (f).
- 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.

Electrical connections

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

4 to 20 mA HART
(connection with a cable)

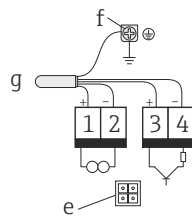


Fig. 3

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4 to 20 mA HART
(connection with two cables)

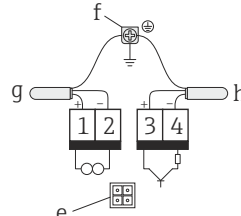


Fig. 4

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4 to 20 mA HART
(PFM connection)

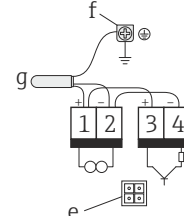


Fig. 5

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PROFIBUS PA

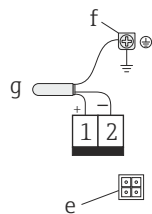


Fig. 6

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FOUNDATION Fieldbus

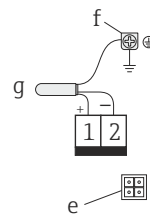








Fig. 7


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e Service connector (→  7)

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 (→  3): cable for supply voltage and/or pulse output
HART (→  4): cable for supply voltage
PFM (→  5): Optional pulse/frequency output, can also be operated as a status output (not for PROFIBUS PA and FOUNDATION Fieldbus)
PROFIBUS PA (→  6): cable of input and output circuits
FOUNDATION Fieldbus (→  7): cable of input and output circuits


 **Note!**

PFM output (pulse/frequency modulation): connection as illustrated in →  5 (only together with flow computer RMC or RMS 621).

Connecting the supply voltage or signal cable

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

 Note!

For a graphic illustration of the electrical connections: →  6.



Terminal assignment /connection data

	Terminals	1 (+)	2 (-)	3 (+)	4 (-)
Prosonic 92F**_*****A Prosonic 92F**_*****W	Terminal designation	Transmitter power supply / 4 to 20 mA HART		Optional pulse/status output	
	Safety related values	≤ 35 V (U _{max} = 253 V)		≤ 35 V (U _{max} = 253 V)	

	Terminals	1 (+)	2 (-)
Prosonic 92F**_*****H	Terminal designation	PROFIBUS PA	
	Safety related values	U = 35 V (U _{max} = 253 V)	

	Terminals	1 (+)	2 (-)
Prosonic 92F**_*****K	Terminal designation	FOUNDATION Fieldbus	
	Safety related values	U = 35 V (U _{max} = 253 V)	

Service connector

The service connector (for connection →  2 to →  7, 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.

Technical Data**Dimensions**

The dimensions of the Ex transmitter housing and the sensor correspond to the standard versions. Please refer to the Technical Information for these dimensions.

 Note!

Associated "Technical Information":
Proline Prosonic Flow 92F → TI00073D

Associated documentation

All documentation is available:

- On the CD-ROM supplied (not included in the delivery for all device versions)
- Available for all devices via:
 - Internet: www.endress+Hauser Operations App
 - Smart phone/tablet: Endress+Hauser website: www.endress.com → Download

Additional documentation:

- Explosion-protection brochure: CP00021Z/11

www.addresses.endress.com
