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Safety Instructions
Proline Prosonic Flow 500

Cl.I, II, III Div.1 for XP
(Ex d Flameproofed version)

Document: XA01853D
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

Endress+Hauser
People for Process Automation

Proline Prosonic Flow 500

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Associated documentation

All documentation is available:
- On the CD-ROM supplied (not included in the delivery for all device versions).
- Available for all device versions via:
  - Internet: www.endress.com/deviceviewer
  - Smart phone/tablet: *Endress+Hauser Operations App*
- In the Download Area of the Endress+Hauser web site: www.endress.com → Download.

This document is an integral part of the following Operating Instructions:

Measuring device	Documentation code	
	HART	Modbus RS485
Prosonic Flow G 500	BA01836D	BA01837D

Additional documentation

Contents	Document type	Documentation code
Explosion Protection	Brochure	CP00021Z/11
Control drawing		As wanted on the nameplate.

Please note the documentation associated with the device.

Manufacturer's certificates

Certificate number

CSA 16.70087366

Notified body

CSA Group

Manufacturer address

Endress+Hauser Flowtec AG
Kägenstrasse 7
4153 Reinach BL
Switzerland

Extended order code

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

Structure of the extended order code

* * * * * *	–	* * * * * ... * * * * *	+	A*B*C*D*E*F*G*...
(Device type)		*(Basic specifications)*		*(Optional specifications)*

* = Placeholder
At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

Device type

The device and the device design is defined in the "Device type" section (Product root).

Basic specifications

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.
The selected option of a feature can consist of several positions.

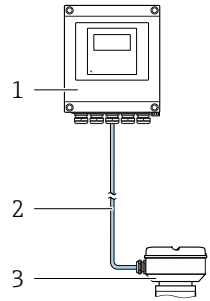
Optional specifications

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Device type

Position	Order code for	Option selected	Description
1	Instrument family	9	Ultrasonic transit time flowmeter
2	Sensor	G	Sensor type
3	Transmitter	5	Transmitter type: 4-wire, remote version
4	Generation index	B	Platform generation
5, 6	Nominal diameter	DN 25...300	Nominal diameter of sensor

Proline 500 – digital
Order code for "Integrated ISEM Electronic", option **A** "Sensor"
 *1 Transmitter* *2 Connecting cable* *3 Sensor connection housing with integrated ISEM*

Basic specifications

Position 1, 2 Order code for "Approval" Option selected	Position 10 Order code for "Integrated ISEM electronics" Option selected	Type of protection	
		Transmitter	Sensor
CN	A	Cl.I, Div.2, Gps. A-D T5...T4	Cl.I, Div.1, Cl.II, III Gps. A-G T6...T1

Position	Order code for	Option selected	Description
4, 5	Output, input 1	BA	4-20mA HART
		MA	Modbus RS485
6	Output, input 2	A	W/o
		B	4-20mA
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		H	Relay
		I	4-20mA input
		J	Status input
7	Output, input 3	A	W/o
		B	4-20mA
		D	Configurable I/O initial setting off

Position	Order code for	Option selected	Description
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		H	Relay
		I	4-20mA input
		J	Status input
8	Output; input 4	A	W/o
		B	4-20mA
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		H	Relay
		I	4-20mA input
		J	Status input
9	Display; Operation	F	4-line, illuminated; touch control
		G	4-line, illuminated; touch control + WLAN
10	Integrated ISEM Electronic	A	Sensor
11	Transmitter Housing	A	Alu, coated
		D	Polycarbonate
22	Device Model	A2	2

Optional specifications

ID	Order code for	Option selected	Description
Jx	Test, certificate	JP	Ambient temperature, measuring device −50 °C
Px	Enclosed accessories	P8	Wireless antenna, wide area (external WLAN antenna) [1]

1) The external WLAN antenna is available with the order code for "Accessory Enclosed", option P8.

Safety instructions: General

- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations or guidelines (e.g. CEC or NEC)
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.

- Only use the device in media to which the wetted materials have sufficient durability.
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application, and the temperature classes.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- When using in hybrid mixtures (gas and dust occurring simultaneously), observe additional measures for explosion protection.
- For measuring device with digital signal transmission, order code for "Integrated ISEM electronics", Option A "Sensor" open the housing cover of the **sensor connection housing** only if one of the following conditions is met:
  - An explosive atmosphere is not present.
  - A waiting time of 10 minutes is observed after switching off the power supply.
    The following warning notice is on the device:
    WARNING – AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING ENCLOSURE IN TYPE OF PROTECTION EX D
- Observe all the technical data of the device (see nameplate).
- Avoid electrostatic charge (e.g. caused by friction, cleaning, maintenance, strong currents in the medium):
  on the attached stainless steel nameplate and on painted metallic housings that are not integrated into the local potential equalization system
- Class II Group G: The surface temperature of the apparatus cannot exceed +165 °C.

⚠ WARNING

Substitution of components is not permitted.

► Substitution of components may impair intrinsic safety.

Safety instructions: Installation

- Continuous service temperature of the connecting cable:
  −40 to +80 °C (−50 to +60 °C for optional specifications, ID Jx (Test, Certificate) = JP); in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$ and $T_{a,max}$ + 20 K).
- Only use certified cable entries suitable for the application. Observe selection criteria as per CEC or NEC.
- When the measuring device is connected, attention must be paid to explosion protection at the transmitter.

- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover when energized.
- Install the transmitter circuit wiring according to Canadian Electrical Code (CEC) respective National Electrical Code (NEC) using threaded conduit or other wiring methods in accordance with articles 500 to 510.
- Transmitter enclosures with XP rating: Enclosures are factory sealed when using in ambient temperature of not lower than -40 °C.
- For transmitter housing with digital signal transmission (order code for "Integrated ISEM electronics", Option A) the housing cover are tighten with a torque of 2.5 Nm.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the housing.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Only use certified sealing plugs. The metal sealing plugs supplied meet this requirement.

Optional external WLAN antenna

- Connect the antenna bushing H337 to the transmitter housing and tighten by hand.
- Use only external antennas supplied by Endress+Hauser.
- Connect antenna or antenna cable with plug-in connector type N (MIL-STD-348) to antenna bushing H337.

Intrinsic safety

Observe the guidelines for interconnecting intrinsically safe circuits (e.g. Proof of Intrinsic Safety).

Potential equalization

- Integrate the device into the local potential equalization .
- If the ground connection has been established via the pipe as specified, it is also possible to integrate the sensor into the potential equalization system via the pipe.
- The antenna bushing H337 of the external antenna must be integrated into the local potential equalization system. This is the case if the sensor is connected in accordance with the regulations via the coupling.

Safety instructions: Class II, Class III

- To ensure dust-tightness, securely seal the transmitter and sensor housing, cable entries and sealing plugs.
- Only open the transmitter and sensor housing briefly, ensuring that no dust or moisture enters the housing.

Temperature tables

Ambient temperature

Minimum ambient temperature

- T_a = −40 °C depending on the selected device variant (see nameplate)
- *Optional specification, ID Jx (Test, Certificate) = JP*
  T_a = −50 °C depending on the selected device variant (see nameplate)

Maximum ambient temperature

T_a = +60 °C depending on the temperature class.

Proline 500 – digital transmitter

Non-hazardous area, Division 2

	T_a [°C]			
Transmitter housing material	**Non-hazardous area**	**T6**	**T5**	**T4**
Aluminum	60	–	45	60
Polycarbonate	60	–	–	–

Medium temperature

Minimum medium temperature

T_m = −50 °C

Maximum medium temperature

T_m for T6…T1 depending on the maximum ambient temperature T_a

Proline 500 - digital

Order code for "Integrated ISEM electronics", option A

Maximum medium temperature with or without thermal insulation according to Endress+Hauser specifications

With integrated pressure measuring cell

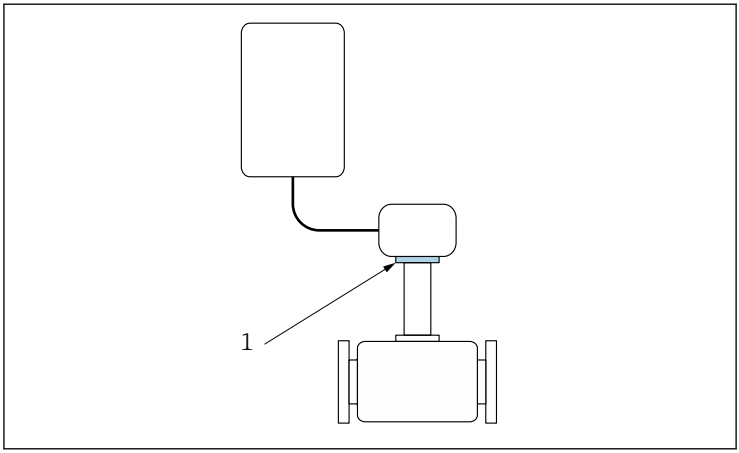
DN	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25...300	40	40	40	90	90	90	90
	55	–	40	90	90	90	90
	60	–	–	90	90	90	90

Without integrated pressure measuring cell

DN	T_a [°C]	T_m [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25...300	60	70	85	120	150	150	150

With thermal insulation without Endress+Hauser specifications

The specified reference temperature T_{ref} and the maximum medium temperature $T_{m, max}$ for each temperature class must not be exceeded .



1 Position of reference point for temperature measurement

1 Reference point (T_{ref})

Reference temperature T_{ref}

T6 [80 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
69	71	75	77	77	77

Connection values: Signal circuits

The following tables contain specifications which are dependent on the transmitter type and its input and output assignment. Compare the following specifications with those on the nameplate of the transmitter.

Terminal assignment

Transmitter: supply voltage, input/outputs

HART

Supply voltage		Input/output 1		Input/output 2		Input/output 3		Input/output 4	
1 (+)	2 (–)	26 (+)	27 (–)	24 (+)	25 (–)	22 (+)	23 (–)	20 (+)	21 (–)
		Device-specific terminal assignment: adhesive label in terminal cover.							

Modbus RS485

Supply voltage		Input/output 1		Input/output 2		Input/output 3		Input/output 4	
1 (+)	2 (–)	26 (B)	27 (A)	24 (+)	25 (–)	22 (+)	23 (–)	20 (+)	21 (–)
		Device-specific terminal assignment: adhesive label in terminal cover.							

Safety-related values

Order code for "Output; input 1"	Output type	Safety-related values "Output; input 1"	
		26 (+)	27 (–)
Option **BA**	Current output 4 to 20 mA HART	U_N = 30 V_{DC} U_M = 250 V_{AC}	
Option **MA**	Modbus RS485	U_N = 30 V_{DC} U_M = 250 V_{AC}	

Order code for "Output; input 2"; "Output; input 3" "Output; input 4"	Output type	Safety-related values					
		Output; input 2		Output; input 3		Output; input 4	
		24 (+)	25 (–)	22 (+)	23 (–)	20 (+)	21 (–)
Option **B**	Current output 4 to 20 mA	U_N = 30 V_{DC} U_M = 250 V_{AC}					
Option **D**	User-configurable input/output	U_N = 30 V_{DC} U_M = 250 V_{AC}					
Option **E**	Pulse/frequency/ switch output	U_N = 30 V_{DC} U_M = 250 V_{AC}					

Order code for "Output; input 2"; "Output; input 3" "Output; input 4"	Output type	Safety-related values					
		Output; input 2		Output; input 3		Output; input 4	
		24 (+)	25 (–)	22 (+)	23 (–)	20 (+)	21 (–)
Option **F**	Double pulse output	U_N = 30 V_{DC} U_M = 250 V_{AC}					
Option **H**	Relay output	U_N = 30 V_{DC} I_N =100 mA_{DC}/500 mA_{AC} U_M = 250 V_{AC}					
Option **I**	Current input 4 to 20 mA	U_N = 30 V_{DC} U_M = 250 V_{AC}					
Option **J**	Status input	U_N = 30 V_{DC} U_M = 250 V_{AC}					

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