Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Proline Prowirl 72, 73

XP (Ex-d version)

Division 1
Documentation for hazardous location Cl.I Div.1

Safety instructions for electrical apparatus for explosion-hazardous areas according to FACTORY MUTUAL standards →→ 🖹 3

Safety instructions for electrical apparatus for explosion-hazardous areas according to CANADIAN STANDARDS ASSOCIATION →→ 🖹 13

XA00095D/06/EN/13.11
71154576

Endress+Hauser
People for Process Automation

Examples for markings according to FM and CSA:

FM APPROVALS

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

Type of Protection

XP	Explosionproof
IS	Intrinsically Safe Apparatus
AIS	Associated Apparatus with Intrinsically Safe Connections
ANI	Associated Nonincendive Field Wiring Apparatus
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 dust 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

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

CSA (Canadian Standards Association)

Example: **Class I, Division 1, Group ABCD**

Class

I	Class I (Gas)
II	Class II (Dust)
III	Class III (Fibre)

Division

1	Division 1
2	Division 2

Group

CSA / CSC	Gases, vapours and dust 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	Mill dust (Class II)	
	Textile fibres (Class III)	

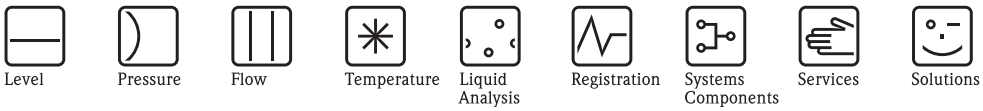
Type of Protection

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

Temperature Class

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

A0005630



Safety Instructions

Proline Prowirl 72, 73

XP (Ex-d version)

Division 1

FM Documentation for hazardous location Cl.I Div.1

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

- BA084D, Proline Prowirl 72 HART
- BA085D, Proline Prowirl 72 PROFIBUS PA
- BA095D, Proline Prowirl 72 FOUNDATION Fieldbus
- BA094D, Proline Prowirl 73 HART
- BA093D, Proline Prowirl 73 PROFIBUS PA
- BA096D, Proline Prowirl 73 FOUNDATION Fieldbus

Table of Contents FM

XA00095D/06/EN/13.11
71154576

Endress+Hauser

People for Process Automation

General warnings

- Any national regulations pertaining to the installation of devices in hazardous areas must be observed.
- 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.

Special conditions

- 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 equalization” chapter on → 9.

Installation instructions

- 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 → 7.
- 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 °F and up to +50 °F above the ambient temperature present (–40 °F ... (T_a +50 °F)).
- All equipment of the measuring system must be included in potential matching (→ 10).
- 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.
- Install per National Electrical Code. Install intrinsically safe circuits per NEC ANSI/NFPA 70 and ISA RP 12.6 respecting the explosionproof integrity of the enclosure.

Approvals

General

The system meets the basic safety and health requirements for the design and construction of devices and protection systems designated for use in hazardous areas in accordance with the National Electrical Code.

Certification number

I.D. 3015769

Inspection authority

FM: Factory Mutual Research

Identification

The system identification must contain the following information:

Compact version and remote version (transmitter and sensor)	
Prowirl 72***-******P****A	
Prowirl 72***-******P****W	
Prowirl 72***-******P****H	Cl. I, Div. 1 Groups ABCD
Prowirl 72***-******P****K	Cl. II, Div. 1 Groups EFG
Prowirl 73***-******P****A	Cl. III
Prowirl 73***-******P****W	Cl. I, Zone 1 Group IIC
Prowirl 73***-******P****H	
Prowirl 73***-******P****K	

Caution!
The installation instructions for the safe use and application of the system must be observed → 4.

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 (see also "Electrical connections" (→ 10) and "Cable specifications for connecting cable" (→ 9).

Device identification

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.

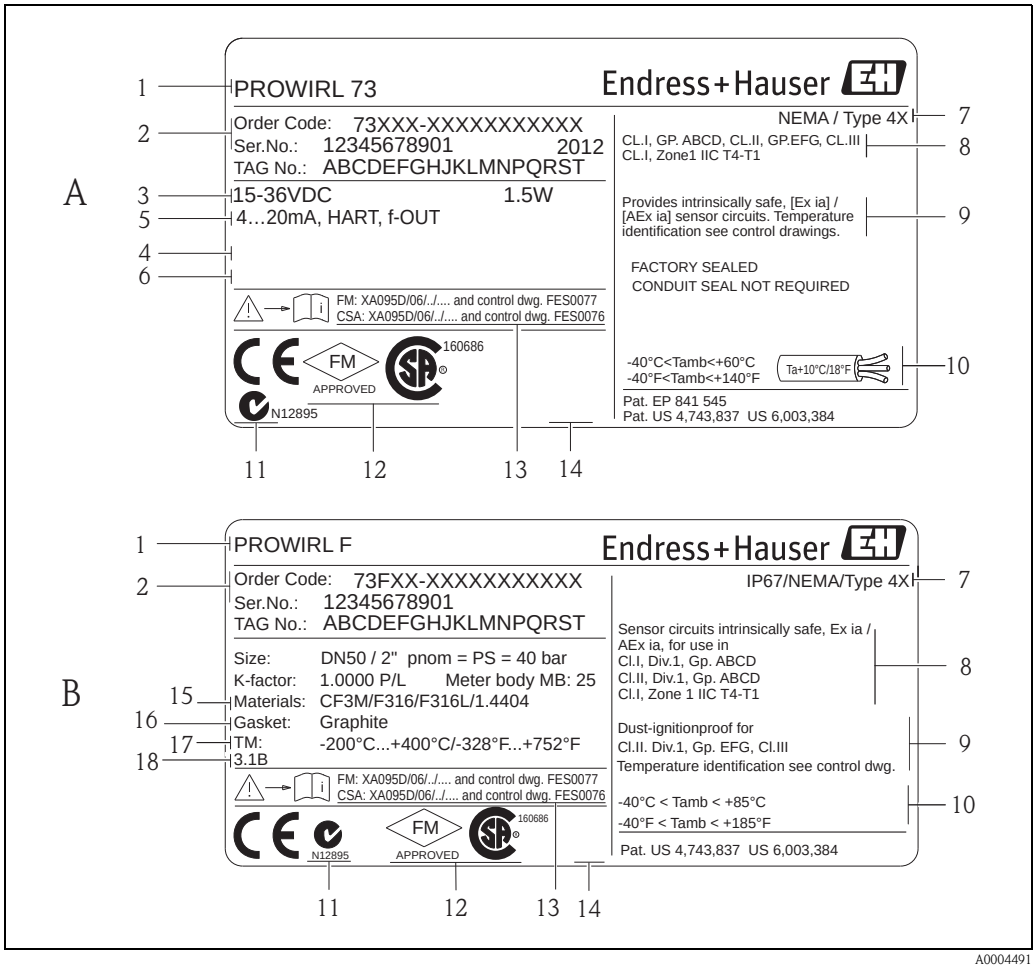
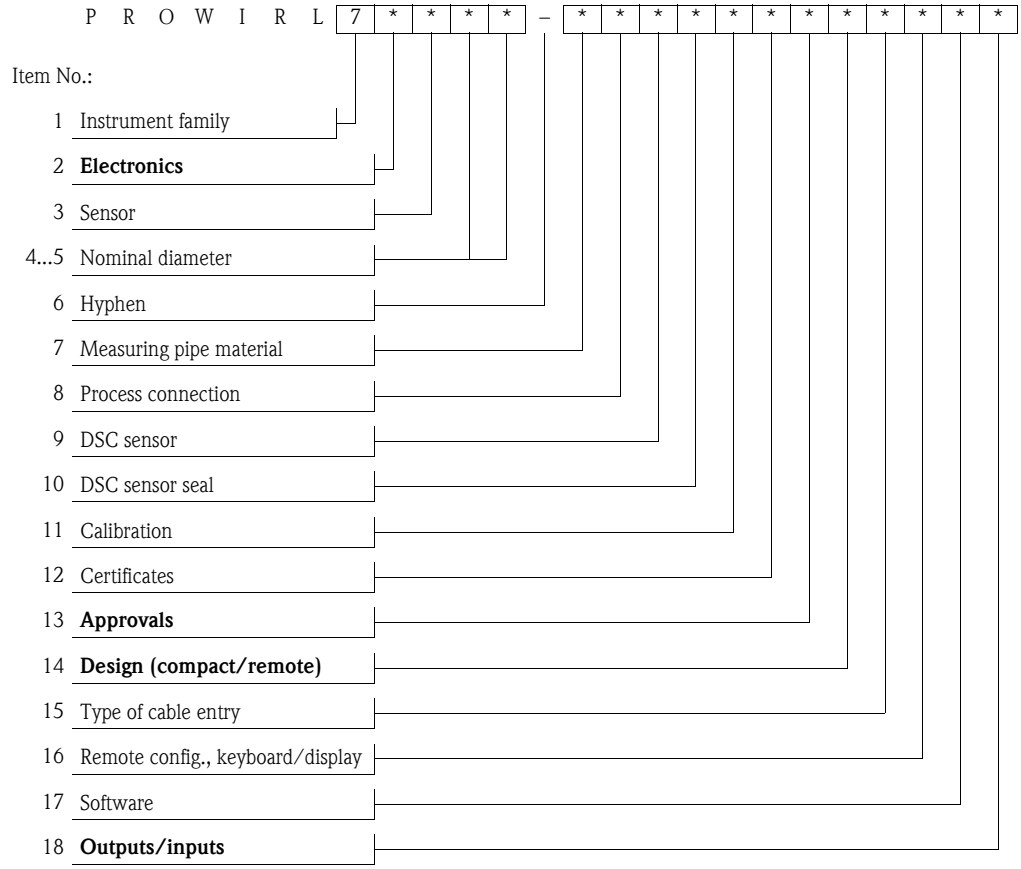


Fig. 1: Example for nameplates of a transmitter and a sensor

A Transmitter nameplate
B Sensor nameplate
1 Transmitter or sensor type
2 Order code and serial number
3 Power supply, frequency and power consumption
4 Additional specifications (only if present)
5 Available inputs/outputs
6 Space for additional information on special products
7 Identification of the type of protection, explosion group, temperature class, Ingress protection
8 Type of housing protection
9 Space for notes, e.g. delays, etc. (only if necessary)
10 Ambient temperature range
11 C-Tick symbol
12 Label of notified body: FACTORY MUTUAL standard
13 Associated Ex documentation for explosion protected devices
14 Space for other approval specifications and certificates, e.g. PROFIBUS, etc. (only if present)
15 Material tube/sensor
16 Seal material
17 Fluid temperature range
18 Additional information, e.g. 3.1 = 3.1 certificate for wetted materials

Type code

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



Electronics (Item No. 2 in type code → 🖹 6)

*	Transmitter	Electronics/housing
2	Prowirl 72	■ Intrinsically safe transmitter electronics ■ Transmitter housing of connection compartment with XP explosion protection
3	Prowirl 73	

Approvals (Item No. 13 in type code)

*	Approval	Sensor	Compact	Remote
P	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Prowirl F Prowirl W	DN 1/2"...12" DN 1/2"...6"	DN 1/2"...12" DN 1/2"...6"

Type (compact/remote; Item No. 14 in type code → 🖹 6)

*	Type	Application/zone	
A, J	Compact	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4
E, F, K, L	Remote	**Transmitter**	
		Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4
		Sensor	
		Prowirl F DN 1/2"...12" Prowirl W DN 1/2"...6"	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4

[1] Item No. 18 in type code → 🖹 6

Outputs/inputs (Item No. 18 in type code → 🖹 6)

*	Approval	
A, W	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Temperature Class: T1-T6
H, K	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Temperature Class: 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 → 🖹 9 onwards.

Compact version temperature table

Maximum fluid temperature [°F] depending on the ambient temperature T_a and the DSC sensor used (Item No. 9 in the type code → 🖹 6).

	T_a	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
Prowirl 72***-**0*********	–40 °F ... +104 °F	176	203	266	374	536	536
	–40 °F ... +140 °F	–	203	266	374	536	536
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 72***-**6********* Prowirl 73***-**4********* Prowirl 73****-*7*********	–40 °F ... +104 °F	176	203	266	374	554	824
	–40 °F ... +140 °F	–	203	266	374	554	824

Dependency of the minimum fluid temperature T_{med} on the DSC sensor:

T_{med} –328 °F	T_{med} –58 °F	T_{med} –40 °F
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 73***-**4********* Prowirl 73***-**7*********	Prowirl 72F***-**6*********	Prowirl 72***-**0*********

⚠ Warning!
For devices with outputs Prowirl 72***-**********H/K and 73***-**********H/K, temperature classes T5 and T6 are not permitted.

Remote version temperature table

Sensor

Maximum fluid temperature [°F] depending on the ambient temperature T_a and the DSC sensor used (Item No. 9 in the type code → 🖹 6).

	T_a	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
Prowirl 72***-**0*********	–40 °F ... +104 °F	176	203	266	383	536	536
	–40 °F ... +140 °F	–	203	266	383	536	536
	–40 °F ... +185 °F	–	–	266	383	536	536
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 72***-**6********* Prowirl 73***-**4********* Prowirl 73****-*7*********	–40 °F ... +104 °F	176	203	266	383	554	824
	–40 °F ... +140 °F	–	203	266	383	554	824
	–40 °F ... +185 °F	–	–	266	383	554	824

Dependency of the minimum fluid temperature T_{med} on the DSC sensor:

T_{med} –328 °F	T_{med} –58 °F	T_{med} –40 °F
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 73***-**4********* Prowirl 73***-**7*********	Prowirl 72F***-**6*********	Prowirl 72***-**0*********

⚠ Warning!
For devices with outputs Prowirl 72***-**********H/K and 73***-**********H/K, temperature classes T5 and T6 are not permitted.

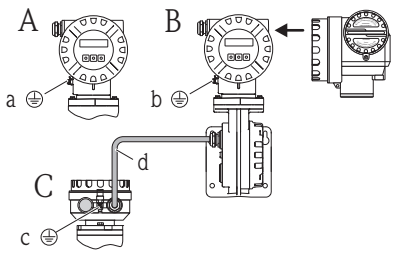
Transmitter

The minimum ambient temperature is –40 °F.
The maximum ambient temperature [°F] depending on the device used is:

	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
Prowirl 72***-**********A Prowirl 72***-**********W Prowirl 73***-**********A Prowirl 73***-**********W	104	140	140	140	140	140
Prowirl 72***-**********H Prowirl 72***-**********K Prowirl 73***-**********H Prowirl 73***-**********K	–	–	140	140	140	140

Design of the measuring system

Compact/remote version design



A Transmitter housing (compact/remote version)
B Transmitter housing (remote version)
C Sensor connection housing (remote version)
D Transmitter housing side view (compact version)

a Screw terminal for connecting to potential matching system
b Remote version connecting cable (→ 9)
c Terminal/electronics compartment cover (see below)
d Remote version connecting cable (→ 9)

Fig. 2 A0004031

Terminal assignment and connection data → 10

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 (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.

Cable entries

Cable entries for the connection compartment (XP version):
Thread for cable entry ½"-NPT

Connecting cable cable specifications

The sensor cable connection between the sensor and the transmitter has intrinsically safe explosion protection.

The maximum capacitance per unit length of the cable connection is 300µF/ft (1µF/km).
The maximum inductance of the cable is 0.3 mH/ft (1 mH/km).

The cable supplied by Endress+Hauser (max. 98 ft (30 m)) complies with these values.

Electrical connections

Connection compartment (terminal assignment, see tables on → 10)

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

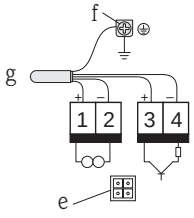


Fig. 3 A0004027

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

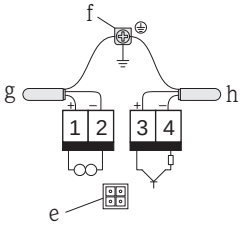


Fig. 4 A0004028

4...20 mA HART
(PFM connection with Prowirl 72)

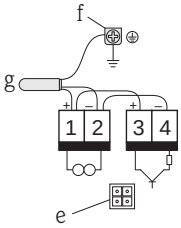


Fig. 5 A0004029

PROFIBUS PA

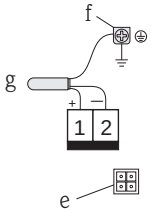


Fig. 6 A0004030

FOUNDATION Fieldbus

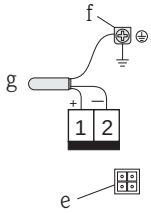


Fig. 7 A0004030

e Service connector (→ 11)
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 and FOUNDATION Fieldbus: between the stripped fieldbus cable and the ground terminal, the cable shielding must not exceed 2" in length
g HART (one cable): cable for supply voltage and/or pulse output
HART (two cables): cable for supply voltage
PROFIBUS: cable of input and output circuits)
FOUNDATION Fieldbus: 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) for Prowirl 73: connection as illustrated in → 3 or → 4; 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!
A graphic illustration of the electrical connections is provided on → 10.

Terminal assignment /connection data

	Terminals	1 (+)	2 (–)	3 (+)	4 (–)
Prowirl 72****-**********A Prowirl 72****-**********W Prowirl 73****-**********A Prowirl 73****-**********W	Terminal designation	Transmitter power supply / 4...20 mA HART		Optional pulse/status output	
	Safety-related values	≤ 36 V (U_{max} = 250 V)		≤ 36 V (U_{max} = 250 V)	

	Terminals	1 (+)	2 (–)
Prowirl 72****-**********H Prowirl 73****-**********H	Terminal designation	FOUNDATION Fieldbus	
	Safety-related values	U = 36 V (U_{max} = 250 V)	

	Terminals	1 (+)	2 (–)
Prowirl 72****-**********K Prowirl 73****-**********K	Terminal designation	PROFIBUS PA	
	Safety-related values	U = 36 V (U_{max} = 250 V)	

Service connector

The service connector (for connection, see → 3...→ 7, e) is only used to connect service interfaces approved by Endress+Hauser.

Only the “PROLINE EX TWO-WIRE CABLE” connecting cable can be used to connect a Prowirl 72 or 73 with the service interface FXA 193.

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

Technical data

Dimensions

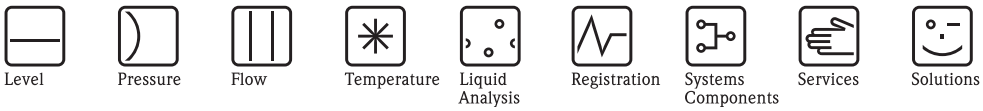
The dimensions of the Ex transmitter housing and the sensor correspond to the standard versions. Please refer to the Technical Information for these dimensions.

✎ Note!
Associated “Technical Information”:
Prowirl 72F, 72W, 73F, 73W → TI070D

Control drawings

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the FACTORY MUTUAL standards.

✎ Note!
The "Documentation/Important Information" folder provided with the measuring device contains a CD-ROM with all the Control Drawings.



Safety Instructions

Proline Prowirl 72, 73

XP (Ex-d version)

Division 1
Documentation for hazardous location Cl.I Div.1

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

- BA084D, Proline Prowirl 72 HART
- BA085D, Proline Prowirl 72 PROFIBUS PA
- BA095D, Proline Prowirl 72 FOUNDATION Fieldbus
- BA094D, Proline Prowirl 73 HART
- BA093D, Proline Prowirl 73 PROFIBUS PA
- BA096D, Proline Prowirl 73 FOUNDATION Fieldbus

Table of Contents CSA

XA00095D/06/EN/13.11
71154576

Endress+Hauser
People for Process Automation

General warnings

- Any national regulations pertaining to the installation of devices in hazardous areas must be observed.
- 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.

Special conditions

- 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 equalization” chapter on → 19.

Installation instructions

- 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 → 17.
- 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 °C above the ambient temperature present (–40 °C ... (T_a +10 °C)).
- All equipment of the measuring system must be included in potential matching (see → 20).
- 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.
- Install per National Electrical Code. Install intrinsically safe circuits per CEC and ISA RP 12.6 respecting the explosionproof integrity of the enclosure.

Approvals

General

The system meets the basic safety and health requirements for the design and construction of devices and protection systems designated for use in hazardous areas in accordance with the Canadian Electrical Code.

Certification number

160686-135901

Inspection authority

CSA: Canadian Standards Association

Identification

The system identification must contain the following information:

Compact version and remote version (transmitter and sensor)	
Prowirl 72***-******P****A	
Prowirl 72***-******P****W	
Prowirl 72***-******P****H	Cl. I, Div. 1 Groups ABCD
Prowirl 72***-******P****K	Cl. II, Div. 1 Groups EFG
Prowirl 73***-******P****A	Cl. III
Prowirl 73***-******P****W	Cl. I, Zone 1 Group IIC
Prowirl 73***-******P****H	
Prowirl 73***-******P****K	

Caution!
The installation instructions for the safe use and application of the system must be observed → 14.

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 (see also Operating Instructions, “Electrical connections” (Page 11) and “Cable specifications for connecting cable” (Page 13).

Device identification

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.

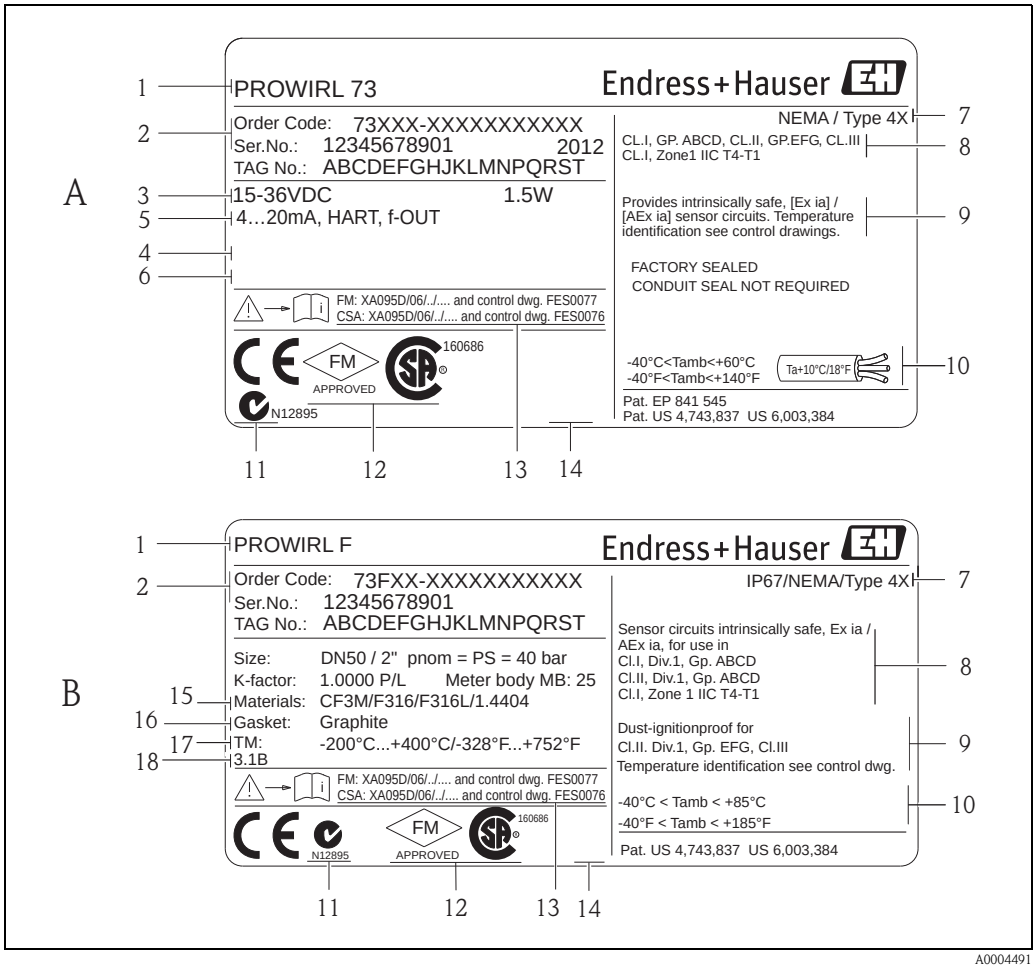
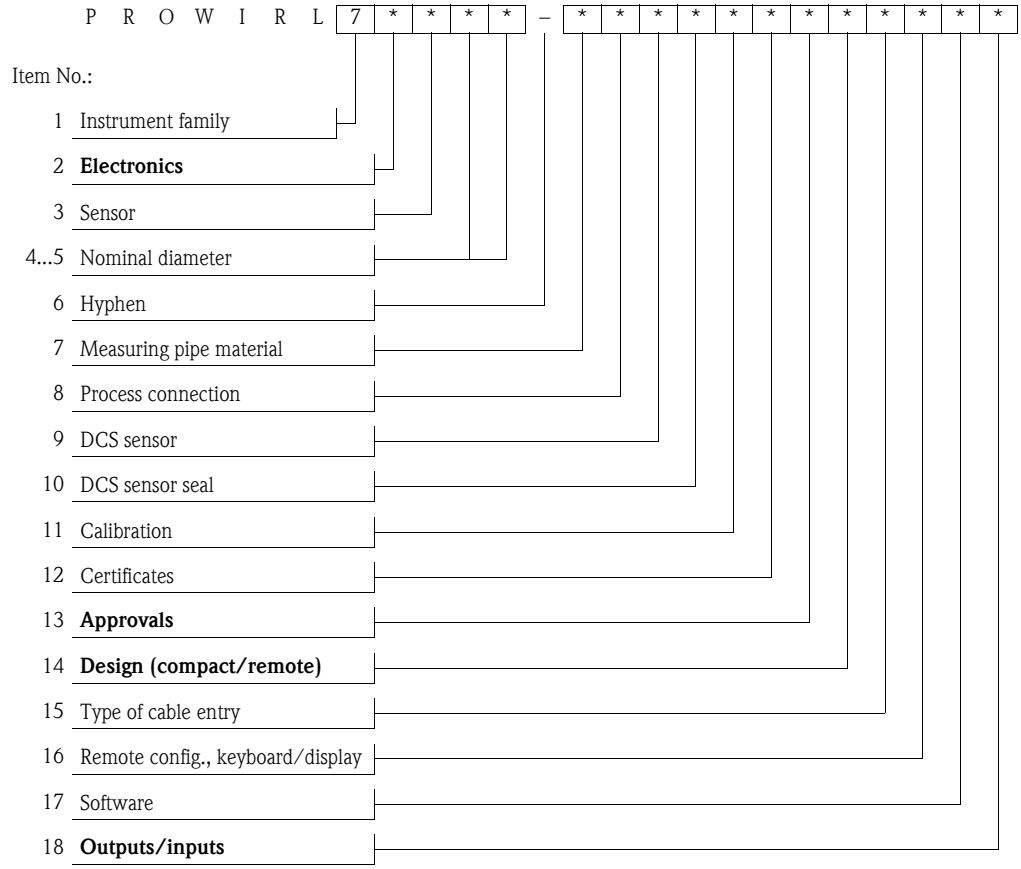


Fig. 8: Example for nameplates of a transmitter and a sensor

A Transmitter nameplate
B Sensor nameplate
1 Transmitter or sensor type
2 Order code and serial number
3 Power supply, frequency and power consumption
4 Additional specifications (only if present)
5 Available inputs/outputs
6 Space for additional information on special products
7 Identification of the type of protection, explosion group, temperature class, Ingress protection
8 Type of housing protection
9 Space for notes, e.g. delays, etc. (only if necessary)
10 Ambient temperature range
11 C-Tick symbol
12 Label of notified body: FACTORY MUTUAL standard
13 Associated Ex documentation for explosion protected devices
14 Space for other approval specifications and certificates, e.g. PROFIBUS, etc. (only if present)
15 Material tube/sensor
16 Seal material
17 Fluid temperature range
18 Additional information, e.g. 3.1 = 3.1 certificate for wetted materials

Type code

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



Electronics (Item No. 2 in type code → 16)

*	Transmitter	Electronics/housing
2	Prowirl 72	■ Intrinsically safe transmitter electronics ■ Transmitter housing of connection compartment with XP explosion protection
3	Prowirl 73	

Approvals (Item No. 13 in type code)

*	Approval	Sensor	Compact	Remote
P	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Prowirl F Prowirl W	DN 15...300 DN 15...150	DN 15...300 DN 15...150

Type (compact/remote; Item No. 14 in type code → 16)

*	Type	Application/zone	
A, J	Compact	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4
E, F, K, L	Remote	**Transmitter**	
		Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4
		Sensor	
		Prowirl F DN 15...300 (1/2"...12") Prowirl W DN 15...150 (1/2"...6")	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC Outputs/inputs A/W [1]: T1-T6 Outputs/inputs H/K [1]: T1-T4

[1] Item No. 18 in type code → 16

Outputs/inputs (Item No. 18 in type code → 16)

*	Approval	
A, W	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Temperature Class: T1-T6
H, K	Cl. I, Div. 1 Groups ABCD Cl. II, Div. 1 Groups EFG Cl. III Cl. I, Zone 1 Group IIC	Temperature Class: 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 → 19 onwards.

Compact version temperature table

Maximum fluid temperature [°C] depending on the ambient temperature T_a and the DSC sensor used (Item No. 9 in the type code → 16).

	T_a	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Prowirl 72***-**0*********	–40 °C ... +40 °C	80	95	130	195	280	280
	–40 °C ... +60 °C	–	95	130	195	280	280
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 72***-**6********* Prowirl 73***-**4********* Prowirl 73****-*7*********	–40 °C ... +40 °C	80	95	130	195	290	440
	–40 °C ... +60 °C	–	95	130	195	290	440

Dependency of the minimum fluid temperature T_{med} on the DSC sensor:

T_{med} –200 °C	T_{med} –50 °C	T_{med} –40 °C
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 73***-**4********* Prowirl 73***-**7*********	Prowirl 72F***-**6*********	Prowirl 72***-**0*********

⚠ Warning!
For devices with outputs Prowirl 72***-**********H/K and 73***-**********H/K, temperature classes T5 and T6 are not permitted.

Remote version temperature table

Sensor

Maximum fluid temperature [°C] depending on the ambient temperature T_a and the DSC sensor used (Item No. 9 in the type code → 🖹 16):

	T_a	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Prowirl 72***-**0*********	–40 °C ... +40 °C	80	95	130	195	280	280
	–40 °C ... +60 °C	–	95	130	195	280	280
	–40 °C ... +85 °C	–	–	130	195	280	280
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 72***-**6********* Prowirl 73***-**4********* Prowirl 73****-*7*********	–40 °C ... +40 °C	80	95	130	195	290	440
	–40 °C ... +60 °C	–	95	130	195	290	440
	–40 °C ... +85 °C	–	–	130	195	290	440

Dependency of the minimum fluid temperature T_{med} on the DSC sensor:

T_{med} –200 °C	T_{med} –50 °C	T_{med} –40 °C
Prowirl 72***-**1********* Prowirl 72***-**2********* Prowirl 72***-**3********* Prowirl 73***-**4********* Prowirl 73***-**7*********	Prowirl 72F***-**6*********	Prowirl 72***-**0*********

⚠ Warning!
For devices with outputs Prowirl 72***-**********H/K and 73***-**********H/K, temperature classes T5 and T6 are not permitted.

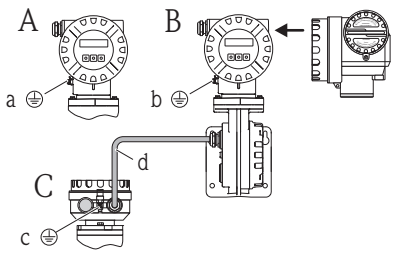
Transmitter

The minimum ambient temperature is –40 °C.
The maximum ambient temperature [°C] depending on the device used is:

	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
Prowirl 72***-**********A Prowirl 72***-**********W Prowirl 73***-**********A Prowirl 73***-**********W	40	60	60	60	60	60
Prowirl 72***-**********H Prowirl 72***-**********K Prowirl 73***-**********H Prowirl 73***-**********K	–	–	60	60	60	60

Design of the measuring system

Compact/remote version design



A Transmitter housing (compact/remote version)
B Transmitter housing (remote version)
C Sensor connection housing (remote version)
D Transmitter housing side view (compact version)

a Screw terminal for connecting to potential matching system
b Remote version connecting cable (see also → 19)
c Terminal/electronics compartment cover (see below)
d Remote version connecting cable (see also → 19)

Fig. 9 A0004031

Terminal assignment and connection data → 20

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 (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.

Cable entries

Cable entries for the connection compartment (XP version):
Thread for cable entry ½"-NPT

Connecting cable cable specifications

The sensor cable connection between the sensor and the transmitter has intrinsically safe explosion protection.

The maximum capacitance per unit length of the cable connection is 1μF/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

Connection compartment (terminal assignment, see tables on → 20)

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

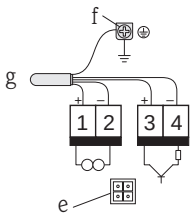


Fig. 10 A0004027

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

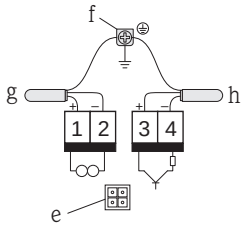


Fig. 11 A0004028

4...20 mA HART
(PFM connection with Prowirl 72)

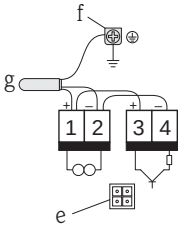


Fig. 12 A0004029

PROFIBUS PA

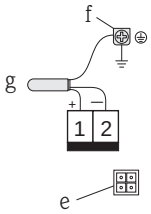


Fig. 13 A0004030

FOUNDATION Fieldbus

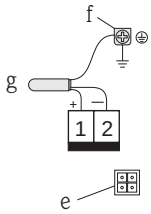


Fig. 14 A0004030

e Service connector (see also → 21)
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 and FOUNDATION Fieldbus: between the stripped fieldbus cable and the ground terminal, the cable shielding must not exceed 5 mm (2") in length
g HART (one cable): cable for supply voltage and/or pulse output
HART (two cables): cable for supply voltage
PROFIBUS: cable of input and output circuits)
FOUNDATION Fieldbus: 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) for Prowirl 73: connection as illustrated in → 10 or → 11; 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!
A graphic illustration of the electrical connections is provided on → 20.

Terminal assignment /connection data

	Terminals	**1 (+)**	**2 (–)**	**3 (+)**	**4 (–)**
Prowirl 72****-**********A Prowirl 72****-**********W Prowirl 73****-**********A Prowirl 73****-**********W	Terminal designation	Transmitter power supply / 4...20 mA HART		Optional pulse/status output	
	Safety-related values	≤ 36 V (U_{max} = 250 V)		≤ 36 V (U_{max} = 250 V)	

	Terminals	**1 (+)**	**2 (–)**
Prowirl 72****-**********H Prowirl 73****-**********H	Terminal designation	FOUNDATION Fieldbus	
	Safety-related values	U = 36 V (U_{max} = 250 V)	

	Terminals	**1 (+)**	**2 (–)**
Prowirl 72****-**********K Prowirl 73****-**********K	Terminal designation	PROFIBUS PA	
	Safety-related values	U = 36 V (U_{max} = 250 V)	

Service connector

The service connector (for connection, see → 10...→ 14, e) is only used to connect service interfaces approved by Endress+Hauser.

Only the “PROLINE EX TWO-WIRE CABLE” connecting cable can be used to connect a Prowirl 72 or 73 with the service interface FXA 193.

⚠ 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”:
Prowirl 72F, 72W, 73F, 73W → TI070D

Control drawings

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

✎ Note!
The "Documentation/Important Information" folder provided with the measuring device contains a CD-ROM with all the Control Drawings.

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