Safety Instructions
Cubemass 100

NEPSI: Zone 2 (Ex nA version)

Document: XA01263D
Safety instructions for electrical apparatus for explosion-hazardous areas classified according to National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI) → 🖹 3

Endress+Hauser
People for Process Automation

Cubemass 100

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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	PROFIBUS DP	Modbus RS485	EtherNet/ IP	PROFINET
Cubemass C 100	BA01188D	BA01247D	BA01178D	BA01183D	BA01425D

Additional documentation:

Document type	Contents	Documentation code
Brochure	Explosion Protection	CP00021Z/11

Please note the documentation associated with the device.

COC certificates of conformity

COC certificates of conformity

- GB3836.1-2010
- GB3836.8-2003

Certification numbers

GYJ13.1225

Inspection body

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

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

* = Spaceholder: 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	Selected option	Description
1	Instrument family	8	Coriolis flowmeter
2	Sensor	C	Sensor type
3	Transmitter	1	Transmitter type: 4-wire, compact version
4	Generation index	B, C, ...	Platform generation
5, 6	Nominal diameter	DN 1: 01 DN 2: 02 DN 4: 04 DN 6: 06	Nominal diameter of sensor

Basic specifications

Position	Order code	Selected option	Explosion protection
1, 2	Approval	NJ	Ex nA IIC T1 ~ T5 Gc Ex nA IIC T1 ~ T6 Gc
3	Input; Output	B	4-20mA HART, Pulse/frequency/switch output
		L	PROFIBUS DP
		M	Modbus RS485
		N	EtherNet/IP
		R	PROFINET IO
4	Display; Operation	A	W/o; via communication
		B	4-line, illum.; via communication
5	Housing	A	Compact, alu, coated
		B	Compact hygienic, stainless
		C	Ultra compact hygienic, stainless

Optional specifications

No options specific to hazardous locations are available.

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 (e.g. GB3836.15-2000).
- Install the device according to the manufacturer's instructions and the following standards:
  - 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".
  - GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres – Part 15: Electrical installations in hazardous area (other than mines)"
  - GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation (other than mines)"
  -
- 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.
- Observe all the technical data of the device (see nameplate).

Safety instructions: Installation

In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.

- Temperature: −20 to +60 °C
- Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
- Air with normal oxygen content, usually 21 % (V/V)

If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.

- Connecting or disconnecting the devices:
  - Ensure the supply voltage is switched off.
  - Or the device is located in a non-hazardous area.
- In potentially explosive atmospheres: Do not disconnect the electrical connection of the power supply circuit.
- Only use certified cable entries and connection plugs M12×1 suitable for the application. Please comply with the selection criteria as defined in GB3836.15-2000.
- Continuous service temperature of the connecting cable: −40 to +80 °C; however, at least 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).
- 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 cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Supplied cable glands M20 × 1.5 are only suitable for fixed installation of cables and connections. In the installation, a strain relief must be provided.

Basic specification, Position 5 (Housing) = B, C
To protect the housing of stainless steel housings ensure that the housing gasket is flat and not bent when closing the housing cover. Replace bent gaskets.

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.

Temperature tables

Ambient temperature

Minimum ambient temperature:
T_a = −40 °C

Maximum ambient temperature:
T_a = +60 °C depending on the medium temperature and temperature class

Medium temperature

Minimum medium temperature:
T_m = −50 °C

Maximum medium temperature:
T_m for T1 ~ T6 depending on the maximum ambient temperature T_a

Compact version

Basic specification, Position 5 (Housing) = A, B

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [300 °C]
35	50	85	120	150 [1)]	150 [2)]	150 [2)]
50	–	85	120	150 [1)]	150 [2)]	150 [2)]
60	–	–	120	150 [1)]	150 [2)]	150 [2)]

1) The following applies to specified sensors with a maximum fluid temperature Tm = 205 °C: Tm = 170 °C
2) The following applies to specified sensors with a maximum fluid temperature Tm = 205 °C: Tm = 205 °C

Basic specification, Position 5 (Housing) = C

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [300 °C]
50	–	85	120	150 [1)]	150 [2)]	150 [2)]
60	–	–	120	150 [1)]	150 [2)]	150 [2)]

1) The following applies to specified sensors with a maximum fluid temperature Tm = 205 °C: Tm = 170 °C
2) The following applies to specified sensors with a maximum fluid temperature Tm = 205 °C: Tm = 205 °C

Connection data: 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

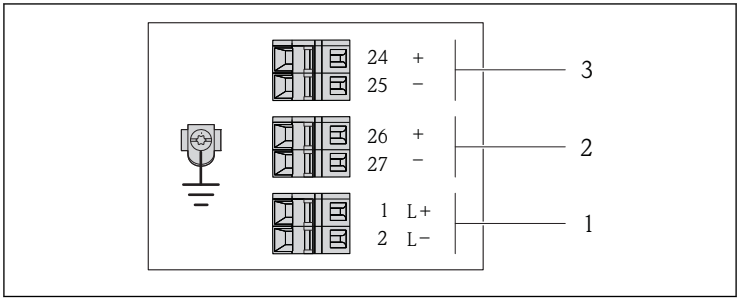
Transmitter

The order code constitutes part of the extended order code. For detailed information on the device features and the structure of the extended order code → 5.

Connection version 4-20 mA HART with pulse/frequency/switch output

Order code for "Output", option **B**

Depending on the housing version, the transmitters can be ordered with terminals or device plugs.



1 *Terminal assignment 4-20 mA HART with pulse/frequency/switch output*

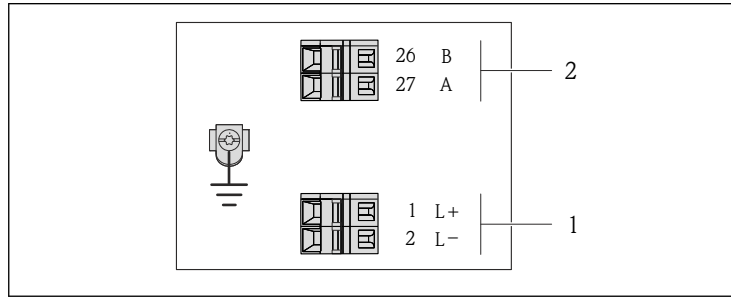
1 *Power supply: DC 24 V*
2 *Output 1: 4-20 mA HART (active)*
3 *Output 2: pulse/frequency/switch output (passive)*

Order code for "Output"	Terminal number					
	Power supply		Output 1		Output 2	
	2 (L-)	1 (L+)	27 (–)	26 (+)	25 (–)	24 (+)
Option **B**	DC 24 V		4-20 mA HART (active)		Pulse/frequency/ switch output (passive)	
Order code for "Output": Option **B**: 4-20 mA HART with pulse/frequency/switch output						

PROFIBUS DP connection version

Order code for "Output", option **L**

Depending on the housing version, the transmitters can be ordered with terminals or device plugs.



2 PROFIBUS DP terminal assignment

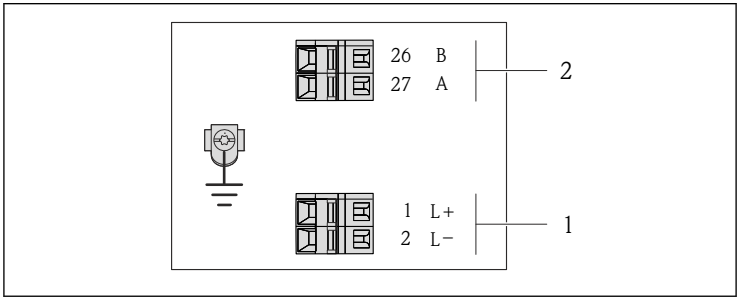
1 Power supply: DC 24 V
2 PROFIBUS DP

Order code for "Output"	Terminal number			
	Power supply		Output	
	2 (L-)	1 (L+)	26 (RxD/ TxD-P)	27 (RxD/ TxD-N)
Option **L**	DC 24 V		B	A
Order code for "Output": Option **L**: PROFIBUS DP, for use in non-hazardous areas and Zone 2				

Modbus RS485 connection version

Order code for "Output", option **M**

Depending on the housing version, the transmitters can be ordered with terminals or device plugs.



3 Modbus RS485 terminal assignment, connection version for use in non-hazardous areas and Zone 2

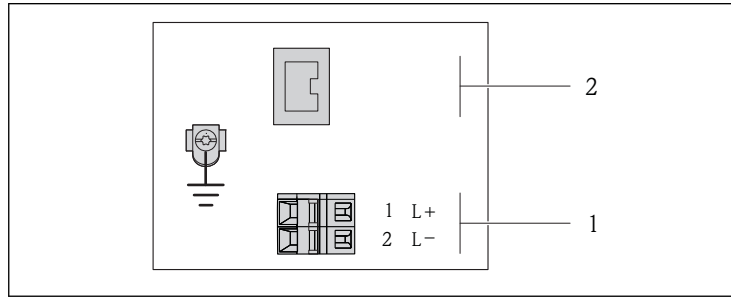
1 Power supply: DC 24 V
2 Modbus RS485

Order code for "Output"	Terminal number			
	Power supply		Output	
	2 (L-)	1 (L+)	27 (B)	26 (A)
Option **M**	DC 24 V		Modbus RS485	
Order code for "Output": Option **M**: Modbus RS485, for use in non-hazardous areas and Zone 2				

EtherNet/IP connection version

Order code for "Output", option **N**

Depending on the housing version, the transmitters can be ordered with terminals or device plugs.



4 *EtherNet/IP terminal assignment*

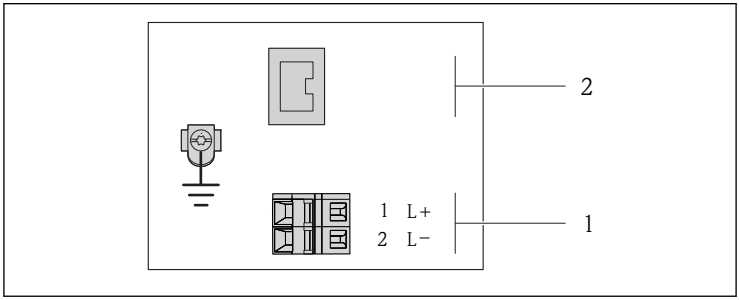
1 Power supply: DC 24 V
2 EtherNet/IP

Order code for "Output"	Terminal number		
	Power supply		Output
	2 (L-)	1 (L+)	Device plug M12x1
Option **N**	DC 24 V		EtherNet/IP
Order code for "Output": Option **N**: EtherNet/IP			

PROFINET connection version

Order code for "Output", option **R**

Depending on the housing version, the transmitters can be ordered with terminals or device plugs.



5 PROFINET terminal assignment

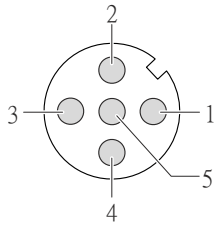
1 Power supply: DC 24 V
2 PROFINET

Order code for "Output"	Terminal number		
	Power supply		Output
	2 (L-)	1 (L+)	Device plug M12x1
Option **R**	DC 24 V		PROFINET
Order code for "Output": Option **R**: PROFINET			

Pin assignment, device plug

Supply voltage

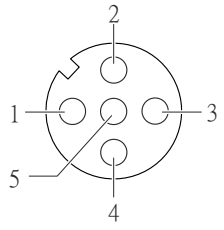
For all connection versions (device side)



Pin	Assignment	
1	L+	DC 24 V
2		Not assigned
3		Not assigned
4	L-	DC 24 V
5		Grounding/shielding
Coding		**Plug/socket**
A		Plug

4-20 mA HART with pulse/frequency/switch output

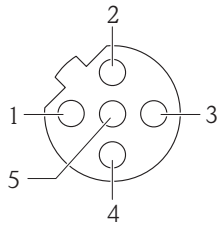
Device plug for signal transmission (device side)



Pin		Assignment
1	+	4-20 mA HART (active)
2	-	4-20 mA HART (active)
3	+	Pulse/frequency/switch output (passive)
4	-	Pulse/frequency/switch output (passive)
5		Grounding/shielding
Coding		**Plug/socket**
A		Socket

PROFIBUS DP

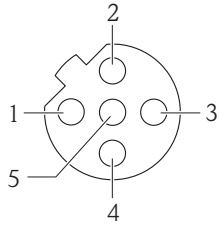
Device plug for signal transmission (device side)



Pin		Assignment
1		Not assigned
2	A	PROFIBUS DP
3		Not assigned
4	B	PROFIBUS DP
5		Grounding/shielding
Coding		**Plug/socket**
B		Socket

MODBUS RS485

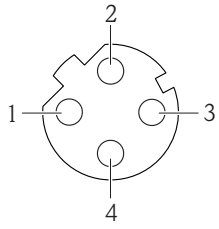
Device plug for signal transmission (device side)



Pin		Assignment
1		Not assigned
2	A	Modbus RS485
3		Not assigned
4	B	Modbus RS485
5		Grounding/shielding
Coding		**Plug/socket**
B		Socket

EtherNet/IP

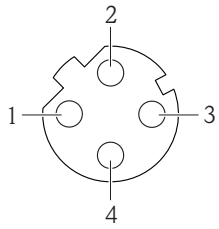
Device plug for signal transmission (device side)



Pin		Assignment
1	+	Tx
2	+	Rx
3	-	Tx
4	-	Rx
Coding		**Plug/socket**
D		Socket

PROFINET

Device plug for signal transmission (device side)



Pin		Assignment
1	+	TD +
2	-	RD +
3	+	TD –
4	-	RD –
Coding		**Plug/socket**
D		Socket

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