Safety Instructions
LNGmass

Cl.I Div.1, Zone 1 for IS (Ex i Intrinsically safe version)

EN Document: XA01218D
Safety instructions for electrical apparatus for explosion-hazardous areas classified according to the National Electrical Code (NEC) and Canadian Electrical Code (CEC) → 3

Endress+Hauser
People for Process Automation

LNGmass

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Associated documentation

This document is an integral part of the following Operating Instructions:
BA01261D, LNGmass Modbus RS485

The Operating Instructions pertaining to the device apply.

Supplementary documentation

Explosion-protection brochure:
CP021Z/00

The Explosion-protection brochure is available:
- In the download area of the Endress+Hauser website: www.endress.com → Download → Advanced → Documentation Code: CP021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

Certificate number

160686-70001050

Notified body

CSA: Canadian Standards Association

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

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

1) * = Place holder: 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		Gewählte Option	Beschreibung
1	Flow	D	D = flow
2	Instrument family	8	Coriolis flowmeter
3	Product	L	L = LNGmass

Position		Gewählte Option	Beschreibung
4	Generation index	B	Platform generation
5, 6	Nominal diameter	08, 15, 25	Nominal diameter of sensor

Relevant features of the device type and the basic specifications

The information applies to devices with the output of "Modbus RS485" (feature "M" for position 4 in the basic specifications).

Basic specifications Position 1, 2 Approval	Explosion protection	
	Transmitter/sensor	Safety Barrier Promass 100
C2	IS, Cl.I,II,III, Div.1	Ex nA [ia Ga] IIC T4 Gc

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. NEC or CEC)
- 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.
- Observe all the technical data of the device (see nameplate).
- When using in hybrid mixtures (gas and dust occurring simultaneously), observe additional measures for explosion protection.
- Class II Group G: The surface temperature of the apparatus cannot exceed +165 °C.
- Classification of Zones: Equipment is intended for use in Zone I and Zone 0 location.
- Warning!
  Substitution of components may impair intrinsic safety.

Safety instructions: Installation

- The LNGmass should only be used with the supplied Safety Barrier Promass 100 (safety barrier).
- When the Safety Barrier Promass 100 is located in Class I Division 2 (respectively safe area) it shall be mounted inside an additional enclosure which meets the requirements of CSA C22.2 No. 213, CAN/CSA 60079-15, ANSI/ISA 60079-15 and FM 3611 (respectively as CAN/CSA C22.2 No. 61010-1 and FM 3810).
- Continuous service temperature of the connecting cable: −40 to ≥ +80 °C (−50 to ≥ +80 °C with Order code for "Test, certificate", option JM); 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).
- 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 cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.

- Control room equipment shall not use or generate more than 250 V rms.
- 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.
- Install all Intrinsically Safe Circuits (respecting the Explosionproof Integrity of the enclosure):
  – Per Canadian Electrical Code (CEC) Part I Section 18 and Appendix F
  – Per National Electrical Code (NEC) ANSI/NFPA 70 and ISA RP 12.6

Intrinsic safety

- The device can be connected to the Endress+Hauser FXA291 service tool: refer to the Operating Instructions.
- Note the connection values in the selection of the connection cable between Safety Barrier Promass 100 and LNGmass (→ 🖹 8).

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.

Safety instructions: Class II, Class III

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

Temperature table

Ambient temperature

Minimum ambient temperature: T_a = −40 °C (−50 °C with order code for "Test, certificate", option JM)

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

Medium temperature

Minimum medium temperature: T_m = −200 °C

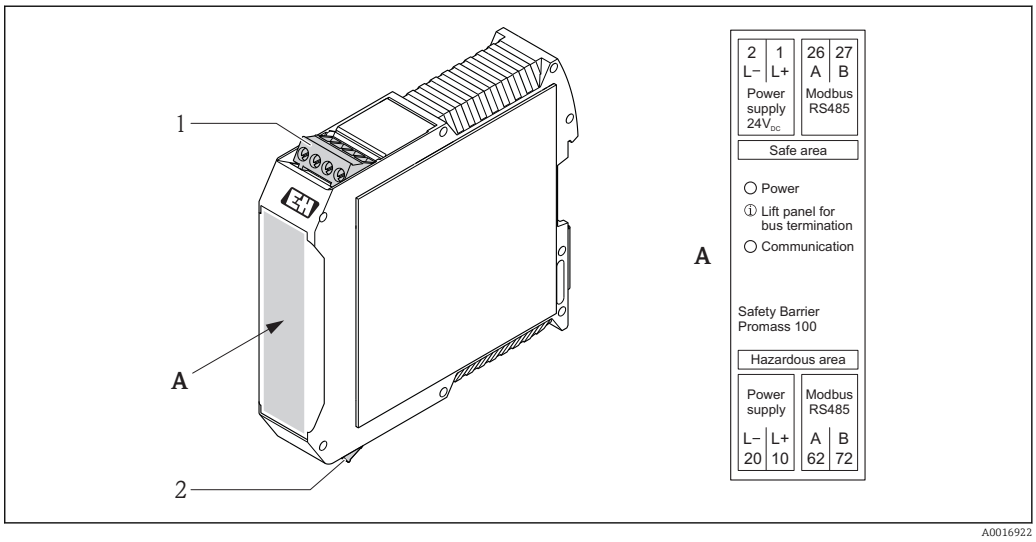
Maximum medium temperature: T_m for T6…T1 depending on the maximum ambient temperature T_a

Temperature table for explosion hazards arising from gas

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35	50	85	120	150	150	150
50	–	85	120	150	150	150
60	–	–	120	150	150	150

Connection data: Signal circuits (intrinsically safe circuits)

Terminal assignment Safety Barrier Promass 100



1 Safety Barrier Promass 100

1 Non-hazardous area and Zone 2/Div. 2
2 Intrinsically safe area

Terminal assignment: Non-hazardous area and Zone 2/Div. 2

Terminal numbers			
Supply voltage		Signal transmission	
1 (L+)	2 (L-)	26 (A)	27 (B)
U_{nom} = DC 24 V DC (20 to 30 V) U_{max} = AC 260 V P_{max} = 4.8 W		U_{nom} = DC 5 V U_{max} = AC 260 V	

Terminal assignment: Intrinsically safe area

Terminal numbers			
10 (L+)	20 (L-)	62 (A)	72 (B)
U_0 = 16.24 V I_0 = 623 mA P_0 = 2.45 W With IIC [1]: C_0 = 0.433 µF, L_0 = 92.8 µH, L_0/R_0 = 14.6 µH/Ω With IIB: C_0 = 2.57 µF, L_0 = 372 µH, L_0/R_0 = 58.3 µH/Ω			

1) The gas group depends on the sensor and nominal diameter.

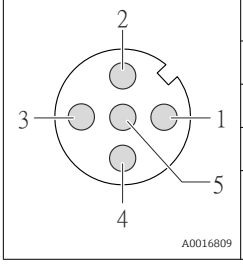
Terminal assignment transmitter

Connection only via Safety Barrier Promass 100

Terminal assignment transmitter intrinsically safe area

Terminal numbers			
10 (L+)	20 (L-)	62 (A)	72 (B)
U_i = 16.24 V I_i = 623 mA P_i = 2.45 W C_i = 6 nF L_i = 0 µH			

PIN assignment, device plug

	PIN	Assignment		Coding	Connector/ socket
	1	L+	Supply voltage, Ex ia	A	Connector
	2	A	Modbus RS485, Ex ia		
	3	B	Modbus RS485, Ex ia		
	4	L–	Supply voltage, Ex ia		
	5		Grounding/shielding		

Connecting cable

Connecting cable between Safety Barrier Promass 100 and measuring device

Comply with the maximum cable resistance specifications to ensure the operational reliability of the measuring device.

The maximum cable length for individual wire cross-sections is specified in the table below. Observe the maximum capacitance and inductance per unit length of the cable and connection values for hazardous areas.

Wire cross-section		Maximum cable length	
[mm²]	[AWG]	[m]	[ft]
0.5	20	70	230
0.75	18	100	328
1.0	17	100	328
1.5	16	200	656
2.5	14	300	984

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