Safety Instructions
Nanomass

Cl.I, Div.1, Zone 0 for IS (Ex i Intrinsically safe version)

Document: XA01376D
Safety instructions for electrical apparatus for explosion-hazardous areas classified according to the National Electrical Code (NEC) and Canadian Electrical Code (CEC)

Nanomass

Table of Contents

Associated documentation. 3

Manufacturer's certificates 3

Extended order code. 3

Safety instructions: General 4

Safety instructions: Installation 5

Temperature information 5

Connection values: Signal circuit 5

Associated documentation

All documentation is available:
- On the CD-ROM supplied.
- Internet: www.endress.com/deviceviewer.
- Smart phone/tablet: Endress+Hauser Operations App.
- In the Download Area of the Endress+Hauser website: www.endress.com → Downloads.

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

Measuring device	Documentation code
Nanomass Gas Density	BA01027D

Additional documentation:

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

Manufacturer's certificates

Certificate number

E466388

Notified body

UL: Underwriters Laboratories

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 are 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 is relevant to hazardous locations.

Device type

Position	Order code	Selected option	Description
1	Flow	D	Flow
2	Instrument family	C	Coriolis MEMS
3	Fluid	D, E	D = Sensor for liquid density, E = Sensor for gas density
4	Generation index	B	Platform generation
5, 6	Nominal diameter	N7	Nominal diameter of sensor

Basic specifications

Position	Order code	Selected option	Description
1, 2	Approval	FA, 8A	$_{C}UL_{US}$ Cl.I, Div. 1 Groups ABCD T4 Cl.I, Zone 0 AEx/Ex ia IIC T4
3	Power Supply	A	DC 8...30 V
4	Output, Input	A	2× 4-20 mA output, passive USB interface incl. cable
		B	2× 4-20 mA output, passive RS232 plug
		C	2× 4-20 mA output, passive RS232 interface incl. 2 m service cable
		D	2× 4-20 mA output, passive RS232 plug incl. 2 m service cable
5	Display, Operation	A	2-line, push buttons
6	Housing	A	Compact

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. IEC 60079-14, 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 fluid to which the wetted materials have sufficient durability.
- Observe all the technical data of the device (see nameplate).
- Modifications to the device can affect of explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- No user replaceable parts inside.

⚠ WARNING

Hazard in potentially explosive atmospheres

- ▶ Disconnect power before servicing.
- ▶ The apparatus enclosure contains aluminium: Care must be taken to avoid ignition hazards due to impact or friction.

⚠ WARNING

For Version with USB connection only:

- ▶ Do not connect USB and power simultaneously.
- ▶ USB data download and configuration done only in non-hazardous location.

Safety instructions: Installation

- Permitted ambient temperature range must be observed.
- Avoid sparks caused by impact and friction.

Intrinsic safety

- Associated apparatus must be installed in accordance with its manufacturer's control drawing and:
  - National Electrical Code (ANSI/NFPA 70) for installations in the United States
  - Canadian Electrical Code for installations in Canada
- 4-20 mA circuits should be separated by individual grounded shields.
- Associated apparatus output current must be limited by a resistor such that the output voltage-current plot has a linear characteristic.

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 information

Ambient temperature

- Minimum ambient temperature: T_a = −20°C (−4 °F)
- Maximum ambient temperature: T_a = +60 °C (+140 °F)

Medium temperature

- Minimum medium temperature: T_{med} = −20 °C (−4 °F)
- Maximum medium temperature: T_{med} = +60 °C (+140 °F)

Temperature class

- Temperature class: T4

Connection values: Signal circuit

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

Output type

The order code is part of the extended order code. For detailed information on the features of the device and the structure of the extended order code → 🖹 3.

Order code for "Output; Input"	Output 1 1 (+/-) / 2 (-/+)	Output 2 3 (+/-) / 4 (-/+)	Output 3 1 to 4
Option **A**	4-20 mA (passive)	4-20 mA (passive)	_
Option **B**	4-20 mA (passive)	4-20 mA (passive)	RS232
Option **C**	4-20 mA (passive)	4-20 mA (passive)	RS232
Option **D**	4-20 mA (passive)	4-20 mA (passive)	RS232

Intrinsically safe values

The order code is part of the extended order code. For detailed information on the features of the device and the structure of the extended order code → 🖹 3.

Order code for "Power Supply"	Intrinsically safe values
Option **A**	U_i = 30 V
	I_i = 300 mA
	P_i = 1.1 W
	L_i = 0.22 mH
	C_i = 55 nF

Order code for "Input; Output"	Output type	Intrinsically safe values
Option **A**	4-20 mA (passive)	U_i = 30 V
		I_i = 320 mA
		P_i = 1.1 W
		L_i = 0.15 mH
		C_i = 48 nF
Option **B**, **C**, **D**	4-20 mA (passive)	U_i = 30 V
		I_i = 320 mA
		P_i = 1.1 W
		L_i = 0.15 mH
		C_i = 48 nF
	RS232	U_i = 15 V
		I_i = 90 mA
		P_i = 1.1 W
		L_i = 1 mH
		C_i = 700 nF

External devices

Device type code (position 3)	External devices	Intrinsically safe values
Option DC**E**B	Pressure sensor	Pressure sensor, Endress+Hauser, PN UC2 - T3C - cable length max. 100 ft
Option DC**D**B	e.g. Temperature sensor or other external device	U_o = 5.88 V
		I_o = 400 mA
		P_o = 0.6 W; $P_0 = (I_0 \cdot U_0)/4$
		L_o = 20 µH
		C_o = 41000 nF

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