Safety Instructions Tank Side Monitor NRF590

Ex d [ia Ga] IIC T6 Gb



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Tank Side Monitor NRF590

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Associated documentation	This document is an integral part of the following Operating Instructions: • BA00256F/00 • BA00257F/00
Supplementary documentation	 Explosion-protection brochure: CP00021Z/11 The Explosion-protection brochure is available: In the download area of the Endress+Hauser website: www.endress.com -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z On the CD for devices with CD-based documentation
Manufacturer's certificates	NEPSI Declaration of Conformity Certificate number: GYJ20.1524X Affixing the certificate number certifies conformity with the following standards (depending on the device version): • GB3836.1-2010 • GB3836.2-2010 • GB3836.4-2010 • GB3836.20-2010
Manufacturer address	Endress+Hauser SE+Co. KG Hauptstraße 1 79689 Maulburg, Germany Address of the manufacturing plant: See nameplate.
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

NRF590	_ **********		+	A*B*C*D*E*F*G*	
(Device		(Basic		(Optional	
type)		specifications)		specifications)	

* = Placeholder

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

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.

Extended order code: Tankside Monitor



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type NRF590

Basic specifications

Position 1 (Approval)					
Selected option		Description			
NRF590	В	NEPSI Ex d [ia Ga]IIC T6 Gb			

Optional specifications

No options specific to hazardous locations are available.

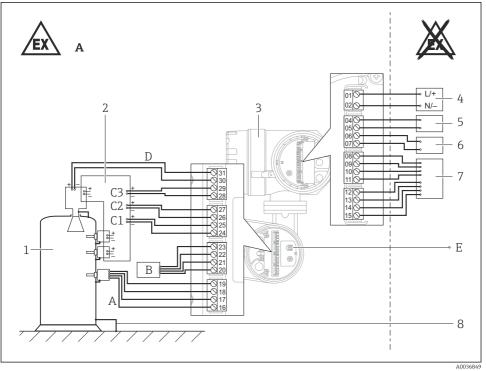
Safety instructions: General

- 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
- Install the device according to the manufacturer's instructions and national regulations.
- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
 - GB 50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB 3836.13-2013: "Explosive atmospheres, Part 13: Equipment repair, overhaul and reclamation".
 - GB/T 3836.15-2017: "Explosive atmospheres, Part 15: Electrical installations design, selection and erection".
 - GB/T 3836.16-2017: "Explosive atmospheres, Part 16: Electrical installations inspection and maintenance".
 - GB/T 3836.18-2017: "Explosive atmospheres, Part 18: Intrinsically safe electrical systems".
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the electronics housing, depending on the range of application and the temperature class.

Safety Permitted ambient temperature range: instructions: $-40 \degree C \le T_a \le +60 \degree C$ Special conditions

- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the housing or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.

Safety instructions: Installation



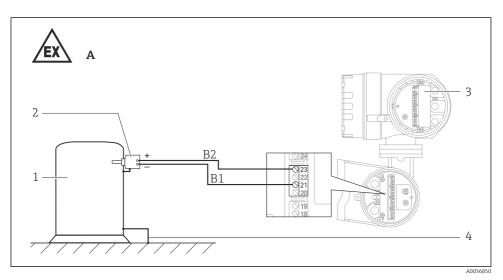
1

- A Zone 1
- 1 Tank; Hazardous area Zone 0
- 2 Multidrop HART BUS
- 3 Housing
- 4 Circuit 1, Power source
- 5 Circuit 2, Digital I/O 1
- 6 Circuit 3, Digital I/O 2
- 7 Circuit 4, Communication
- 8 Potential equalization

• A-D Intrinsic safe circuits (\rightarrow "Connection data" chapter)

■ E Service Port (→ "Connection data" chapter)

For additional information regarding shielding and installation in combination with intrinsic safe sensors (e.g. Micropilot S) refer to associated operation instructions (BA).

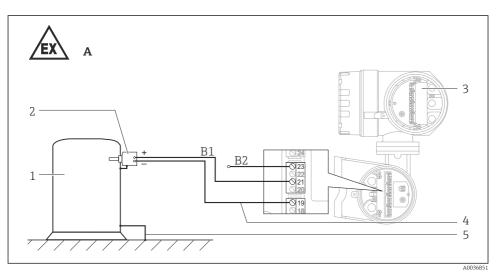


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- A Zone 1
- 1 Tank; Hazardous area Zone 0
- 2 Passive 4 to 20 mA device
- 3 Housing
- 4 Potential equalization



B Intrinsic safe circuits (\rightarrow "Connection data" chapter)

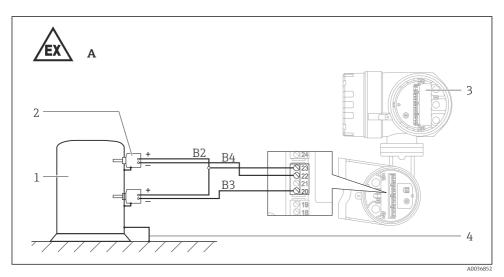


🛃 3

- A Zone 1
- 1 Tank; Hazardous area Zone 0
- 2 Active 4 to 20 mA device
- 3 Housing
- 4 Reference potential
- 5 Potential equalization

B

B Intrinsic safe circuits (\rightarrow "Connection data" chapter)



€ 4

- A Zone 1
- 1 Tank; Hazardous area Zone 0
- 2 Device with switch output
- 3 Housing
- 4 Potential equalization



B Intrinsic safe circuits (\rightarrow "Connection data" chapter)

- Seal unused entry glands with approved Ex d sealing plugs.
- After aligning (rotating) the housing, retighten the fixing screw (see Operating Instructions).
- Continuous service temperature of the connecting cable: $\ge T_a + 5$ K.
- Circuits 1, 2, 3 and 4 are non-intrinsic safe circuits containing potentially hazardous potentials and energies. Appropriate precautions must be taken at all times.
- All cabling, glands, and adapters used on circuits 1, 2, 3 and 4 must be Ex d approved.
- The circuits A, B, C and D are intrinsic safe circuits (type of protection Ex ia IIC or Ex ia IIB). Only certified intrinsically safe equipment is allowed to be connected.

Intrinsic safety

- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- The intrinsically safe input and output power circuits of the device are isolated from ground.

The dielectric strength to earth is limited by 600 V electrode arresters.

Potential equalization

Integrate the device into the local potential equalization.

Connection data Device with integrated intrinsic safe 4 to 20 mA input (for circuit $B \rightarrow \blacksquare 2, 3$ and 4):

		Ports	Electrical data	Ex ia IIC	Ex ia IIB
				combined external capacitance/inductance	
A	RTD Circuit ¹⁾	16 to 19	$U_o = 5.1 V$ $I_o = 31.3 mA$ $P_o = 30.3 mW$	$C_0 = 3100 \text{ nF}$ $L_0 = 2.0 \text{ mH}$	$C_{o} = 14 \ \mu F$ $L_{o} = 5.0 \ mH$
B B1 B2 B3 B4	IS Option Circuit IS 4 to 20 mA Input Power Circuit digital Input 1 digital Input 2	20 to 23: 21 23 (+) 20 22			
B1, I	33, B4 Inputs ²⁾	21, 20, 22 passive: Port 23 (+)	$U_{i} = 30 V$ $I_{i} = 65 mA$ $P_{i} = 800 mW$	$C_0 = 60.0 \text{ nF}$ $L_0 = 0.15 \text{ mH}$	$C_0 = 200 \text{ nF}$ $L_0 = 5.0 \text{ mH}$
B1, B3, B4 Inputs ¹⁾ (Linear characteristic)		21, 20, 22 aktive: Port (-) ³⁾	$U_o = 5.1 V$ $I_o = 1.0 mA$ $P_o = 1.2 mW$	$C_0 = 3700 \text{ nF}$ $L_0 = 1.0 \text{ mH}$	$C_{o} = 20 \ \mu F$ $L_{o} = 1.0 \ mH$
B2	Power Circuit ¹⁾	23 (+) Port (-) ³⁾ or 20, 21, 22 (Inputs)	$U_o = 29.8 V$ $I_o = 95 mA$ $P_o = 708 mW$	$C_{o} = 68 \text{ nF}$ $L_{o} = 62 \mu\text{H}$	$C_0 = 390 \text{ nF}$ $L_0 = 0.5 \text{ mH}$
С	HART Circuit ¹⁾	24, 26, 28 (+), 25, 27, 29 (-) ³⁾	$U_o = 29.8 V$ $I_o = 95 mA$ $P_o = 707 mW$	$C_{o} = 68 \text{ nF}$ $L_{o} = 62 \mu\text{H}$	$C_0 = 390 \text{ nF}$ $L_0 = 0.5 \text{ mH}$
D	Power Circuit ¹⁾	30 (+), 31 (-)	$U_o = 29.8 V$ $I_o = 95 mA$ $P_o = 708 mW$	$C_{o} = 68 \text{ nF}$ $L_{o} = 62 \mu\text{H}$	$C_0 = 390 \text{ nF}$ $L_0 = 0.5 \text{ mH}$
Е	Service Port ¹⁾		$U_o = 5.1 V$ $I_o = 31.2 mA$ $P_o = 30.2 mW$	$C_0 = 3100 \text{ nF}$ $L_0 = 2.0 \text{ mH}$	$C_0 = 14 \ \mu F$ $L_0 = 5.0 \ mH$

1) The circuit has a negligible effective internal capacitance and inductance

The values given are valid for connection to active devices (→ 20 3 and 4). If passive (loop powered) devices are connected the entity values of circuit B2 apply (→ 20 2).

3) The intrinsic safe reference potential (-) is available on all of the following terminals: 19, 25, 27, 29, 31



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