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Safety Instructions
Oil leak detector NAR300

Intrinsic Safety “ia”

Endress+Hauser
People for Process Automation

Oil leak detector NAR300

Table of contents

Associated documentation

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

- BA00402G (NAR300 system)
- BA00403G (NAR300 system high temperature)

Manufacturer's certificates

EU Declaration of Conformity

Declaration Number:
EC00736

The EU Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: EU Declaration -> Product Code: ...

EU type-examination certificate

Certificate number:

FM 14 ATEX 0048X

List of applied standards: See EU Declaration of Conformity.

IEC Declaration of Conformity

Certificate number:

IECEx FMG 14.0024X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):

- IEC 60079-0: 2017
- IEC 60079-1: 2014-06
- IEC 60079-11: 2011
- IEC 60079-25: 2020-06

Manufacturer address

Endress+Hauser Yamanashi Co., Ltd.

406-0846

862-1 Mitsukunugi, Sakaigawa-cho, Fuefuki-shi, Yamanashi

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

NAR300	–	*****....*****	+	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.

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: NAR300

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

NAR300

Basic specifications

Specification code 1 (approval)		
Selected option		**Description**
NAR300	A	ATEX
	B	IECEx

Specification code 2 (type)		
Selected option		**Description**
NAR300	1	Float sensor: Ex ia IIB T5 Ga
	5	Float sensor + transmitter: Ex ia [ia Ga] IIB T4 Gb
	6	High-temperature float sensor + transmitter: Ex ia [ia Ga] IIB T4 Gb
	9	Other float forms (2x cylinder type, dumbbell-type, no vibrionic sensor, etc.)

Specification code 3 (output)		
Selected option		**Description**
NAR300	2	Two-wire current loop

Output represents output of the transmitter.

Specification code 4 (signal line)		
Selected option		**Description**
NAR300	A	6 m (19.69 ft)
	B	10 m (32.8 ft)
	C	15 m (49.21 ft)
	D	20 m (65.62 ft)
	E	25 m (82.02 ft)
	F	30 m (98.46 ft)
	Y	Length other than A through F that is 100 m (328.08 ft) or shorter

Signal line represents the length of the signal cable between the float sensor and the transmitter.

Specification code 5 (external conductor entrance)		
Selected option		**Description**
NAR300	A	Not selected
	B	G1/2
	C	NPT1/2
	F	M20
	Y	Entrances other than those above that meet standards such as ISO, JIS, ANSI and DIN

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.
- 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.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

Safety instructions: Special conditions

The Transmitter is rated for −20 to 60 °C. The liquid measuring sensor parts are rated for −20 to 60 °C (exist in the ambient of vibration sensor, which is attached to the float sensor).

Converter (Associated Intrinsic Safety Device) which connect to oil leak detector NAR300 system must be satisfied the following conditions.

Converter	NRR261-				NRR262-		Remarks
Transmitter	A**	B**	D**	E**	A*	B*	
NAR300-A1****	✓	✗	✗	✗	✗	✗	ATEX
NAR300-A5****	✗	✗	✓	✗	✓	✗	
NAR300-A6****	✗	✗	✓	✗	✓	✗	
NAR300-B1****	✗	✓	✗	✗	✗	✗	IECEx
NAR300-B5****	✗	✗	✗	✓	✗	✓	
NAR300-B6****	✗	✗	✗	✓	✗	✓	
✓ : Connectible ✗ : Not connectible							

The maximum external inductance (Lo) and maximum external capacitance (Co) of the intrinsically safe circuit and the maximum inductance (Lw) and maximum capacitance (Cw) of an external connection cable are shown below.

Cw < Co - 0 nF (Ci) = 0.083 µF
and
Lw < Lo - 48 µH (Li) = 2.3 mH

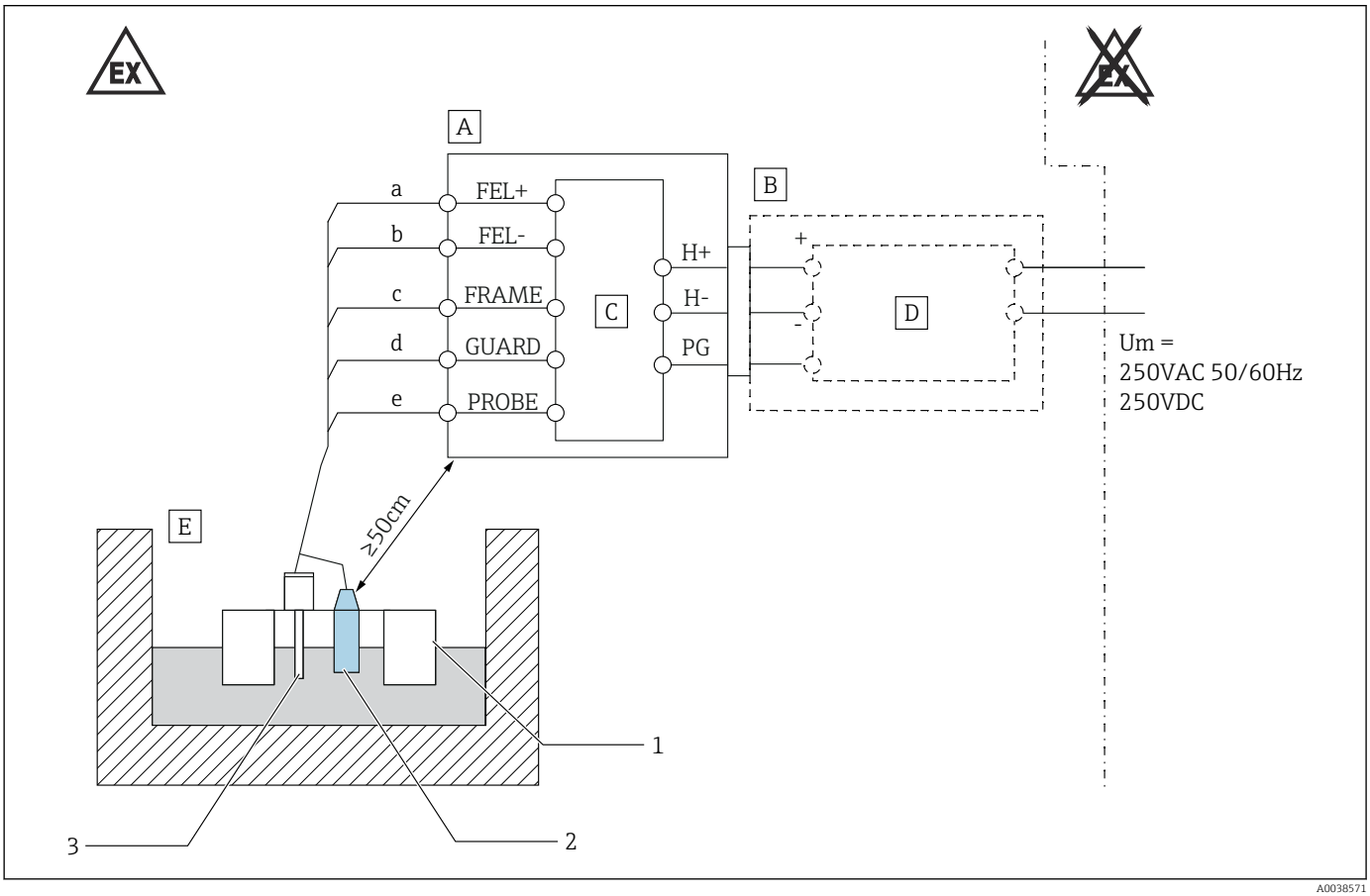
For the above conditions, also see the explosion safety instruction manuals for the converters in the following table.

Converter	Approval No.	Safety instructions	Remarks
NRR261-A** NRR261-D**	FM 14 ATEX 0048X	XA01742G-*/08/EN	Installation in hazardous locations NAR261-A/B; Ex d ia [ia Ga] IIB T4 Ga NAR261-D/E; Ex d [ia] IIB T6 Gb
NRR261-B** NRR261-E**	IECEx FMG 14.0024X		
NRR262-A*	FM 14 ATEX 0048X	XA01743G-*/08/EN	Installation in non-hazardous locations [Ex ia] IIB Gb
NRR262-B*	IECEx FMG 14.0024X		

- The cable that connects the oil leak detector and a converter must have a heat-resistant temperature of at least 70 °C (158 °F).
- Install the float sensor and the oil leak detector's main unit at least 500 mm (19.69) apart, and use the cable that is included with the float sensor (30 m (98.43 ft) or shorter) as the connecting cable.
- A vibrionic sensor that is installed onto a float sensor cannot be replaced or repaired individually. If it becomes damaged or it malfunctions, replace the entire float sensor system.
- For the oil leak detector (intrinsic safety device), converter (associated intrinsic safety device) and their connecting wiring, ensure that no current or voltage is generated that could impair the intrinsic safety function of the intrinsic safety circuit by electromagnetic induction or electrostatic induction.
- Cable entry between transmitter and converter should be sealed with cable gland or conduit rated at least IP65. Selection criteria as per EN/IEC 60079-14 must be observed.

Safety instructions: Installation

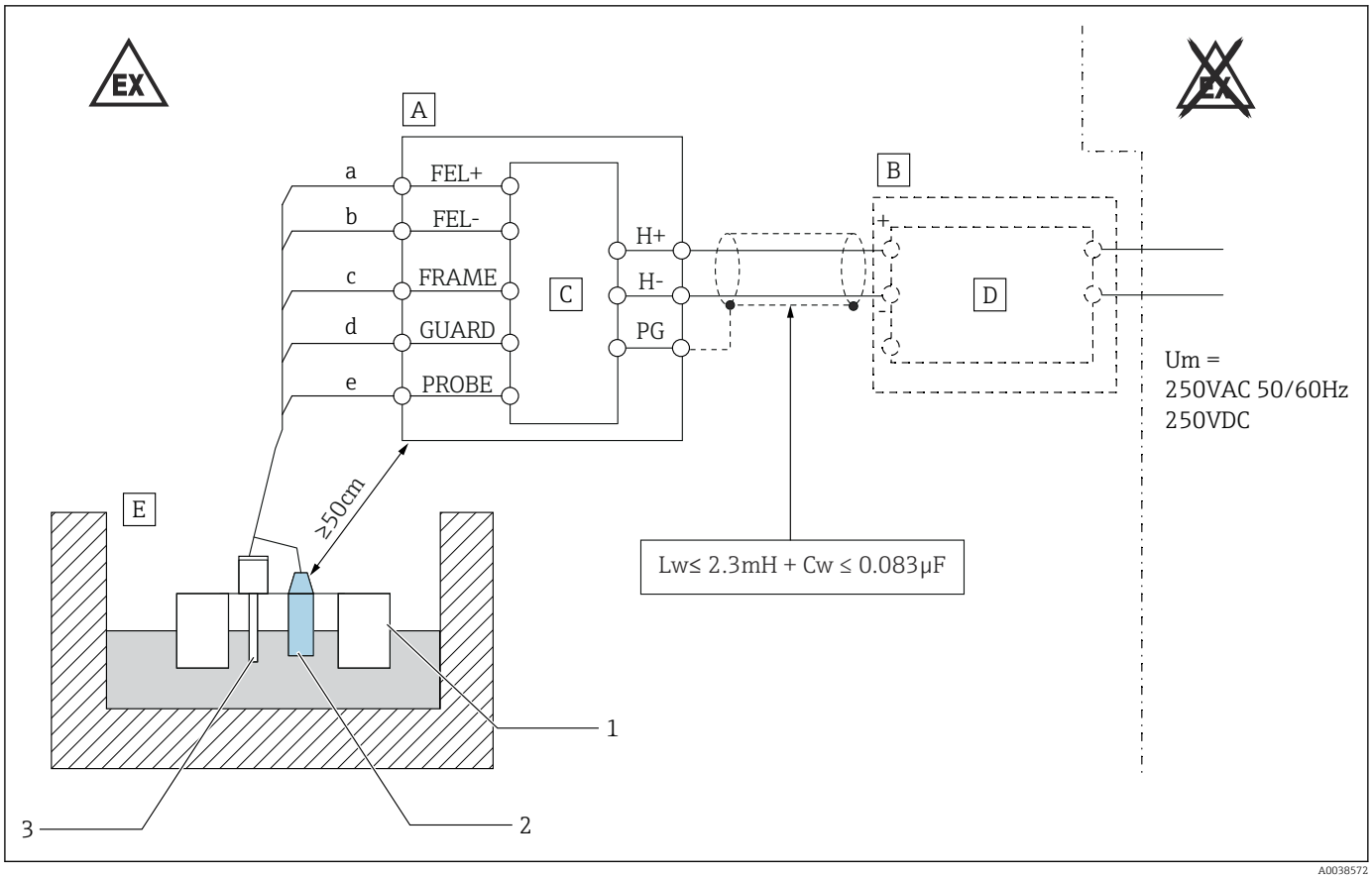
Use Oil leak detector NAR300 by configuring it as shown below.



1 *NAR300-A1/B1*** (Float sensor only)*

A Intrinsically safe compartment
B Ex d compartment
C Transmitter
D Converter (associated intrinsic safety device)
E Float sensor
a Red
b Blue
c Yellow
d Black
e White
1 Float
2 Conductivity sensor
3 Vibrionic sensor

See XA01742G-* for details on Converter NRR261-A/B***.

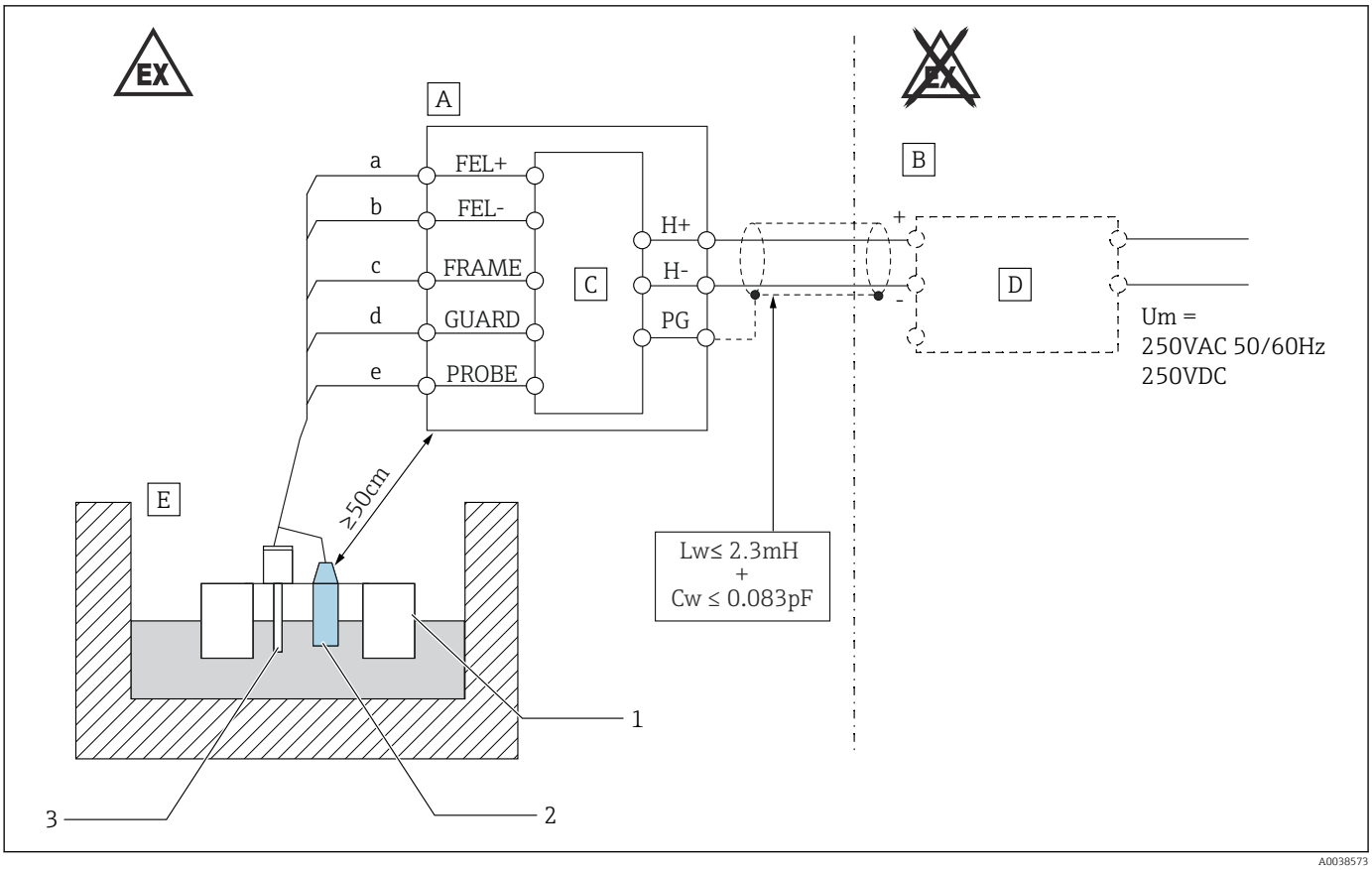


2 *NAR300-A5/A6/B5/B6** (float sensor + transmitter) and NRR261-1-D/E*** wiring*

A Intrinsically safe compartment
B Ex d [ia] converter
C Transmitter
D Converter (associated intrinsic safety device)
E Float sensor
a Red
b Blue
c Yellow
d Black
e White
1 Float
2 Conductivity sensor
3 Vibrionic sensor

NAR300-A/B6 (High temperature version)
- Vibrionic sensor is not installed.
- There is no wiring for FEL+ and FEL-.

See XA01742G for details on Converter NRR261-D/E***



*3 NAR300-A5/A6/B5/B6** (High temperature version)*

A Intrinsically safe compartment
B Ex ia converter
C Transmitter
D Converter (associated intrinsic safety device)
E Float sensor
a Red
b Blue
c Yellow
d Black
e White
1 Float
2 Conductivity sensor
3 Vibrionic sensor

NAR300-A5/A6**/B5**/B6****
- Vibrionic sensor is not installed.
- There is no wiring for FEL+ and FEL-.

See XA01743G for details on Converter NRR262-A/B*

See BA00402G or BA00403G for details on the following wiring arrangements.

- Wiring between NAR300 and NRR261 or NRR262
- Wiring between NAR300's transmitter and float sensor

- Install the device to exclude any mechanical damage or friction during the application.
- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.

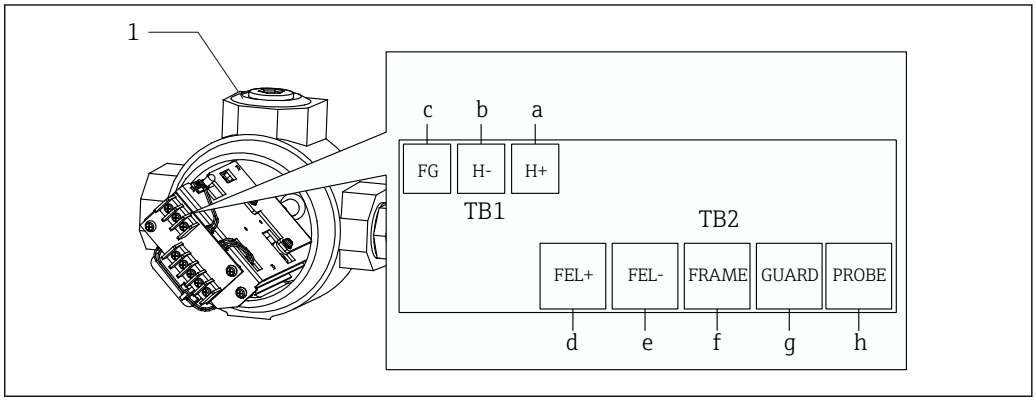
Safety instructions: Zone 0

- 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.

Connection data

Basic specifications

Connect the float sensor cable for NAR300 to the corresponding terminal on NRR261 repeater (transmitter) (see figure below). Terminals (a) through (c) are converter connection terminals, and terminals (d) through (h) are float sensor connection terminals.



4 *Repeater terminals for NAR300*

1 Intrinsically safe terminal
a Blue 1 (already wired at shipping), screw (M3)
b Blue 2 (already wired at shipping), screw (M3)
c Green, screw (M3)
d Red, screw (M3)
e Blue, screw (M3)
f Yellow, screw (M3)
g Black, screw (M3)
h White, screw (M3)

Terminal symbol		Wire color	Intrinsic safety parameter	Remarks
a	H+	-	Ui = 28 V Ii = 93 mA Pi = 650 mW Ci = 0 nF Li = 48 µH	
b	H-			
c	FG			
d	FEL+	Red	Uo = 13 V Io = 46.8 mA Po = 152 mW Co = 250 nF Lo = 58.3 mH	Connection with a float sensor's vibrionic sensor There is no wiring for NAR300-26*** (high temperature)
e	FEL-	Blue		
f	FRAME	Yellow	-	Connection with the float sensor's conductivity sensor
g	GUARD	Black		
h	PROBE	White		

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