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Safety Instructions
Average Temperature Prothermo NMT539

Tank Gauging

ATEX: II 1/2G Ex ia IIB T6...T2 Ga/Gb
II 2G Ex ia IIB T6...T2 Gb
IECEx: Ex ia IIB T6...T2 Ga/Gb
Ex ia IIB T6...T2 Gb

Endress+Hauser
People for Process Automation

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Table of contents

Associated documentation

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

BA01025G

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 -> Media Type: Documentation ->
  Documentation Type: Brochures and catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

EU Declaration of Conformity

Declaration Number

EC00538

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:
KEMA 03 ATEX 1448X
List of applied standards: See EU Declaration of Conformity.

IEC Declaration of Conformity

Certificate number:
IECEx KEM 10.0058 X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):
- IEC 60079-0 : 2017
- IEC 60079-11 : 2011
- IEC 60079-26 : 2014

Manufacturer address

Endress+Hauser Yamanashi Co., Ltd.

406-0846

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

Structure of the extended order code

NMT539	–	**********	+	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: Prothermo

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

NMT539

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
NMT539	B	ATEX Ex ia IIB T6-T2 Ga/Gb
	F	IEC Ex ia IIB T6-T2 Ga/Gb

Position 2 (Application)		
Selected option		**Description**
NMT539	0	Converter
	1	Temperature, Converter
	3	Temperature, Water Bottom, Converter
	4	Temperature, Converter (PTB)
	5	Temperature, Water Bottom, Converter (PTB)
	9	Dual compartment L-shape; 316L

Position 3 (Temperature Measuring Range)		
Selected option		**Description**
NMT539	0	Converter, not selected
	1	−40 to 100 °C (100 to 212 °F) (T4)
	2	−55 to 235 °C (−67 to 455 °F) (T2)
	3	−170 to 60 °C (−274 to 140 °F) (TIIS Ex ia T4, Other T6)
	4	−20 to 120 °C (−4 to 248 °F) (T3) (PTB type approval only)
	5	−20 to 100 °C (−4 to 212 °F) (T4)
	6	−20 to 235 °C (−4 to 455 °F) (T2)
	9	Special version

Position 4 (Water bottom length)		
Selected option		**Description**
NMT539	0	W/o
	1	1 000 mm (39.37 in)
	2	2 000 mm (78.74 in)
	9	Special version

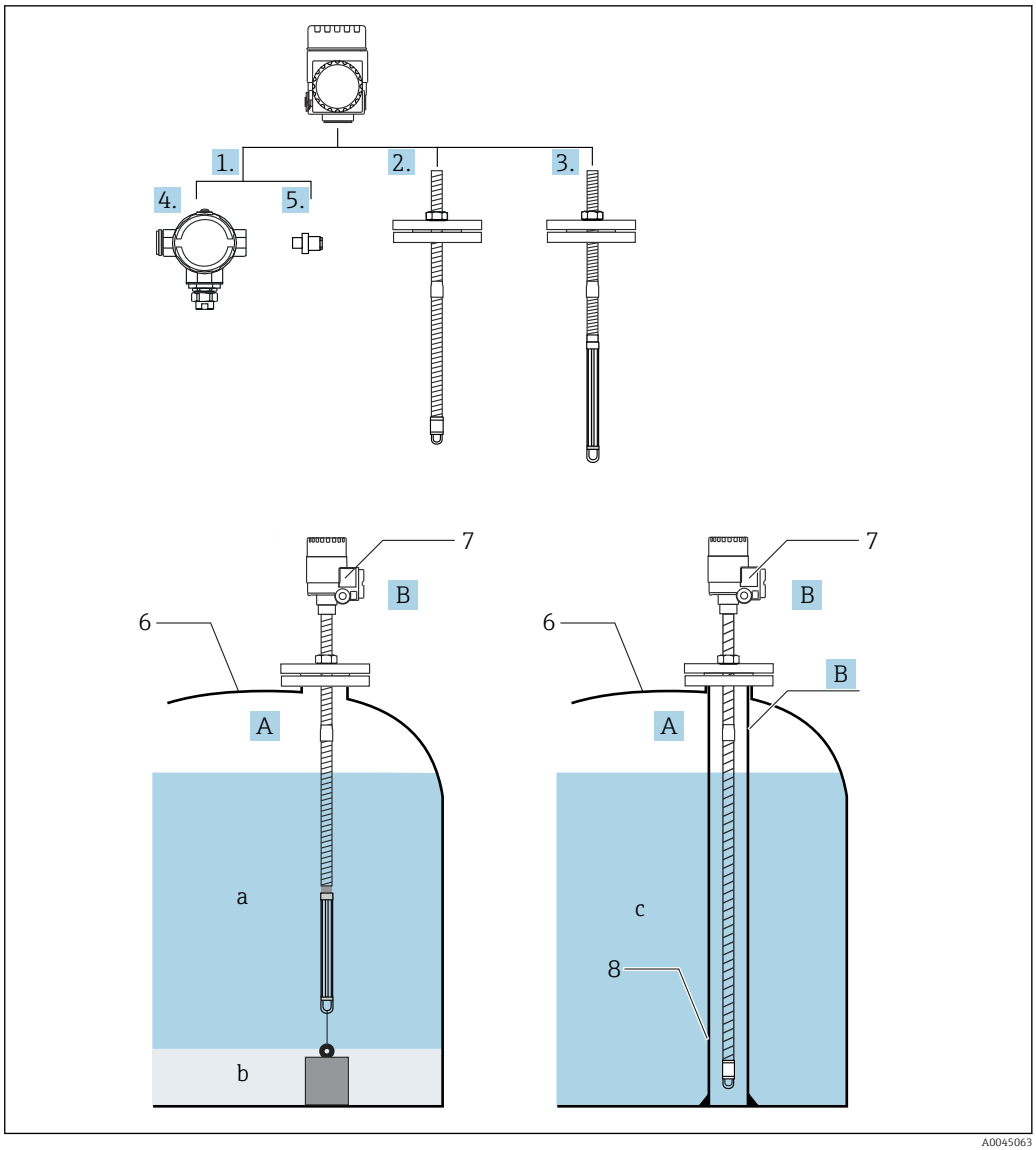
Safety instructions: General

- Comply with the installation and safety instructions in the Operating Instructions.
- 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)
- 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 class.
- 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

Permitted ambient temperature range at the device:
$-40\ °C \leq T_a \leq +\ 60\ °C$
Observe the information in the temperature table on page → 9

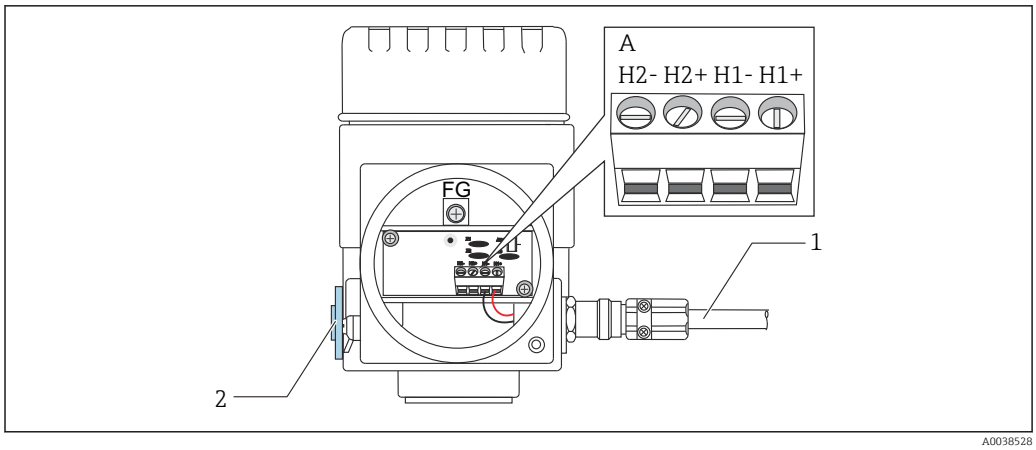
Safety instructions: Installation



1 *NMT539 installation*

A Zone 0
B Zone 1
a Liquid without water
b Water
C Liquid
1 Converter only
2 Temperature
3 Water bottom (temperature + water bottom)
4 Type 1
5 Type 2
6 Tank
7 NMT539
8 Thermowell

If the pressure inside a tank exceeds the atmospheric pressure (absolute pressure 1 bar, 100 kPa, 14.5 psi), install a thermowell (protective pipe) with no holes or slits onto NMT539.



2 *NMT539 terminal*

A Temperature (WB) data/NMT539 intrinsically safe 2-wire HART communication (see Information)
1 Shielded twisted pair wire or steel-armored wire
2 Standard aluminum (die-cast plug) (see Information)

- Only a metal cable gland may be used. The shielded wire on the HART communication line must be grounded.
- Material cable gland must be replaced for loop terminal connection.

- All metal parts of the sensor and transmitter shall electrically conductive and securely be connected to the potential equalization system within the hazardous area.
- In order to exclude ignition sources due to impact and friction sparks, even in the event of rare incidents, the temperature sensor tube shall not be subject to environmental stress, such as impact from moving parts, and the bottom parts shall be secured.
  - Continuous duty temperature of the cable ≥ Tamb + 5 K
  - When taking out and winding the flexible tube, keep the length a minimum of 1 meter in diameter. When attaching and bending the flexible tube, the radius of curvature must be 500 mm (19.69 in) at any bend portion.
- When removing the device from the tank, flammable gas may escape from the tank or the flame may enter the tank.
  - Work with particular attention so as not to generate sparks due to friction or collision between the mounting nozzle and the flexible tube.
  - Make sure that flammable gas/vapor does not stay in the work area.
- Circuit is not capable of withstanding 500 V, between signal and ground, according to clause 6.3.13 of IEC60079-11, this is limited to a maximum voltage of 250 V.

Mounted in Area Ga

When the enclosure of the Transmitter Model Prothermo is made of aluminum, if it is mounted in an area where the use of EPL Ga equipment is required, it must be installed such, that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded the temperature sensor tube shall not be subject to environmental stress, such as impact from moving parts, and the bottom part shall be secured. Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.

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.

Potential equalization

Temperature tables

The ambient temperature for the transmitter is minimum −40 °C (−40 °F). The relation between the ambient temperature, the process temperature and the temperature class is shown in the following table.

Temperature class	Ambient temperature	Medium temperature of sensor	
		Temperature measurement only	Temperature measurement and water level or water level only
T6	≤ 60 °C (140 °F)	≤ 60 °C (140 °F)	≤ 60 °C (140 °F)
T5	≤ 85 °C (185 °F)	≤ 80 °C (176 °F)	≤ 80 °C (176 °F)
T4	≤ 85 °C (185 °F)	≤ 100 °C (212 °F)	≤ 100 °C (212 °F)
T3	≤ 85 °C (185 °F)	≤ 175 °C (347 °F)	≤ 125 °C (257 °F)
T2	≤ 85 °C (185 °F)	≤ 235 °C (455 °F)	-

Connection data

Supply and Output Circuit; All Versions (Terminals H1+ and H1-)

This is only for connection to a certified intrinsically safe circuit with the following maximum values.

Power supply
Ui = 30 V
Ii = 120 mA
Pi = 1 W
Ci = 7.9 nF
Li = 48 µH

Converter Only

Power supply
Uo = 8.6 V
Io = 71 mA
Po = 153 mW
Co = 9.5 µF
Lo = 7.5 mH

The level sensor circuit is connected to ground and is infallibly galvanically isolated from the supply and output circuit and from temperature measurement circuit.

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