

Technical Information

Prothermo NMT532

Intrinsically safe multi-signal converter with precision average temperature sensor for inventory control



Application

Prothermo NMT532 consists of an intelligent local HART signal converter and average temperature sensor.

For average temperature measurement, it consists of precision multi-spot Pt100 (Max.6) elements which have fixed interval (2 m (6.57 ft) or 3 m (9.84 ft)).

NMT532 is a highly capable solution for a variety of tank gauging applications and provides constant average temperature data via local HART communication.

For accurate inventory measurement, it is best suited connected to Tank Side Monitor NRF590 or NRF81 with Micropilot radar tank gauge, Proservo NMS5, or NMS8x.

Features and benefits

- High accuracy
- Intrinsically safe device allowing for safest electrical configuration possible
- Compatible with FieldCare
- Simple and economical
- Compact size and weight
- High-reliability and easy installation
- Maintenance free

Table of contents

Important document information	3	Operating condition: Installation	12
Notes on safety conventions and symbols	3	Process connection	12
Function and system design	4	Recommended installation height	12
Measuring system	4	Recommended stilling well installation	13
Operation principle	4	Installation equipment	13
System design	5	Anchor weight	14
Connection with NRF590	6	Wire hook+ top anchor with stilling well	14
NMT532 + Converter+ temperature probe	6	#1 element position	15
Connection with NMS8	7	NMT532 with anchor weight	16
NMT532 + NMS8x	7	Pressurized tank with NMT532	17
Input and output	8	Operating condition: Terminal connection	18
Measured variables	8	NMT532 terminal (Ex ia)	18
Number of elements	8	NMS5 terminal (Ex d [ia])	19
Communication	8	NMS8x, NMR8x, and NRF81 terminal (Ex d [ia])	19
Alarm signal	8	NRF590 intrinsically safe terminal	20
Output signal	8	Grounding	20
Connection	8	Mechanical construction	21
Auxiliary energy	9	Dimensions	21
Load HART	9	Weight	21
Overvoltage protection	9	Material	21
Cable entry	9	Human interface	22
Supply voltage	9	Operation via FieldCare	22
Power consumption	9	Certificates and approvals	23
Grounding	9	CE mark	23
Performance characteristics	10	RoHS	23
Temperature accuracy	10	Ex approval	23
Temperature measuring range	10	External standards and guidelines	23
Reference operating conditions	10	Order information	24
Maximum measured error	10	NMT532	24
New module	10	Accessories	25
Operating condition: Environment and process	11	Anchor weight (High profile)	25
Ambient temperature range	11	Anchor weight (Low profile)	26
Storage temperature	11	Wire hook and top anchor	26
Climate class	11	Top anchor	27
Degree of protection	11	Documentation	28
Electromagnetic compatibility	11	Technical information	28
Process temperature range	11	Operating instructions	28
Process pressure limits	11	Safety instructions	28
Data transmission	11	Appendix	29
		Stainless steel conversion table	29

Important document information

Notes on safety conventions and symbols

Symbols for safety conventions

Symbol	Meaning
 DANGER A0011189-EN	DANGER! This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 WARNING A0011190-EN	WARNING! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 CAUTION A0011191-EN	CAUTION! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 NOTICE A0011192-EN	NOTICE! This symbol contains information on procedures and other facts which do not result in personal injury.

Symbols for certain types of information

Symbol	Meaning
 A0011182	Allowed Indicates procedures, processes or actions that are allowed.
 A0011183	Recommendation Indicates procedures, processes or actions that are recommended.
 A0011184	Forbidden Indicates procedures, processes or actions that are forbidden.
 A0011193	Tip Indicates additional information.

Function and system design

Measuring system

The NMT532 is compact and economical. The average temperature sensor consists of six Pt100 elements which have fixed interval of 2 m (6.57 ft) or 3 m (9.84 ft) from the next sensor. Temperature data is transmitted to the NRF560, NRF81, NMS5, NMS8x, or NMR81x via an intrinsically safe (i.s.) 2-wire local HART signal.

Operation principle

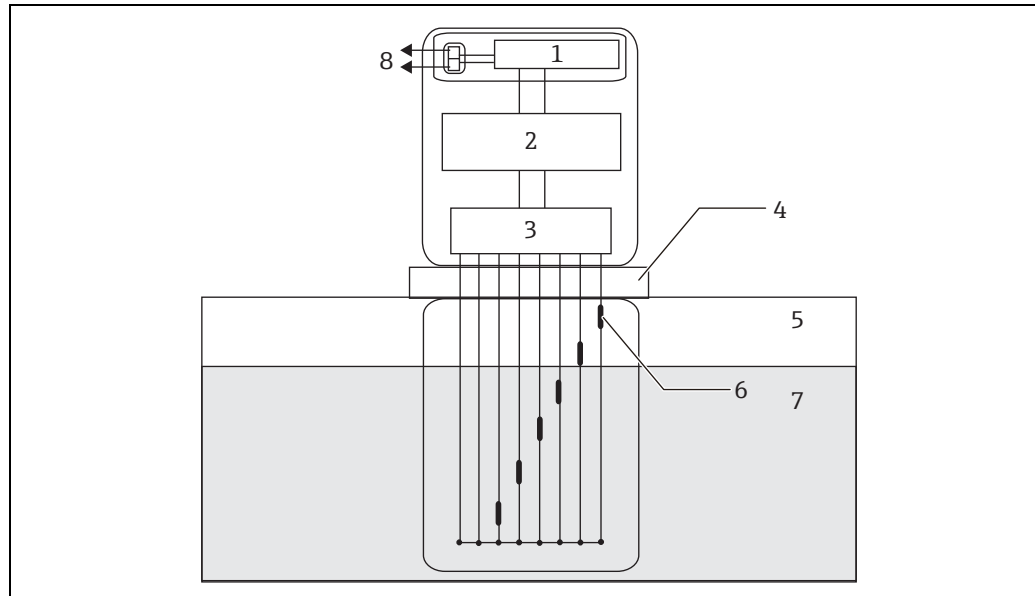


Figure 1: Operation principle

- 1 Noise filter
- 2 Power supply module
- 3 CPU module
- 4 Flange
- 5 Gas phase
- 6 Pt100 Multi-spot element (up to 6 points)
- 7 Liquid phase
- 8 Local HART communication

System design

Endress+Hauser offers a wide range of solutions to utilize data of the sensor into the process management requirements.

The diagrams above describe some individual solutions according to various example concepts. For additional application requirements, contact local Endress+Hauser representatives.

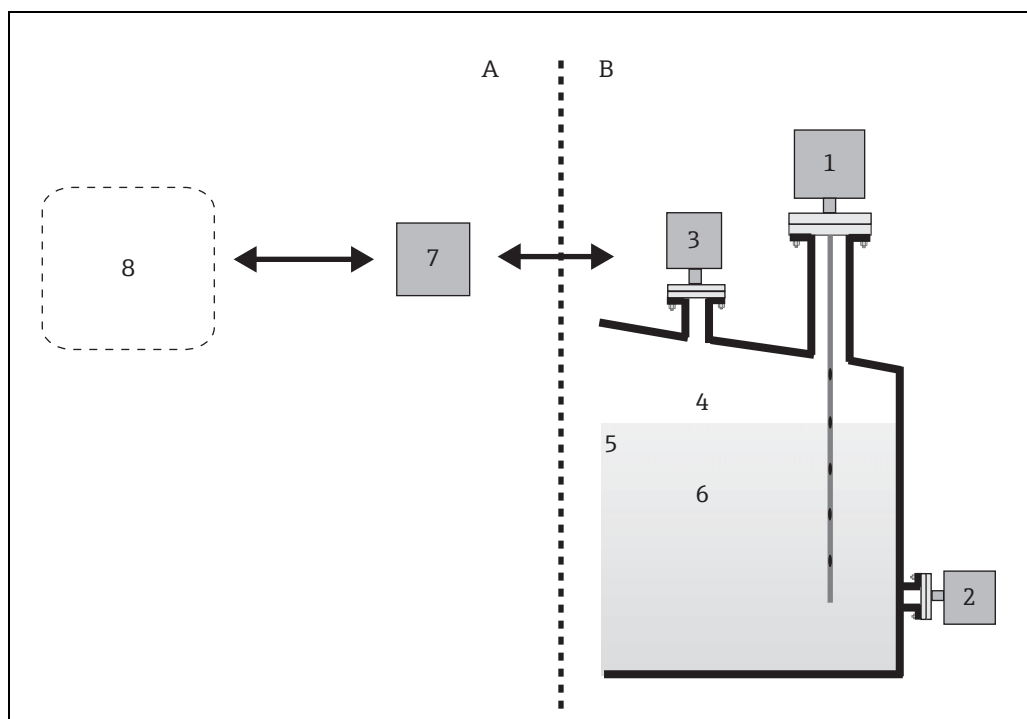


Figure 2: System layout

- A Data management
- B Filed process
- 1 NMT532
- 2 Pressure gauge
- 3 Level gauge
- 4 Gas phase
- 5 Liquid level
- 6 Liquid temperature
- 7 System (Filed interface, NXA820, NXA83)
- 8 Host application (Tankvision, DCS, PLC, others)

Connection with NRF590

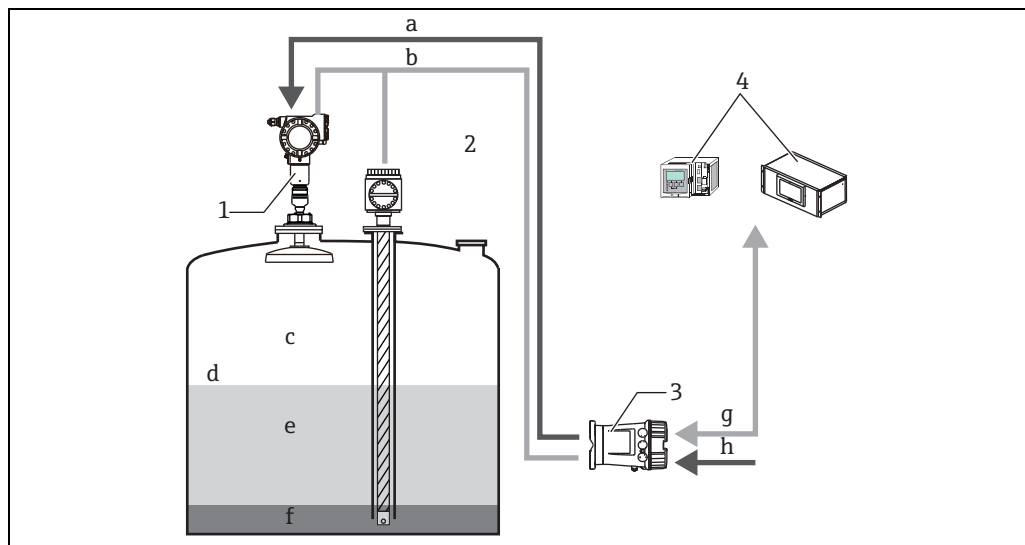


Figure 3: Connection with NRF590

- a* FMR power (DC, Ex i)
- b* Ex i HART loop (Data transmission)
- c* Gas temperature
- d* Liquid level
- e* Liquid temperature
- f* Water
- g* Fieldbus protocol
- h* Power
- 1* FMR 540
- 2* NMT532
- 3* NRF81
- 4* Tankvision

NMT532 + Converter+ temperature probe

Temperature and level measurement with data collection and calculations via NRF81 allows for optimal inventory control. Basic functionality of NMT532 is displayed and configured on NRF81. Detailed NMT532 functionality and data access can be performed by FieldCare.

NMT532 receives radar level data from NRF81 and then calculates liquid and gas phase average temperature. Calculated and standard data including temperature element raw data and device status are transmitted to NRF81.

All gathered data in the interface unit is sent to inventory management software, such as Endress+Hauser tank vision, Tank computer or directly sent to the customer's specific DCS or PLC.

Connection with NMS8

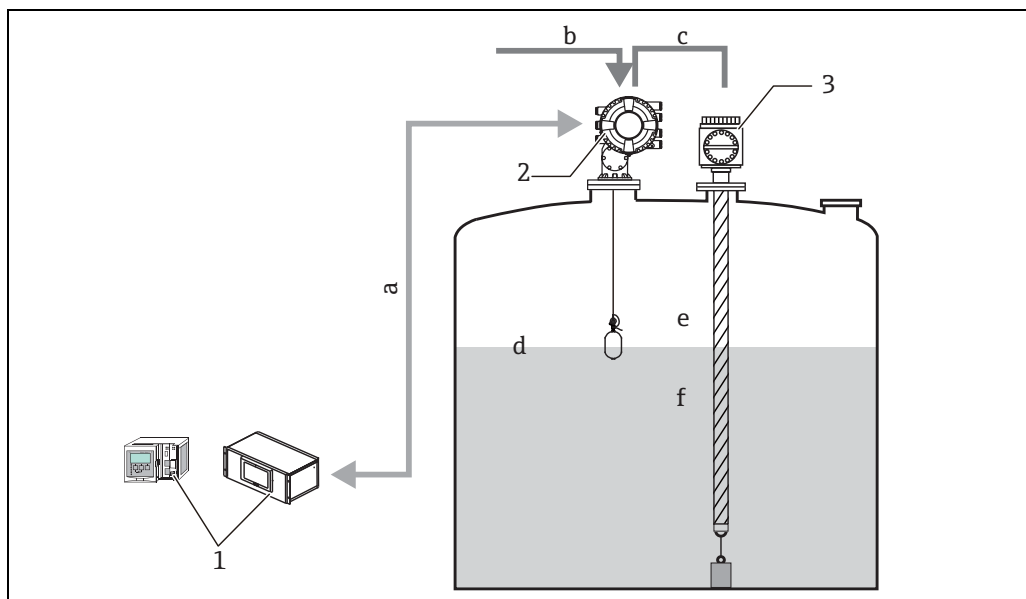


Figure 4: Connection with NMS8x

- a* Fieldbus protocol
- b* Power
- c* Ex i HART loop (Data transmission)
- d* Liquid level
- e* Gas temperature
- f* Liquid temperature
- 1* Tankvision
- 2* NMS8x
- 3* NMT532

NMT532 + NMS8x

NMT532 is used most effectively with NMS8x to provide average temperature, level, water interface, and density measurement.

All the necessary configuration and parameter settings for NMT532 are performed via either NMS5, NMS8x, or FieldCare.

NMT532 receives liquid level data from NMS5 or NMS8x, then calculates liquid and gas phase average temperature. Calculated data and basic information including raw data for each temperature element and device status are transmitted to NMS5 or NMS8x.

All gathered data in the interface unit is sent to inventory management software, such as Endress+Hauser's Tankvision, Fuelsmanager, Tank computer or directly sent to the customer's specific DCS or PLC.

Input and output

Measured variables	Liquid and gas temperature range: -20 to +100 °C (-4 to +212 °F) Probe length: 18.5 m (60.6 ft) or less
Number of elements	Maximum of six  For the intervals of attaching elements, the distance of 2 m (6.57 ft) or 3 m (9.84 ft) must be required.
Communication	2 wire, Endress+Hauser local HART protocol to host commanding gauge ■ NRF590 ■ NRF81 ■ NMS5 ■ NMS8x ■ NMR8x
Alarm signal	Error information via the following interface and transmission digital protocol. Refer to Operating Instructions of each device. ■ NMS5: BA00401G ■ NMS8x: BA1456G, BA1459G, BA1462G ■ NRF590: BA00256F, BA00257F ■ NRF81: BA01465G ■ NMR8x: BA01450G, BA01453G
Output signal	Temperature data via 2 wire intrinsically safe local HART protocol.
Connection	■ NMS5 ■ NMS8x ■ NMR8x ■ NRF81 ■ NRF590

Auxiliary energy

Load HART	Minimum loading for local HART circuit: 250 Ω		
Overvoltage protection	The NMT532 has an internal surge arrester that complies with EN/IEC 61000-4-5 (Line to Line 1.0 kV). Connect the metallic housing of the NMT532 to the tank wall directly with an electrically conductive lead to ensure reliable potential matching.		
Cable entry	Wiring of NMT 532 must meet intrinsically safe requirements. The following cable entries are available: ▪ Thread NPT 1/2 ▪ Thread M 20		
Supply voltage	16 to 30V: Ex ia Only for connection to a certified intrinsically safe circuit with the following maximum values <table> <tr> <td> U_i = 30 V I_i = 120 mA P_i = 1 W </td><td> Internal capacitance C_i = 7.9 nF (ATEX, IECEx, CSA, NEPSI) 6.6 nF (FM) Internal inductance L_i = 48 μH </td></tr> </table>	U _i = 30 V I _i = 120 mA P _i = 1 W	Internal capacitance C _i = 7.9 nF (ATEX, IECEx, CSA, NEPSI) 6.6 nF (FM) Internal inductance L _i = 48 μH
U _i = 30 V I _i = 120 mA P _i = 1 W	Internal capacitance C _i = 7.9 nF (ATEX, IECEx, CSA, NEPSI) 6.6 nF (FM) Internal inductance L _i = 48 μH		
Power consumption	6 mA		
Grounding	The NMT532 must be grounded to the tank potential before connection to the host gauge. All ground connections must be compliant with local and company regulations, and checked before the equipment is commissioned.		

Performance characteristics

Temperature accuracy	$\pm 0.1\text{ }^{\circ}\text{C}$ or better (at reference condition)  Reference condition Accuracy of RTD - Temperature conversion. Accuracy measurement shall be conditioned with precisely calibrated dial resistor or IEC60751/ DIN EN 60751 class A Pt100 ohm temperature element.
Temperature measuring range	-20 to +100 °C (-4 to +212 °F)
Reference operating conditions	■ Temperature = +25 °C (77 °F) ± 5 (9 °F) ■ Pressure = 1013mbar abs. ± 20 mbar abs. (1013hPa abs. ± 20hPa abs., 14.7 psi abs. ± 0.3 psi abs.) ■ Relative humidity (air) = 65 % ± 20 %
Maximum measured error	Typical statements for reference conditions, include linearity, repeatability, and hysteresis: ■ Linearity: – Temperature: $\pm 0.15\text{ }^{\circ}\text{C}$ (0.27 °F) + element deviation (based on IEC 60751/DIN EN 60751 class A standard)
New module	NMT532 employs a completely new electronic module compared to the previous NMT535.

	NMT532	NMT535
CPU Performance	16 bit	8 bit
Clock Speed	2.7648 MHz	0.9216 MHz
Memory Capacity (RAM)	20 K bytes	176 bytes
EEPROM	2 K bytes	256 bytes
Flash Memory	256 K bytes	16 K bytes
Total # of Print Boards	4	5
Current Consumption (Converter + Temp. Probe)	6 mA@16 VDC Ex ia	10 mA@16 VDC

Operating condition: Environment and process

Ambient temperature range	-40 to +85 °C (-40 to +185 °F)
Storage temperature	-40 to +85 °C (-40 to +185 °F)
Climate class	DIN EN 60068-2-38 (test Z/AD)
Degree of protection	■ Housing: IP65, NEMA 4X (Converter only, open housing: IP20) ■ Probe: IP68
Electromagnetic compatibility	■ Interference emission: EN 61326, Electrical Equipment Class B ■ Interference immunity: EN 61326, Annex A (Industrial) Interference emission and immunity apply to each standard shown above when installing probes in metal and concrete tanks and when using coax probes.
Process temperature range	Temperature probe: -20 to +100 °C (-4 to 212 °F)
Process pressure limits	1 bar (100 kPa, 14.5 psi) NOTICE When the pressure inside the tank exceeds 1 bar (100 kPa, 14.5 psi), stilling well which does not have any holes or slits must be installed.
Data transmission	Minimum dimension of cable: #24 AWG Cable type: twisted pair with shields

Operating condition: Installation

Process connection

The following flange sizes are available.

- NPS 2" Cl.150 RF, 304 flange ASME B16.5
- DN50 PN10 B1, 304 flange EN1092-1 (DIN2527 C)

Recommended installation height

The required bottom clearance of both the temperature probe and WB (water bottom) sensor varies depending on the anchoring method. Consider the required bottom clearance when ordering NMT532. See the recommended bottom clearance in the above illustration and/or consult Endress+Hauser representatives for further information.

The standard location of the lowest temperature element should be set at 500 mm (20 in) from the bottom of the tank regardless of probe type.

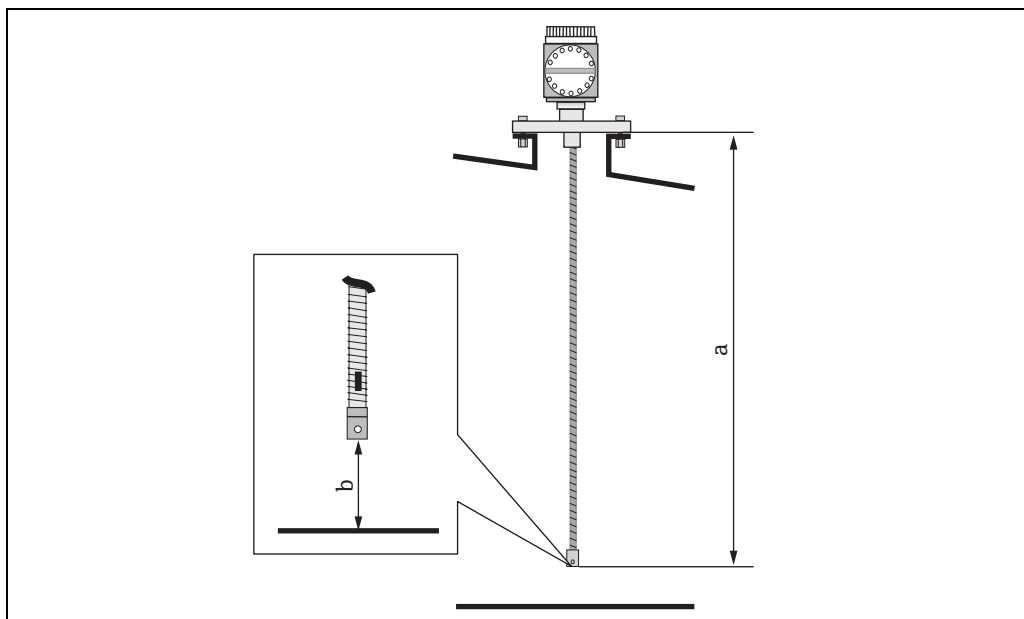


Figure 5: Recommended installation

a Installation height (see Tips.)

b Bottom clearance (see Tips.)



- Installation height shows height below the flange to the end of the temperature probe.
- Recommended bottom clearance with mounting attachment A, B, C, or D (refer to the next table) is 400 mm (15.75 in).

Recommended stilling well installation

Base plate should be mounted on the bottom of the tank below the slotted stilling well (see (B)) or located 300 mm (12in) or more below the slotted stilling well (see (A)).

If the anchor weight is not used when installing stilling well, the water should fill the tank up to the bottom from the end of the stilling well, enough to allow liquid to enter/exit the pipe.

NOTICE Avoid turbulence in the water so that WB (Water Bottom) sensor will not be damaged.

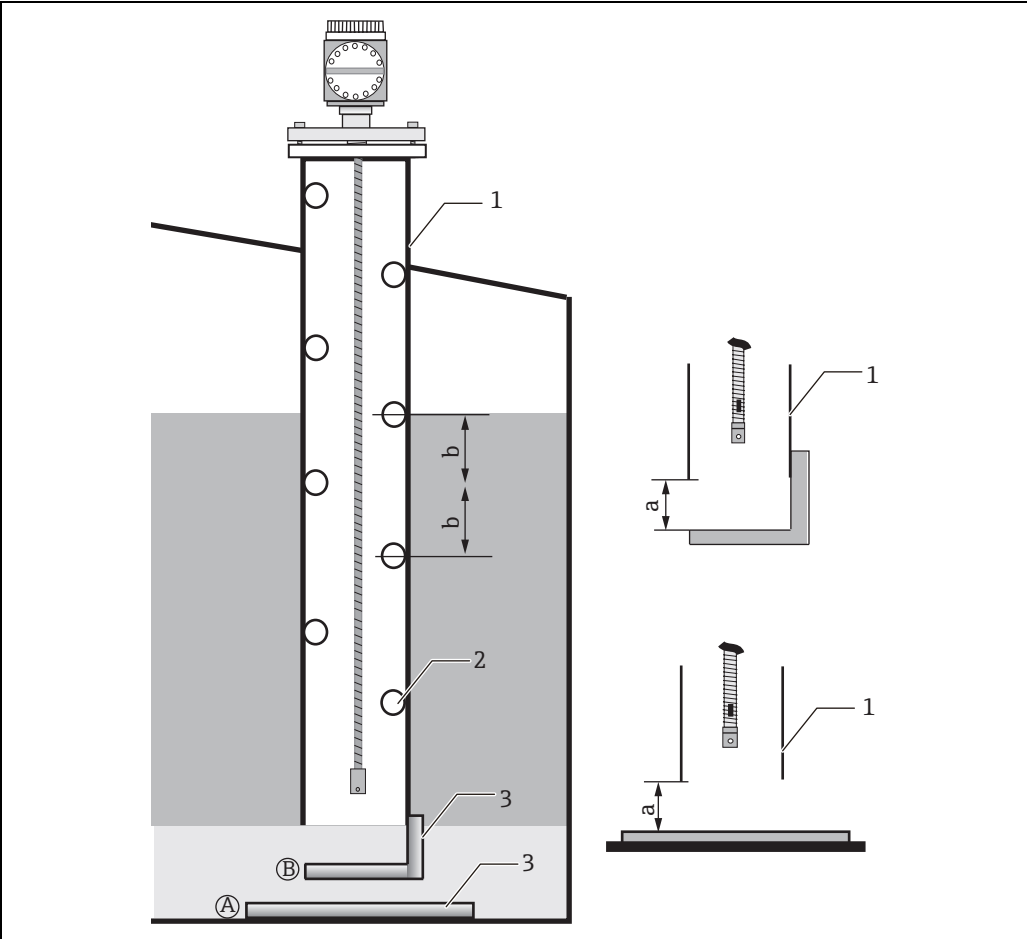


Figure 6: Stilling well, Unit of measurement: mm (in)

- a 300 mm (11.81 in) or more
- b 150 mm (5.91 in) or less
- 1 Slotted stilling well
- 2 Slot hole (Ø 25 mm (0.98 in))
- 3 Base plate

Installation equipment Contents of anchoring hardware: based on the selection of 100: mounting attachment

020 100	A: No installation material	B: Anchor weight (High profile, D120)	C: Anchor weight (Low profile, hexagon H41)	D: Tension wire + Wire hook + NPT1 top anchor	F: Tension wire + Wire hook + R1 top anchor
	Converter + Temp. Probe	Bottom hook	Bottom hook Anchor weight Sling wire	Bottom hook Base plate Wire hook NPT1 top anchor Tension wire	Bottom hook Base plate Wire hook R1 top anchor Tension wire

Anchor weight

High profile anchor weight is the anchor method designed for converter + temperature probe.

Low profile anchor weight is the anchor method designed for small tank nozzle (max. 2 inches (50A)).

Temperature probes with anchor weights methods have a recommended clearance 400 mm (16 in).

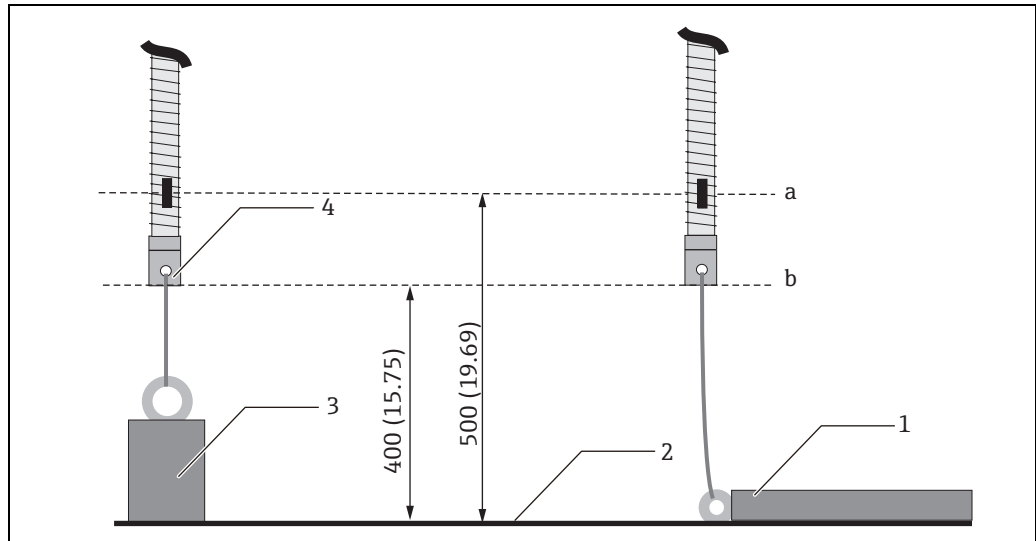


Figure 7: Anchor weight, Unit of measurement: mm (in)

- a Element position #1 (bottom element)
- b Clearance from the tank floor
- 1 Weight for low profile
- 2 Tank floor
- 3 Weight for high profile
- 4 Bottom hook

Wire hook+ top anchor with stilling well

Temperature probes with wire hook and top anchor, and stilling well methods have a recommended clearance 400mm (16 in). Refer to Accessories for details of anchor weight, wire hook, and top anchor.

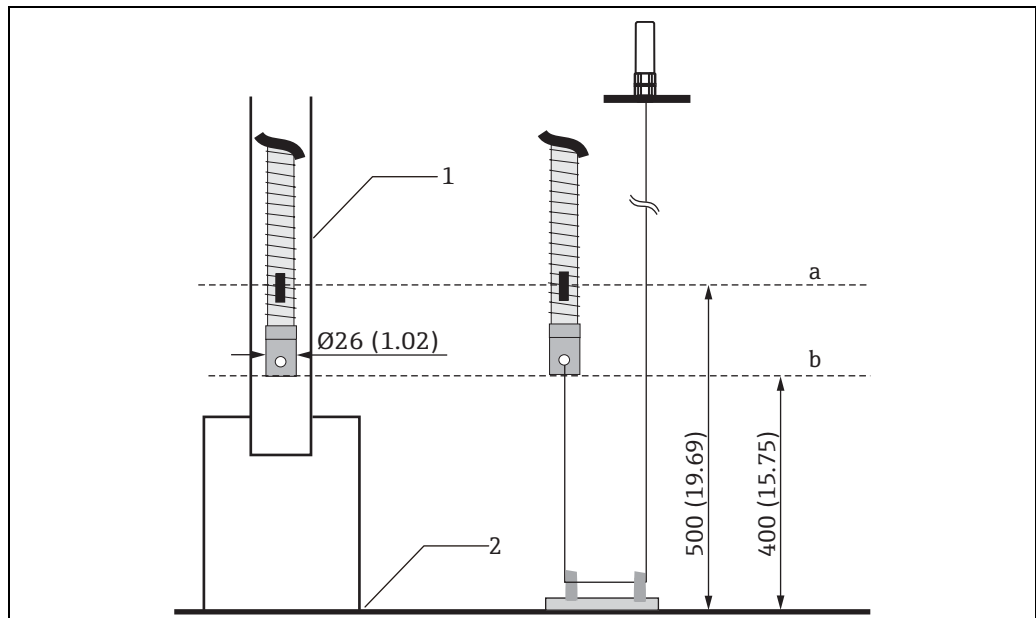


Figure 8: Wire hook, top anchor, stilling well, Unit of measurement: mm (in)

- a Element position #1 (bottom element)
- b Clearance below bottom hook
- 1 Still well (Ø 5.08 (2 in) or less)
- 2 Tank floor

#1 element position

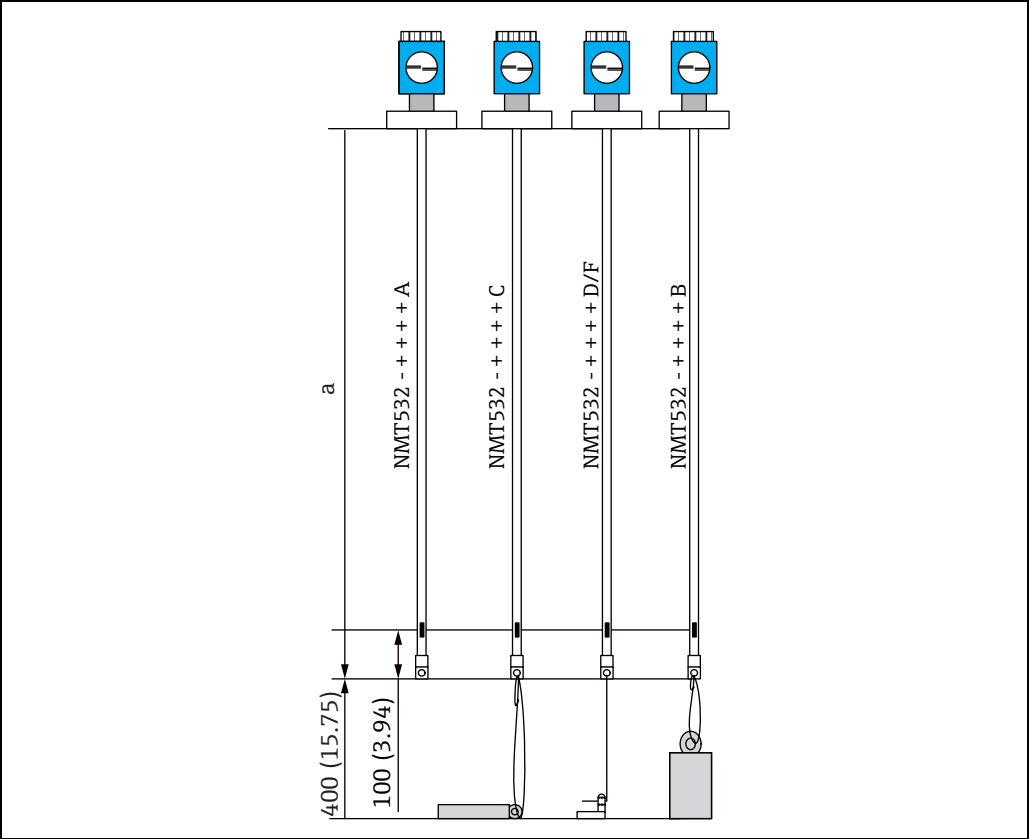


Figure 9: #1 element position, Unit of measurement: mm (in)

a Height below the flange to the end of the temperature probe for all types of NMT532

NMT532 with anchor weight

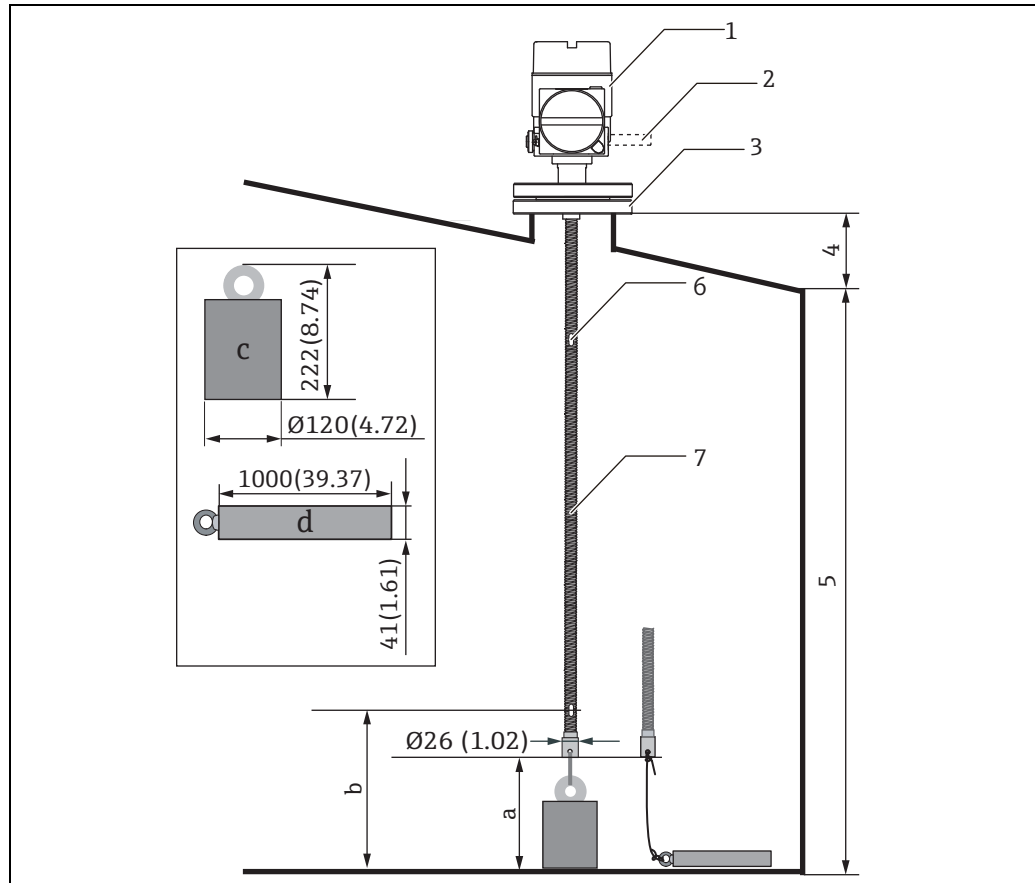


Figure 10: Anchor weight method, Unit of measurement: mm (in)

- a* 400 mm (15.57 in) (clearance below the bottom hook)
- b* 500 mm (20 in) (from the bottom of the tank to the element position #1)
- c* Anchor weight for high profile
- d* Anchor weight for low profile
- 1 Electrical compartment
- 2 Cable entry as specified
- 3 Flange
- 4 Nozzle height
- 5 Tank height
- 6 Upper element
- 7 Flexible tube

⚠ CAUTION

- Ensure to put the anchor weight at the bottom of the tank. When installing with the suspended anchor weight, use the anchor weight of 16 kg or less. Exceeding the limit may cause internal breakage in the flexible tube.
- The flexible tube must be lowered carefully without overbending and scratching the inner edge of the nozzle hole.

Pressurized tank with NMT532

Pressurized tank is required to install a stilling well to protect the probe from the pressure.

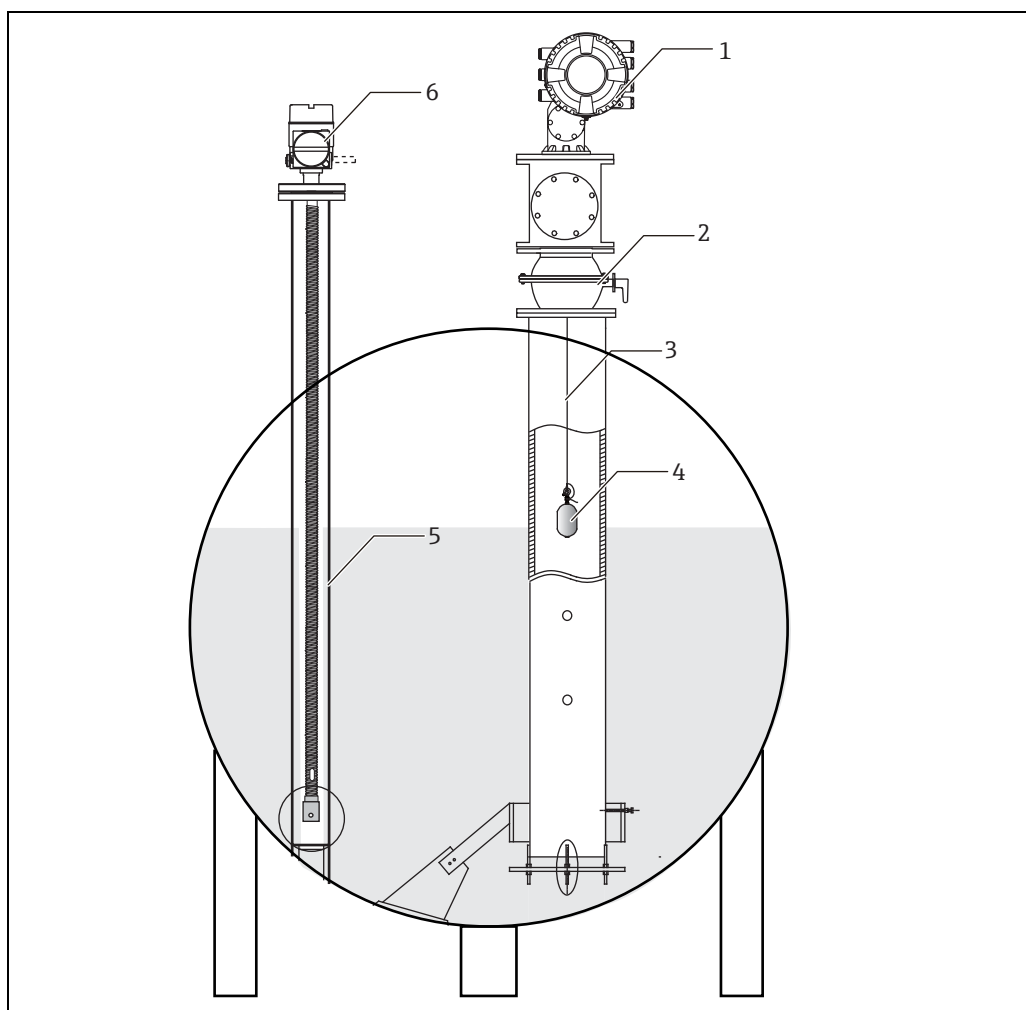


Figure 11: Stilling well for pressurized tank

- 1 NMS8x / NMS5
- 2 Ball valve
- 3 Measuring wire
- 4 Displacer
- 5 Stilling well
- 6 NMT532

CAUTION

- When the pressure inside the tank exceeds 1 bar (100KPa, 14.5psi), a stilling well that does not have any holes or slits must be installed for the NMT532. However the NMS8x and NMT5 require a stilling well with holes or slits.
- The NMT532 is installed in the stilling well from the top of the tank nozzle.
- Cover the bottom of the stilling well of the NMT532 and weld it to protect the probe from the pressure.

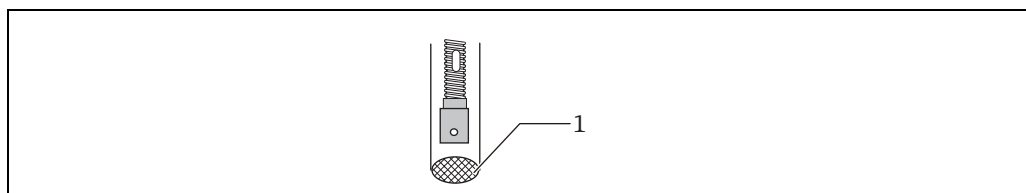


Figure 12: Welding part of stilling well

- 1 Welding part

Operating condition: Terminal connection

NMT532 terminal (Ex ia)

NMT532 allows an intrinsically safe HART connection only. Refer to the IS regulation for establishing wiring and field device layout.

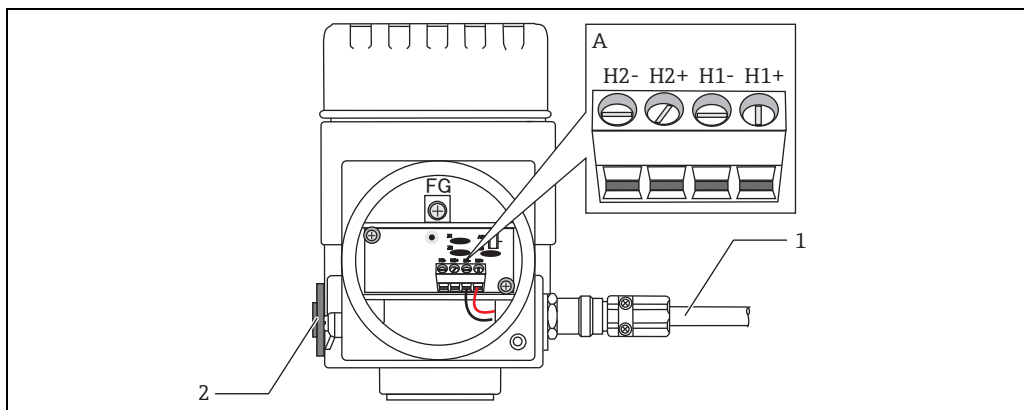


Figure 13: NMT532 terminal

A Temperature data/Intrinsically safe HART on NMT532

1 Screened twisted pair or steel armored wire

2 Blind plug



Use only metal cable glands HART communication line shielded cables must be grounded.

Connection list

To NRF590		To NMS5		To NMS8x/NMR8x/NRF81	
+	24, 26, 28	+	24	+	E1
-	25, 27, 29	-	25	-	E2



+H1 and +H2 show plus (+) terminal and -H1 and -H2 show minus (-) terminal.

NMS5 terminal (Ex d [ia])

Since NMT 532 is an intrinsically safe instrument, the terminal connection to Ex i side on local HART connection is allowed on the NMS terminal housing.

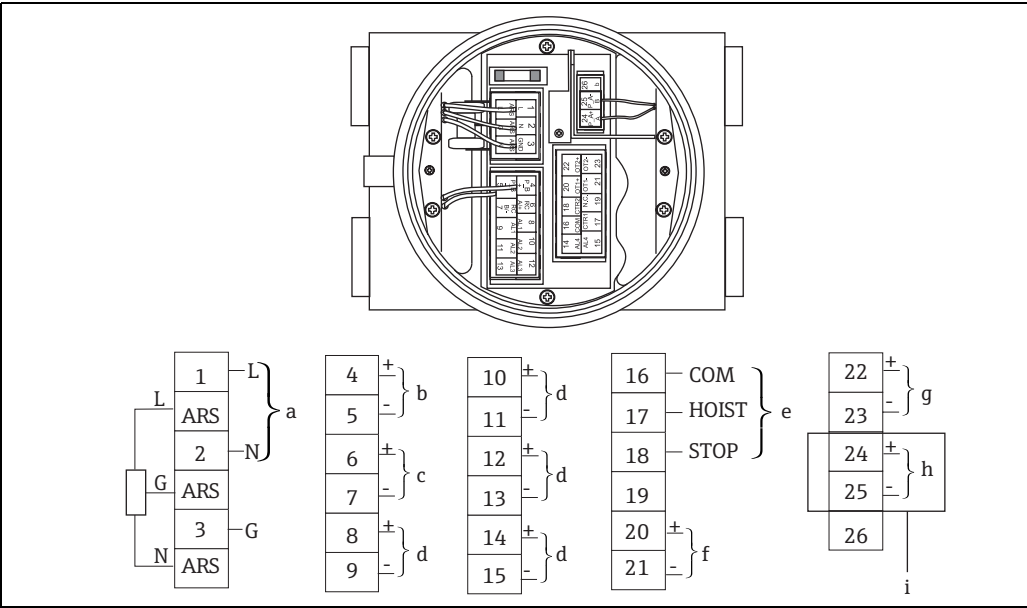


Figure 14: NMS5 terminal

- a Power supply 85 to 264 VAC 50/60 Hz or 20 to 60 VDC, 20 to 55 VAC
- b Non IS HART to NRF or others
- c Digital output Racbus RS485, serial pulse or HART
- d Alarm contact
- e Operation contact input
- f 4 to 20 mA channel 1
- g 4 to 20 mA channel 2
- h HART Ex i
- i from NMT532

CAUTION Do not connect NMT532 HART communication on terminals 4 and 5 on NMS5. These terminals are designed to connect Ex d HART communication.

NMS8x, NMR8x, and NRF81 terminal (Ex d [ia])

Since NMT532 is an intrinsically safe instrument, the terminal connection to the Ex i side on local HART connection is allowed on NMS8x, NMR8x or NRF81 terminal housing.

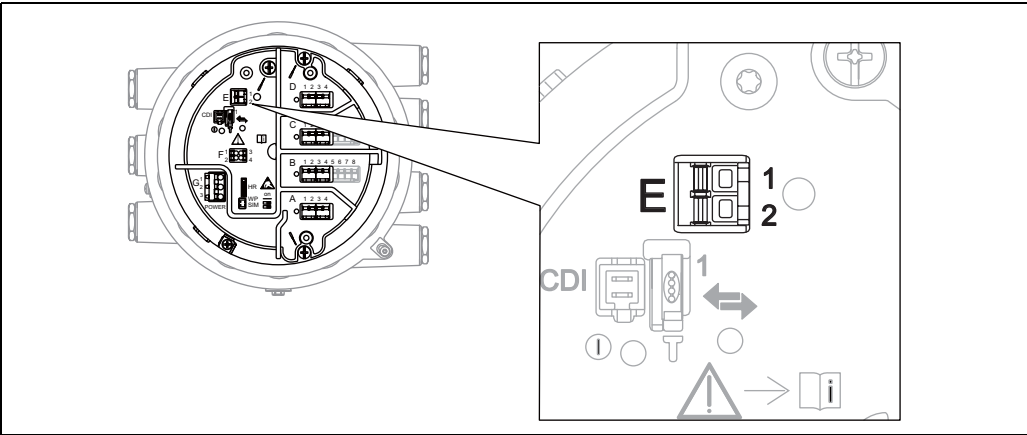


Figure 15: NMS8x terminal for NMT532

- E1 H+ terminal
- E2 H- terminal

NRF590 intrinsically safe terminal

NRF590 has three sets of IS HART terminals. These three pairs are looped internally.

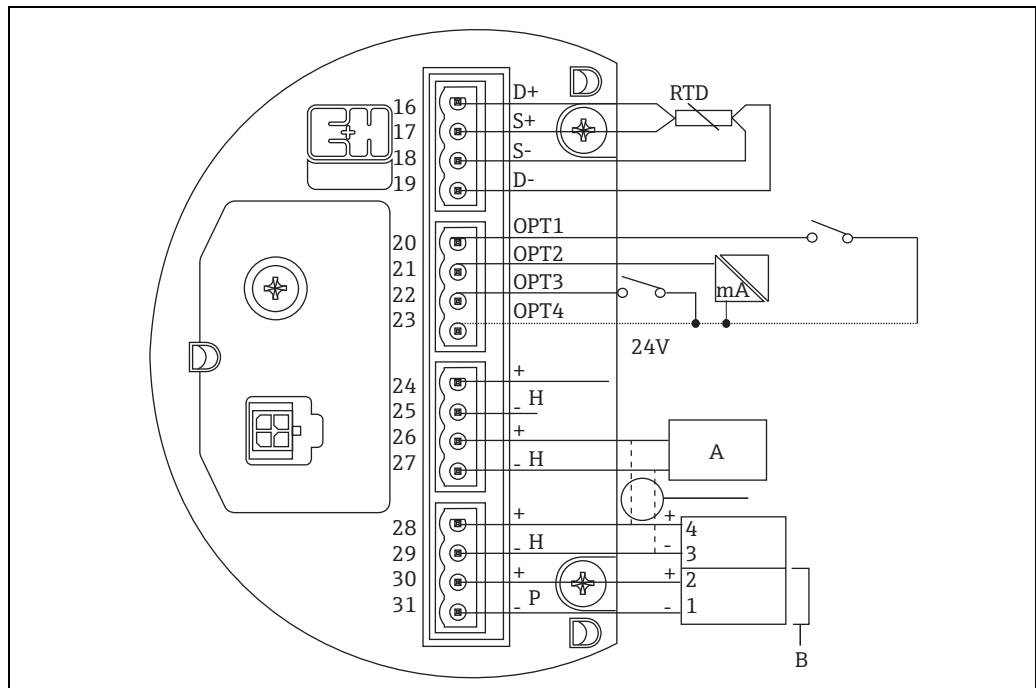


Figure 16: NRF590 terminal

A HART sensor: internally interconnected as one HART fieldbus loop

B for Micropilot S-series only



CAUTION Do not connect signal HART lines from NMT532 to terminals 30 & 31. These terminals are designed to supply drive power of FMR 53x series only.

Grounding

The NMT532 must be grounded to the tank potential before communication and power connections are made. The connections from the ground terminal of the NMT532 to the tank ground must be made before any other wiring connections are made. All grounding must comply with local and company regulations and must be checked before the equipment is commissioned.

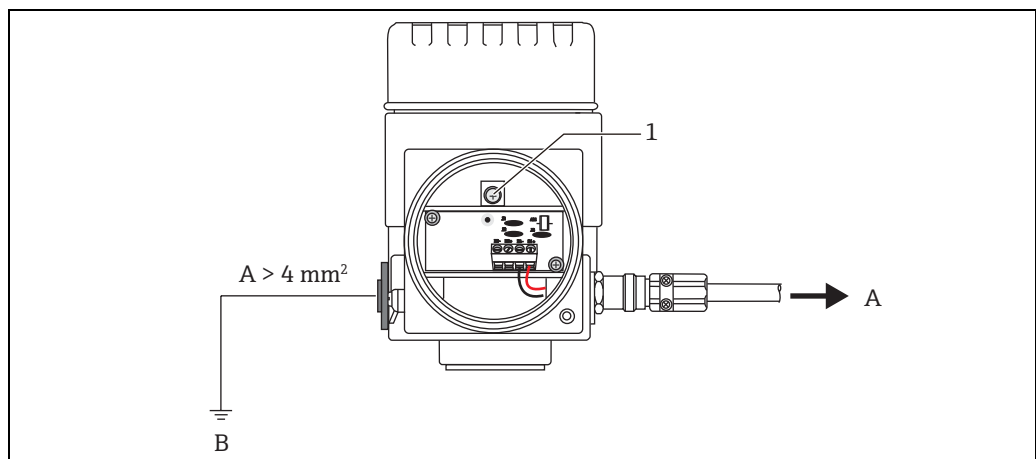


Figure 17: Grounding

A To NRF590, NMS5, NMS8x, NMR8x, or NRF81

B Tank ground

1 Ground terminal

Mechanical construction

Dimensions

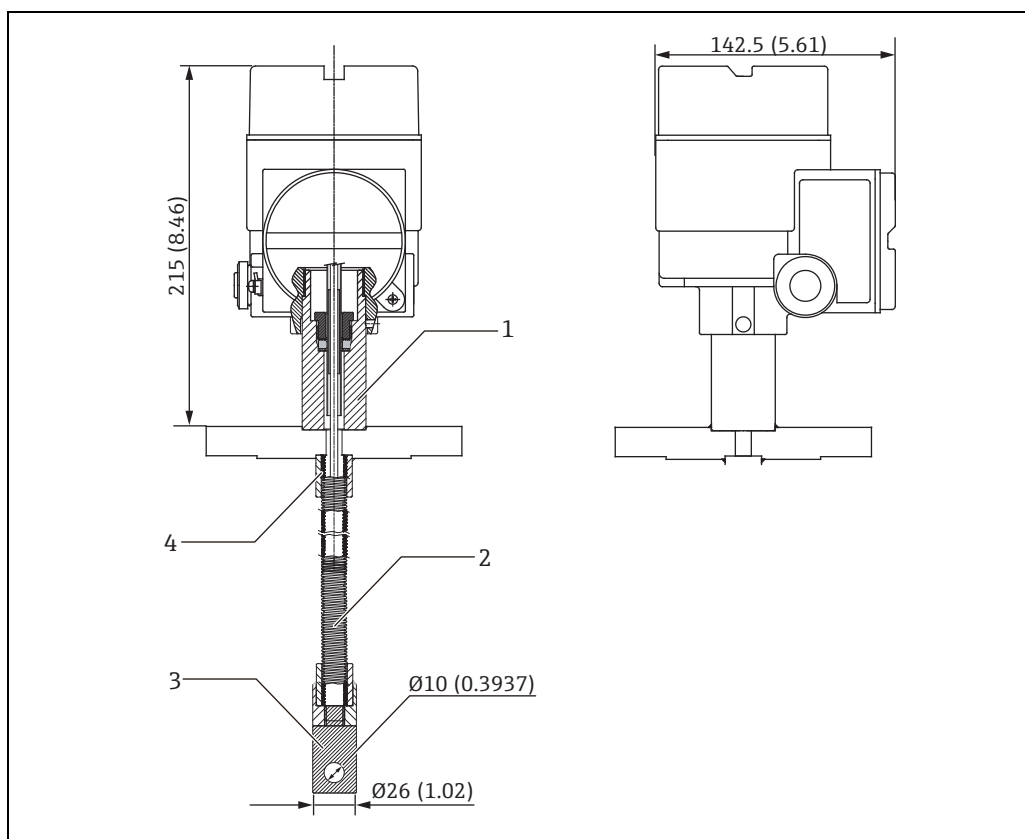


Figure 18: NMT532 dimensions, Unit of measurement: mm (in)

- 1 SUS304
- 2 Temperature probe (SUS316L) (see tips below.)
- 3 Bottom hook (SUS316)
- 4 SUS316

Weight

Approx. 8 kg
 Condition: 6 elements
 Temp. probe: 11.5 m
 Flange: NPS 2" Cl.150 RF, 304 flange ASME B16.5

Material

Elements: Class A Pt100, IEC 60751/DIN EN 60751/ JISC 1604
 Housing: Aluminum die-casting
 Temp. probe: SUS316, SUS316L flexible tube (refer to Dimension)

Human interface

Operation via FieldCare

NMT532 can also be operated via FieldCare. These programs support commissioning, securing of data, signal analysis, and documentation of the instruments.

FieldCare supports the following functions.

- Online configuration of transmitters
- Loading and saving of instrument data (Upload/Download)
- Documentation of measuring points

Certificates and approvals

CE mark	By attaching the CE mark, Endress+Hauser confirms that the instruments pass the required tests.												
RoHS	The measuring system complies with the substance restrictions of the Restriction on Hazardous Substance Directive 2011/65/EU (RoHS 2).												
Ex approval	<table border="1"> <thead> <tr> <th>Ex approval</th><th>Class</th></tr> </thead> <tbody> <tr> <td>ATEX</td><td>II 1/2 G Ex ia IIB T4-T6 Ga/Gb</td></tr> <tr> <td>IEC</td><td>Ex ia IIB T4-T6 Ga/Gb</td></tr> <tr> <td>FM</td><td>IS Class I, Div. 1, Gp. C, D, T6, T4, Class I, Zone 0, AEx ia IIB, T6, T4</td></tr> <tr> <td>CSA</td><td>Ex ia Class I, Div.1, Gp. C, D, T6, T4, Ex ia IIB T6, T4</td></tr> <tr> <td>NEPSI</td><td>Ex ia IIB T4-T6</td></tr> </tbody> </table>	Ex approval	Class	ATEX	II 1/2 G Ex ia IIB T4-T6 Ga/Gb	IEC	Ex ia IIB T4-T6 Ga/Gb	FM	IS Class I, Div. 1, Gp. C, D, T6, T4, Class I, Zone 0, AEx ia IIB, T6, T4	CSA	Ex ia Class I, Div.1, Gp. C, D, T6, T4, Ex ia IIB T6, T4	NEPSI	Ex ia IIB T4-T6
Ex approval	Class												
ATEX	II 1/2 G Ex ia IIB T4-T6 Ga/Gb												
IEC	Ex ia IIB T4-T6 Ga/Gb												
FM	IS Class I, Div. 1, Gp. C, D, T6, T4, Class I, Zone 0, AEx ia IIB, T6, T4												
CSA	Ex ia Class I, Div.1, Gp. C, D, T6, T4, Ex ia IIB T6, T4												
NEPSI	Ex ia IIB T4-T6												
External standards and guidelines	IEC 61326 Appendix: A, Immunity according to table A-1 EN 60529 Protection class of housing (IP-code) EN 61326 Emissions (equipment class B), compatibility (appendix A - industrial area)												

Order information

NMT532

010		Approval:	
	7	FM IS Cl.I Div.1 Gr. C-D	
	8	CSA IS Cl.I Div.1 Gr. C-D	
	B	ATEX Ex ia IIB T4 - T6	
	F	IEC Ex ia IIB T4 - T6	
	G	NEPSI Ex ia IIB T4-T6	
020		Cable Entry:	
	B	Thread NPT1/2	
	D	Thread M20	
030		Process Connection:	
	1	NPS 2" Cl.150 RF, 304 flange ASME B16.5	
	2	DN50 PN10 B1, 304 flange EN1092-1 (DIN2527 C)	
	9	Special version, TSP-no. to be spec.	
040		Probe Length; Element; Interval:	
	022	...mm; 2x Pt100; 2 m	
	032	...mm; 3x Pt100; 2 m	
	042	...mm; 4x Pt100; 2 m	
	052	...mm; 5x Pt100; 2 m	
	062	...mm; 6x Pt100; 2 m	
	023	...mm; 2x Pt100; 3 m	
	033	...mm; 3x Pt100; 3 m	
	043	...mm; 4x Pt100; 3 m	
	053	...mm; 5x Pt100; 3 m	
	063	...mm; 6x Pt100; 3 m	
050		Additional Option:	
	A	Not selected	
	B	Anchor weight, High profile	
	C	Anchor weight, low profile	
	D	Tensioning wire, wire hook, NPT1 top anchor	
	F	Tensioning wire, wire hook, R1 top anchor	
NMT532		Complete product designation	

Accessories

Anchor weight (High profile) Mounting attachment option: B

This high profile anchor type is designed for converter + temperature probe version.

NOTICE The lowest measuring element (lowest temperature measurement position) must be set at a position of approximately 500 mm (20 in) from the bottom of the tank.

Ensure that the opening size of the nozzle is six inches (150 A) or more when installing the high-profile anchor weight from a nozzle at the top of the tank.

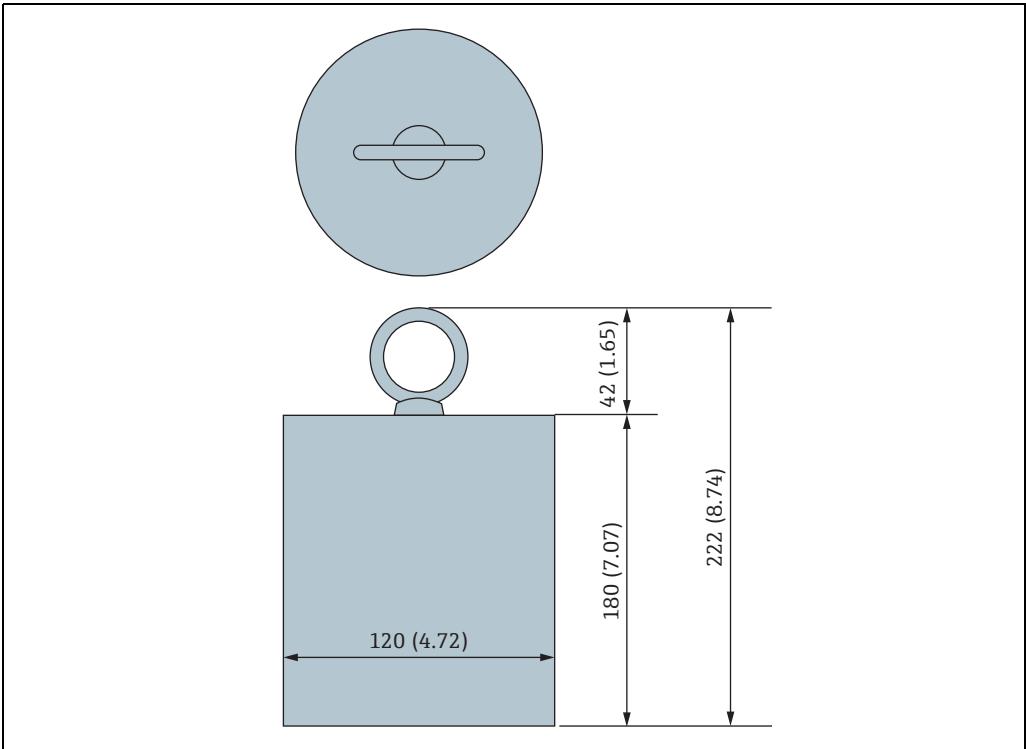


Figure 19: Anchor weight for high profile, Unit of measurement: mm (in)

Different dimension, weight, and material anchor are also available. Consult Endress+Hauser representatives for further details.

Item	Description
Weight	JIS SS400 (Mild carbon steel)
Ring	JIS SS400 (Mild carbon steel)
Total weight	16 kg

Anchor weight (Low profile) **Mounting attachment option: C**

The low-profile anchor weight is mainly designed to secure the WB sensor and to measure a range of the measurable water level. The anchor weight can also be used as an attachment for converters or temperature probes when it is installed to a small nozzle.

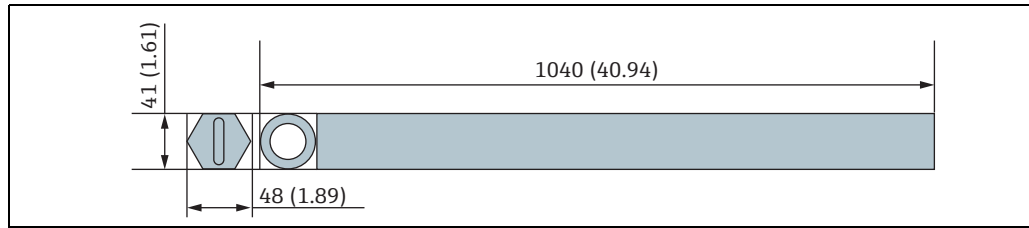


Figure 20: Anchor weight for low profile, Unit of measurement: mm (in)

Item	Description
Weight	JIS SS400 (Mild carbon steel)
Ring	JIS SS400 (Mild carbon steel)
Total weight	12 kg

Wire hook and top anchor

Actual tensioning can be completed with the SUS316 stranded 3 mm diameter tension wire between the wire hook and the top anchor. Based on the application and installation variables, various types of wire, size, material, and special coatings are available. Consult Endress+Hauser representatives for further details.

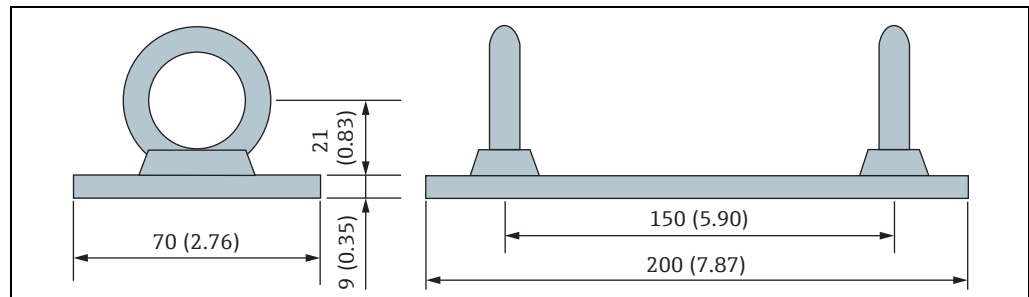


Figure 21: Wire hook, Unit of measurement: mm (in)

Item	Description
Weight	JIS SS400 (Mild carbon steel)
Ring	JIS SS400 (Mild carbon steel)
Total weight	1.5 kg

Top anchor

The standard connection of the top anchor is an R1 or NPT1 threaded connection. However other sizes and materials can be used for the connection and the flange.

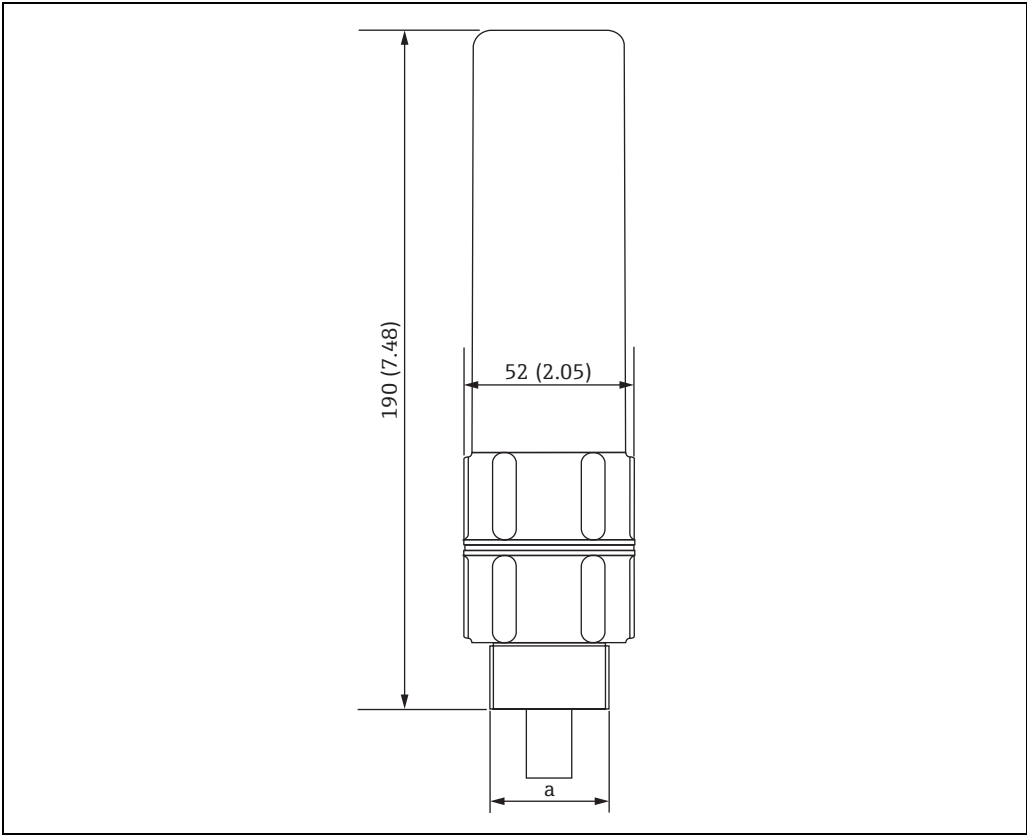


Figure 22: Top anchor, Unit of measurement: mm (in)

Item	Description
Exterior	ADC (Aluminum)
Internal parts	SUS316, Carbon steel
Total weight	1.2 kg

Documentation

Technical information**TI00452G**

Proservo NMS5

TI01248G / TI01249G / TI01250G

Proservo NMS8x

TI01252G / TI01253G

Micropilot NMR8x

TI00462G

Promonitor NRF560

TI01251G

Promonitor NRF81

Operating instructions**BA01032G**

Prothermo NMT532

Safety instructions

NMT532	ATEX	IEC	NEPSI	FM	CSA
Average temperature	XA00584G	XA00581G	XA01260G	Ex461-852-1	Ex462-875-1

Appendix

Stainless steel conversion table

The stainless steel material used in products of Endress+Hauser Japan is normally specified according to Japanese industrial standards, such as JIS or TIIS. Each country or region may have different specifications. The following conversion table contains the specifications of equivalent stainless steel material based on the chemical composition and mechanical properties.

Country	Standard	Expressions			
Japan	JIS / TIIS	SUS304	SUS304L	SUS316	SUS316L
Germany	DIN 17006	X5 CrNi 18 10 X5 CrNi 18 12	X2 CrNi 18 11	X5 CrNiMo 17 12 2 / 1713 3	X2 CrNiMo 17 13 2
	W.N. 17007	1.4301 1.4303	1.4306	1.4401 / 1.4436	1.4404
France	AFNOR	Z 6 CN 18-09	Z 2CN 18-10	Z 6 CND 17-11 / 17 12	Z2 CND 17-12
Italy	UNI	X5 CrNi 1810	X2 CrNi 1911	X5 CrNiMo 1712 / 1713	X2 CrNiMo 1712
U.K.	BSI	304S15 / 304S16	304S11	316S31 / 316S33	316S11
U.S.A.	AISI	304	304 L	316	316L
E.U.	EURONORM	X6 CrNi 1810	X3 CrNi 1810	X6 CrNiMo 17 12 2 / 17 13 3	X3 CrNiMo 17 12 2
Spain	UNE	X6 CrNi 19-10	X2 CrNi 19-10	X6 CrNiMo 17-12- 03	X2 CrNiMo 17-12- 03
Russia	GOST	08KH18N10 06KH18N11	03KH18N11	—	03KH17N14M2
-	ISO	11	10	20	19
-	ASME	S30400	S30403	S31600	S31603

NOTICE

Since each standard carries its own mechanical and scientific definition, some specifications may not have a direct conversion from the Japanese standard. Consult with the local authority or legislature to ensure proper comparison with the applied standard prior to determining the specification.

www.addresses.endress.com

For more Endress+Hauser product please visit: www.ainstru.com
Mail: Sales@ainstru.com