Technical
Information

Intelligent Temperature Measuring Elements for Tank Gauging System *Prothermo NMT 53 Series*

For average temperature measurement in a tank

NMT535 temperature element

Features at a Glance

- NMT 53 temperature elements are used in conjunction with the Proservo NMS 53 series of tank gauges. They enable the net and normalised volume of the liquid to be calculated. This fulfills the exacting demands of tank inventory management
- NMT 53 series are tank top mounted temperature elements designed to measure the average temperature from the surface of the liquid to the tank bottom
- The NMT 53..series scan all the temperature elements all the time and measure
  - Liquid average temperature
  - Gas average temperature

  in accordance with level data provided by Proservo intelligent tank gauge via HART protocol.
- The temperature profile is available by reading position of the temperature elements and the temperature of each element.
- Temperature data can transfer to control through Proservo intelligent tank gauge by Rack bus RS485 or Bidirectional serial pulse.
- A local indication of average temperature is available.

Endress+Hauser

Nothing beats know-how

Operating Principle

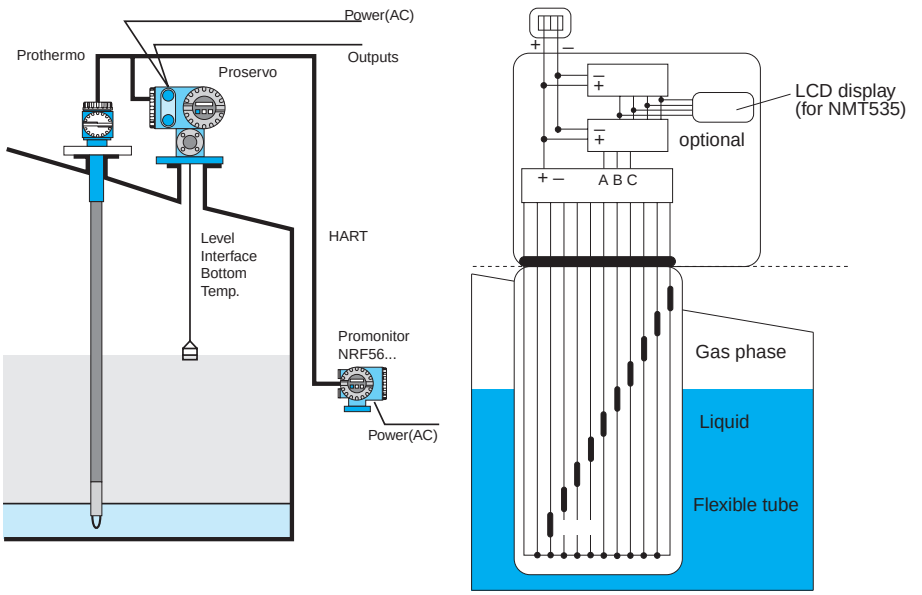
High Precision Sensor

The NMT series of temperature measuring bulb are based on Pt100 elements in accordance with IEC and JIS standards.

The NMT535/6 comprises up to 10 measuring elements (standard), depending on the height of the tank and the spacing of the elements. Each measuring elements consists of one class A Pt 100 measuring point.

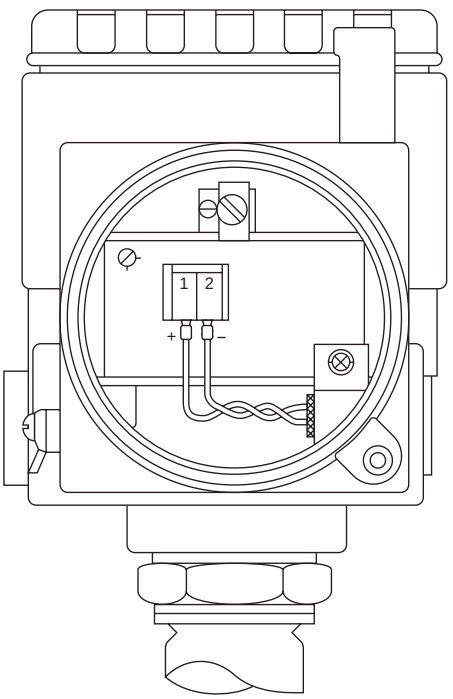
All the elements are continuously scanned and the average liquid temperature and/or gas phase temperature is derived dependent upon the liquid data provided by the Proservo intelligent tank gauge.

Local indication can be provided on the NMT535, the temperature can be display on the Proservo tank gauge and transmitted for remote indication.



Operating principle of NMT temperature element

Electrical Connections

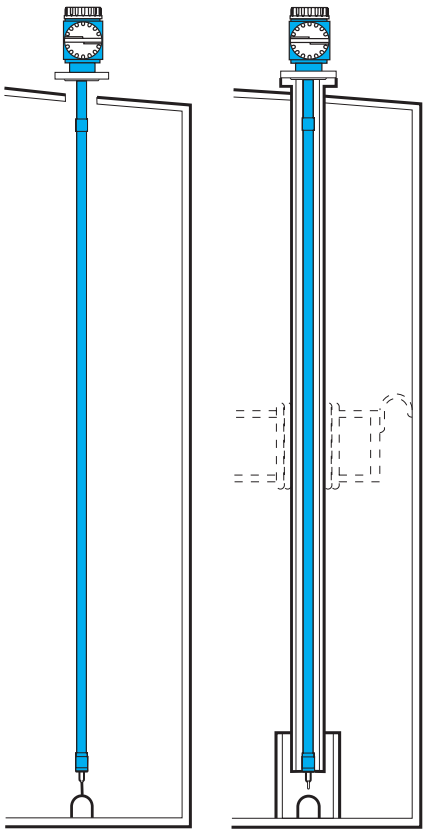


Connection diagram for the NMT temperature element

Installation

The NMT temperature bulb is mainly for use in cone, dome and floating roof tanks and is mounted on top of the vessels by means of a flange. The unit is fixed to the bottom using an anchor hook or weight, alternatively, a stilling well can be used to prevent turbulence from moving the probe.

If the installation is in the pressurised tank exceed 10 bar (gauge), the instllation must be in the pipe with closed and which can isolate the pressure. The recommended mounting position is ideally 500mm (minimum) from the vessel wall to prevent atmospheric temperature change from influencing the measurement.

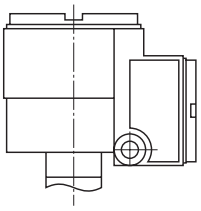


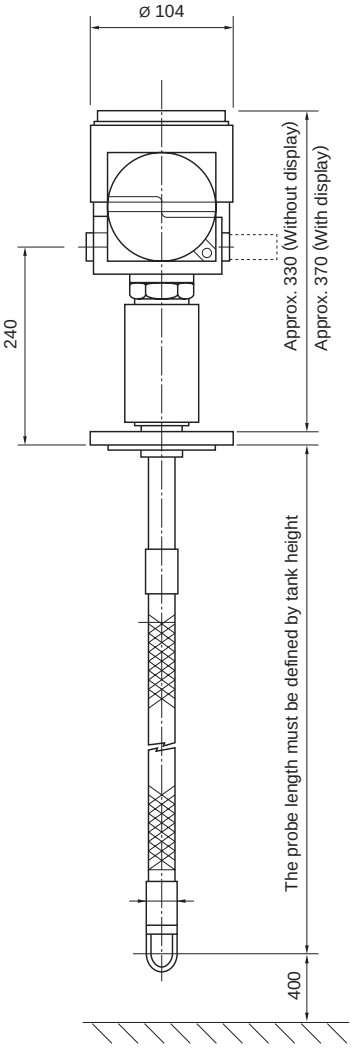
NMT temperature element installed on a covered floating roof tank

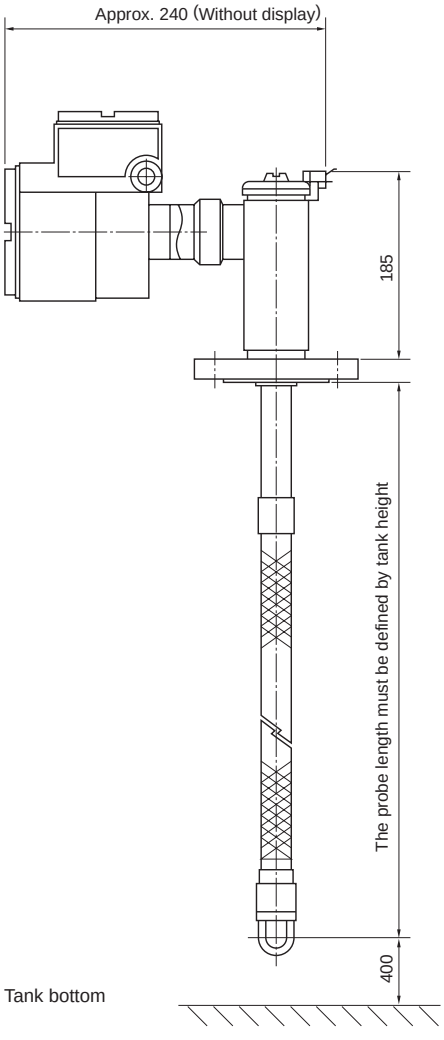
NMT installed cone roof tank by anchor weight

NMT installed on a covered floating roof tank by stilling well liquid pipe

Dimensions







Left: NMT535 temperature element
Right:NMT536 temperature element

Tank bottom

Technical Data

Manufacturer	Sakura Endress Co., Ltd
Designation	Prothermo NMT 535 / 536
Function	Average temp. (Liquid, Gas) Temp. profile

Measuring element	Platinum (Pt100), Class A according to IEC, Pub 751 1983 and/or JIS 1604 1989
Accuracy of element	± (0.15+0.002)t ^{o}C
Measuring range	-50 ...+100^{o}C(standard) 50 ...200^{o}C(high temp.) Minimum -200^{o}C (optional) For optional measuring range, the measuring span is 150^{o}C
Tolerance of reading	± 0.25 ^{o}C(for standard measuring range)
Numbers of element	2 - 10 (standard), max 15 (optional)

Flexible tube	Inner tube - SS 316 Outer mesh - SS 304
Housing	Aluminium diecast
Flange	Mild steel(standard),SS304/316 (optional)

Flange rating	JIS 10K 50A RF ANSI 150 lb 2" RF JPI 150 lb 2" RF DIN BN50 PN10RF others (optional)

Output	HART multi drop
Power supply	DC14 - 36V (NMS53.. supplies DC24V)

Cable entry	1XG (PF) 1/2, 1X NPT 1/2, 1X PG16, 1X M20, others (optional)

Ambient temperature	-20....+60^{o}C (housing)

Explosion proof	Exd IIB T4(TIIS) for NMT535 EExd IIB T4(CENELEC) for NMT536

Element position (standard)	Lowest 100mm above bottom of flexible tube Highest 1000mm below flange surface
Flexible tube bottom	400mm from tank bottom

Product Structure

NMT535

Protection
0 Weather proof (IP 66)
1 Flame proof (TIIS, Exd IIBT4)
9 Special version

Cable Entry
A One G(PF) 1/2 cable entry
B One NPT 1/2 thread cable entry
C One PG 16 thread cable entry
D One M 20 thread cable entry
Y Special version

Process Connection
0 A JIS 10 K 50A RF flange
1 B ANSI 2" 150lbs RF flange
2 C DIN 50 PN 10 RF flange
3 D JPI 2" 150lbs RF flange
9 Y Special version

Flange Material
0 Carbon steel (JIS SS41) flange
1 Stainless steel SS 304 flange
9 Special version

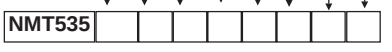
Meas range
0 -50 to +100C liquid / gas temp.
1 +50 to +200C liquid / gas temp.
9 Special version

Numbers of elements
A TWO Pt 100 elements
B THREE Pt 100 elements
C FOUR Pt 100 elements
D FIVE Pt 100 elements
E SIX Pt 100 elements
F SEVEN Pt 100 elements
G EIGHT Pt 100 elements
H NINE Pt 100 elements
J TEN Pt 100 elements
Y Special version

Tank height
A 4 to 5m
B 5 to 6m
C 6 to 7m
D 7 to 8m
E 8 to 9m
F 9 to 10m
G 10 to 11m
H 11 to 12m
J 12 to 13m
K 13 to 14m
L 14 to 15m
M 15 to 16m
N 16 to 17m
P 17 to 18m
Q 18 to 19m
R 19 to 20m
S 20 to 21m
T 21 to 22m
U 22 to 23m
V 23 to 24m
W 24 to 25m
Y Special version

Display
A No display
B With display

Installation
A Free hanging pipeinstallation
B Fixed via anchor weight for CRT
C Fixed via anchor weight for FRT
D Fixed via tension wire
Y Special version



NMT536

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Installation
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B Fixed via anchor weight for CRT
C Fixed via anchor weight for FRT
D Fixed via tension wire
Y Special version

Please specify height of tank, ie dimensions taken from tank bottom to process connection.

Supplementary Documentation

- ❑ Proservo NMS53...
  Technical Information Ti
- ❑ Promonitor NRF560
  Technical Information Ti
- ❑ Tank Gauging
  System Information Si 001N/e
- ❑ MIC
  Single Tank Receiver
- ❑ BBB
  20 Tank Receiver
- ❑ MDP
  Tank Inventory System

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WHESSOE VAREC

Endress+Hauser
Nothing beats know-how

The NMT is manufactured by Endress+Hauser, the mother company of Whessoe Varec.

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