

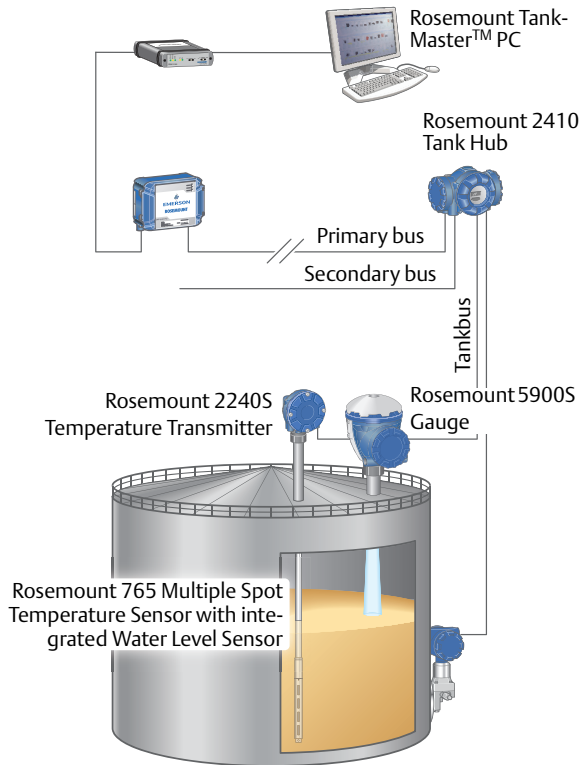
Rosemount™ 565/566/765/614 Temperature and Water Level Sensors

for tank gauging systems



- Get custody transfer net volume accuracy with four-wire multiple spot temperature sensors for bulk liquid storage tanks
- Improve accuracy with unique sensor calibration
- Measure liquid temperature with up to 16 spot elements
- Combine with integrated water level sensor measurement
- Include temperature sensors for measurements in cryogenic and refrigerated gas applications such as LNG
- Select from a wide range of accessories such as anchor weights and vapor boots

Multiple spot temperature and water level sensors for highly accurate volume measurement



Rosemount 765 Multiple Spot Temperature Sensor installed together with a Rosemount 2240S Multi-input Temperature Transmitter, in a Tank Gauging System

Measure precise product temperature for custody transfer and inventory measurement in bulk liquid storage tanks.

The highly accurate four-wire multiple spot temperature sensors in Rosemount Tank Gauging System measure liquid temperature with up to 16 spot elements.

The available versions are:

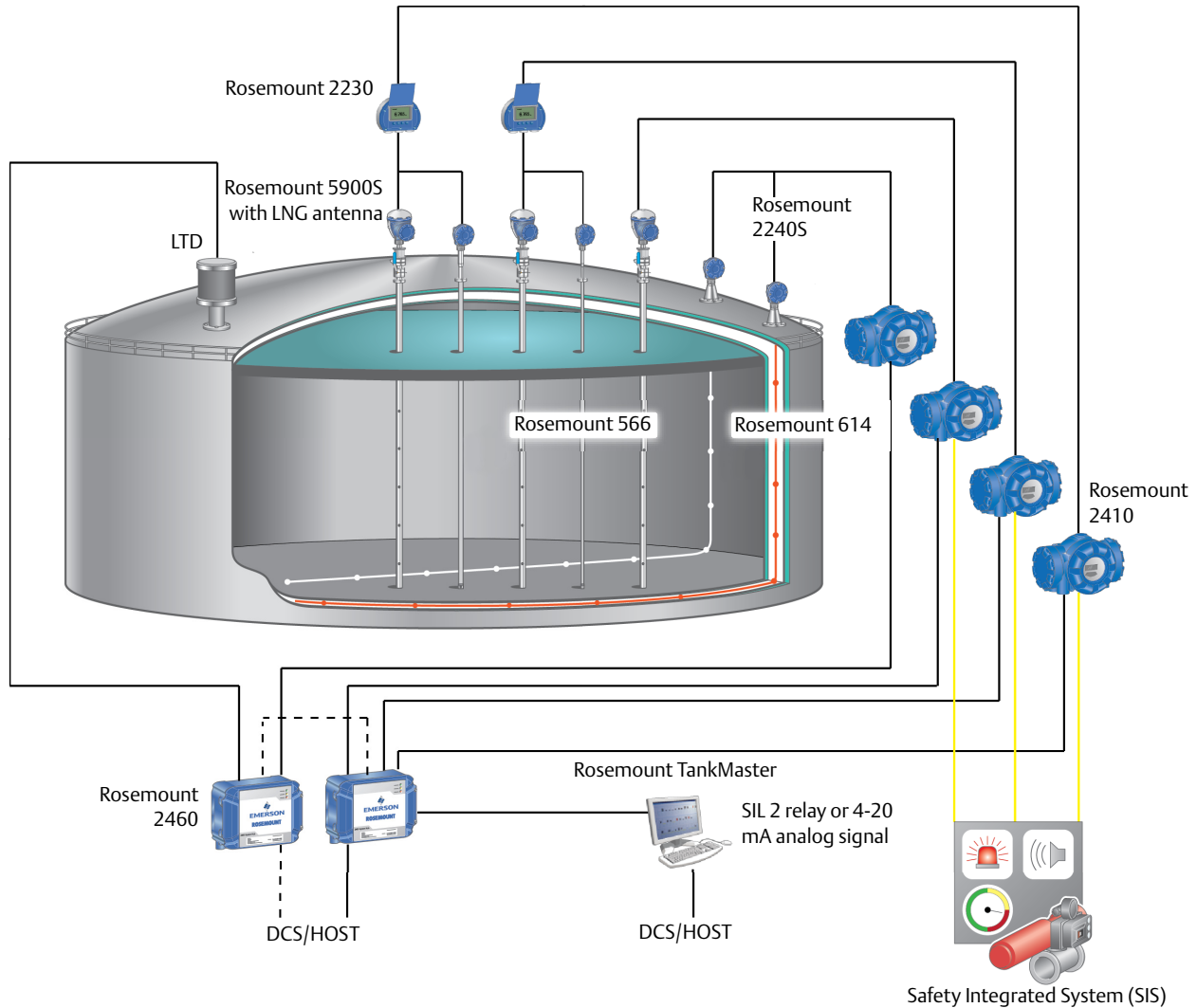
- Rosemount 565 Multiple Spot Temperature Sensor
- Rosemount 566 Multiple Spot Temperature Sensor for cryogenic applications such as LNG
- Rosemount 765 Multiple Spot Temperature Sensor with integrated water level sensor

The multiple spot temperature sensor, with an optional integrated water level sensor, is connected to a Rosemount 2240S Multi-input Temperature Transmitter. The measured values are distributed to the Rosemount TankMaster Inventory Software or a DCS/host system via the Rosemount 2410 Tank Hub.

Features with four-wire connection

- Further improved accuracy
- True compensation for wiring resistance
- Unique calibration process for individual sensor elements to get the highest net volume accuracy

Cryogenic Temperature Sensors for highly accurate temperature measurements



Rosemount 566 Multiple Spot Temperature Sensors installed together with a Rosemount 2240S Multi-Input Temperature Transmitter, in a Tank Gauging system for temperature profile and stratification monitoring. The system includes the Rosemount 614 Cryogenic Spot Temperature Sensor installed with the Rosemount 2240S Multi-Input Temperature Transmitters for cool-down (white dotted line) and leak detection (red dotted line).

Complete temperature measurements for cryogenic and refrigerated full containment storage.

Rosemount 566 Multiple Spot Temperature Sensors for:

- Precise spot and average product temperature
- Continuous measurements for stratification profile

Rosemount 614 Cryogenic Spot Temperature Sensors for:

- Distributed cool-down monitoring during first fill
- Distributed leak detection between inner and outer tank

Both the Rosemount 566 and Rosemount 614 temperature sensors are connected to the Rosemount 2240S Multi-Input Temperature Transmitters. The measured values are distributed to the TankMaster Inventory Software, DCS/host or safety systems via the Rosemount 2410 Tank Hub.

Rosemount 565 Multiple Spot Temperature Sensor

- Measures temperature with one to sixteen Pt-100 spot elements placed at different heights to provide a tank temperature profile and an average temperature.
- The calculated average liquid temperature, based on fully immersed elements, is used as an input for accurate volume calculations in storage tanks.

The temperature sensor is easily installed on the tank nozzle, and is then connected either directly to the Rosemount 2240S multi-input temperature transmitter or via cable. The Rosemount 565 sensor is mounted with a flange or a thread at the top of the tank.

The spot elements are placed in a flexible gas-tight protection tube, made from convoluted stainless steel, for easier handling during installation. All spot elements are attached to a wire, which runs from the top to the bottom of the sensor. An anchor weight can be hung at the bottom, or the tube can be fixed to the bottom to keep the sensor vertical and avoid floating when the tank is filled.

The Rosemount 565 is designed for atmospheric tanks up to 0.2 bar (2.9 psi). For pressurized tanks it must be installed in a closed thermowell enabling service or inspection while the tank is in operation.

Rosemount 765 Multiple Spot Temperature Sensor with integrated water level sensor

- Continuously measures free water level below the oil surface and provides an input for online net inventory calculations.
- Available in two versions, open and closed. The open version is suitable for crude oil applications and the closed version is suitable for lighter fuels such as diesel oil, etc.

The integrated multiple spot temperature sensor is Rosemount 565 (see [“Rosemount 565 Multiple Spot Temperature Sensor” on page 4](#)).

The Rosemount 765 sensor is hung vertically from the top of the tank, and the position/length is chosen according to the actual bottom water range. It should be anchored to the tank bottom to ensure a fixed position in case of turbulence.

One of the Pt-100 temperature sensor elements can be installed inside the water level probe allowing temperature measurements at low levels.

The water level sensor delivers a digital signal, and is connected to the Rosemount 2240S Multi-input Temperature Transmitter.

Rosemount 765 is delivered in a stainless steel (AISI 316) housing, welded to the flexible temperature sensor tube to get a hermetic design. It has a heavy duty design with no moving parts.

Offset calibration can be done with an integrated calibration feature in the Rosemount 2240S transmitter.



The Rosemount 765 Water Level Sensor open version, suitable for crude oil applications

Rosemount 614 Cryogenic Spot Temperature Sensor

The Rosemount 614 spot elements are wired through a mineral-insulated flexible steel cable up to 300 m (980 ft). This allows temperature measurements inside a full containment tank during the cool-down procedure and for leak detection and corner protection in the insulation space.

Rosemount 614 temperature sensors are easily integrated through a conical connection or a junction box to the Rosemount 2240S Multi-input Temperature Transmitter. Each 2240S Transmitter supports up to 16 Rosemount 614 temperature sensors.



Rosemount 614 temperature sensors, connected to the Rosemount 2240S temperature transmitter via a conical connection.

Rosemount 566 Temperature Sensor for cryogenic applications

- Equipped with Class A sensors, suitable for low temperatures
- Used for measurements in LNG tanks and other low-temperature applications

The spot elements are encapsulated in a stainless steel tube, filled with argon gas to prevent the condensation of water inside the sensor at low temperatures.

Unique calibration process to get highest accuracy meeting International Group of Liquefied Natural Gas Importers (GIIGNL) requirements for stratification detection, enabling continuous product stratification monitoring. True compensation for wiring resistance with 4-wire connection.

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Ordering information

Rosemount 565 Multiple Spot Temperature Sensor



- Custody transfer accuracy
- The highest reliability
- Rugged design for harsh environments
- Wide range of accessories such as anchor weights and vapor boots
- A version with integrated water level sensor is available, see [page 13](#).

Additional information

Specifications: [page 20](#)

Certifications: [page 28](#)

Dimensional drawings: [page 30](#)

Table 1. Rosemount 565 Multiple Spot Temperature Sensor Ordering Information

Model	Product description
0565	Multiple Spot Temperature Sensor
Overall length (L₀)	
Mxxxxx	Metric units, xxxxx in millimeters (mm), range: 02000-70000 (Specify in steps of 10 millimeters.)
Exxxxx	U.S. units, xxxxx in inches (in.), range 00400-02700 (Longer on request. Specify in steps of 1 inch.)
Sheath type	
A	1-in. (25.4-mm) AISI 316 SST
Tank connection	
ANSI flanges (SST AISI 316) - Raised face	
A	1 1/2-in. Class 150
B	1 1/2-in. Class 300
C	2-in. Class 150
D	2-in. Class 300
E	3-in. Class 150
F	3-in. Class 300
G	4-in. Class 150
H	4-in. Class 300
EN flanges (SST AISI 316) - Flat face	
1	DN 50 PN 16
2	DN 50 PN 40
3	DN 65 PN 16

Table 1. Rosemount 565 Multiple Spot Temperature Sensor Ordering Information

4	DN 65 PN 40
5	DN 80 PN 16
6	DN 80 PN 40
7	DN 100 PN 16
Threaded connection	
0	M33x1.5
Temperature sensor wiring	
4	Four-wire
Number of temperature spot elements	
01 to 16	Specify number.
Element type	
P	Pt-100
Performance class	
1	1/6 DIN Class B (IEC/EN60751)
Temperature range	
1	-50 to +120 °C (-58 to +248 °F)
2	-20 to +250 °C (-4 to +482 °F)
Lead wires, temperature sensor	
00	For integrated installation with Rosemount 2240S (standard)
04-10	Specify other length in meters.
13-33	Specify other length in feet.

Options – None or multiple selections are possible. Specify in the same order as listed below.

Certificate	
Q1	Certificate of conformance
Q4	Calibration certificate (Requires option Sensor Calibration code X4, X5, X6, X7, or X8)
Q7	Printed copy of hazardous location certificate
Q8	Material certificate EN10204 3.1
Country-specific hazardous location certification	
I2	INMETRO Intrinsic Safety (Brazil)
I4	Japan Intrinsic Safety
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety

Table 1. Rosemount 565 Multiple Spot Temperature Sensor Ordering Information

Stabilization weights (SST AISI 304)⁽¹⁾	
AA ⁽²⁾	Anchor weight, 2 kg (4.4 lbs), Ø=40; LW=200 mm (Ø=1.6; LW=7.9 in.)
AB ⁽²⁾	Anchor weight, 3 kg (6.6 lbs), Ø=50; LW=200 mm (Ø=2.0; LW=7.9 in.)
AC ⁽²⁾	Anchor weight, 4 kg (8.8 lbs), Ø=45; LW=330 mm (Ø=1.8; LW=13.0 in.)
AD ⁽³⁾	Anchor weight, 5 kg (11 lbs), Ø=100; LW=85 mm (Ø=3.9; LW=3.3 in.)
AE ⁽³⁾	Anchor weight, 10 kg (22 lbs), Ø= 95; LW=175 mm (Ø=3.7; LW=6.9 in.)
AF ⁽³⁾	Anchor weight, 15 kg (33 lbs), Ø=140; LW=130 mm (Ø=5.5; LW=5.1 in.)
AP ⁽⁴⁾	Anchor weight, 3 kg (6.6 lbs), Ø=48.5; L=255; LW=152.4 mm (Ø=1.9; L=10; LW=6 in.)
AR ⁽⁴⁾	Anchor weight, 6 kg (13.2 lbs), Ø=48.5; L=625; LW=152.4 mm (Ø=1.9; L=24.6; LW=6 in.)
AS ⁽⁴⁾	Anchor weight, 9 kg (19.8 lbs), Ø=48.5; L=998; LW=152.4 mm (Ø=1.9; L=39.3; LW=6 in.)
AT ⁽⁴⁾	Anchor weight, 12 kg (26.4 lbs), Ø=48.5; L=1365; LW=152.4 mm (Ø=1.9; L=53.7; LW=6 in.)
AU ⁽⁴⁾	Anchor weight, 15 kg (33.1 lbs), Ø=48.5; L=1735; LW=152.4 mm (Ø=1.9; L=68.3; LW=6 in.)
Vapor boot⁽¹⁾	
VA	Vapor boot with a 2-in. NPS threaded tank connection
VB	Vapor boot with a 3-in. NPS threaded tank connection
VC	Vapor boot for a 3-in. ANSI Class 150 flange
VD	Vapor boot for a 4-in. ANSI Class 150 flange
VE	Vapor boot for a 6-in. ANSI Class 150 flange
VF	Vapor boot for an 8-in. ANSI Class 150 flange
Hose kit⁽¹⁾	
HA	Hose kit including glands, 3 m (10 ft), 1/2-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
HB	Hose kit including glands, 10 m (33 ft), 1/2-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
Adapters	
IA	Adapter M33x1.5 female to 1-in. NPT female
IB	Adapter 1-in. NPT female to M33x1.5 male
Sensor calibration	
X4 ⁽⁵⁾	Sensor calibration at 0 °C (+32 °F)
X5 ⁽⁵⁾	Sensor calibration at +40 °C (+104 °F)
X6 ⁽⁵⁾	Sensor calibration at +80 °C (+176 °F)
X7 ⁽⁵⁾	Sensor calibration at 0 and +80 °C (+32 and +176 °F)
X8 ⁽⁵⁾	Sensor calibration at 0, +40 and +80 °C (+32, +104 and +176 °F) with Callendar-Van Dusen constants

Table 1. Rosemount 565 Multiple Spot Temperature Sensor Ordering Information

Extended warranty	
WR3 ⁽⁶⁾	3-year extended warranty
WR5 ⁽⁶⁾	5-year extended warranty
Typical model number: 0565 M25000 A 0 4 16 P 2 2 00 Q8 AE VE - temperature sensor positions⁽⁷⁾	

1. Mutually exclusive options under this category.
2. For still-pipes.
3. For free-hanging.
4. Installed in section(s) around sensor hose.
5. Requires temperature sensor wiring code 4 and option certificate code Q4.
6. Standard warranty is 18 months from delivery.
7. Temperature sensor positions are specified in the [Rosemount Tank Gauging System Configuration Data Sheet](#).

Rosemount 566 Multiple Spot Temperature Sensor for cryogenic use (NL-Cryo)



- Custody transfer accuracy
- The highest reliability
- Rugged design for harsh environments
- Equipped with type A elements, suitable for low temperatures
- Supplied with a non-adjustable flange

Additional information

Specifications: [page 20](#)

Certifications: [page 28](#)

Dimensional drawings: [page 31](#)

Table 2. Rosemount 566 Multiple Spot Temperature Sensor for Cryogenic Use (NL-Cryo) Ordering Information

Model	Product description
0566	Multiple Spot Temperature Sensor for cryogenic applications
Overall length (L₀)	
Mxxxxx	Metric units, xxxxx in millimeters (mm). Range: 02000-70000 (Specify in steps of 10 millimeters.)
Exxxxx	U.S. units, xxxxx in inches (in.). Range 00400-02700 (Longer on request. Specify in steps of 1 inch.)
Sheath type	
A	1-in. (25.4-mm) AISI 316
Tank connection	
ANSI flanges (SST AISI 316) - Raised face	
A	1 1/2-in. Class 150
B	1 1/2-in. Class 300
C	2-in. Class 150
D	2-in. Class 300
E	3-in. Class 150
F	3-in. Class 300
G	4-in. Class 150
H	4-in. Class 300
EN flanges (SST AISI 316) - Flat face	
1	DN 50 PN 16
2	DN 50 PN 40
3	DN 65 PN 16
4	DN 65 PN 40
5	DN 80 PN 16

Table 2. Rosemount 566 Multiple Spot Temperature Sensor for Cryogenic Use (NL-Cryo) Ordering Information

6	DN 80 PN 40
7	DN 100 PN 16
Temperature sensor wiring	
4	Four-wire
Number of temperature spot elements	
01-16	Specify number.
Element type	
P	Pt-100
Temperature accuracy class	
A	DIN Class A (IEC/EN60751)
Temperature range	
3	-170 to +100 °C (-274 to +212 °F)
Lead wires, temperature sensor	
00	Integrated installation with Rosemount 2240S (standard)
04-10	Specify other length in meters.
13-33	Specify other length in feet.

Options – None or multiple selections are possible. Specify in the same order as listed below.

Certificate	
Q1	Certificate of conformance
Q4	Calibration certificate (Requires option Sensor Calibration code X4 or X8)
Q7	Printed copy of hazardous location certificate
Q8	Material certificate EN 10204 3.1
Country-specific hazardous location certification	
I2	INMETRO Intrinsic Safety (Brazil)
I4	Japan Intrinsic Safety
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety
Stabilization weights (SST AISI 304)⁽¹⁾	
AA ⁽²⁾	Anchor weight, 2.0 kg (4.4 lbs), Ø=40; LW=200 mm (Ø=1.6; LW=7.9 in.)
AB ⁽²⁾	Anchor weight, 3 kg (6.6 lbs), Ø=50; LW=200 mm (Ø=2.0; LW=7.9 in.)
AC ⁽²⁾	Anchor weight, 4 kg (8.8 lbs), Ø=45; LW=330 mm (Ø=1.8; LW=13.0 in.)
AD ⁽³⁾	Anchor weight, 5 kg (11 lbs), Ø=100; LW=85 mm (Ø=3.9; LW=3.3 in.)
AE ⁽³⁾	Anchor weight, 10 kg (22 lbs), Ø=95; LW=175 mm (Ø=3.7; LW=6.9 in.)
AF ⁽³⁾	Anchor weight, 15 kg (33 lbs), Ø=140; LW=130 mm (Ø=5.5; LW=5.1 in.)

Table 2. Rosemount 566 Multiple Spot Temperature Sensor for Cryogenic Use (NL-Cryo) Ordering Information

Hose kit⁽¹⁾	
HA	Hose kit including glands, 3 m (10 ft), ½-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
HB	Hose kit including glands, 10 m (33 ft), ½-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
Adapters	
IA	Adapter M33x1.5 female to 1-in. NPT female
IB	Adapter 1-in. NPT female to M33x1.5 male
Sensor calibration	
X4 ⁽⁴⁾	Sensor calibration at 0 °C (+32 °F)
X8 ⁽⁴⁾⁽⁵⁾	Sensor calibration at 0, +40 and +80 °C (+32, +104 and +176 °F) with Callendar-Van Dusen constants
Other	
DN	Drain nipple on flange
Extended warranty	
WR3 ⁽⁶⁾	3-year extended warranty
WR5 ⁽⁶⁾	5-year extended warranty
Typical model number: 0566 M25000 A E 4 16 P A 3 00 Q8 AA DN - temperature sensor positions⁽⁷⁾	

1. Mutually exclusive options under this category.
2. For still-pipes.
3. For free-hanging.
4. Requires temperature sensor wiring code 4 (four-wire) and option certificate code Q4.
5. C constant from EN 60751.
6. Standard warranty is 18 months from delivery.
7. Temperature sensor positions are specified in the [Rosemount Tank Gauging System Configuration Data Sheet](#).

Rosemount 765 Multiple Spot Temperature Sensor with water level sensor



- Custody transfer accuracy
- The highest reliability
- Rugged design for harsh environments
- Close to bottom measurements
- Special crude version available

Additional information

Specifications: [page 17](#)

Certifications: [page 28](#)

Dimensional drawings: [page 32](#)

Table 3. Rosemount 765 Multiple Spot Temperature Sensor with Water Level Sensor Ordering Information

Model	Product description
0765	Multiple Spot Temperature Sensor with integrated water level sensor
Overall length (L₀)	
Mxxxxx	Metric units, xxxxx in millimeters (mm). Range: 02000-60000 (Specify in steps of 10 millimeters.)
Exxxxx	U.S. units, xxxxx in inches (in.). Range 00400-02300 (Longer on request. Specify in steps of 1 inch.)
Sheath type	
A	1-in. (25.4-mm) AISI 316
Tank connection	
ANSI flanges (SST AISI 316) - Raised face	
A	1 1/2-in. Class 150
B	1 1/2-in. Class 300
C	2-in. Class 150
D	2-in. Class 300
E	3-in. Class 150
F	3-in. Class 300
G	4-in. Class 150
H	4-in. Class 300
EN flanges (SST AISI 316) - Flat face	
1	DN 50 PN 16
2	DN 50 PN 40
3	DN 65 PN 16
4	DN 65 PN 40
5	DN 80 PN 16
6	DN 80 PN 40
7	DN 100 PN 16

Table 3. Rosemount 765 Multiple Spot Temperature Sensor with Water Level Sensor Ordering Information

Threaded connection	
0	M33x1.5
Temperature sensor wiring	
4	Four-wire (maximum 10 spot elements)
0	No temperature sensor - water level sensor only
Number of temperature spot elements	
01 to 10	Specify number.
00	No temperature sensor - water level sensor only
Element type	
P	Pt-100
0	No temperature sensor - water level sensor only
Temperature accuracy class	
1	1/6 DIN Class B (IEC/EN60751)
0	No temperature sensor - water level sensor only
Temperature range	
1	0 to +120 °C (+32 to +248 °F)
Lead wires, temperature sensor	
00	Integrated installation with Rosemount 2240S (standard)
04-10	Specify other length in meters.
13-33	Specify other length in feet.
Water level sensor	
C05	Closed, suitable for light products, 500-mm (19.6-in.) range
C10	Closed, suitable for light products, 1000-mm (39.3-in.) range
H05	Open, suitable for crude and heavy duty products, 500-mm (19.6-in.) range
H10	Open, suitable for crude and heavy duty products, 1000-mm (39.3-in.) range

Options – None or multiple selections are possible. Specify in the same order as listed below.

Certificate	
QD	Water level sensor calibration certificate
Q1	Certificate of conformance
Q4	Calibration certificate (Requires option Sensor calibration code X4, X5, X6, X7, or X8)
Q7	Printed copy of hazardous location certificate
Q8	Material certificate EN10204 3.1

Table 3. Rosemount 765 Multiple Spot Temperature Sensor with Water Level Sensor Ordering Information

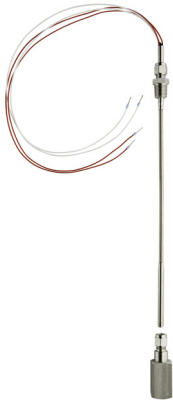
Country-specific hazardous location certification	
I2	INMETRO Intrinsic Safety (Brazil)
I4	Japan Intrinsic Safety
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety
Stabilization weights (SST AISI 304)⁽¹⁾	
AA ⁽²⁾	Anchor weight, 2.0 kg (4.4 lbs), Ø=40; LW=200 mm (Ø=1.6; LW=7.9 in.)
AB ⁽²⁾	Anchor weight, 3 kg (6.6 lbs), Ø=50; LW=200 mm (Ø=2.0; LW=7.9 in.)
AC ⁽²⁾	Anchor weight, 4 kg (8.8 lbs), Ø=45; LW=330 mm (Ø=1.8; LW=13.0 in.)
AD ⁽³⁾	Anchor weight, 5 kg (11 lbs), Ø=100; LW=85 mm (Ø=3.9; LW=3.3 in.)
AE ⁽³⁾	Anchor weight, 10 kg (22 lbs), Ø=95; LW=175 mm (Ø=3.7; LW=6.9 in.)
AF ⁽³⁾	Anchor weight, 15 kg (33 lbs), Ø=140; LW=130 mm (Ø=5.5; LW=5.1 in.)
BA	Top weight, water level sensor, 5 kg (11 lbs), Ø= 80; L=165 mm (Ø=3.15; L=6.5 in.)
Vapor boot⁽¹⁾	
VA	Vapor boot with a 2-in. NPS threaded tank connection
VB	Vapor boot with a 3-in. NPS threaded tank connection
VC	Vapor boot for a 3-in. ANSI Class 150 flange
VD	Vapor boot for a 4-in. ANSI Class 150 flange
VE	Vapor boot for a 6-in. ANSI Class 150 flange
VF	Vapor boot for an 8-in. ANSI Class 150 flange
Hose kit⁽¹⁾	
HA	Hose kit including glands, 3 m (10 ft), ½-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
HB	Hose kit including glands, 10 m (33 ft), ½-in. 14 NPT connection (Cable, galvanized steel, and nickel-plated brass material)
Adapters	
IA	Adapter M33x1.5 female to 1-in. NPT female
IB	Adapter 1-in. NPT female to M33x1.5 male

Table 3. Rosemount 765 Multiple Spot Temperature Sensor with Water Level Sensor Ordering Information

Sensor calibration	
X4 ⁽⁴⁾	Sensor calibration at 0 °C (+32 °F)
X5 ⁽⁴⁾	Sensor calibration at +40 °C (+104 °F)
X6 ⁽⁴⁾	Sensor calibration at +80 °C (+176 °F)
X7 ⁽⁴⁾	Sensor calibration at 0 and +80 °C (+32 and +176 °F)
X8 ⁽⁴⁾	Sensor calibration at 0, +40 and +80 °C (+32, +104 and +176 °F) with Callendar-Van Dusen constants
Extended warranty	
WR3 ⁽⁵⁾	3-year extended warranty
WR5 ⁽⁵⁾	5-year extended warranty
Typical model number:	
0765 M25000 A 3 4 10 P 2 1 00 C05 QD Q8 AA BA VC - temperature sensor positions ⁽⁶⁾	

1. Mutually exclusive options under this category.
2. For still-pipes.
3. For free-hanging.
4. Requires temperature sensor wiring code 4 and option certificate code Q4.
5. Standard warranty is 18 months from delivery.
6. Temperature sensor positions are specified in [Rosemount Tank Gauging System Configuration Data Sheet](#).

Rosemount 614 Cryogenic Spot Temperature Sensor for cool-down and leak detection



- Possible to have dual RTD spot elements
- Up to 300m length
- Can be connected to Rosemount Tank Gauging infrastructure
- Can be used with junction box or cone
- Integrated mounting block
- Mineral insulated

Additional information:

Specifications: [page 22](#)

Certifications: [page 28](#)

Dimensional drawings: [page 33](#)

Table 4. Rosemount 614 Cryogenic Spot Temperature Sensor for Cool-down and Leak Detection Ordering Information

Model	Product description
614	Cryogenic Spot Temperature Sensor for cool-down and leak detection
Overall length (L₀)	
Mxxxxxx	Metric units, xxxxxx in millimeters (mm). Range: 002000-300000 (Specify in steps of 10 millimeters.)
Exxxxxx	U.S. units, xxxxxx in inches (in.). Range 000080-011810 (Longer on request. Specify in steps of 1 inch.)
Number of elements	
S	Single temperature element
D	Dual temperature element
Temperature sensor wiring	
4	Four-wire
3	Three-wire, individual return
Tolerance Class EN 60751	
A ⁽¹⁾	Grade A
B	Grade B
Lead out type	
1	Wired (2240S mounting cone bought separately)
2 ⁽¹⁾	Cable (For Junction Box)
3	Wired with sliding fitting (For junction box with sliding fitting on sensor)
4 ⁽¹⁾	Cable with sliding fitting (For junction box with sliding fitting on sensor)
Lead out length	
00 ⁽²⁾	Standard length 560 mm (22 in.)
XX ⁽³⁾	Non-standard length (1 - 20m (3 - 66 ft.) depending on the chosen measurement unit in position Overall Length)

Flange fitting	
1 ⁽⁴⁾	1/8-in. (3.1-mm) NPT SS ferrule compression fitting
3 ⁽⁵⁾	1/2-in. (12.7-mm) NPT SS ferrule compression fitting
Sensor tip fitting	
0	None
S	Sensor block for sensor fitting

Options – None or multiple selections are possible. Specify in the same order as listed below.

Calibration certificate	
Q4 ⁽⁶⁾	Calibration certificate
Material traceability certificate	
Q8	Material traceability certificate per EN 10204 3.1
Conformance certificate	
Q1	Certificate of conformance
Hazardous location certificate	
Q7	Printed copy of hazardous location certificate
Calibration	
X4 ⁽⁷⁾	Calibration at 0 °C (+32 °F)
X9 ⁽⁷⁾	Calibration at -195°C, -75°C, 0°C and 100°C (-319, -103, 32 and +212 °F) with Callendar-Van Dusen constant
Typical model number: 614 M186400 D 4 A2 00 3S/Q4 X9	

Flanges

Product description	
614-FLNG	Flange for 614
Tank connection	
A	Flange EN 10204 3.1, 6-in. 150Psi
B	Flange EN 10204 3.1, 6-in. 300Psi
C	Flange EN 10204 3.1, 8-in. 150Psi
D	Flange EN 10204 3.1, 8-in. 300Psi
E	Flange EN 10204 3.1, 12-in. 150Psi
F	Flange EN 10204 3.1, 12-in. 300Psi
G	Flange EN 10204 3.1, 16-in. 150Psi
H	Flange EN 10204 3.1, 16-in. 300Psi
I	Flange EN 10204 3.1, 20-in. 150Psi
J	Flange EN 10204 3.1, 20-in. 300Psi
X	Customer-specific, consult factory
Flange fitting	
1	1/8-in. (3.1-mm) NPT SS ferrule compression fitting
3	1/2-in. (12.7-mm) NPT SS ferrule compression fitting
Hole pattern	
C	Conical connection to 2240S
S	Standard
Amount of holes	
XXX	Holes (Refer to Table 7 for maximum amount of holes per flange configuration.)
Typical model number: 614-FLNG D 1 C 016	

- Requires temperature sensor wiring code 4 (four-wire).
- Requires lead out type code 1 (Wired) or 3 (Wired with sliding fitting).
- Requires lead out type code 2 (Cable) or 4 (Cable with sliding fitting).
- Requires lead out type 3 (Wired with sliding fitting) and 4 (Cable with sliding fitting), or lead out type 1 (Wired) and code S (single temperature element).
- Requires lead out type 2 (Cable), or lead out type code 1 (Wired) and number of elements code D (dual temperature element).
- Printed copy. Requires option sensor calibration code X4 or X9.
- Requires temperature sensor wiring code 4 (four-wire) and calibration certificate code Q4.

Specifications

Specifications of Rosemount 565, 566, 765

Elements type

Pt-100 spot elements according to EN 60751 with four-wire design

Accuracy

1/6 DIN Class B (standard)
MST sensor for cryogenic use: DIN Class A
DIN Class A and B are specified in EN 60751

Liquid pressure range

0-4 Bar (0-58 Psi). Designed for atmospheric non-pressurized tanks. Handles liquid pressure from hydrocarbons and petrochemical products equivalent to a level of 40 m (130 ft).

Liquid temperature range

- -50 to +250 °C (-58 to +482 °F)
- -170 to +100 °C (-274 to +212 °F) for cryogenic use

Number of elements

Maximum 16 spot elements, see [Table 5 on page 21](#)

Overall length

Standard is 5-70 m (16.4-230 ft). Maximum 60 m (197 ft) for Rosemount 765. Other lengths on request.

Protective sheath

Stainless steel, AISI 316. Wall thickness 0.3 mm (0.012 in.).
Ø= 1 in.

Top fitting/mounting thread

Steel pipe with M33 x 1.5.
Thread length 257 mm (10.12 in.)

Tank opening

Minimum Ø= 2 in. (50.8 mm)

Wire insulation

Sensor type	Insulation
Rosemount 565 (-50 to +120 °C)	ETFE
Rosemount 565 (-20 to +250 °C)	PTFE
Rosemount 566	PTFE (lead out wire is ETFE)
Rosemount 765	ETFE

Flange (option)

1½ to 4 in. (38.1 to 101.6 mm) according to standards, stainless steel (AISI 316)

Immersed material

Stainless steel (AISI 316)
Bottom weights - Stainless steel (AISI 304)

Lead wire length

0.4 m (16 in.) is standard for integrated installation with Rosemount 2240S Temperature Transmitter.
Longer wires up to 10 m (32.8 ft) are available as an option.

Number of wires

- Four independent wires per element

Bottom weight

2 - 15 kg (4.4 to 31.1 lbs), stainless steel (AISI 304)

Minimum distance from the bottom of the sensor to the first spot element

150 mm (5.9 in.)

Minimum distance from the top of the sensor to the uppermost spot element

850 mm (33.5 in.)

Ingress protection

IP 68⁽¹⁾

1. Ingress protection only applies when the sensor is attached to the Rosemount 2240S.

Table 5. Number of Elements (Rosemount 565, 566, 765)

Sensor type ⁽¹⁾	Temperature range (PT-100)	Conductors	Maximum number of spot elements
Rosemount 565	-50 to +120 °C (-58 to +248 °F) or -20 to +250 °C (-4 to +482 °F)	Four-wire, individual wiring ⁽²⁾	16
Rosemount 566	-170 to +100 °C (-274 to +212 °F)	Four-wire, individual wiring ⁽²⁾	16
Rosemount 765	-50 to +120 °C (-58 to +248 °F)	Four-wire, individual wiring ⁽²⁾	10

1. All types have Pt-100 spot elements. Protective sheath made of stainless steel (AISI 316). Maximum 70 m (230 ft) length.
2. Wire diameter is AWG 24 (0.24 mm²).

Specifications of the Rosemount 765's WLS

Open model

Recommended for crude oil and heavy duty products

Closed model

Recommended for lighter fuels such as diesel oil

Active measuring range

500 mm (20 in.), 1000 mm (40 in.)

Output

High-speed RS485/Modbus communication with Rosemount 2240S

Accuracy

± 2 mm (±0.08 in.) [500 mm active length]
± 4 mm (±0.16 in.) [1000 mm active length]

Repeatability

± 0.5 mm (0.02 in.)

Measuring principle

Capacitive

Calibration

Zero to full range factory calibration, and on-tank calibration possibility

Storage temperature

-40 to +80 °C (-40 to +180 °F)

Operating temperature

0 to +120 °C (+32 to +250 °F). Maximum temperature at mounting flange is +80 °C (+180 °F)

Operating pressure

0-4 bar (0-58 Psi). Designed for atmospheric non-pressurized tanks. Handles liquid pressure from hydrocarbons and petrochemical products equivalent to a level of 40 m (130 ft).

Mechanical dimensions

Connection thread M33x1.5 mm

Immersed material

Stainless steel (AISI 316), FEP, PTFE, and PEEK with 30% glass

Length of water level sensor

Active length + 140 mm (5.5 in.)

Outer diameter of water level sensor

Closed: Ø=38 mm (1.5 in.)
Open: Ø=48 mm (1.9 in.)

Specifications of Rosemount 614

Element Type

Pt-100 spot elements according to EN 60751

Accuracy

- Grade A: $\pm (0.15 + 0.002 * |t|)$ °C
- Grade B: $\pm (0.30 + 0.005 * |t|)$ °C
- Calibrated: ± 0.02 °C (± 0.036 °F)

Liquid pressure range

≤ 50 bar

Liquid temperature range

-200 to +100 °C (-328 to +212 °F)

Number of elements

Single or dual elements

Overall length

Maximum 300 m (984 ft)

Protective sheath

Ø 4.5-mm (0.18-in) AISI 316L filled with compressed magnesium oxide powder

Flange fittings

Fixed or sliding 1/8-in. NPT or 1/2-in. NPT depending on configuration

Immersed material

Stainless steel (AISI 316L)

Maximum tightening torque

- NPT fitting: 16 Nm
- Compression nut: 16 Nm

Sensor tip

Ø 6mm (0.24 in) AISI 316L

Lead out diameter

- Wired: 4 or 8 mm
- Cable: 6.9 or 9.4 mm

Table of dependencies

- See [Table 6](#) and [Table 7](#).

Accessories

- Cone for Rosemount 2240S connection: drawing no. 9261085-039
- Flange example: drawing no. 9261085-092
- Junction box: Consult factory.

Table 6. Lead out Dependencies

Number of elements												
Single	X	X	X	X					X	X		
Dual					X	X	X	X			X	X
Temperature Sensor Wiring												
Four-wire	X	X			X	X			X	X	X	X
Three-wire			X	X			X	X				
Lead out type												
Wired	X		X		X		X					
Wired with sliding fitting		X		X		X		X				
Cable									X		X	
Cable with sliding fitting										X		X
Steel lead out⁽¹⁾	6 (0,25)	6 (0,25)	6 (0,25)	6 (0,25)	10 (0,4)	10 (0,4)	10 (0,4)	10 (0,4)	10 (0,4)	10 (0,4)	12 (0,45)	12 (0,45)
Fixed fitting (NPT)	1/8 in.	-	1/8 in.	-	1/2 in.	-	1/2 in.	-	1/2 in.	-	1/2 in.	-
Sliding fitting (NPT)	-	1/8 in.	-	1/8 in.	-	1/8 in.	-	1/8 in.	-	1/8 in.	-	1/8 in.

1. Dimensions are in millimeters (inches).

Table 7. Maximum Amount of Sensor Openings per Flange Configuration

Standard flange	Maximum number of 1/8-in. NPT sensors	Maximum number of 1/2-in. NPT sensors
6-in. 150/300 with JB	24	10
6-in. 150/300 with Cone	16	8
8-in. 150/300 with JB	36	18
8-in. 150/300 with Cone	16	8
12-in. 150/300 with JB	64	40
12-in. 150/300 with Cone	16	8
16-in. 150/300 with JB	106	62
16-in. 150/300 with Cone ⁽¹⁾	16	8
20-in. 150/300 with JB	166	100
20-in. 150/300 with Cone ⁽¹⁾	16	8

1. The maximum number of sensors is per cone, large flanges can fit two cones on the same flange.

Functional specification

Thermometer characteristics

In IEC/EN 60751 and ASTM E1137, the relationship between resistance and temperature is defined. Two classes are stated for resistance thermometer tolerances (t is the temperature in °C):

- Class A: $\pm (0.15 + 0.002 * |t|)$
- Class B: $\pm (0.30 + 0.005 * |t|)$

When Classes A and B are not sufficient, suppliers often deliver improved sensor versions; 1/5, 1/6 and 1/10 of Class B –slightly better than Class A.

The temperature sensors supplied by Emerson contain elements made from a very pure platinum material. Combined with a four-wire design to eliminate wire influence, the result is predictable and stable characteristics for very accurate temperature measurement. The tolerance is even better than the standard states.

Class B delivered by Emerson is better than the standard:
1/6 DIN B: $\pm (0.05 + 0.002 * |t|)$

Unique automated factory calibration procedure for Rosemount 565, 765, and 566

When measuring temperature by using PT-100 (platinum) elements, there are two major factors that affect the accuracy:

- Differences in wire/connection resistance
- PT-100 element temperature related influence $\Omega / ^\circ\text{C}$

Deviations deriving from the PT-100 element itself are very repeatable and can be eliminated with a standard manufacturing calibration procedure, where the Callendar – Van Dusen equation is used. The resistance $R(t)$ at a temperature t in the temperature range -200°C to 850°C is given by:

$$R(t) = R_0 * (1 + A * t + B * t^2 + C * (t-100) * t^3)$$

where R_0 is the resistance at 0°C and A, B, and C are coefficients. For $t > 0^\circ\text{C}$ the C coefficient equals zero. Standard coefficients can be found in EN60751.

Sensors can be calibrated at three or four temperatures and the coefficients can be individually calculated. The more accurate the calibration equipment the more accurate the coefficients. For practical reasons the sensors are calibrated by comparing them with very precise, traceable, and certified reference thermometers in three 500-liter liquid baths at 0°C , 40°C , and 80°C ($+32$, $+104$ and $+176$ °F) using high-precision instruments. The whole process is computer-controlled and up to 16 elements in each tube are automatically calibrated at the same time.

After calibration, the calculated Callendar – Van Dusen coefficients are included in the calibration certificate. These values can then be entered into the Rosemount 2240S Temperature Transmitter via Rosemount TankMaster for superior accuracy, approximately $\pm 0.025^\circ\text{C}$ ($\pm 0.045^\circ\text{F}$), which is about ten times better than without calibration.

See [Table 8](#) for accuracy comparison between standard and calibrated Rosemount 565s and 765s and [Table 9](#) for an accuracy comparison between standard and calibrated Rosemount 566s. See [Table 10](#) for the effect on Net Standard Volume calculations.

Figure 1. Calibration Station for Accurate State-of-the-Art Sensor Elements



Table 8. Temperature Accuracy for Rosemount 565 or 765

	Cable 20 m	PT-100 [-40 °C (-40 °F)]	PT-100 [70 °C (158 °F)]	Total sensor accuracy [0-70 °C (32 - 158 °F)] ⁽¹⁾
Four-wire connection, 1/6 DIN B	± 0.001 °C (± 0.002 °F)	± 0.13 °C (± 0.234 °F)	± 0.19 °C (± 0.342 °F)	± 0.19 °C (± 0.342 °F)
Four-wire connection, calibrated	± 0.001 °C (± 0.002 °F)	± 0.045 °C ⁽²⁾ (± 0.081 °F)	± 0.025 °C (± 0.045 °F)	± 0.025 °C (± 0.045 °F)

1. Root Mean Square values for wiring error and the largest platinum element error for the given range.
2. X8 calibration extrapolated under use of standard Callendar-Van Dusen C constant from EN 60751.

Table 9. Temperature Accuracy for Rosemount 566

	Cable 20 m	PT-100 [-170 °C (-274 °F)]	PT-100 [40 °C (104 °F)]	PT-100 [100 °C (212 °F)]	Total sensor accuracy [-170 to +100 °C (-274 to 212 °F)] ⁽¹⁾
Four-wire connection, DIN A	± 0.001 °C (± 0.002 °F)	± 0.49 °C (± 0.882 °F)	± 0.23 °C (± 0.414 °F)	± 0.35 °C (± 0.63 °F)	± 0.49 °C (± 0.882 °F)
Four-wire connection, calibrated	± 0.001 °C (± 0.002 °F)	± 0.1 °C ⁽²⁾ (± 0.18 °F)	± 0.025 °C (± 0.045 °F)	± 0.025 °C (± 0.045 °F)	± 0.1 °C ⁽²⁾ (± 0.18 °F)

1. Root Mean Square values for wiring error and the largest platinum element error for the given range.
2. X8 calibration extrapolated under use of standard Callendar-Van Dusen C constant from EN 60751.

Table 10. Net Standard Volume (NSV) Uncertainty in a Tank with a Radius of 20 m (66 ft) and a Level of 18.5 m (60.7 ft)

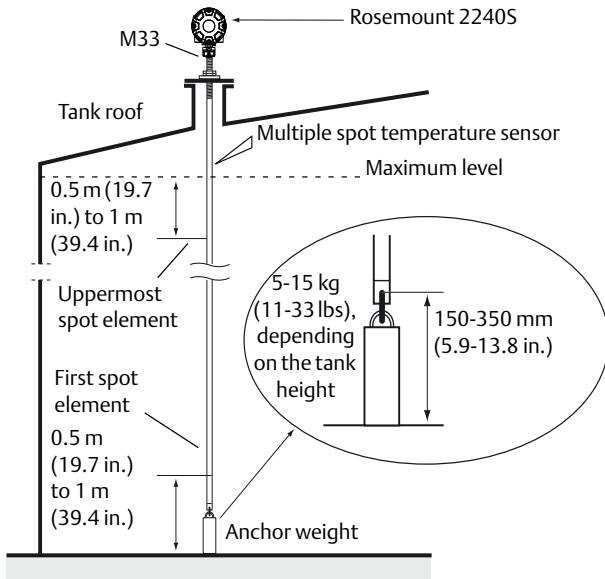
	Total accuracy [0 to +70 °C (32 to +158 °F)]	NSV uncertainty in a 20 m (66 ft) tank and a level at 18.5 m (60.7 ft)
Four-wire connection, 1/6 DIN B	± 0.19 °C (± 0.342 °F)	3.8 m ³ (23.9 bbl)
Four-wire connection, calibrated	± 0.025 °C (± 0.081 °F)	0.5 m ³ (3.1 bbl)

Physical specifications

Fixed roof tanks

The sensor is attached to a flange mounted on a suitable nozzle. The multiple spot temperature sensor can be equipped with 16 spot elements.

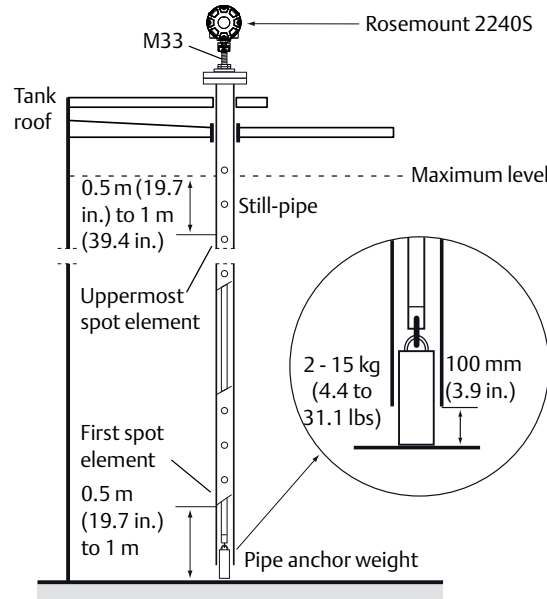
Figure 2. Temperature Sensor Mounted on a Nozzle



Floating roof tanks

The sensor can be installed in a still-pipe.

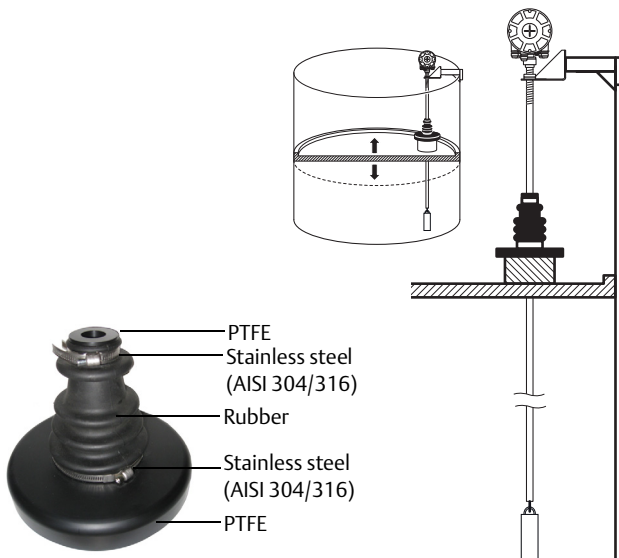
Figure 4. Temperature Sensor Installed in a Still-Pipe



Vapor boot

A vapor boot is used to guide and protect the multiple spot temperature sensor if installed on a floating roof tank.

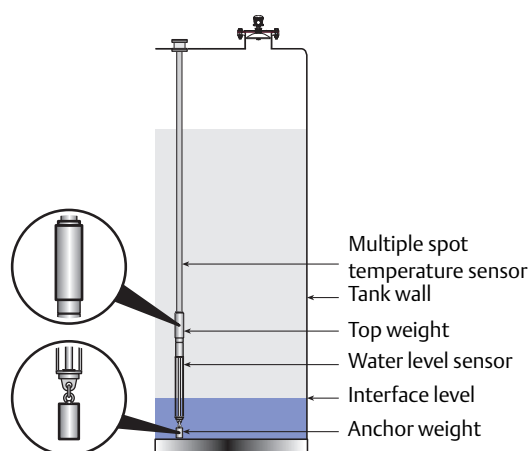
Figure 3. Temperature Sensor with Vapor Boot Mounted on Floating Roof



Weight

An anchor weight can be used for any of the Rosemount 565/566/765 sensors to keep it in position. It can alternatively be clamped to the tank bottom. For Rosemount 765, a weight can be mounted in the bottom eye bolt and/or above the water level sensor, in which case the weight is hollow and fitted on the temperature sensor. The eye bolt can be removed for close bottom measurements.

Figure 5. Top and Anchor Weights Mounted on Rosemount 765



**Open and closed water level sensor versions
(Rosemount 765)**

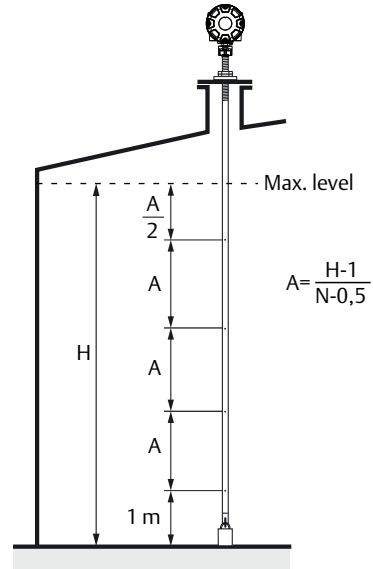
The Rosemount 765 sensor is available in two versions, open and closed. The open version is suitable for crude oil applications and the closed version is suitable for lighter fuels such as diesel oil, etc. See [Figure 9 on page 32](#).

**Temperature sensor positions
(Rosemount 565, 566)**

API chapter 7 recommends minimum one element per 10 feet (3 m) tank height for custody transfer applications. See [Figure 6 on page 27](#) for API's recommendations.

The sensor should be positioned at least 1 m (3ft) from tank shell, inlets, and outlets to avoid a misrepresentation of the average, caused by ambient temperature effects.

Figure 6. Temperature Sensor Positions



Recommended temperature sensor positions for custody transfer according to API. Example: 4 spot elements, H=8 m. A=2 m

Product certifications

Special conditions for safe use (x)

The WLS and the RTDs are intrinsically safe circuits. At connection facilities the requirements in clause 6.2.1 in EN 60079-11 for separation between intrinsically safe circuits and possibly non-intrinsically safe circuits shall be strictly followed.

The WLS and the RTDs are two separate intrinsically safe circuits. They must not be interconnected and the requirements for separation listed in clause 6.2.1 in EN 60079-11 shall be followed.

Terminating and connecting the WLS cable and the wires from the RTDs, requirements in the local installation codes shall be followed.

Connecting WLS and junction box adequate the strain relief shall be provided.

To avoid the effects of process temperature and other thermal effects, care shall be taken to ensure that the temperature at the mounting flange does not exceed 70 °C.⁽⁴⁾

Declaration of conformity

Designed according to EN 60751. Accuracy approved by PTB.

- ISO 15156-06-2009 (NACE MR0175) for all wetted parts

CE-mark

- ATEX directive 94/9/EC
- Low voltage directive (LVD): 2006/95/EC
- EMC directive: 2004/108 EC

European ATEX directive information

EC-Type Examination Certificate Number: FM08ATEX0060X

Control drawing: 800-9020-FM

Rosemount 765

II 1 G Ex ia IIC T4/T6⁽¹⁾

Temperature element parameters: $U_i=7.2$ VDC, $I_i=400$ mA,

$P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

Communication/transmitter parameters: $U_i=7.2$ VDC,

$I_i=250$ mA,

$P_i=700$ mW, $L_i=130$ μH, $C_i=0$ nF

Rosemount 565

II 1 G Ex ia IIC T2/T4⁽²⁾

$U_i=7.2$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

1. Above flange: T6: $-50\text{ °C} \leq T_a \leq +70\text{ °C}$
Below flange: T4: $-50\text{ °C} \leq T_a \leq +120\text{ °C}$

Rosemount 566

II 1 G Ex ia IIC T5⁽³⁾

$U_i=7.2$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

Rosemount 614

EC-Type Examination Certificate Number: FM13ATEX0019X

Control drawing: 800-MNS-EX

II 1 G Ex ia IIC T6⁽⁴⁾

$U_i=9.6$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

US Factory Mutual (FM-US) certification

Certificate of compliance: 3032389

Control drawing: 800-9020-FM

Rosemount 765

Intrinsically safe for Class I, Division 1, Groups A, B, C, and D and Class I, Zone 0 Group IIC hazardous locations; Temperature class T4 below the flange at an ambient temperature range of $-50\text{ °C} \leq T_a \leq +120\text{ °C}$, and T6 above the flange at an ambient temperature range of $-50\text{ °C} \leq T_a \leq +70\text{ °C}$.

Temperature element parameters: $U_i=7.2$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

Communication/transmitter parameters: $U_i=7.2$ VDC, $I_i=250$ mA, $P_i=700$ mW, $L_i=130$ μH, $C_i=0$ nF

Rosemount 565

Intrinsically safe for Class I, Division 1, Groups A, B, C, and D and Class I, Zone 0 Group IIC hazardous locations;

Temperature class as indicated⁽²⁾

$U_i=7.2$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

Rosemount 566

Intrinsically safe for Class I, Division 1, Groups A, B, C, and D and Class I, Zone 0 Group IIC hazardous locations;

Temperature class as indicated⁽³⁾

$U_i=7.2$ VDC, $I_i=400$ mA, $P_i=700$ mW, $L_i=40$ μH, $C_i=500$ nF

2. Above flange: T2: $-50\text{ °C} \leq T \leq +70\text{ °C}$
Below flange: $-50\text{ °C} \leq T \leq +250\text{ °C}$
Above flange: T4: $-50\text{ °C} \leq T \leq +70\text{ °C}$
Below flange: $-50\text{ °C} \leq T \leq +130\text{ °C}$
3. Above flange: T5: $-50\text{ °C} \leq T \leq +70\text{ °C}$
Below flange: $-200\text{ °C} \leq T \leq +95\text{ °C}$
4. Above flange: T6: $-50\text{ °C} \leq T_a \leq +70\text{ °C}$
Below flange: T4: $-200\text{ °C} \leq T_a \leq +100\text{ °C}$

Canadian Factory Mutual (FM-C) certification

Certificate of compliance: 3032389C

Control drawing: 800-9020-FM

Rosemount 765

Intrinsically safe for Class I, Zone 0, Group IIC hazardous locations;
 Temperature class T4 below the flange at an ambient temperature range of $-50\text{ }^{\circ}\text{C} \leq T_a \leq +120\text{ }^{\circ}\text{C}$, and T6 above the flange at an ambient temperature range of $-50\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$.

Temperature element parameters: $U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$
 Communication/transmitter parameters: $U_i=7.2\text{ VDC}$, $I_i=250\text{ mA}$, $P_i=700\text{ mW}$, $L_i=130\text{ }\mu\text{H}$, $C_i=0\text{ nF}$

Rosemount 565

Intrinsically safe for Class I, Zone 0 Group IIC hazardous locations;
 Temperature class as indicated⁽²⁾
 $U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$

Rosemount 566

Intrinsically safe for Class I, Zone 0 Group IIC hazardous locations;
 Temperature class as indicated⁽³⁾
 $U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$

IECEX certification

Certification of conformity number: IECEX FME 08.0007X

Control drawing: 800-9020-FM

Rosemount 765Ex ia IIC T4/T6⁽¹⁾

Temperature element parameters: $U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$
 Communication/transmitter parameters: $U_i=7.2\text{ VDC}$, $I_i=250\text{ mA}$, $P_i=700\text{ mW}$, $L_i=130\text{ }\mu\text{H}$, $C_i=0\text{ nF}$

Rosemount 565Ex ia IIC T2/T4⁽²⁾

$U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$

Rosemount 566II 1 G Ex ia IIC T5⁽³⁾

$U_i=7.2\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$

Rosemount 614

Certification of conformity number: IECEX FME 13.0003X

Control drawing: 800-MNS-EX

Ex ia IIC T4

$U_i=9.6\text{ VDC}$, $I_i=400\text{ mA}$, $P_i=700\text{ mW}$, $L_i=40\text{ }\mu\text{H}$, $C_i=500\text{ nF}$

-
1. Above flange: T6: $-50\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
 Below flange: T4: $-50\text{ }^{\circ}\text{C} \leq T_a \leq +120\text{ }^{\circ}\text{C}$
 2. Above flange: T2: $-50\text{ }^{\circ}\text{C} \leq T \leq +70\text{ }^{\circ}\text{C}$
 Below flange: $-50\text{ }^{\circ}\text{C} \leq T \leq +250\text{ }^{\circ}\text{C}$
 Above flange: T4: $-50\text{ }^{\circ}\text{C} \leq T \leq +70\text{ }^{\circ}\text{C}$
 Below flange: $-50\text{ }^{\circ}\text{C} \leq T \leq +130\text{ }^{\circ}\text{C}$
 3. Above flange: T5: $-50\text{ }^{\circ}\text{C} \leq T \leq +70\text{ }^{\circ}\text{C}$
 Below flange: $-200\text{ }^{\circ}\text{C} \leq T \leq +95\text{ }^{\circ}\text{C}$

Dimensional drawings

Figure 7. Rosemount 565 Multiple Spot Temperature Sensor Dimensions

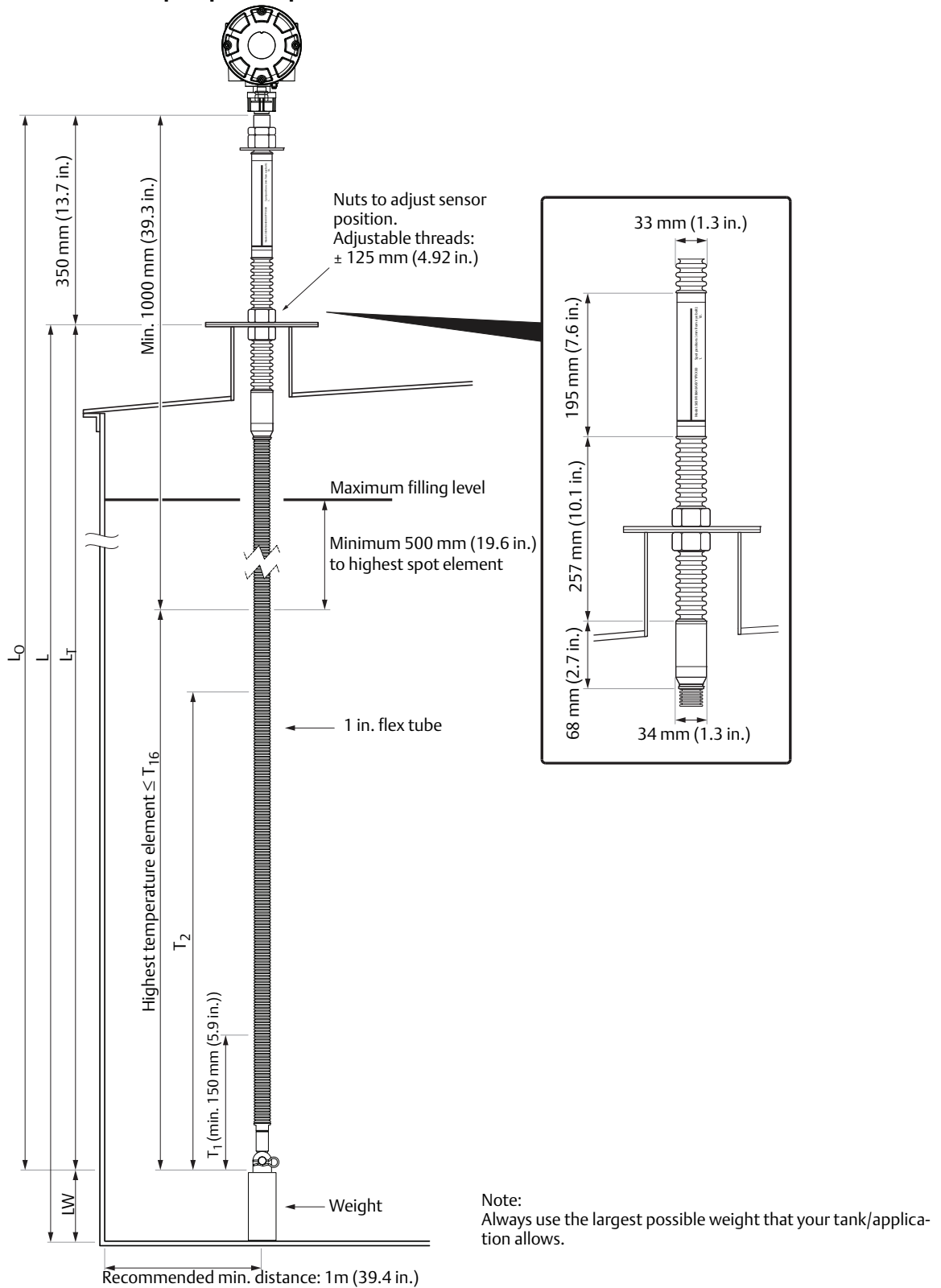


Figure 8. Rosemount 566 Multiple Spot Temperature Sensor for Cryogenic Use (NL-Cryo) Dimensions

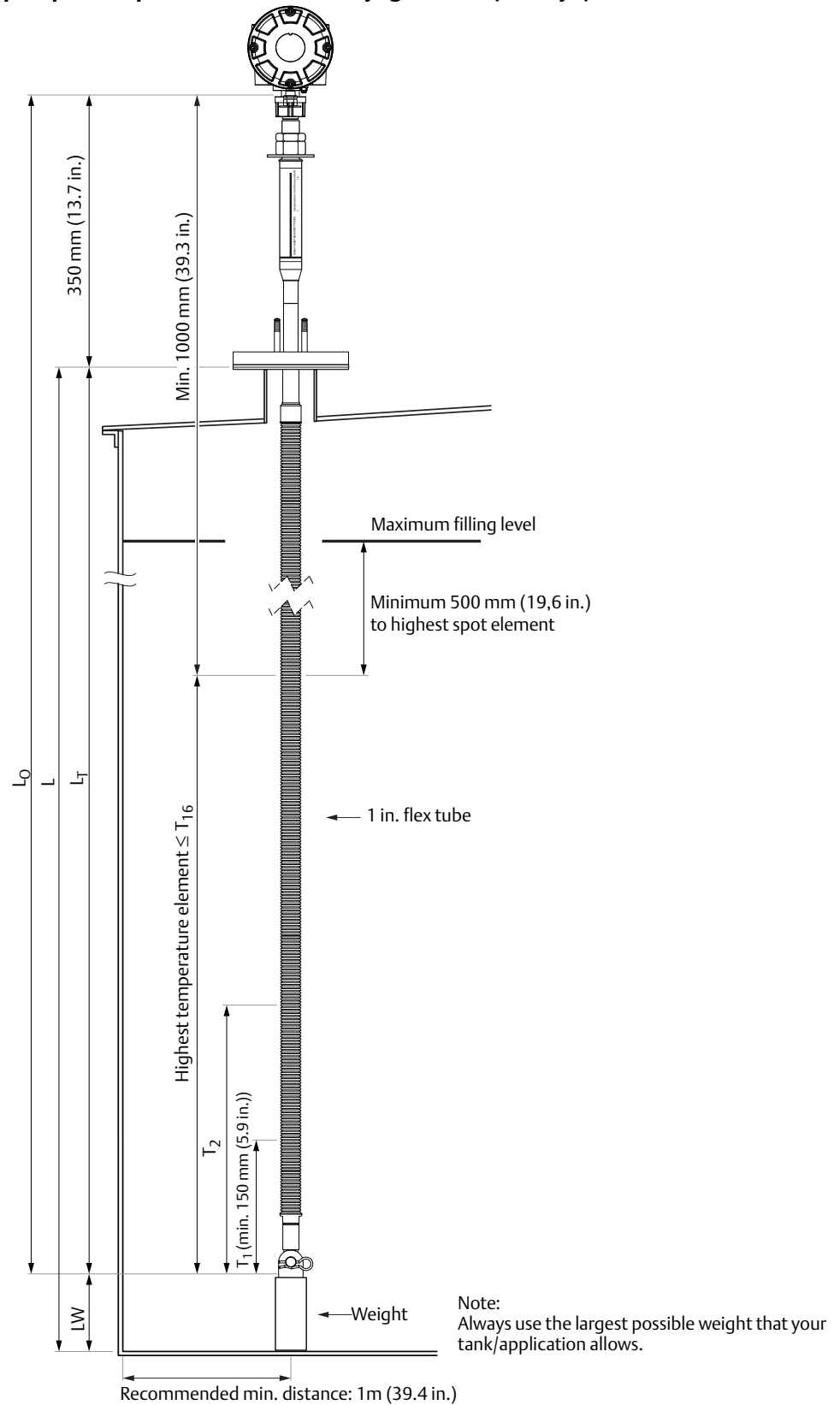


Figure 9. Rosemount 765 Multiple Spot Temperature Sensor with Water Level Sensor Dimensions

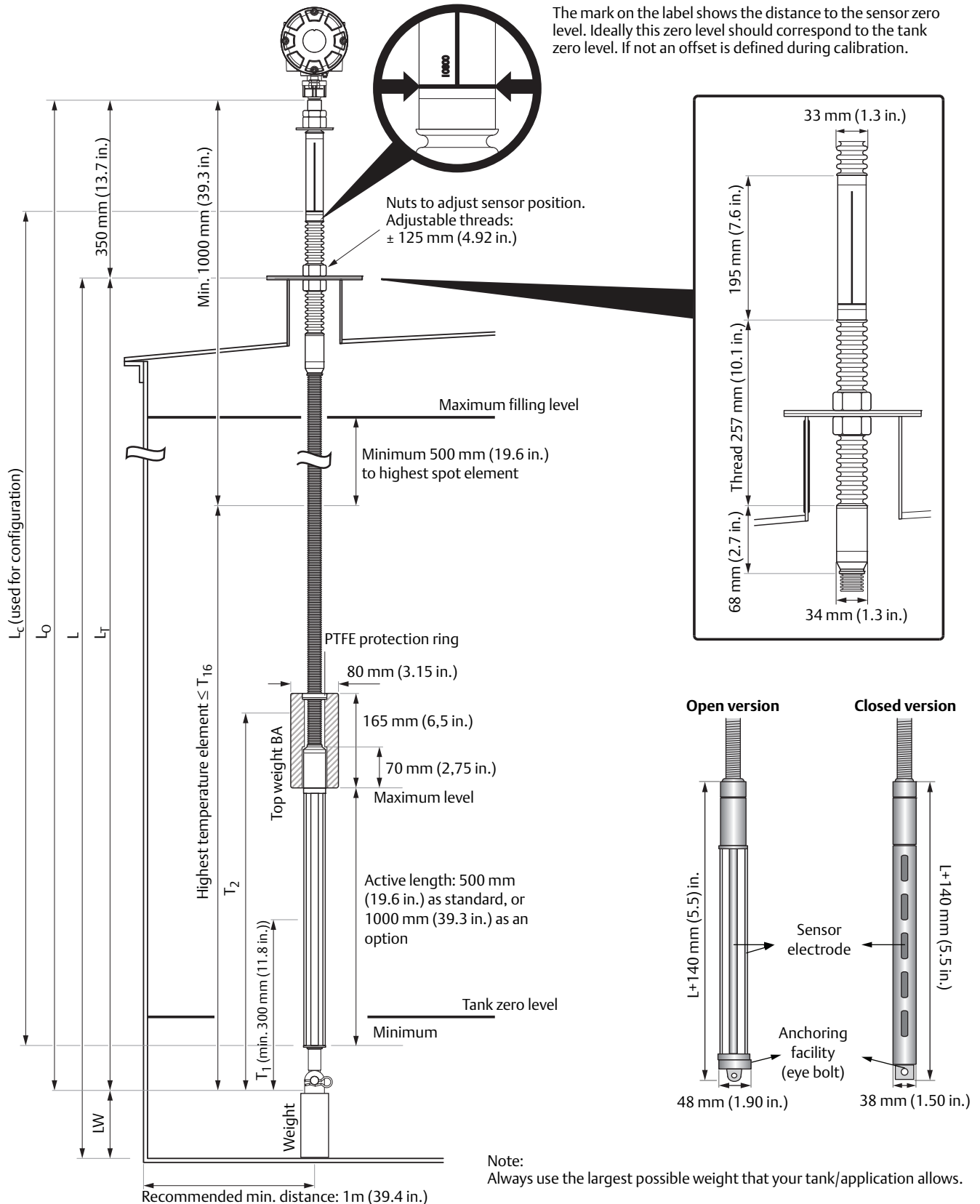


Figure 10. Rosemount 614 Cryogenic Spot Temperature Sensor with Wired Lead Out and Fixed Flange Fitting

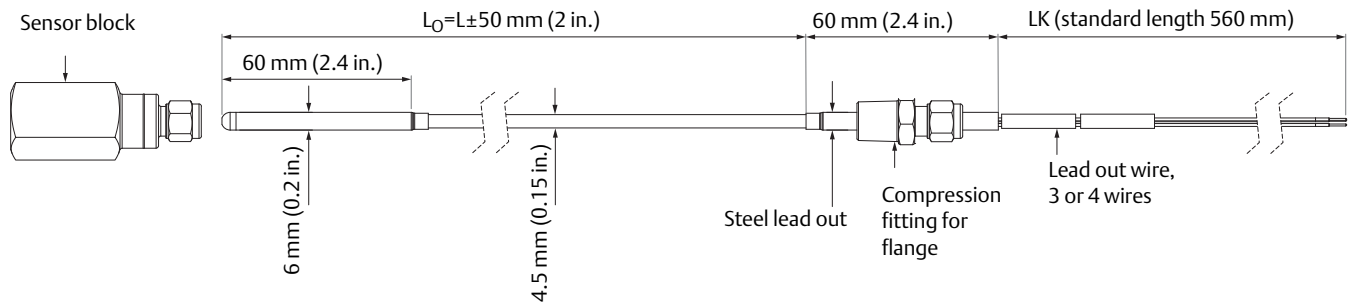


Figure 11. Rosemount 614 Cryogenic Spot Temperature Sensor with Wired Lead Out and Sliding Flange Fitting

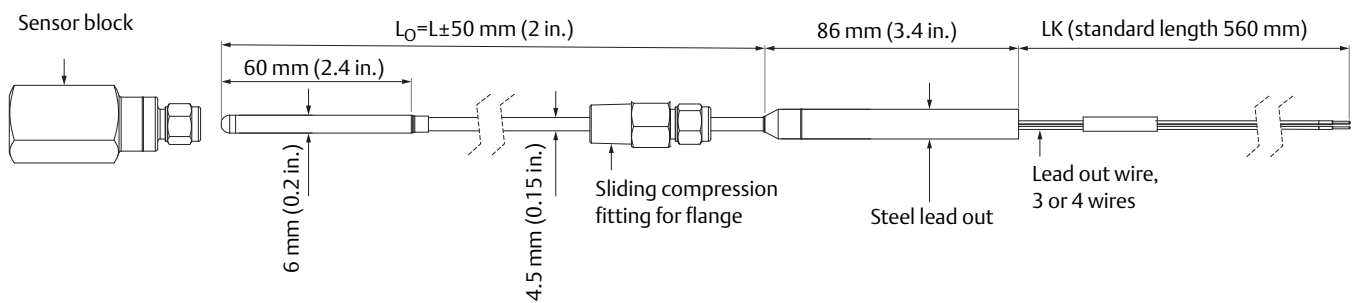


Figure 12. Rosemount 614 Cryogenic Spot Temperature Sensor with Cable Lead Out and Fixed Flange Fitting

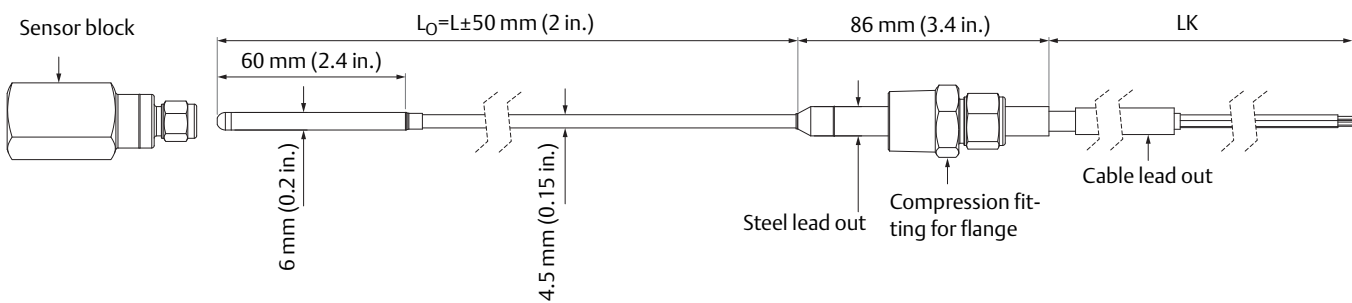


Figure 13. Rosemount 614 Cryogenic Spot Temperature Sensor with Cable Lead Out and Sliding Flange Fitting

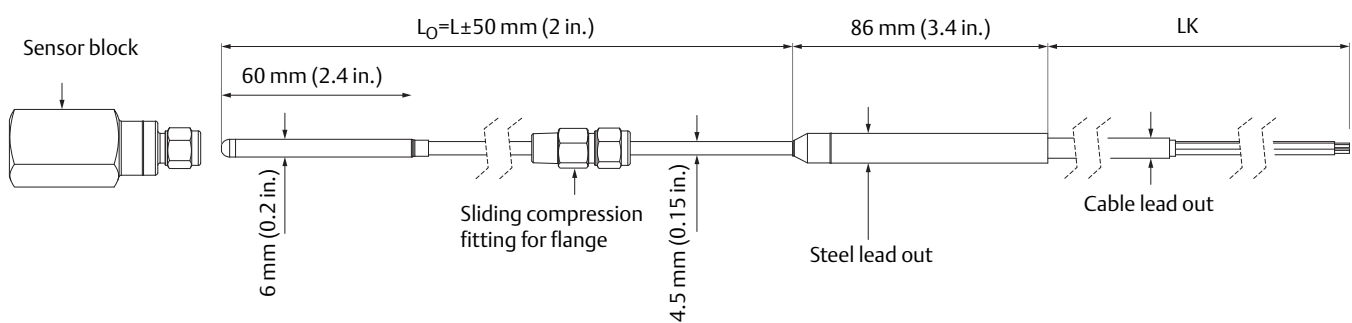


Figure 14. Modular Weights for 2-in. Still-Pipes

Note: Only applicable for Rosemount 565.

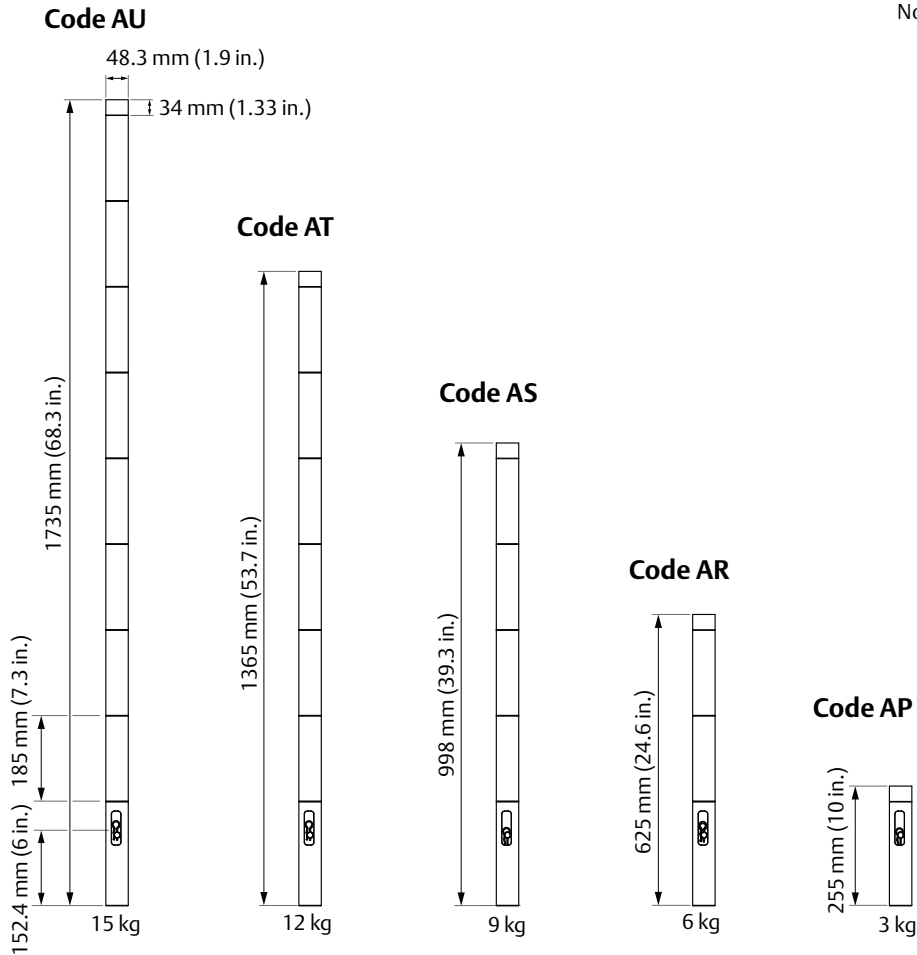
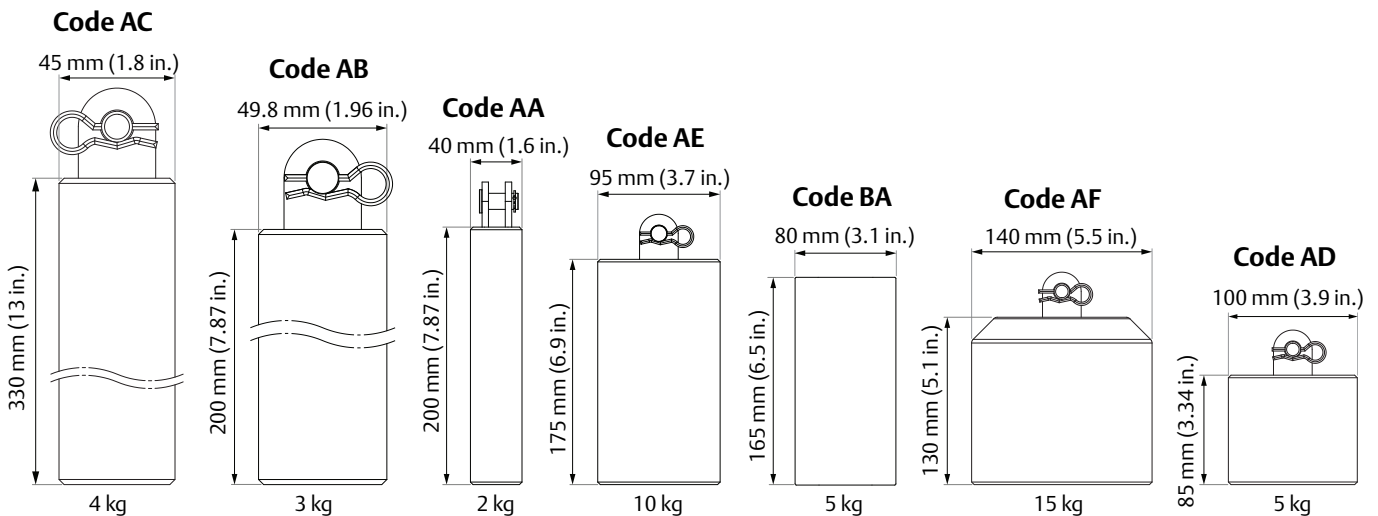


Figure 15. Standard Weights

Note: Option BA is only applicable for Rosemount 765.



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