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## Overview

SITRANS LR250 with flanged encapsulated antenna is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 20 m (66 ft) (antenna dependent).

## Benefits

- Fully encapsulated horn antenna design with FDA approved TFM 1600 PTFE lens for use in chemical and sanitary environments where aggressive and corrosive materials are used
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 50 mm (2 inch) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- Suitable for API 2350

## Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using Quick Start Wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

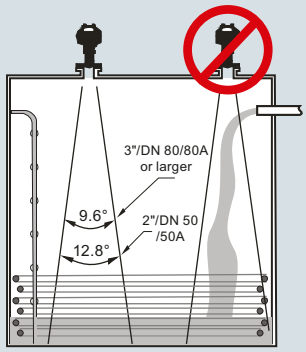
SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with dk > 1.6.

- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 170 °C (338 °F), corrosive and aggressive materials and applications where ease of cleaning is required such as food or fine chemicals

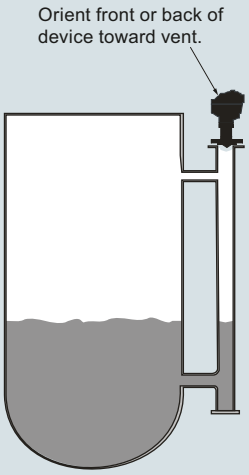
## Configuration

**Installation**

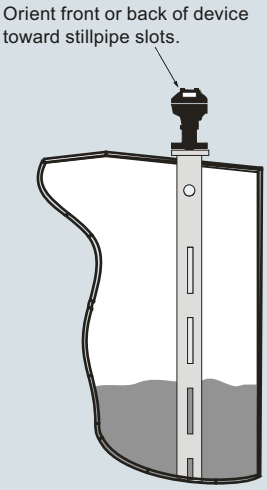
**Note:**
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



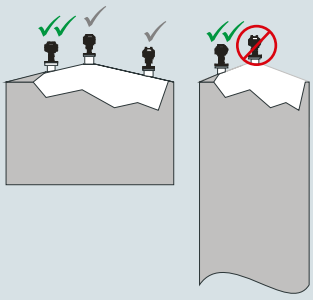

**Mounting on bypass**



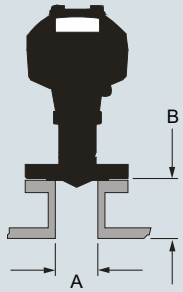

**Mounting on stilling well**




**Mounting on vessel**



**Mounting on a nozzle**




| A | B* |
|---|---|
| ø 50 (2) | 500 (20) max. |
| ø 80 (3) | 500 (20) max. |
| ø 100 (4) | 500 (20) max. |
| ø 150 (6) | 500 (20) max. |

*Reference conditions

SITRANS LR250 Flanged Encapsulated Antenna installation, dimensions in mm (inch)



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## SITRANS LR250 Flanged Encapsulated Antenna

### Technical specifications

| | |
|---|---|
| **Mode of operation** | |
| Measuring principle | Radar level measurement |
| Frequency | K-band (25.0 GHz) |
| Minimum measuring range | 50 mm (2 inch) from end of antenna |
| Maximum measuring range | 20 m (66 ft) |
| **Output** | |
| HART | Version 5.1 |
| • Analog output | 4 ... 20 mA |
| • Accuracy | ± 0.02 mA |
| • Fail-safe | • Programmable as high low or hold (loss of echo)<br>• NE 43 programmable |
| PROFIBUS PA | Profile 3.01 |
| • Function blocks | 2 Analog Input (AI) |
| FOUNDATION Fieldbus | H1 |
| • Functionality | Basic or LAS |
| • Version | ITK 5.2.0 |
| • Function blocks | 2 Analog Input (AI) |
| **Performance (according to reference conditions IEC60770-1)** | |
| Maximum measured error | • > 500 mm from sensor reference point: 3 mm (0.118 inch)<br>• < 500 mm from sensor reference point: 25 mm (1 inch) |
| Influence of ambient temperature | < 0.003 %/K |
| **Rated operating conditions** | |
| Installation conditions | |
| • Location | Indoor/outdoor |
| Ambient conditions (enclosure) | |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Installation category | I |
| • Pollution degree | 4 |
| **Medium conditions** | |
| Dielectric constant $\varepsilon_r$ | ≥ 1.6 (antenna dependent) |
| Process temperature | -40 ... +170 °C (-40 ... +338 °F) at process connection |
| Process pressure | See Pressure/Temperature curves for more information (page 4/233) |
| **Design** | |
| Enclosure | |
| • Material | Aluminum, polyester powder-coated |
| • Cable inlet | 2 x M20 x 1.5 or 2 x ½" NPT |
| Degree of protection | Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 |
| Weight (dependent on process connection) | • Approx. 7 kg (15.43 lb) for 2" Class 150 ASME B16.5 raised face flange (smallest size)<br>• Approx. 17.7 kg (39.02 lb) for 6" Class 150 ASME B16.5 raised face flange (largest size) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile display |
| Antenna | |
| • Material | Stainless Steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part) |
| • Dimensions (nominal sizes) | 48 mm (2 inch), 80 mm (3 inch), 100 mm (4 inch), 150 mm (6 inch) |
| **Process connections** | |
| Flanged connection | Raised Face<br>• 2, 3, 4, 6" Class 150 ASME B16.5<br>• 50A, 80A, 100A, 150A 10K JIS B 2220<br>• DN 50, DN 80, DN 100 & DN 150 PN 10/16 EN 1092-1 type B1 |

| | |
|---|---|
| **Power supply** | |
| 4 ... 20 mA/HART | Nominal 24 V DC (max. 30 V DC) with max. 550 Ω |
| PROFIBUS PA | • 15 mA<br>• Per IEC 61158-2 |
| FOUNDATION Fieldbus | • 20.0 mA<br>• Per IEC 61158-2 |
| **Certificates and approvals** | |
| General | $CSA_{US/C}$, CE, FM, RCM |
| Radio | FCC, Industry Canada, RED, RCM |
| Hazardous | |
| • Explosion Proof (Brazil) | INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Increased Safety (Brazil) | INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Intrinsically Safe (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Non-incendive (Canada/USA) | CSA/FM Class I, Div. 2, Groups A, B, C, D T5 |
| • Flame Proof/Increased Safety (China) | NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C |
| • Intrinsically Safe (China) | NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C |
| • Non-sparking/Energy Limited (China) | NEPSI Ex nA IIC T4 Gc |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 Ga<br>ATEX II 1D Ex ia ta IIIC T100 °C Da |
| • Non-sparking/Energy Limited (Europe) | ATEX II 3G Ex nA IIC T4 Gc |
| • Flame Proof (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da |
| • Increased Safety (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (International) | IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Russia/Kazakhstan) | EAC Ex d |
| • Increased Safety (Russia/Kazakhstan) | EAC Ex e |
| • Intrinsically Safe (Russia/Kazakhstan) | EAC Ex ia |
| • Marine | • Lloyd's Register of Shipping<br>• ABS Type Approval<br>• Bureau Veritas |
| • Functional Safety | SIL-2 suitable in accordance with IEC 61508/61511 |
| **Programming** | |
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld-programmer | IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C $T_a$ = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 $T_a$ = 50 °C IECEx SIR 09.0073 |
| Handheld communicator | HART communicator 375/475 |
| PC | • SIMATIC PDM<br>• Emerson AMS<br>• SITRANS DTM (for connection into FDT such as PACTware or Fieldcare) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile displays |

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## Selection and ordering data

| | Article No. |
|---|---|
| **SITRANS LR250 Radar level transmitter with encapsulated horn and PTFE lens** ↗ | **7ML5432-** |
| Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries in the chemical industry. | ■■■■0-■■■■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Process Connection Material** | |
| Stainless steel 1.4404/1.4435 | **0** |
| **Process Connection Type** | |
| Flanged Process Connection Types (stainless steel 1.4404/1.4435) | |
| 2" Class 150 ASME B16.5 raised face[1] | **BF** |
| 3" Class 150 ASME B16.5 raised face | **BG** |
| 4" Class 150 ASME B16.5 raised face | **BH** |
| 6" Class 150 ASME B16.5 raised face | **BJ** |
| 50A 10K JIS B 2220 raised face[1] | **FD** |
| 80A 10K JIS B 2220 raised face | **FE** |
| 100A 10K JIS B 2220 raised face | **FF** |
| 150A 10K JIS B 2220 raised face | **FG** |
| DN 50 PN 10/16 EN 1092-1 type B1 raised face[1] | **GA** |
| DN 80 PN 10/16 EN 1092-1 type B1 raised face | **GB** |
| DN 100 PN 10/16 EN 1092-1 type B1 raised face | **GC** |
| DN 150 PN 10/16 EN 1092-1 type B1 raised face | **GD** |
| **Communication/Output** | |
| PROFIBUS PA | **1** |
| 4 ... 20 mA, HART, start-up at < 3.6 mA | **2** |
| FOUNDATION Fieldbus | **3** |
| **Enclosure/Cable inlet** | |
| Aluminum, Epoxy painted | |
| 2 x ½" NPT | **0** |
| 2 x M20 x 1.5 | **1** |
| **Antenna lens material** | |
| TFM 1600 PTFE Flush Lens | **A** |
| **Approvals** | |
| General Purpose, CE, CSA, FM, FCC, RED, RCM | **A** |
| Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada | **B** |
| Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, RED, RCM | **C** |
| Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada | **D** |
| Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, RED, RCM | **E** |
| Increased Safety: IECEx/ATEX II 1/2 GD,1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[2] | **F** |
| Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[2] | **G** |
| Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[2] | **H** |
| Non Sparking: NEPSI Ex nA IIC T4 Gc | **K** |
| Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C | **L** |
| Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[2] | **M** |
| Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[2] | **N** |
| **Pressure rating** | |
| Rating per Pressure/Temperature curves in instruction manual | **0** |

[1] Maximum range 10 m (32.8 ft), dk > 3 [20 m (66 ft)] and dk > 1.6 when mounted in stillpipe].

[2] Applicable with communication option 2 only.

| | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code(s). | |
| Plug M12 with mating Connector[1)2)3)] | **A50** |
| Plug 7/8" with mating Connector[2)3)4)] | **A55** |
| Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text | **Y15** |
| Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 | **C11** |
| Material inspection Certificate Type 3.1 per EN 10204 | **C12** |
| Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[5)6)] | **C20** |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[5)] | **N07** |
| ***Operating Instructions*** | |
| All literature is available to download for free, in a range of languages, at | |
| http://www.siemens.com/processinstrumentation/documentation | |

| ***Accessories*** | Article No. |
|---|---|
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| HART modem/USB (for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (2 are required)[6)] | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (2 are required)[2)] | **7ML1930-1AQ** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-.....-.** |
| SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 | **7ML5742-.....-....** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-.....-..** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-.....-..** |
| For applicable back up point level switch - see point level measurement section | |

[1)] Available with enclosure option 1 only.

[2)] Available with communication options 1 and 3 only.

[3)] Available with approval options A, B, C, and L only.

[4)] Available with enclosure option 0 only.

[5)] Applicable with communication option 2 only.

[6)] Available with approval options A, B, C, D, E, K, and L only.

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## SITRANS LR250 Flanged Encapsulated Antenna

### Selection and ordering data

### *SITRANS LR250 flanged encapsulated Specials*

| | Article No. |
|---|---|
| **SITRANS LR250 flanged encapsulated antenna version enclosures (PROFIBUS PA models)** | |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E32462853** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E32462854** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection | **A5E32462855** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection | **A5E32462856** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection | **A5E32462857** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection | **A5E32462858** |
| **SITRANS LR250 flanged encapsulated antenna version enclosures (FOUNDATION Fieldbus models)** | |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E32462859** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E32462860** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection | **A5E32462861** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection | **A5E32462862** |
| SITRANSLR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection | **A5E32462863** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection | **A5E32462864** |

| | Article No. |
|---|---|
| **SITRANS LR250 flanged encapsulated antenna version enclosures (< 3.6 mA start-up HART models)** | |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462865** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462866** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462867** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462868** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462869** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462830** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462831** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462832** |
| SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection | **A5E32462833** |

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| Selection and ordering data | Article No. |
|---|---|
| **SITRANS LR250 flanged encapsulated antenna lens kits** | |
| Replacement TFM 1600 Lens and Spring Washer Kit for 2 inch Class 150 ASME B16.5 raised faced | **A5E32462817** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 3 inch Class 150 ASME B16.5 raised faced | **A5E32462819** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 4 inch Class 150 ASME B16.5 raised faced | **A5E32462820** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 6 inch Class 150 ASME B16.5 raised faced | **A5E32462821** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 50A 10K JIS B 2220 raised Face | **A5E32462822** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 80A 10K JIS B 2220 raised Face | **A5E32462823** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 100A 10K JIS B 2220 raised Face | **A5E32462824** |
| Replacement TFM 1600 Lens and Spring Washer Kit for 150A 10K JIS B 2220 raised Face | **A5E32462825** |
| Replacement TFM 1600 Lens and Spring Washer Kit for DN50 PN10/16 EN 1092-1 type B1 raised face | **A5E32462826** |
| Replacement TFM 1600 Lens and Spring Washer Kit for DN80 PN10/16 EN 1092-1 type B1 raised face | **A5E32462827** |
| Replacement TFM 1600 Lens and Spring Washer Kit for DN100 PN10/16 EN 1092-1 type B1 raised face | **A5E32462828** |
| Replacement TFM 1600 Lens and Spring Washer Kit for DN150 PN10/16 EN 1092-1 type B1 raised face | **A5E32462829** |
| **Ex-proof plugs** | |
| Ex-proof plugs kit, 1/2" NPT, qty 5 | **A5E39979991** |
| Ex-proof plugs kit, M20, qty 5 | **A5E39979992** |

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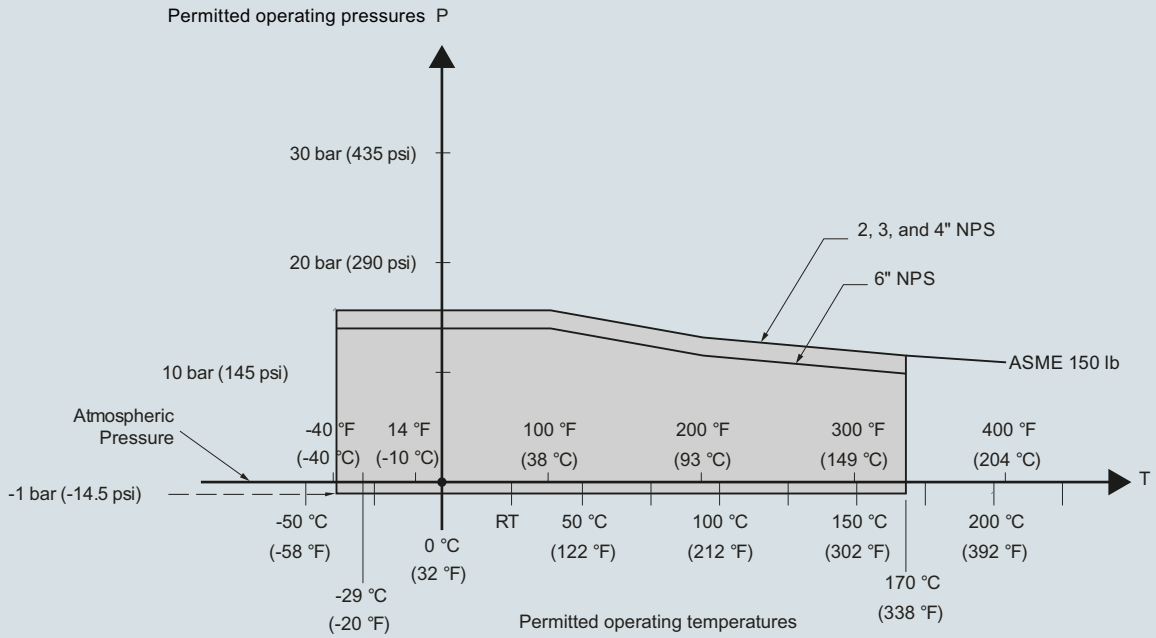
## Characteristic curves

**Pressure/ temperature curve**
**LR250 Flanged Encapsulated Antenna**
**ASME flanged process connections**
**(7ML5432)**




SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

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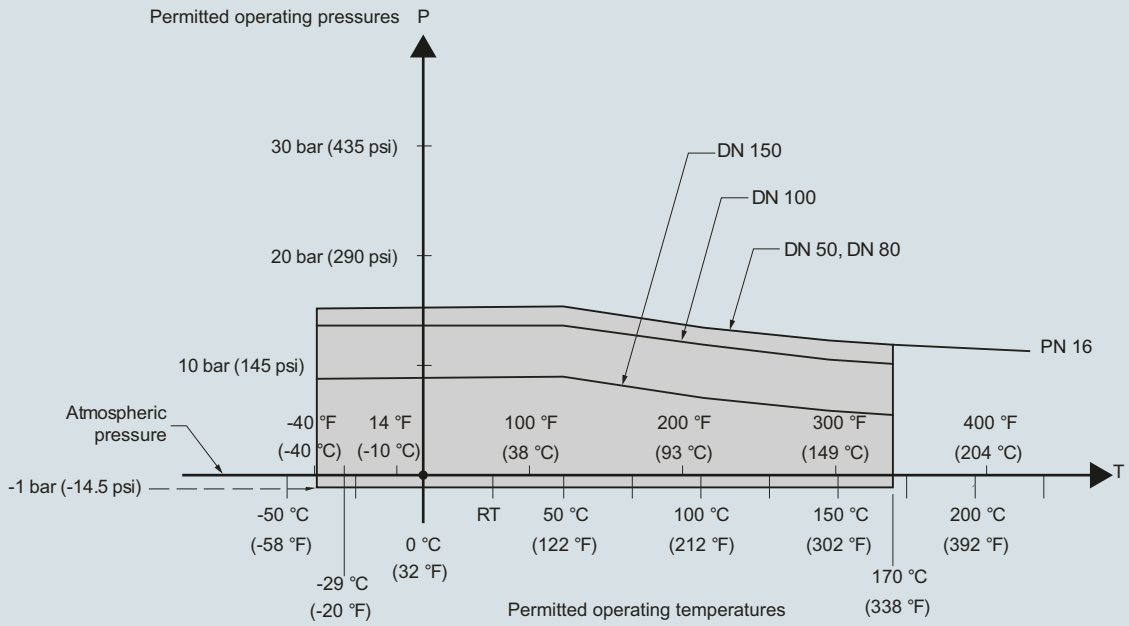
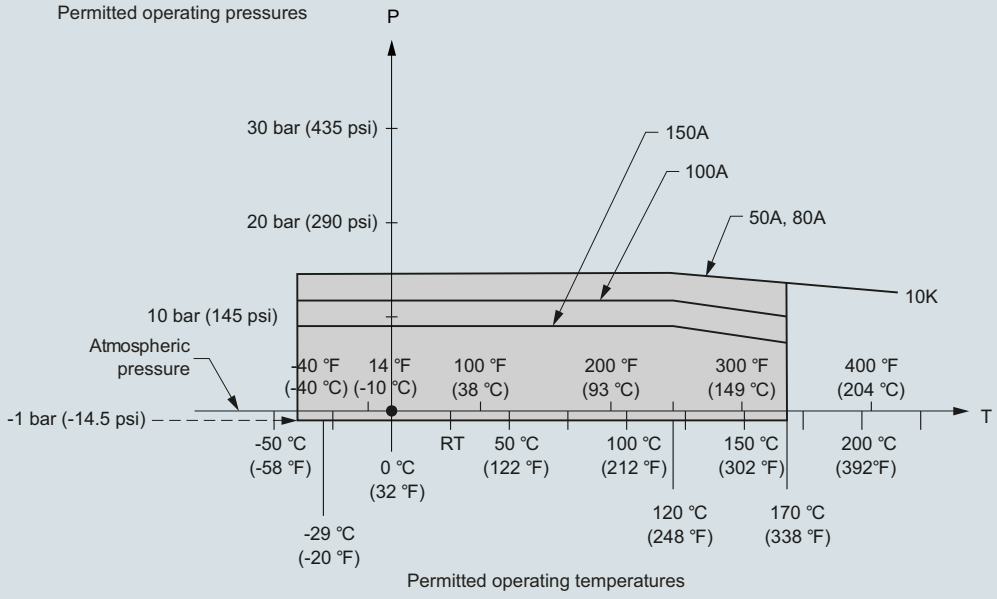
## Characteristic curves (continued)

**Pressure/ temperature curve**
**LR250 Flanged Encapsulated Antenna**
**EN 1092-1 flanged process connections**
**(7ML5432)**




SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

**Pressure/ temperature curve**
**LR250 Flanged Encapsulated Antenna**
**JIS B 2220 flanged process connections**
**(7ML5432)**




SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

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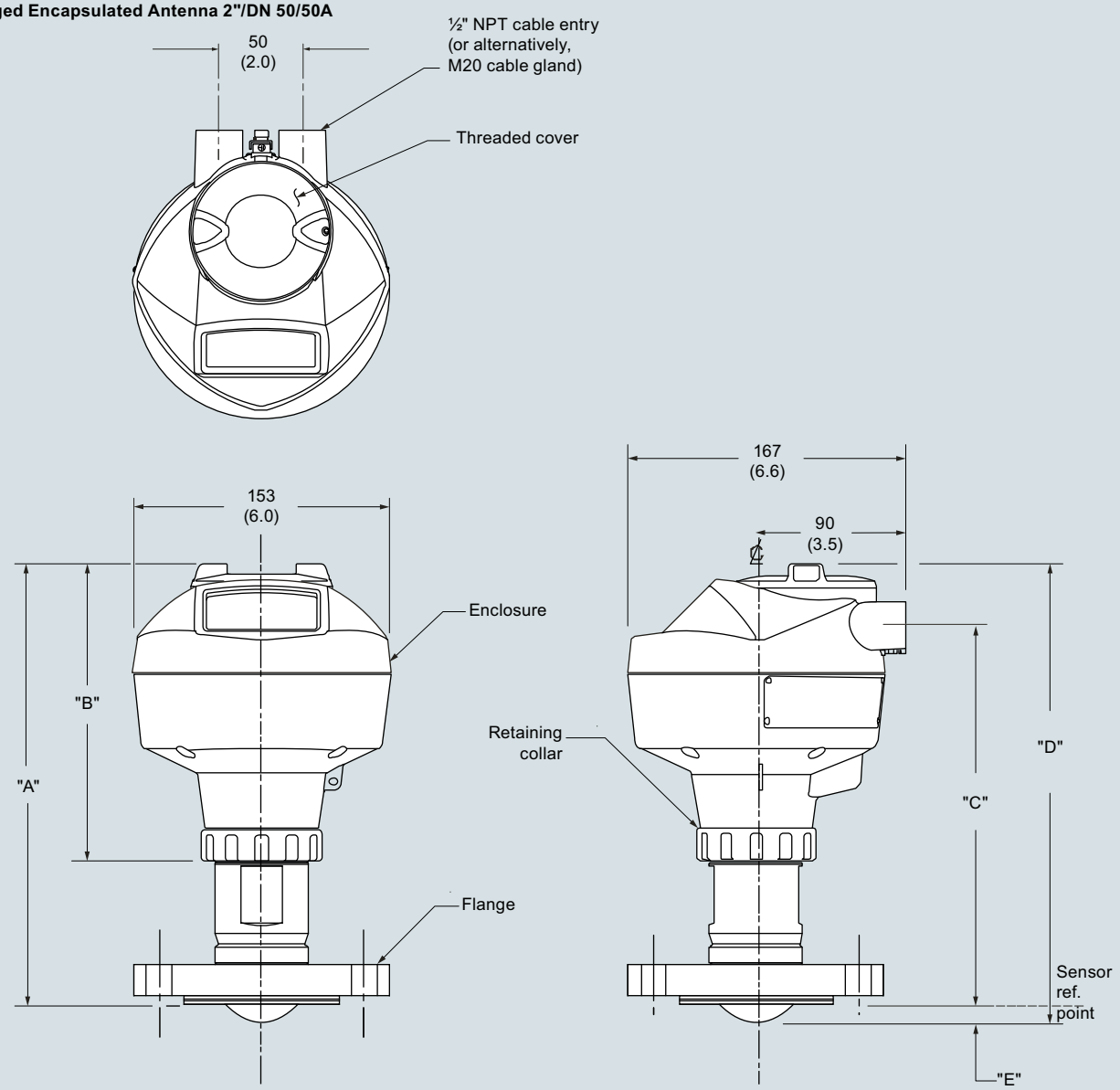
4

## Dimensional drawings

**Flanged Encapsulated Antenna 2"/DN 50/50A**




| Flange Size | Flange Class | Flange O.D. | Antenna aperture size | Height to Sensor reference point dimension E[1)] | Beam angle | Measurement Range | Dimension A | Dimension B | Dimension C | Dimension D |
|---|---|---|---|---|---|---|---|---|---|---|
| 2" | 150 lb | 152 (5.98) | 50 (1.97) | 11 (0.43) | 12.8° | 10 m (32.8 ft) | 263 (10.35) | 178 (7) | 223 (8.78) | 274 (10.79) |
| DN 50 | PN 10/16 | 165 (6.50) | | | | | | | | |
| 50A | 10K | 155 (6.10) | | | | | | | | |

[1)] Height from tip of lens to sensor reference point as shown.

SITRANS LR250 Flanged Encapsulated Antenna, dimensions in mm (inch)

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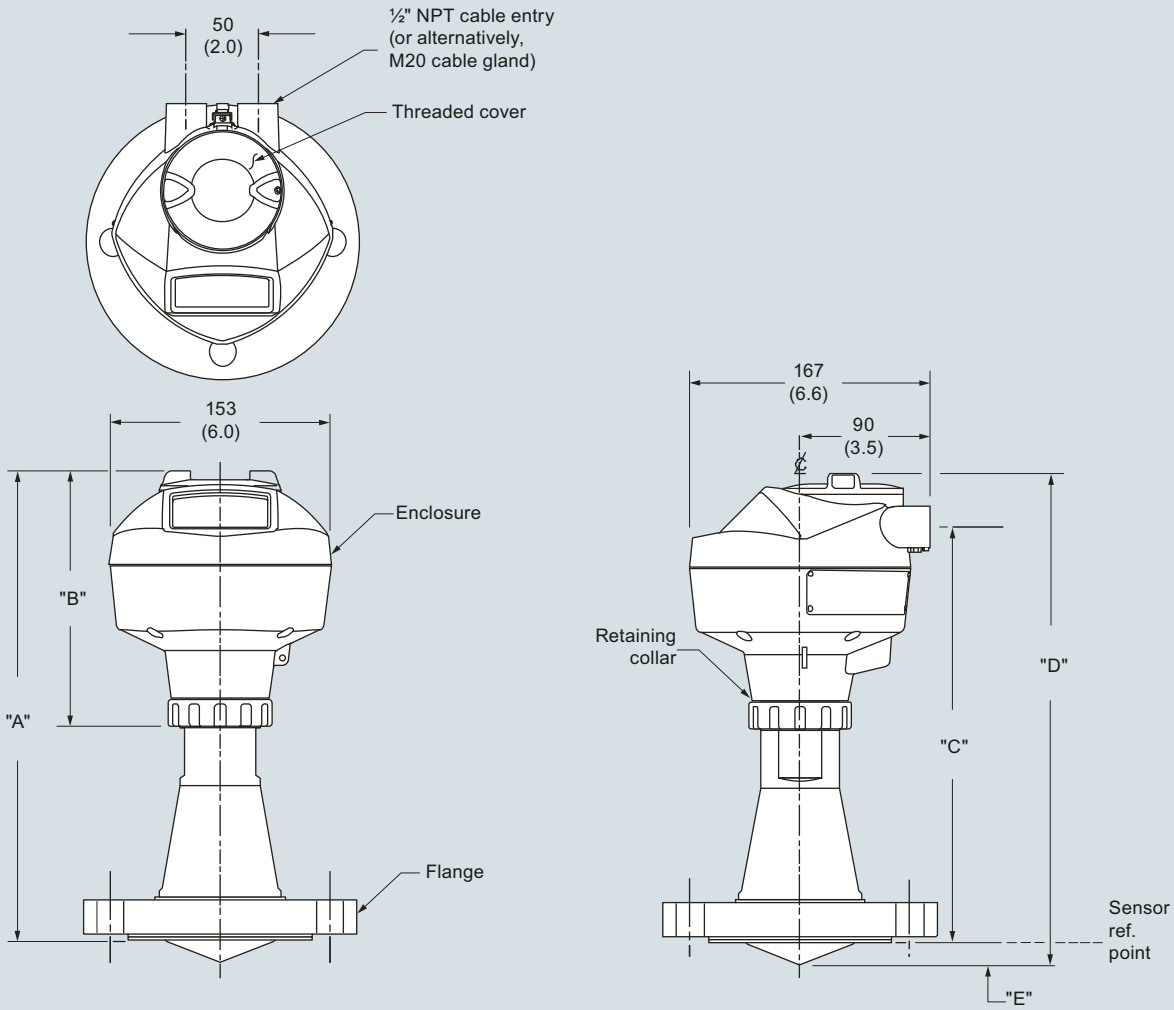
## Dimensional drawings (continued)

**Flanged Encapsulated Antenna 3"/DN 50/80A or greater**




| Flange Size | Flange Class | Flange O.D. | Antenna aperture size | Height to Sensor reference point dimension E[1)] | Beam angle | Measurement Range | Dimension A | Dimension B | Dimension C | Dimension D |
|---|---|---|---|---|---|---|---|---|---|---|
| 3" | 150 lb | 190 (7.48) | 75 (2.95) | 15 (0.59) | 9.6° | 20 m (65.6 ft) | 328 (12.91) | 178 (7) | 288 (11.34) | 343 (13.54) |
| DN 80 | PN 10/16 | 200 (7.87) | | | | | | | | |
| 80A | 10K | 185 (7.28) | | | | | | | | |
| 4" | 150 lb | 230 (9.06) | 75 (2.95) | 13 (0.51) | 9.6° | 20 m (65.6 ft) | 328 (12.91) | 178 (7) | 288 (11.34) | 343 (13.50) |
| DN 100 | PN 10/16 | 220 (8.66) | | | | | | | | |
| 100A | 10K | 210 (8.27) | | | | | | | | |
| 6" | 150 lb | 280 (11.02) | 75 (2.95) | 15 (0.59) | 9.6° | 20 m (65.6 ft) | 333 (13.11) | 178 (7) | 293 (11.54) | 348 (13.70) |
| DN 150 | PN 10/16 | 285 (11.25) | | | | | | | | |
| 150A | 10K | 280 (11.02) | | | | | | | | |

[1)] Height from tip of lens to sensor reference point as shown.

SITRANS LR250 Flanged Encapsulated Antenna, dimensions in mm (inch)

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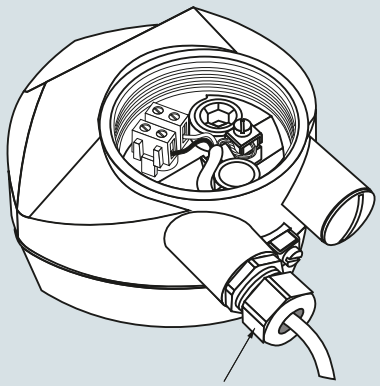
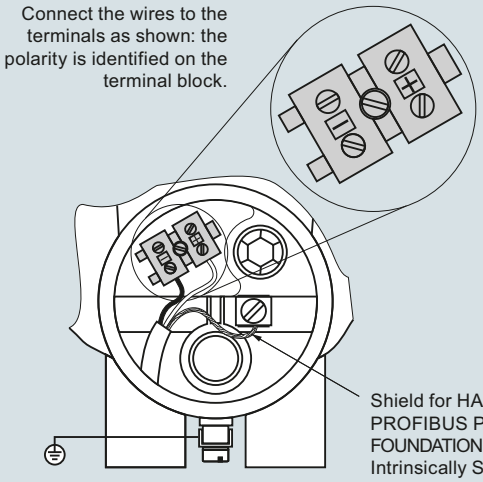
## Circuit diagrams



Gland may or may not be provided depending on approval option.




**Hand Programmer**

Part number:
7ML1930-1BK

**Notes:**

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

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## Overview

The SITRANS LR250 Hygienic Encapsulated Antenna is a 2-wire 25 GHz pulse radar level transmitter with sanitary and hygienic approvals for continuous monitoring of liquids, slurries, and pastes within the food, beverage, chemical, and pharmaceutical industries to a range of 20 m (66 ft) (antenna dependent).

Picture shown with accessories sold separately.

## Benefits

- Fully encapsulated horn antenna design with FDA approved and USP Class VI compliant, TFM 1600 PTFE lens
- < 0.8 µ Ra surface finish for maximum cleanability and hygiene requirements commonly required in sanitary environments
- Chemically resistant TFM 1600 PTFE lens is also suitable for aggressive or corrosive materials
- Approved device in accordance with 3-A, EHEDG EL Class I and/or EHEDG EL Aseptic Class I
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play set-up using the intuitive Quick Start Wizard
- Industry standard process connections including ISO 2852, DIN 11851, DIN 11864-1, DIN 11864-2, DIN 11864-3, and Tuchenhagen Varivent Type F and N
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 2 inch (50 mm) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM.
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511

## Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves set-up and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

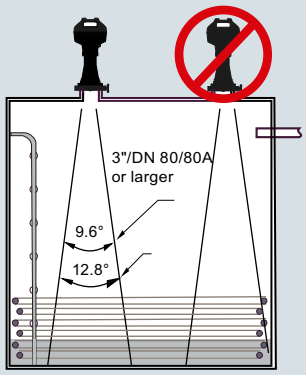
SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with dk > 1.6.

- Key Applications: applications within the food, beverage, chemical and pharmaceutical industries where sanitary, aseptic, or hygienic approvals are required or easy in-stall/clean flush antennas are preferable, such as ice cream, fruit juice, milk, beer, and pharmaceutical or chemical additives and ingredients.

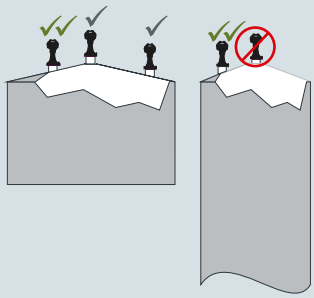
## Configuration

**Installation**

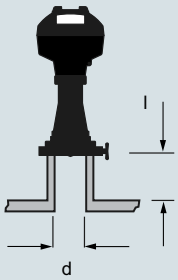
**Note:**
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.




**Mounting on vessel**



**Mounting on a nozzle**




Nozzles should be maximum l/d ratio 1:1 (Eg. 50 mm length, 50 mm diameter)

LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

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## SITRANS LR250 Hygienic Encapsulated Antenna

### Technical specifications

| | |
|---|---|
| **Mode of Operation** | |
| Measuring principle | Radar level measurement |
| Frequency | K-band (25.0 GHz) |
| Minimum measuring range | 50 mm (2 inch) from end of antenna |
| Maximum measuring range | 20 m (66 ft) |
| **Output** | |
| HART | Version 5.1 |
| • Analog output | 4 ... 20 mA |
| • Accuracy | ± 0.02 mA |
| • Fail-safe | • Programmable as high low or hold (loss of echo)<br>• NE 43 programmable |
| PROFIBUS PA | Profile 3.01 |
| • Function blocks | 2 Analog Input (AI) |
| FOUNDATION Fieldbus | H1 |
| • Functionality | Basic or LAS |
| • Version | ITK 5.2.0 |
| • Function blocks | 2 Analog Input (AI) |
| **Performance (according to reference conditions IEC60770-1)** | |
| Maximum measured error | • > 500 mm from sensor reference point: 3 mm (0.118 inch)<br>• < 500 mm from sensor reference point: 25 mm (1 inch) |
| Influence of ambient temperature | < 0.003 %/K |
| **Rated operating conditions** | |
| Installation conditions | |
| • Location | Indoor/outdoor |
| Ambient conditions (enclosure) | |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Installation category | I |
| • Pollution degree | 4 |
| **Medium conditions** | |
| Dielectric constant $\varepsilon_r$ | ≥ 1.6 (antenna dependent) |
| Process temperature | -40 ... +170 °C (-40 ... +338 °F) at process connection |
| Process pressure | See Pressure/Temperature curves for more information |
| **Design** | |
| Enclosure | |
| • Material | Aluminum, polyester powder coated |
| • Cable inlet | 2 x M20 x 1.5 or 2 x ½" NPT |
| Degree of protection | Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 |
| Weight (dependent on process connection) | • Approx. 4.7 kg (10.4 lb) for 2" ISO 2852 (smallest size)<br>• Approx. 7.9 kg (17.4 lb) for DN 100 DIN 11864-2 (largest size) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile display |
| Antenna | |
| • Material | Stainless steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part) |
| • Lens surface finish ($R_a$) | 0.8 µm |

| | |
|---|---|
| **Process connections** | |
| Hygienic/Sanitary connections | • 2", 3" & 4" Sanitary Clamp according to ISO 2852<br>• DN 50, DN 80 & DN 100 Aseptic/Hygienic threaded to DIN 11864-1 [Form A]<br>• DN 50, DN 80 & DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A]<br>• DN 50, DN 80 & DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A]<br>• DN 50, DN 80 & DN 100 Hygienic Union according to DIN 11851<br>• Type F (50 mm) & Type N (68 mm) Tuchenhagen Varivent |
| **Power supply** | |
| 4 ... 20 mA/HART | Nominal 24 V DC (max. 30 V DC) with max. 550 Ω |
| PROFIBUS PA | • 15 mA<br>• Per IEC 61158-2 |
| FOUNDATION Fieldbus | • 20.0 mA<br>• Per IEC 61158-2 |
| **Certificates and approvals** | |
| General | $CSA_{US/C}$, CE, FM, RCM |
| Radio | FCC, Industry Canada, RED, RCM |
| Hazardous | |
| • Explosion Proof (Brazil) | INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Increased Safety (Brazil) | INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Intrinsically Safe (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Non-incendive (Canada/USA) | CSA/FM Class I, Div. 2, Groups A, B, C, D T5 |
| • Flame Proof/Increased Safety (China) | NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C |
| • Intrinsically Safe (China) | NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C |
| • Non-sparking (China) | NEPSI Ex nA IIC T4 Gc |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da |
| • Non-sparking (Europe) | ATEX II 3G Ex nA IIC T4 Gc |
| • Flame Proof (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da |
| • Increased Safety (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (International) | IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Russia/Kazakhstan) | EAC Ex d |
| • Increased Safety (Russia/Kazakhstan) | EAC Ex e |
| • Intrinsically Safe (Russia/Kazakhstan) | EAC Ex ia |
| Hygienic/Sanitary | EHEDG EL Class I<br>EHEDG EL Aseptic Class I |

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## Technical specifications (continued)

| | |
|---|---|
| **Programming** | |
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld programmer | IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 $T_a$ = 50 °C IECEx SIR 09.0073 |
| Handheld communicator | HART communicator 375/475 |
| PC | • SIMATIC PDM<br>• Emerson AMS<br>• SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile displays |

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## SITRANS LR250 Hygienic Encapsulated Antenna

### Selection and ordering data — Article No.

| | |
|---|---|
| **SITRANS LR250 Radar level transmitter with encapsulated horn and PTFE lens** ↗<br>Continuous, non-contact, 20 m (66 ft) range, for liquids, solids, and slurries.<br>For use in hygienic applications.<br>↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | **7ML5433-** _ _ _ _ **0** **-** _ **A** _ _ |
| **Hygienic/Sanitary Approvals** | |
| EHEDG EL Class I[1] | **1** |
| EHEDG EL Aseptic Class I[1] | **2** |
| 3-A (Tuchenhagen connections only - FC ... FF)[2][3] | **3** |
| EHEDG EL Class I & 3-A (excludes Tuchenhagen connections)[2][4] | **4** |
| **Process Connection Types (all types have TFM1600 PTFE lens)** | |
| 316L st/st [1.4435 or 1.4404] | |
| 2" Sanitary Clamp according to ISO 2852[5] | **A A** |
| 3" Sanitary Clamp according to ISO 2852 | **A B** |
| 4" Sanitary Clamp according to ISO 2852 | **A C** |
| 316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301) | |
| DN 50 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A][5] | **B A** |
| DN 80 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A] | **B B** |
| DN 100 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A] | **B C** |
| 316L st/st [1.4435 or 1.4404] | |
| DN 50 Aseptic/Hygienic flanged to DIN 11864-2 [Form A][5] | **C A** |
| DN 80 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] | **C B** |
| DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] | **C C** |
| 316L st/st [1.4435 or 1.4404] | |
| DN 50 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A][5] | **D A** |
| DN 80 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] | **D B** |
| DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] | **D C** |
| 316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301) | |
| DN 50 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851[5] | **E A** |
| DN 80 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851 | **E B** |
| DN 100 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851 | **E C** |

### Article No.

| | |
|---|---|
| **SITRANS LR250 Radar level transmitter with encapsulated horn and PTFE lens**<br>Continuous, non-contact, 20 m (66 ft) range, for liquids, solids, and slurries.<br>For use in hygienic applications. | **7ML5433-** _ _ _ _ **0** **-** _ **A** _ _ |
| 316L st/st [1.4435 or 1.4404] | |
| Type F (50 mm) Tuchenhagen Varivent (EHEDG only)[5] | **F A** |
| Type N (68 mm) Tuchenhagen Varivent (EHEDG only)[5] | **F B** |
| Type F (50 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 ... 120 °C (-40 ... 248 °F )][5] | **F C** |
| Type N (68 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 ... 120 °C (-40 ... 248 °F)][5] | **F D** |
| Type F (50 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 ... 170 °C (-4 ... 338 °F)][5] | **F E** |
| Type N (68 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 ... 170 °C (-4 ... 338 °F)][5] | **F F** |
| **Communication** | |
| PROFIBUS PA | **1** |
| 4 ... 20 mA HART, start-up at < 3.6 mA | **2** |
| FOUNDATION Fieldbus | **3** |
| **Enclosure (with Cable Inlets)** | |
| Aluminum, Epoxy paint, 2 X ½" NPT | **0** |
| Aluminum, Epoxy paint, 2 X M20 x 1.5 | **1** |
| **Approvals** | |
| General Purpose, CE, CSA, FM, FCC, RED, RCM | **A** |
| Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada | **B** |
| Intrinsically Safe: IECEx/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, RED, RCM | **C** |
| Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada | **D** |
| Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, RED, RCM | **E** |
| Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[6] | **F** |
| Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[6] | **G** |
| Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[6] | **H** |
| Non Sparking: NEPSI Ex nA IIC T4 Gc | **K** |
| Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C | **L** |
| Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[6] | **M** |
| Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[6] | **N** |
| **Pressure Rating** | |
| Rating per pressure/temperature curves in instruction manual | **0** |

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## Selection and ordering data

| | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code(s). | |
| Electrical Connection cable entry: | |
| Plug M12 (IP 67 rating) with mating connector[2)7)8)] | **A50** |
| Plug 7/8" (IP 67 rating) with mating Connector[2)8)9)] | **A55** |
| Test Certificates | |
| Manufacturer's Test Certificate M to DIN 55350, Part 18 and to ISO 9000 | **C11** |
| Material inspection Certificate 3.1 of EN 10204 | **C12** |
| Functional Safety | |
| Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[6)10)] | **C20** |
| Namur | |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[6)] | **N07** |
| Tagging | |
| Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)] | |
| Measuring-point number / identification (max. 27 characters) specify in plain text | **Y15** |
| ***Operating Instructions*** | |
| All literature is available to download for free, in a range of languages, at | |

http://www.siemens.com/processinstrumentation/documentation

| | Article No |
|---|---|
| ***Accessories*** | |
| Handheld programmer, Intrinsically safe, EEx ia (LUI enabled) | **7ML1930-1BK** |
| HART modem/USB (for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required)[6)] | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required)[8)] | **7ML1930-1AQ** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-.....-.** |
| SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 | **7ML5742-.....-....** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-.....-..** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-.....-..** |
| For applicable back up point level switch - see point level measurement section | |

1) Available with Process connection options AA ... FB & FF only.
2) Available with Approval options A, B, C, L only.
3) Available with Process connections FC ... FF only.
4) Available with Process connection options AA ... EC & FF only.
5) Max. range 10 m (32.8 ft), dk > 3 [20 m (66 ft) and dk > 1.6 if installed in a stillpipe].
6) Applicable with Communication option 2 only.
7) Available with Enclosure option 1 only.
8) Available with Communication options 1 and 3 only.
9) Available with Enclosure option 0 only.
10) Available with Approval options A, B, C, D, E, K, L only.

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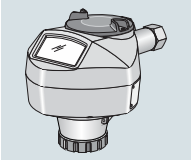
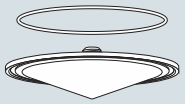
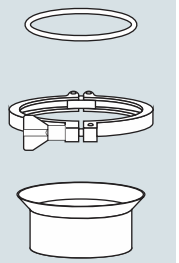
## SITRANS LR250 Hygienic Encapsulated Antenna

### Selection and ordering data — Article No.

***SITRANS LR250 hygienic encapsulated Specials***

| | |
|---|---|
| **For "Electronics Head only" follow the standard configuration and choose YY option on positions 9 and 10 of the full part number.**<br>**For example: 7ML5433-1YY20-1AA0 will order an electronics head for the following:**<br>**EHEDG EL Class 1 approval, 4 ... 20 mA HART, M20 cable entries, General purpose Haz Loc approval, pressure rating as per manual.** |  |
| **Spare Lens Kits (Lens and O-ring)** |  |
| Kit, 2 inch, ISO 2852, HEA, Lens, silicone secondary O-ring | **A5E32572731** |
| Kit, 3 inch, ISO 2852, HEA, Lens, silicone secondary O-ring | **A5E32572745** |
| Kit, 4 inch, ISO 2852, HEA, Lens, silicone secondary O-ring | **A5E32572747** |
| Kit, DN 50, DIN 11851, HEA, Lens, silicone secondary O-ring | **A5E32572758** |
| Kit, DN 80, DIN 11851, HEA, Lens, silicone secondary O-ring | **A5E32572770** |
| Kit, DN 100, DIN 11851, HEA, Lens, silicone secondary O-ring | **A5E32572772** |
| Kit, DN 50, DIN 11864-1, HEA, Lens, silicone secondary O-ring | **A5E32572773** |
| Kit, DN 80, DIN 11864-1, HEA, Lens, silicone secondary O-ring | **A5E32572779** |
| Kit, DN 100, DIN 11864-1, HEA, Lens, silicone secondary O-ring | **A5E32572782** |
| Kit, DN 50, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring | **A5E32572785** |
| Kit, DN 80, DIN11864-2/3, HEA, Lens, silicone secondary O-ring | **A5E32572790** |
| Kit, DN 100, DIN11864-2/3, HEA, Lens, silicone secondary O-ring | **A5E32572791** |
| Kit, Tuchenhagen, Type F, HEA, Lens, silicone secondary O-ring | **A5E32572794** |
| Kit, Tuchenhagen, Type N, HEA, Lens, silicone secondary O-ring | **A5E32572795** |
| **Accessories (customer side process connection and FKM and EPDM seal for each size and type)** |  |
| Kit DN50 DIN11864-1 GS Form A tank connection, EPDM Seal Class II | **A5E32910638** |
| Kit, DN80 DIN11864-1 GS Form A tank connection, EPDM Seal Class II | **A5E32910649** |
| Kit, DN100 DIN11864-1 GS Form A tank connection, EPDM Seal Class II | **A5E32910657** |
| Kit DN50 DIN11864-1 GS Form A tank connection, FKM Seal Class I | **A5E32910658** |
| Kit, DN80 DIN11864-1 GS Form A tank connection, FKM Seal Class I | **A5E32910671** |
| Kit, DN100 DIN11864-1 GS Form A tank connection, FKM Seal Class I | **A5E32910681** |
| Kit 2" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II | **A5E32910686** |
| Kit 3" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II | **A5E32910697** |
| Kit 4" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II | **A5E32910708** |
| Kit 2" ISO2852 tank connection, Clamp, Cleanable FKM Seal | **A5E32910718** |
| Kit 3" ISO2852 tank connection, Clamp, Cleanable FKM Seal | **A5E32910723** |
| Kit 4" ISO2852 tank connection, Clamp, Cleanable FKM Seal | **A5E32910734** |
| Kit DN50 DIN11851 SC Tank connection, EPDM Seal Class II[11)] | **A5E32910746** |
| Kit DN80 DIN11851 SC Tank connection, EPDM Seal Class II[11)] | **A5E32910771** |
| Kit DN100 DIN11851 SC Tank connection, EPDM Seal Class II[11)] | **A5E32910780** |
| Kit DN50 DIN11851 SC Tank connection, FKM Seal Class II | **A5E32910784** |
| Kit DN80 DIN11851 SC Tank connection, FKM Seal Class II | **A5E32910789** |
| Kit DN100 DIN11851 SC Tank connection, FKM Seal Class II | **A5E32910790** |
| Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), EPDM Seal Class II | **A5E32910791** |
| Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II | **A5E32910793** |
| Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II | **A5E32910799** |
| Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), FKM Seal Class I | **A5E32910805** |
| Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I | **A5E32910809** |
| Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I | **A5E32910812** |
| Kit DN50 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II | **A5E32910813** |
| Kit DN80 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II | **A5E32910814** |
| Kit DN100 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II | **A5E32910815** |
| Kit DN50 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I | **A5E32910816** |
| Kit DN80 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I | **A5E32910817** |
| Kit DN100 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I | **A5E32910818** |
| Kit Type F, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection | **A5E33489537** |
| Kit Type N, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection | **A5E33489543** |
| Kit Type F, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection | **A5E33489828** |
| Kit Type N, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection | **A5E33489830** |
| **Ex-proof plugs** | |
| Ex-proof plugs kit, 1/2" NPT, qty 5 | **A5E39979991** |
| Ex-proof plugs kit, M20, qty 5 | **A5E39979992** |

[11)] Class II for low fat applications when EPDM seal used on DIN11851

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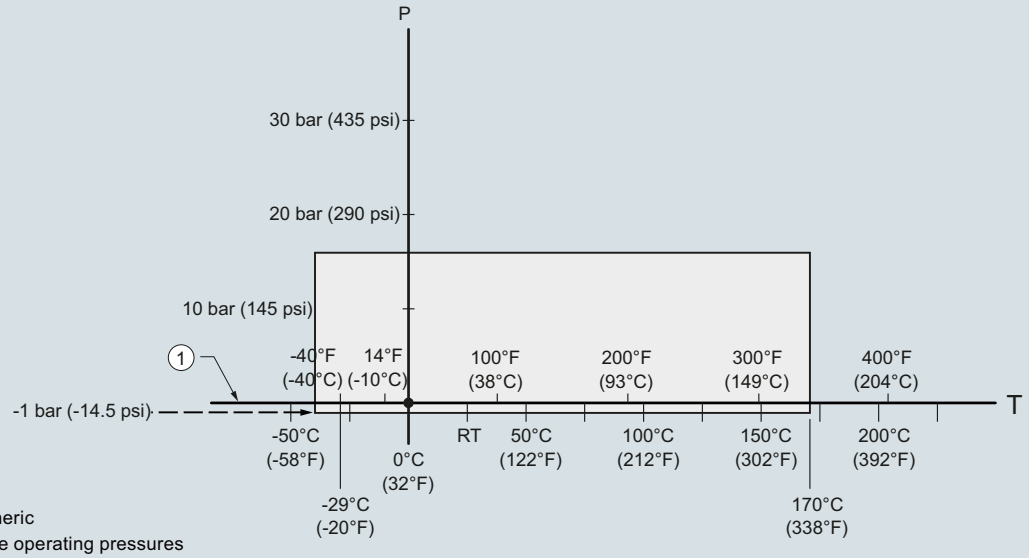
## Characteristic curves

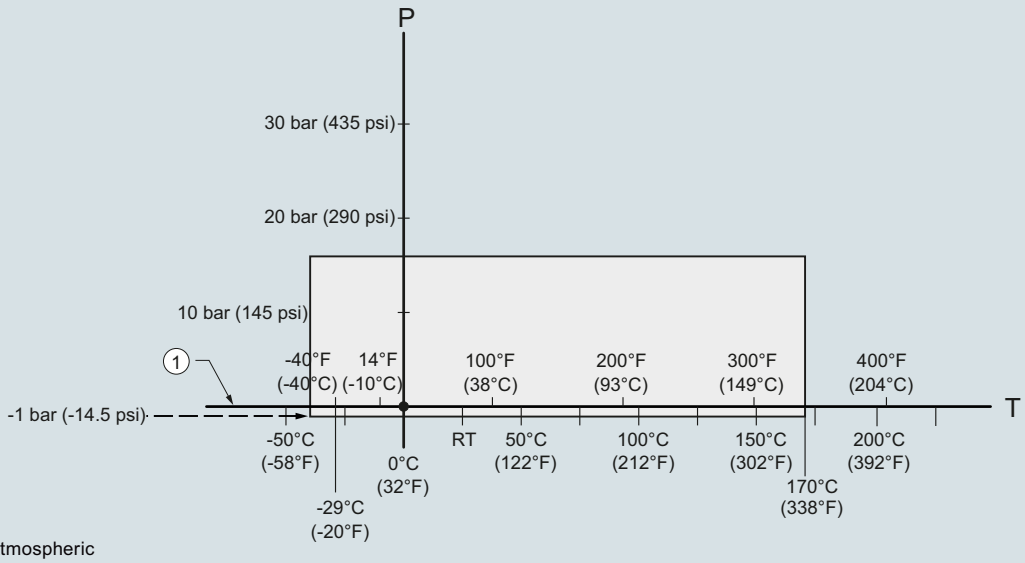
DIN 11851 Sanitary/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100
DIN 11864-1 Aseptic/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100




1 Atmospheric
P Allowable operating pressures
T Allowable operating temperatures

SITRANS LR250 Hygienic Encapsulated Antenna, process pressure/temperature rating curve

DIN 11864-2 Aseptic/Hygienic flanged: DN 50, DN 80, and DN 100




1 Atmospheric
P Allowable operating pressures
T Allowable operating temperatures

Note: For pressure applications, all attachment hardware must be suitably rated.

SITRANS LR250 Hygienic Encapsulated Antenna, process pressure/temperature rating curve

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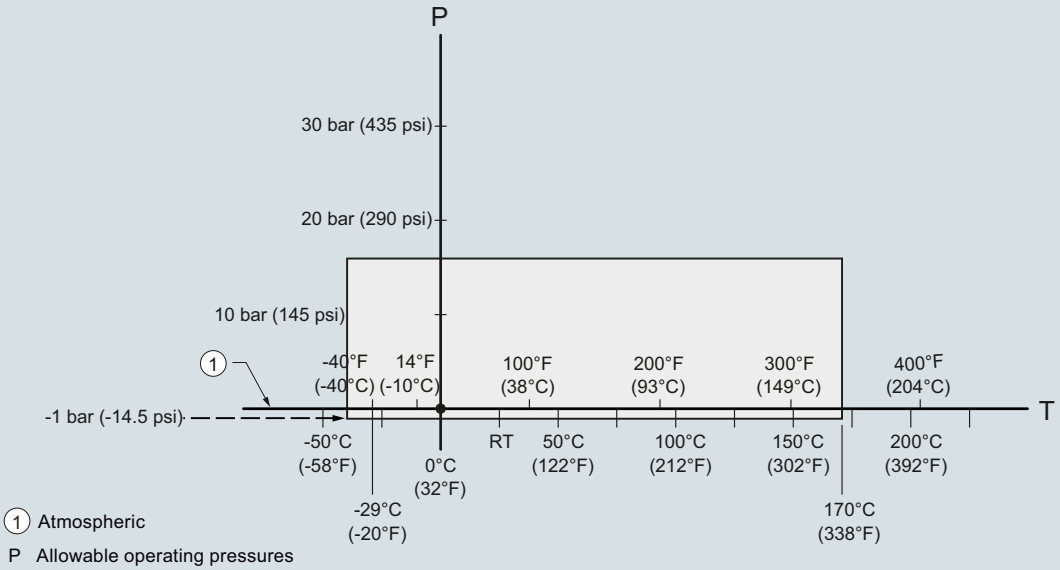
**Characteristic curves** (continued)

DIN 11864-3 Aseptic/Hygienic clamp: DN 50, DN 80, and DN 100
IS0 2852 Sanitary/Hygienic clamp: 2", 3", and 4"
Tuchenhagen Varivent face seal clamp: Type N (68 mm) and Type F (50 mm)




1 Atmospheric
P Allowable operating pressures
T Allowable operating temperatures

Note: For pressure applications, all clamps must be rated accordingly.

SITRANS LR250 Hygienic Encapsulated Antenna, process pressure/temperature rating curve

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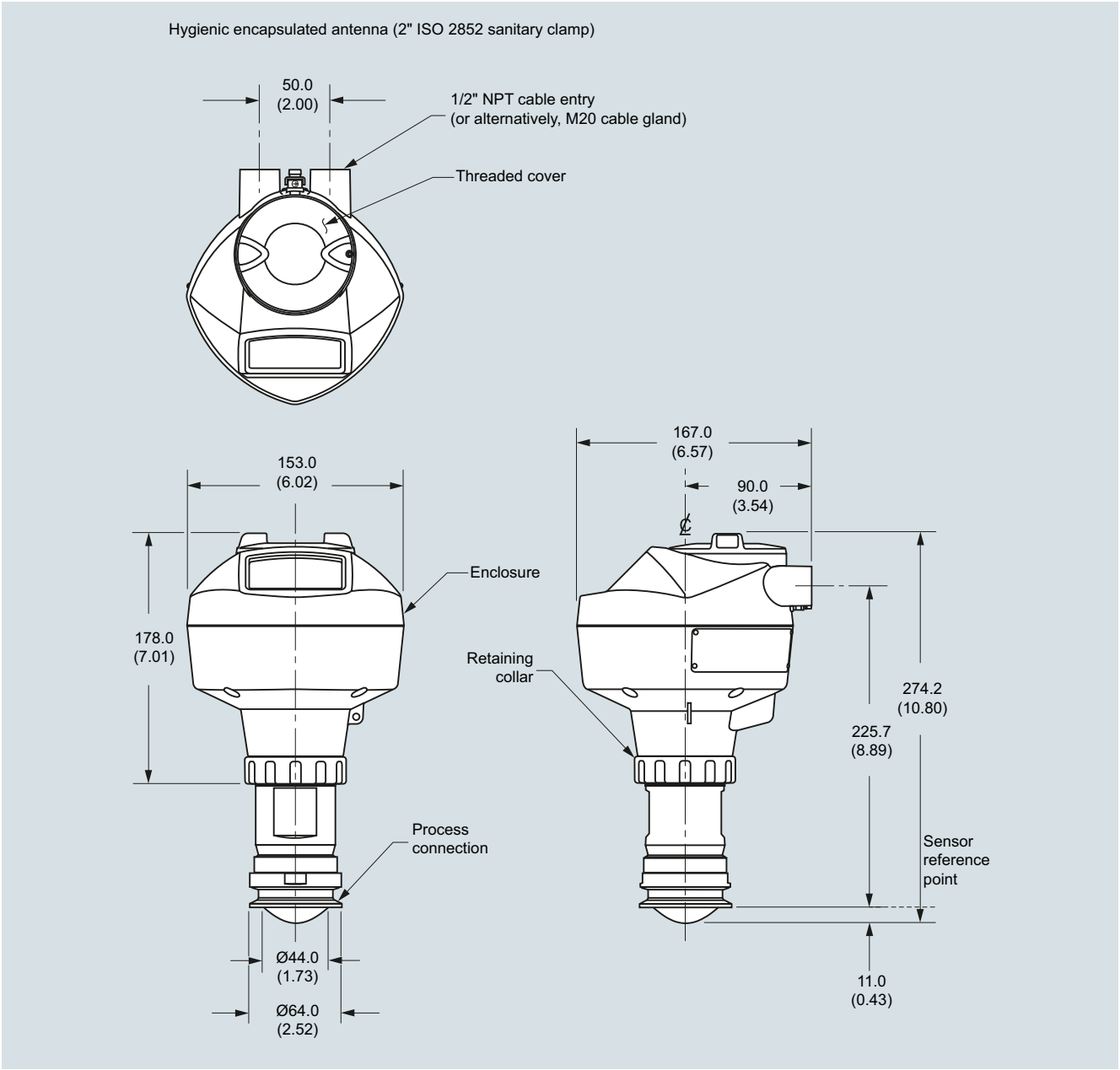
## Dimensional drawings




SITRANS LR250 Hygienic Encapsulated Antenna (2" ISO 2852 sanitary clamp), dimensions in mm (inch)

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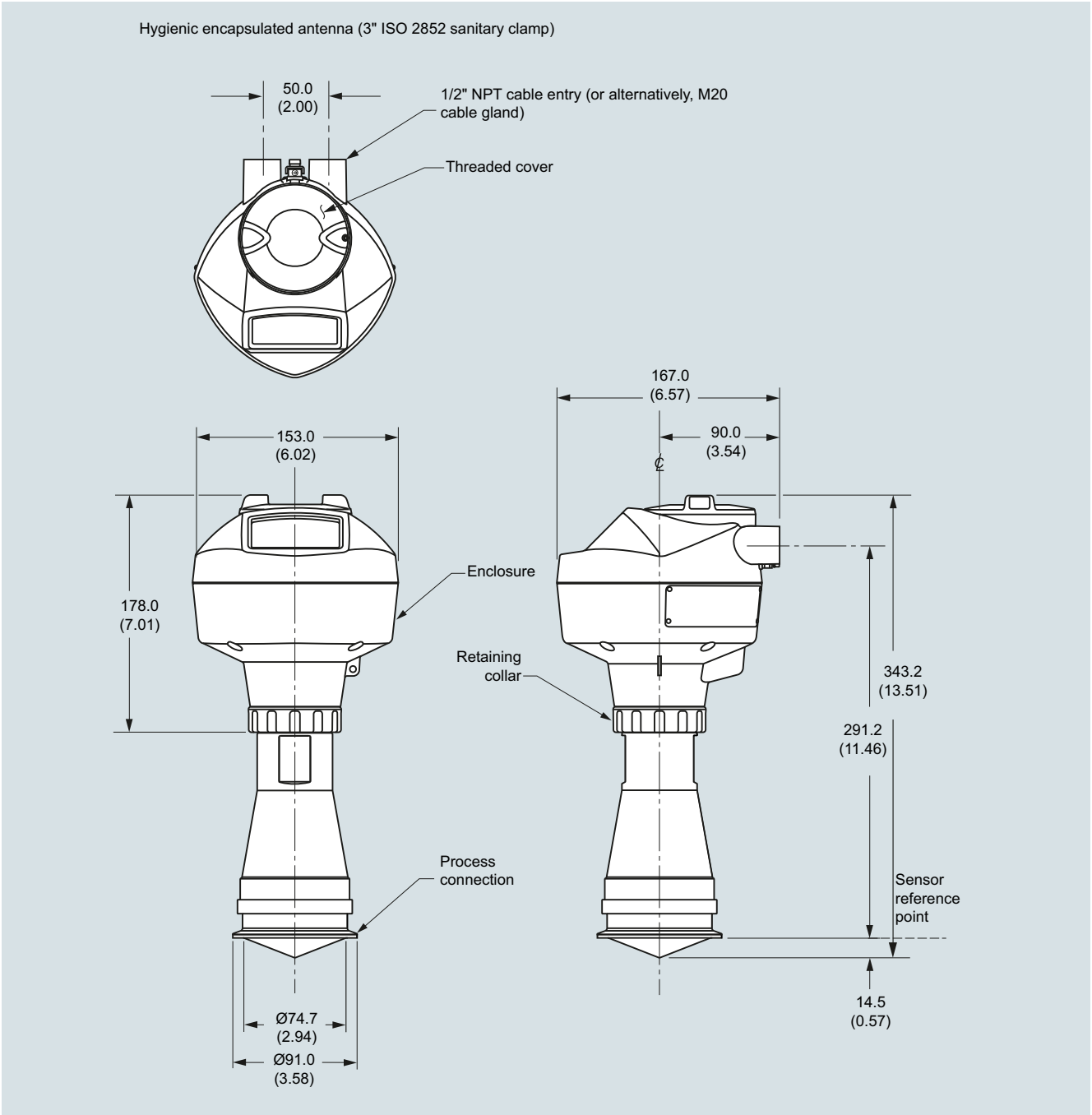
4

## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (3" ISO 2852 sanitary clamp), dimensions in mm (inch)

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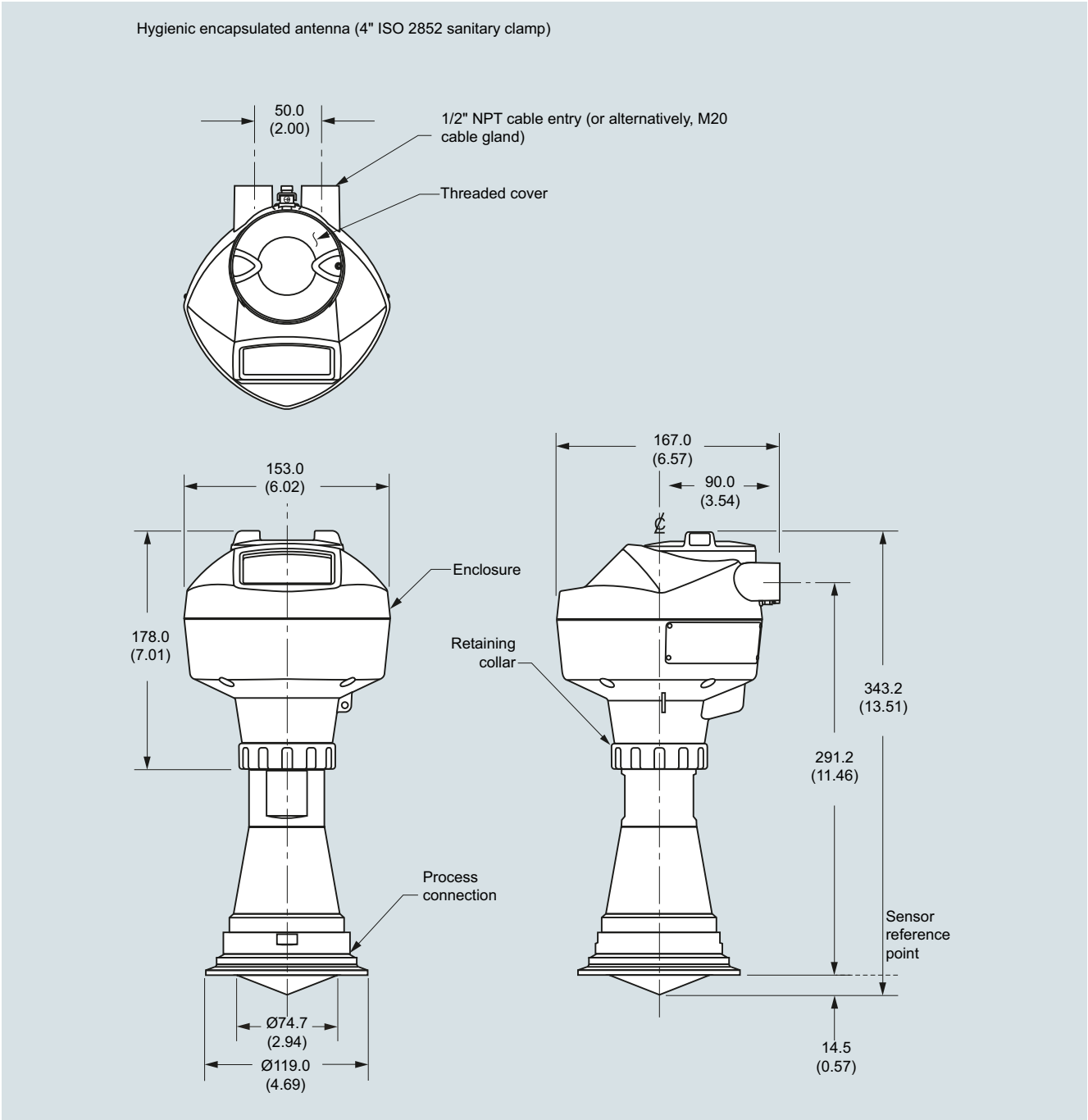
## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (4" ISO 2852 sanitary clamp), dimensions in mm (inch)

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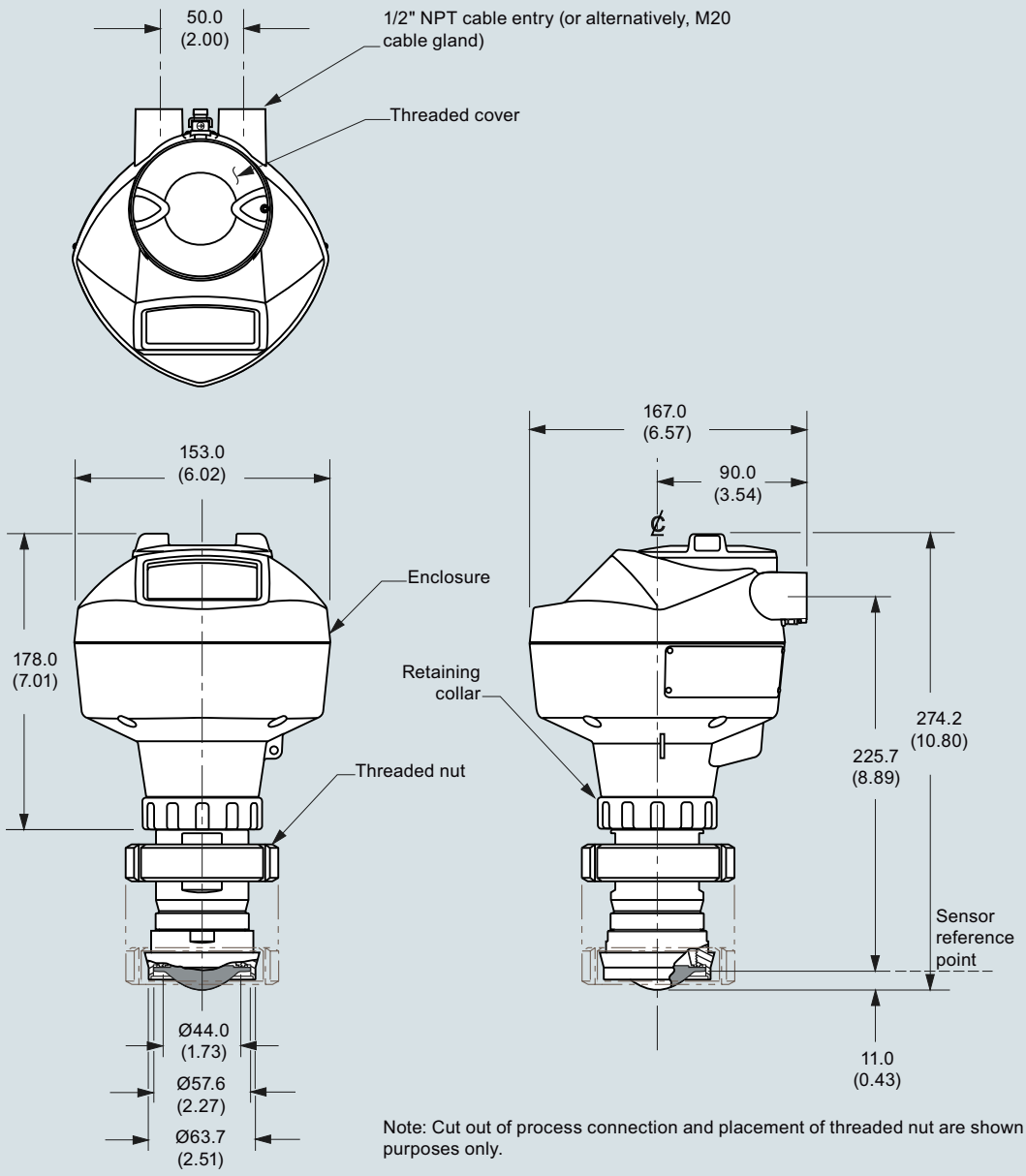
4

## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 50 nozzle/slotted nut to DIN 11851)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

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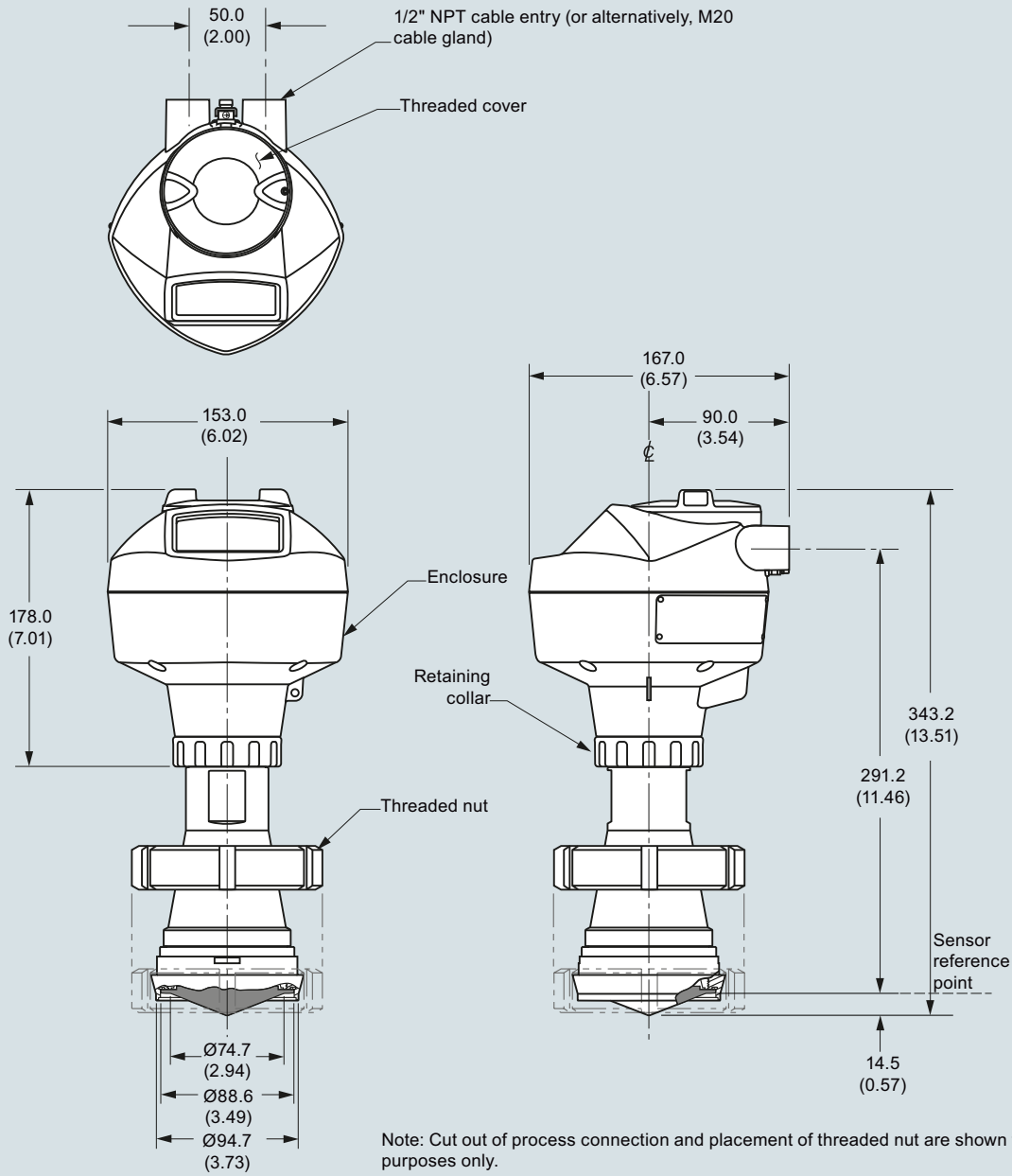
## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 80 nozzle/slotted nut to DIN 11851)




Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

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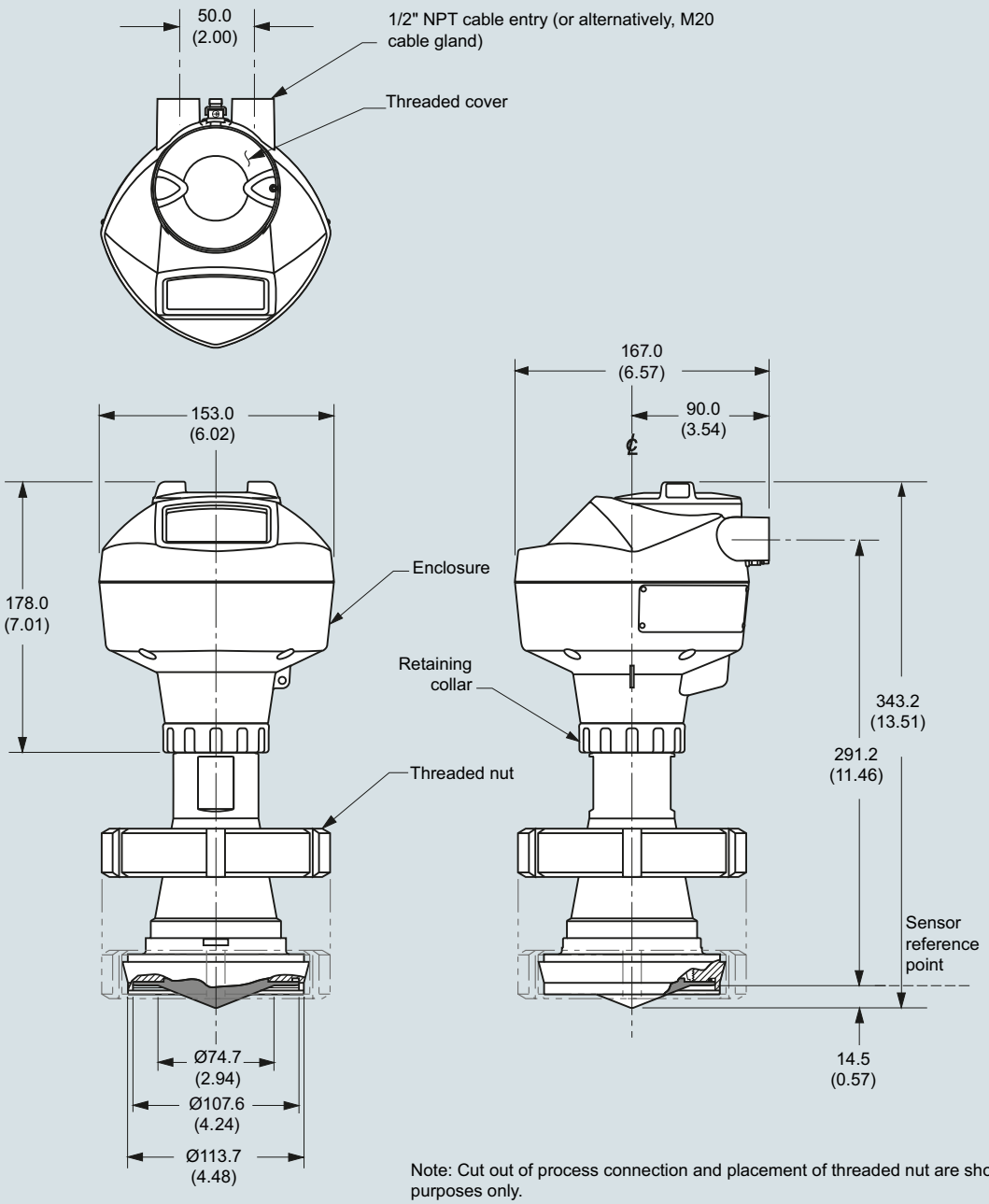
## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 100 nozzle/slotted nut to DIN 11851)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

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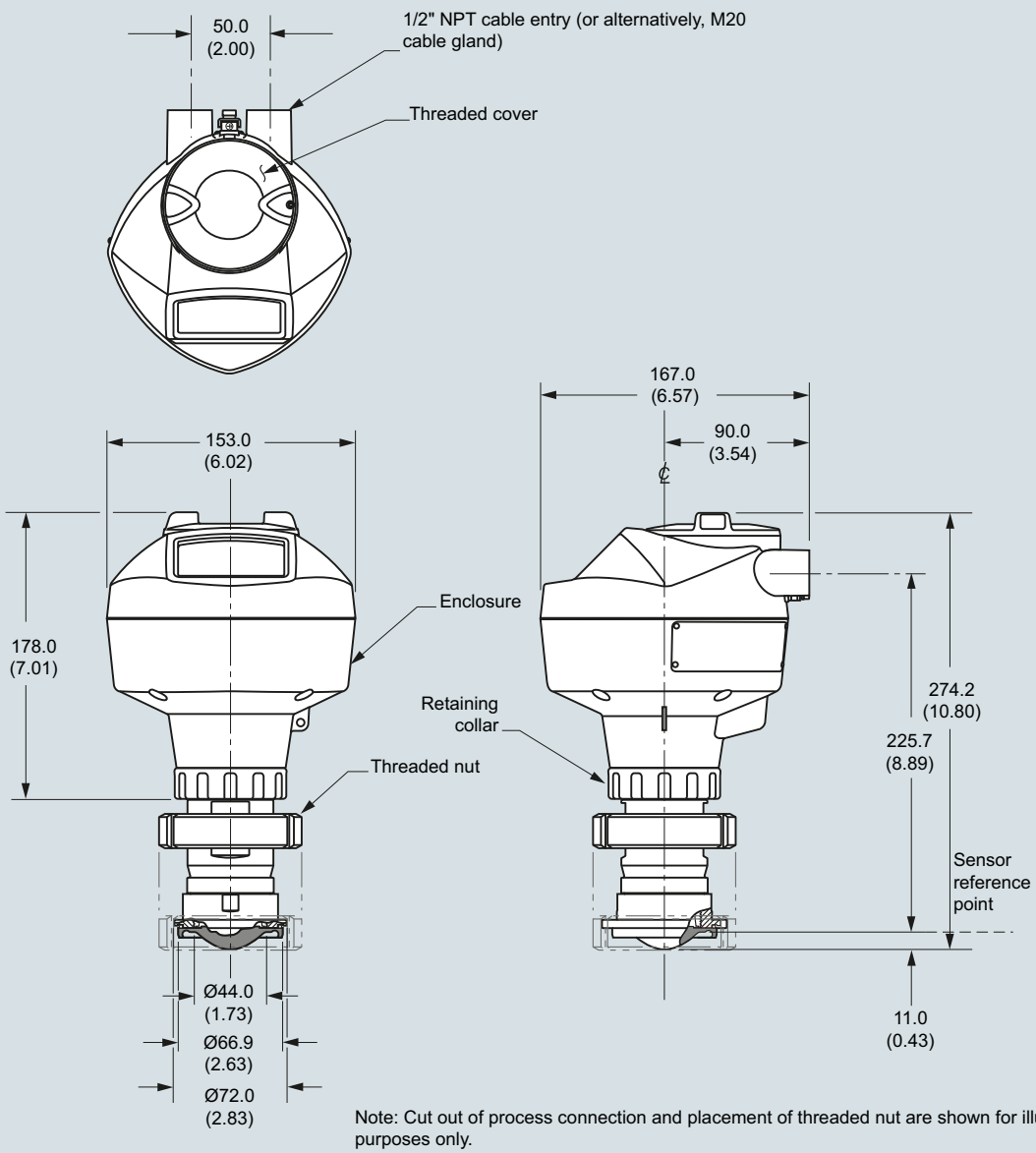
## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 50 aseptic clamp to DIN 11864-1)




Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

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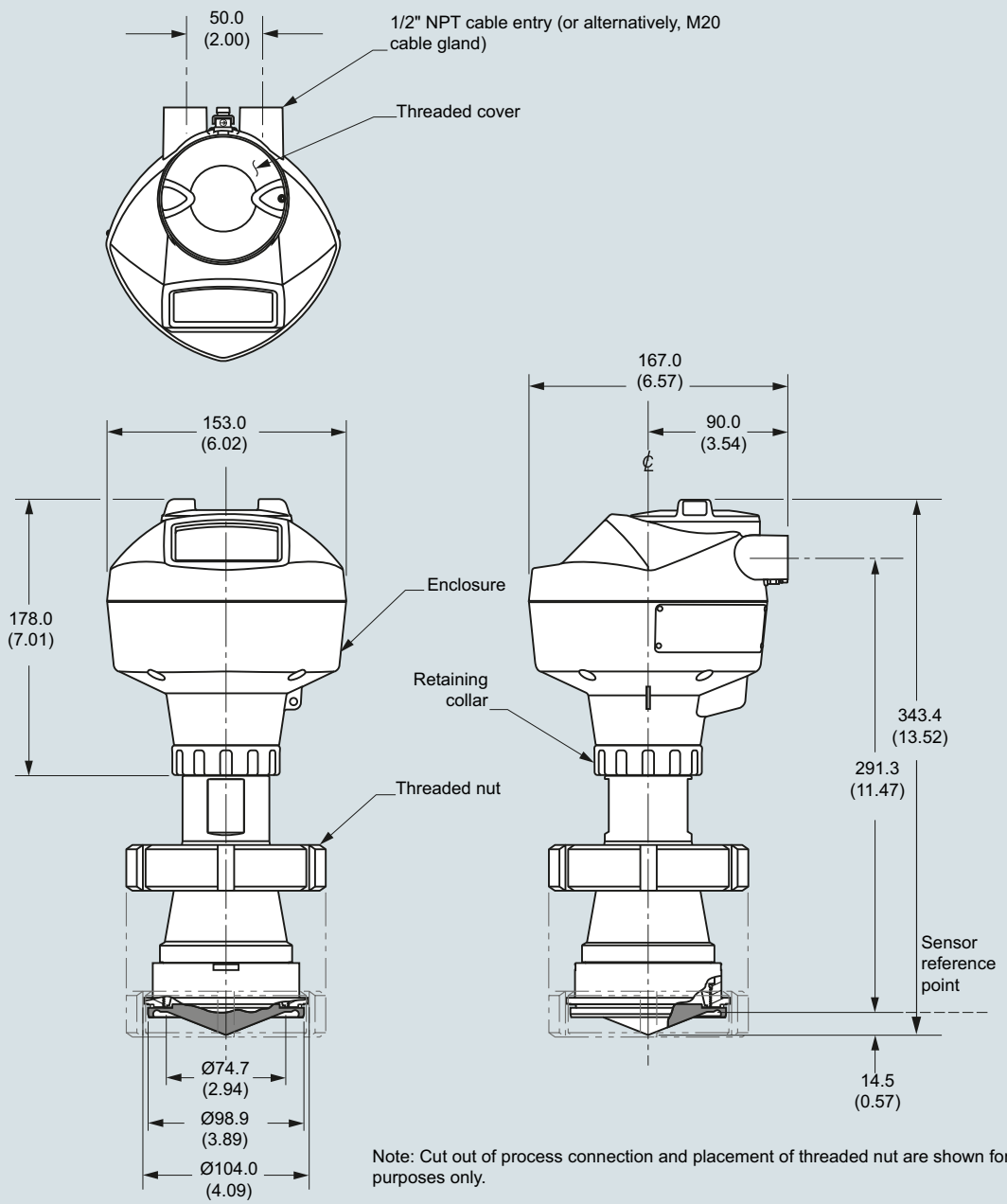
## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-1)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

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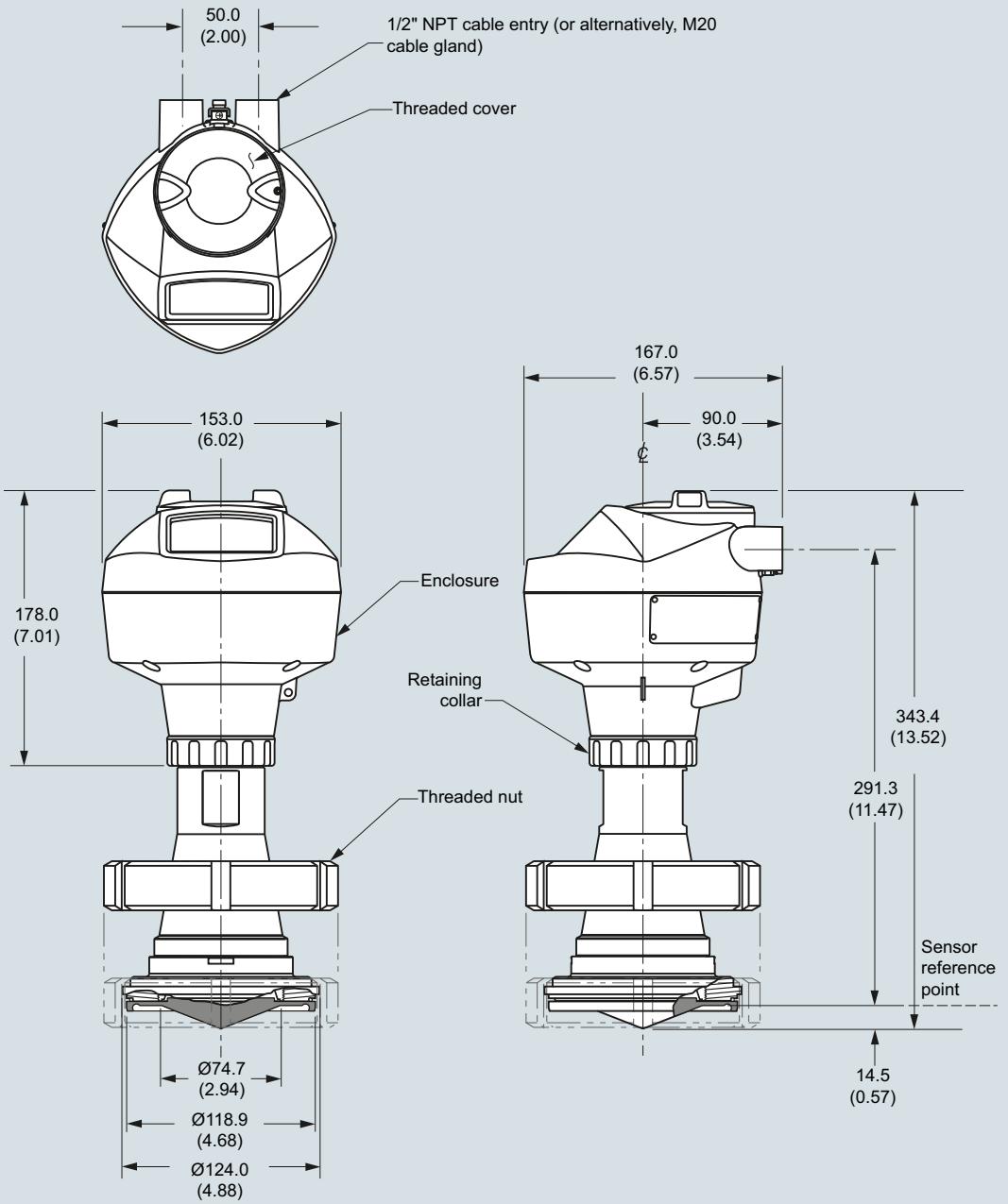
## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-1)




Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

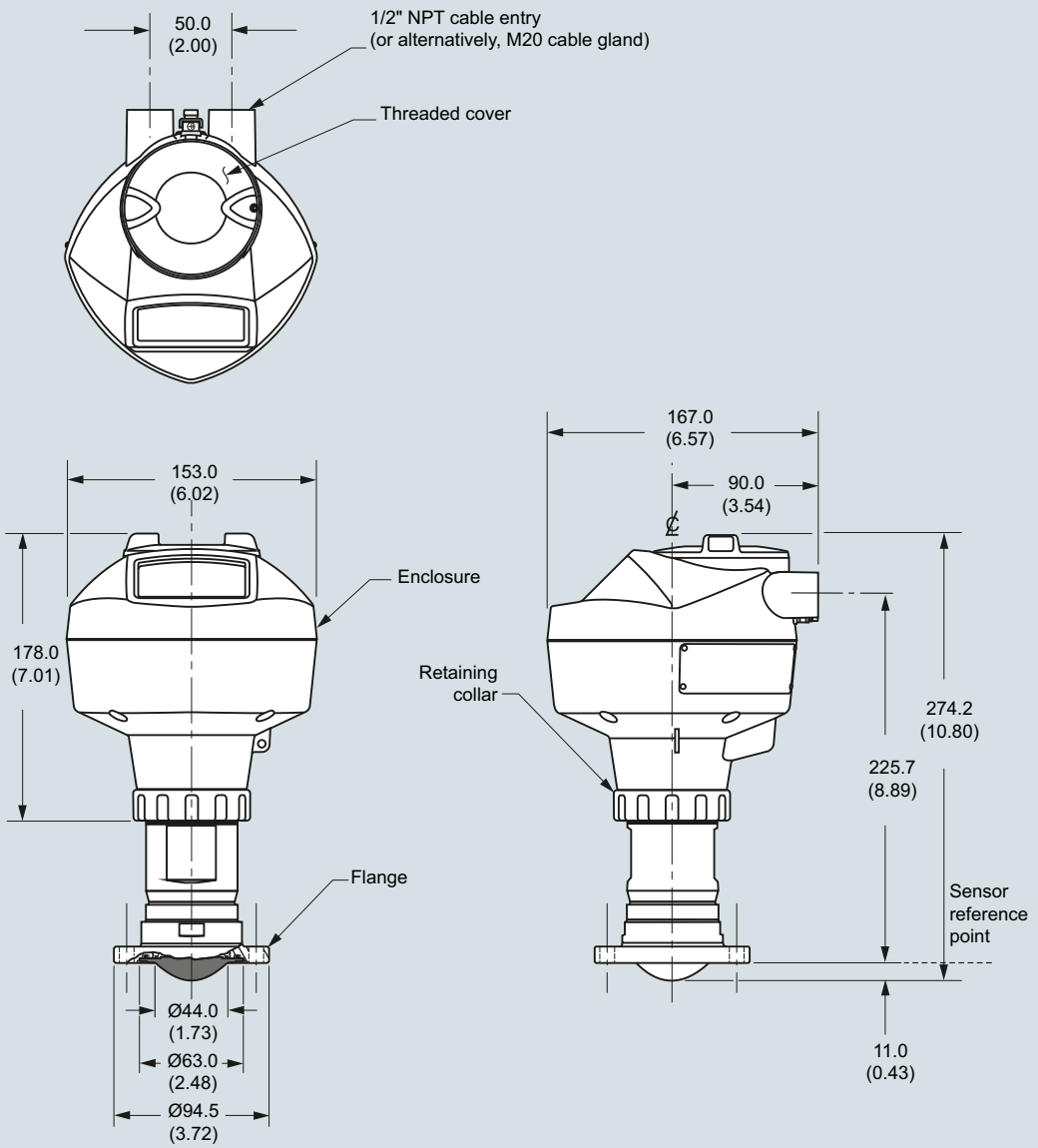
SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

© Siemens 2020



## Dimensional drawings (continued)

Hygienic encapsulated antenna (DN 50 aseptic flange to DIN 11864-2)




Note: Cut out of process connection and flange are shown for illustration purposes only.

SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic flange to DIN 11864-2), dimensions in mm (inch)

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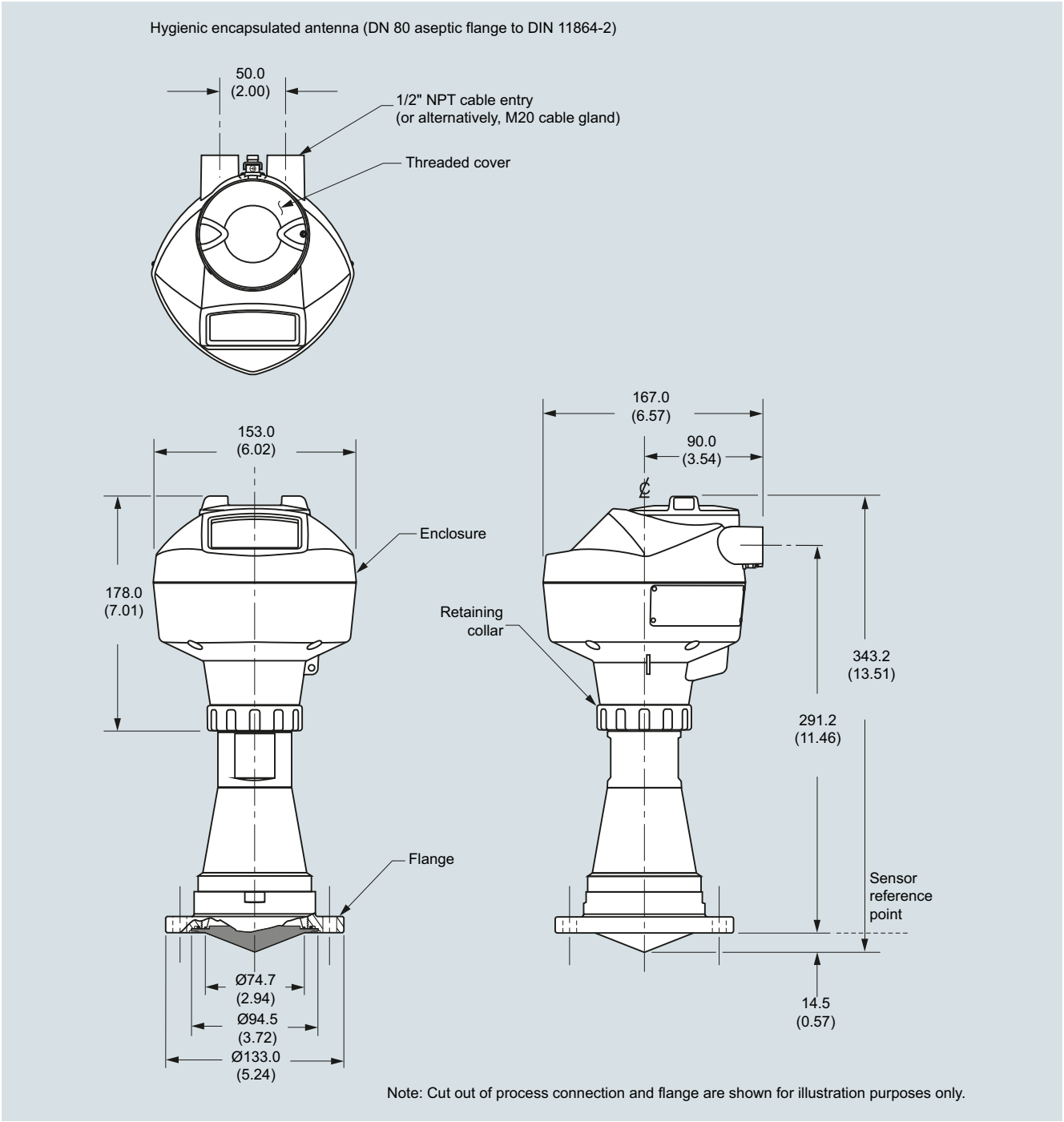
## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic flange to DIN 11864-2), dimensions in mm (inch)

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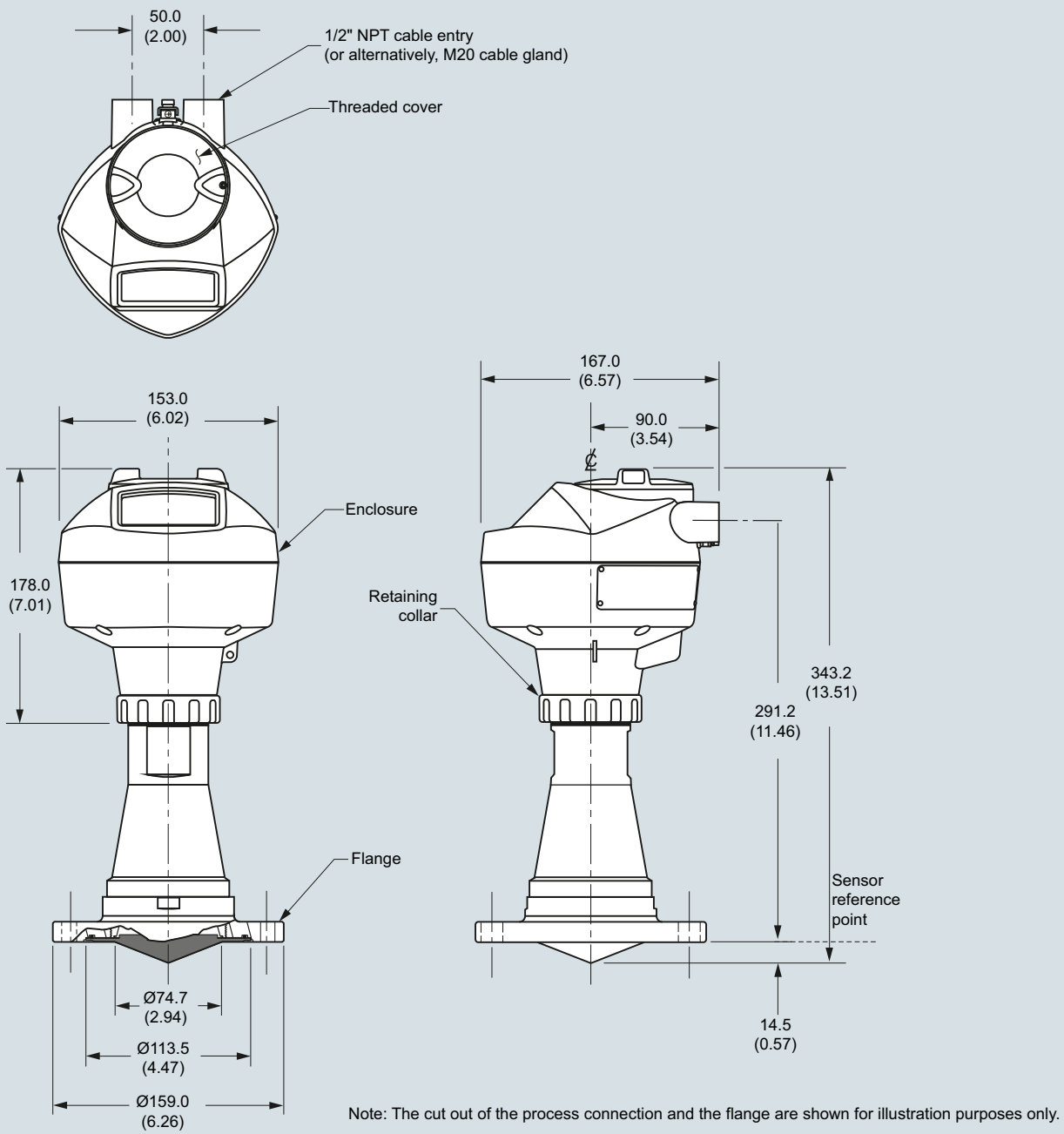
**Dimensional drawings** (continued)

Hygienic encapsulated antenna (DN 100 aseptic flange to DIN 11864-2)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic flange to DIN 11864-2), dimensions in mm (inch)

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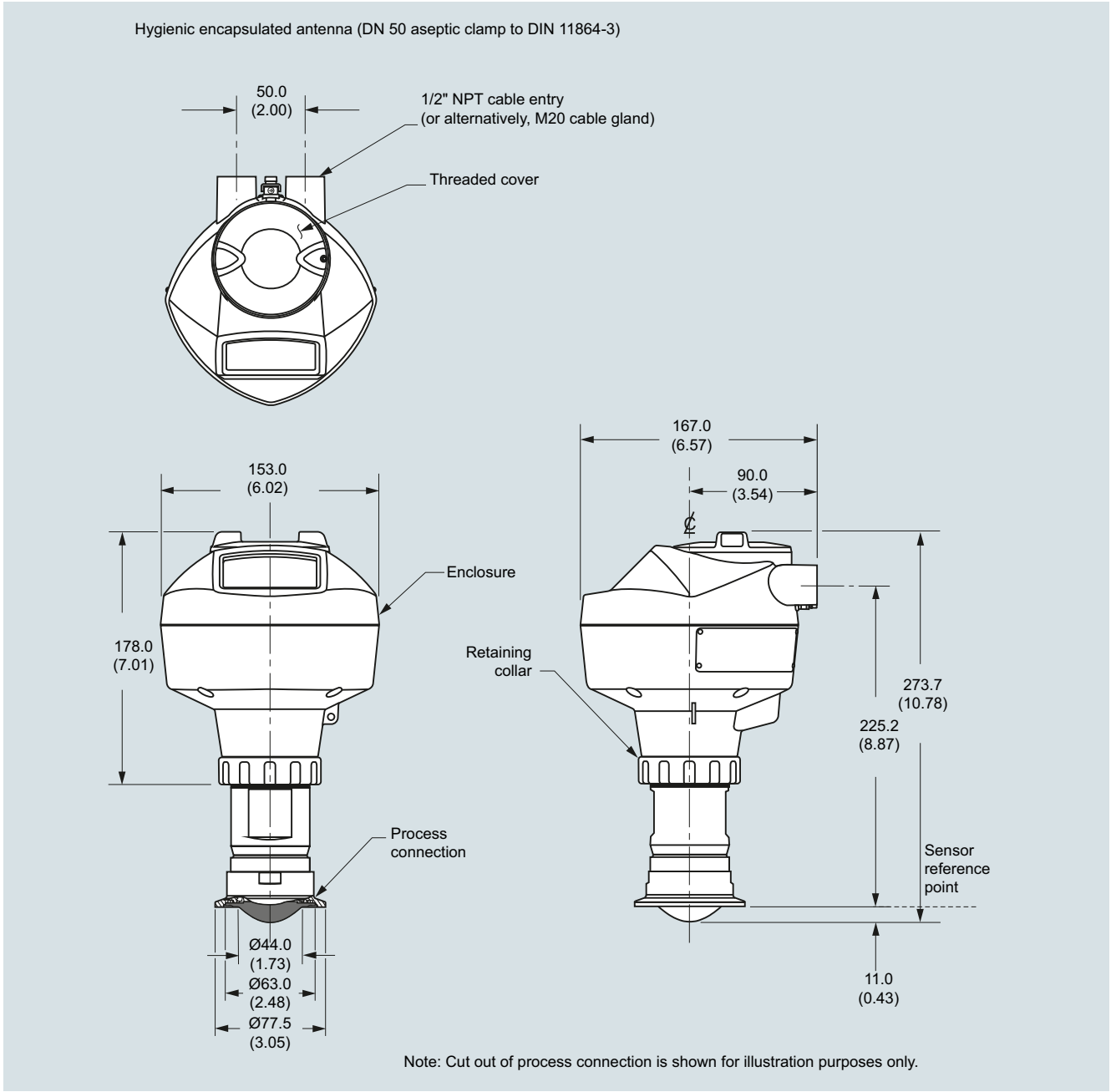
## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

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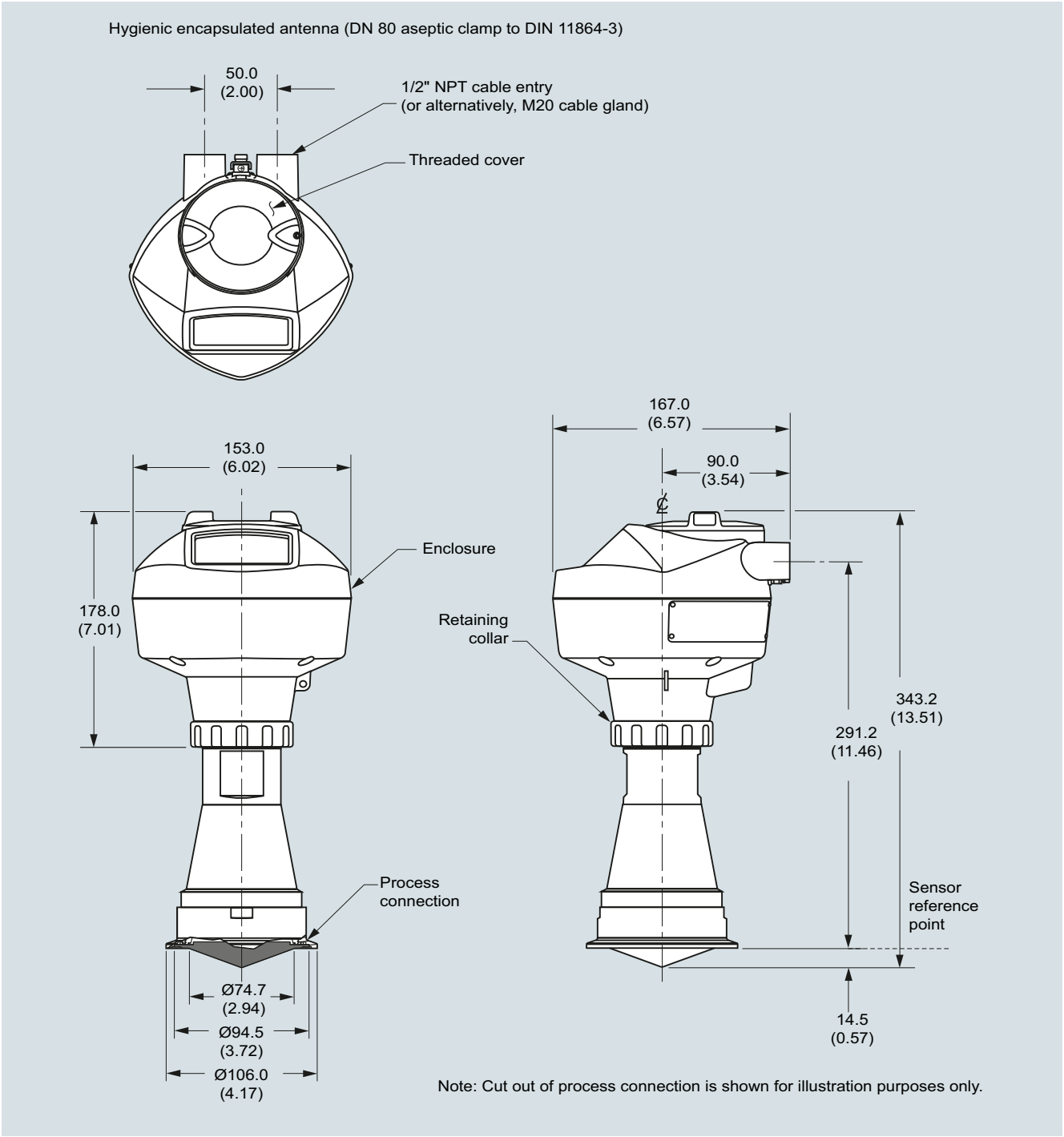
**Dimensional drawings** (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

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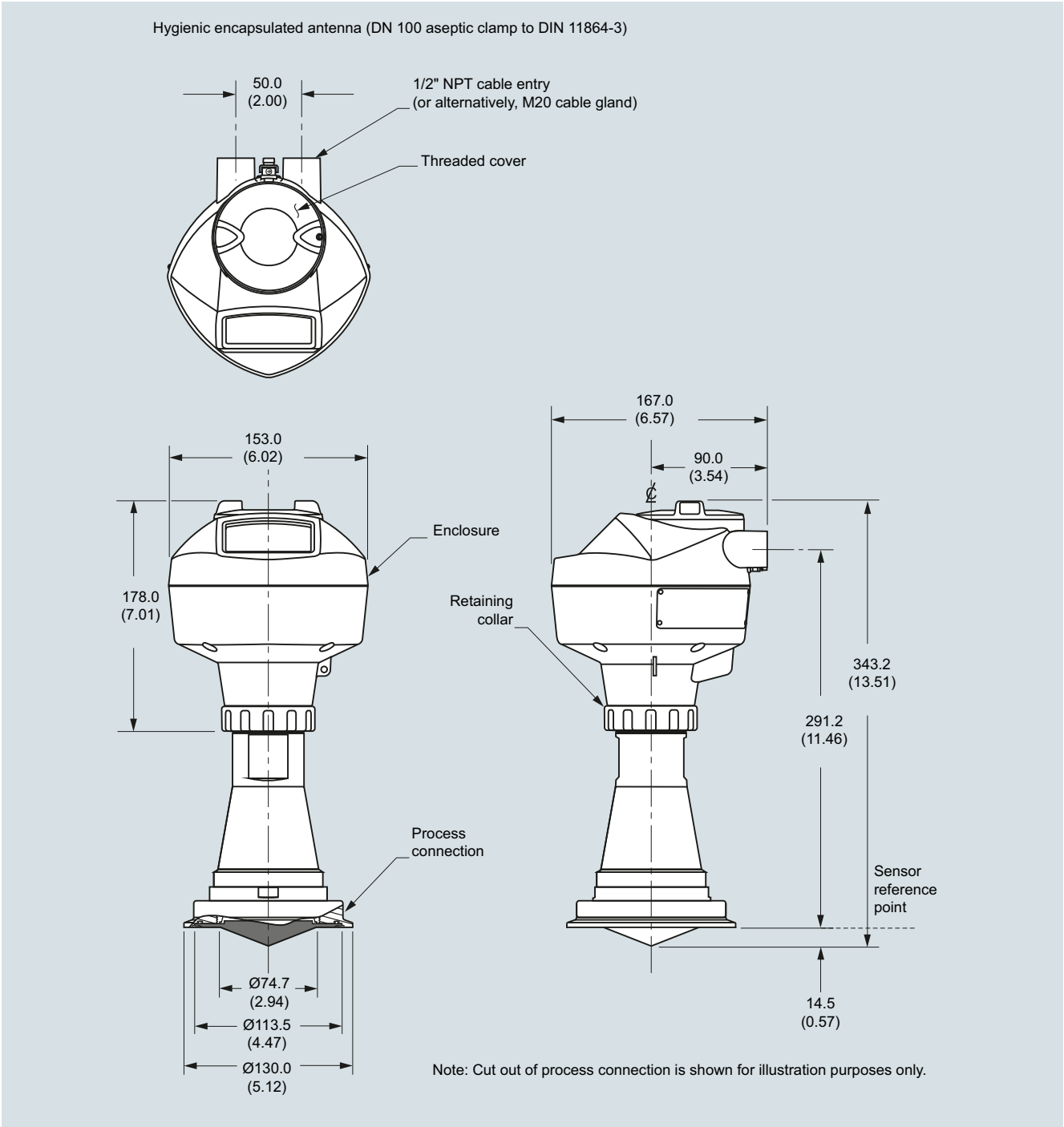
## **Dimensional drawings** (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

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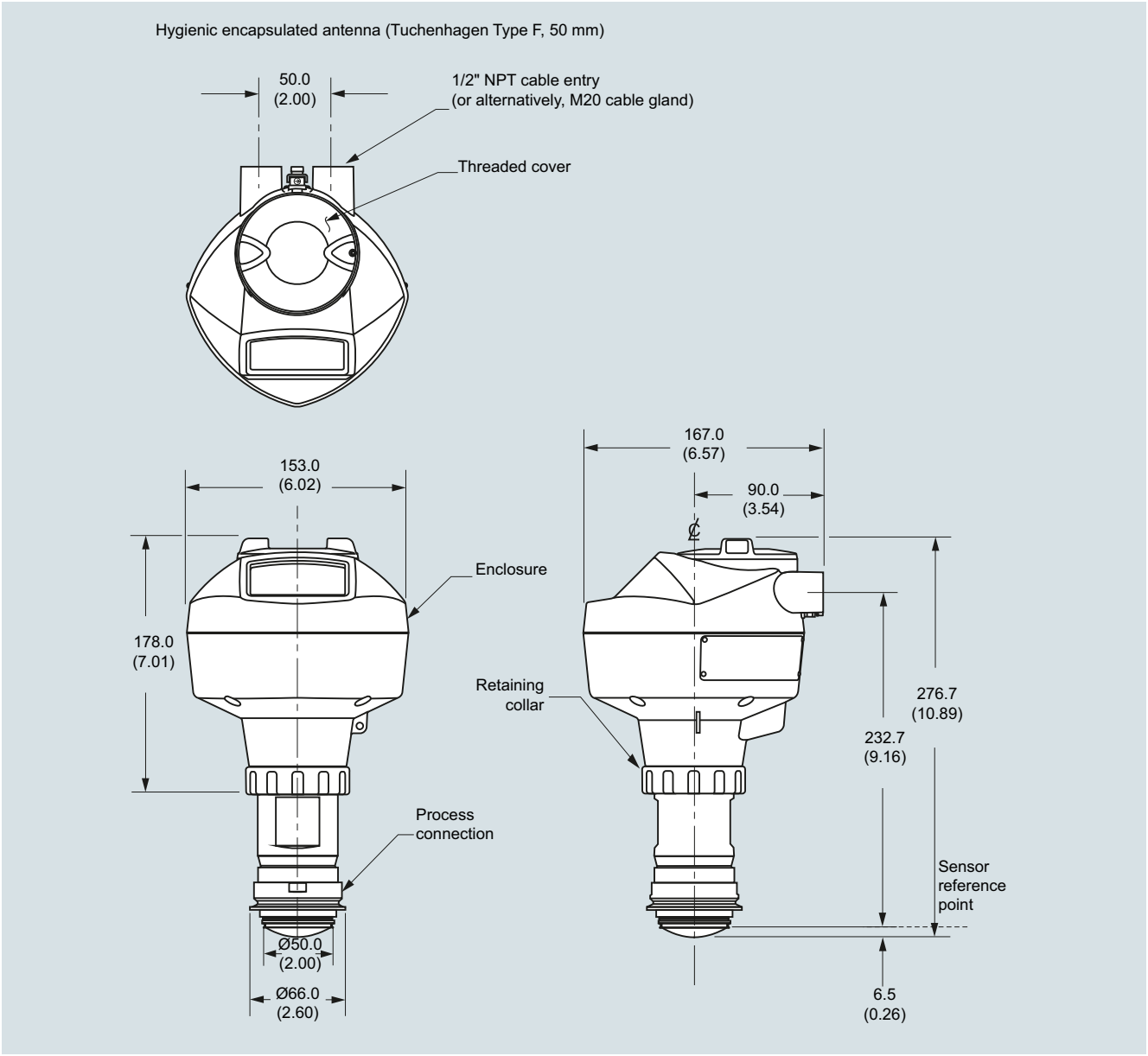
## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (Tuchenhagen Type F), dimensions in mm (inch)

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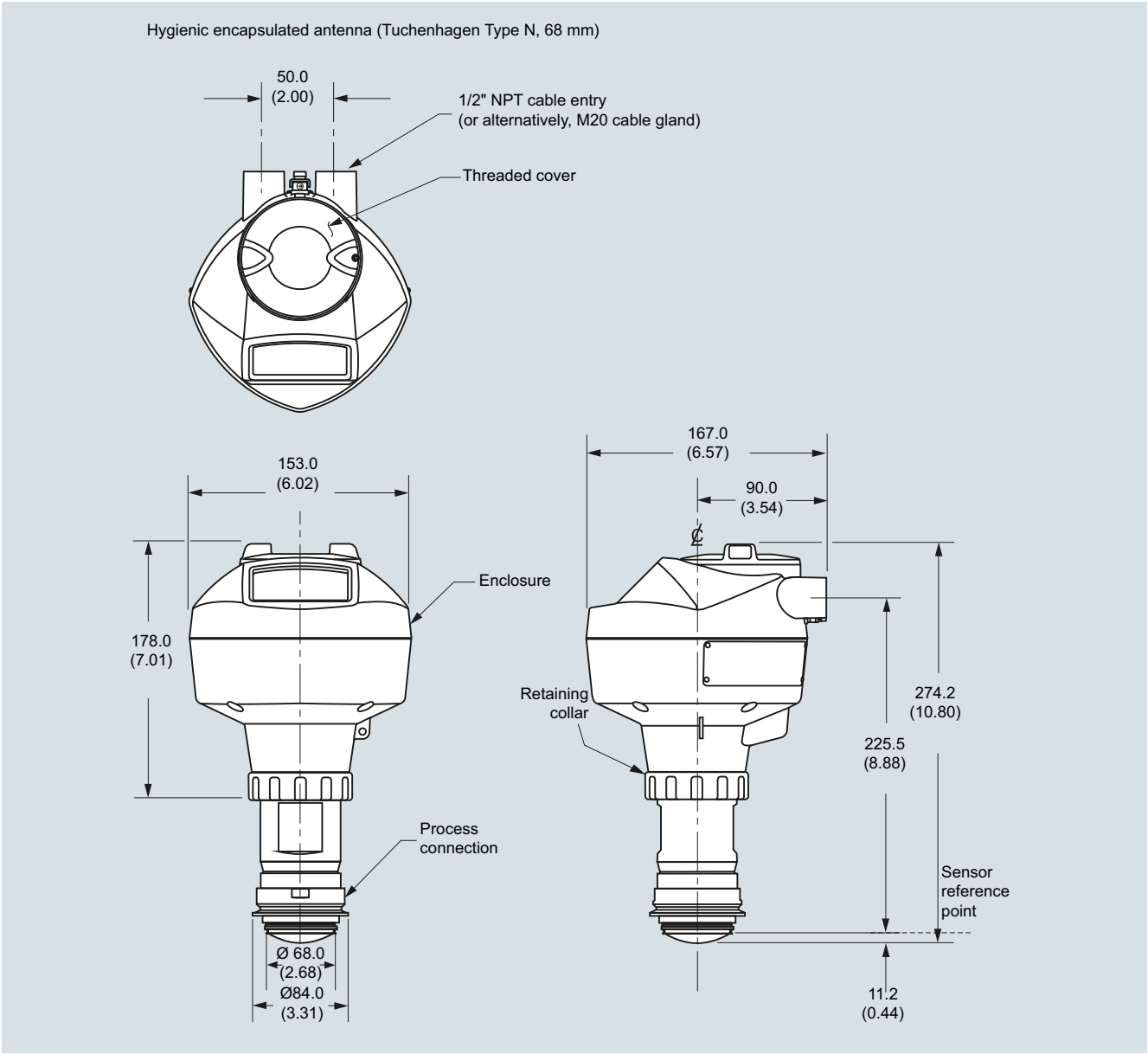
## Dimensional drawings (continued)




SITRANS LR250 Hygienic Encapsulated Antenna (Tuchenhagen Type N), dimensions in mm (inch)

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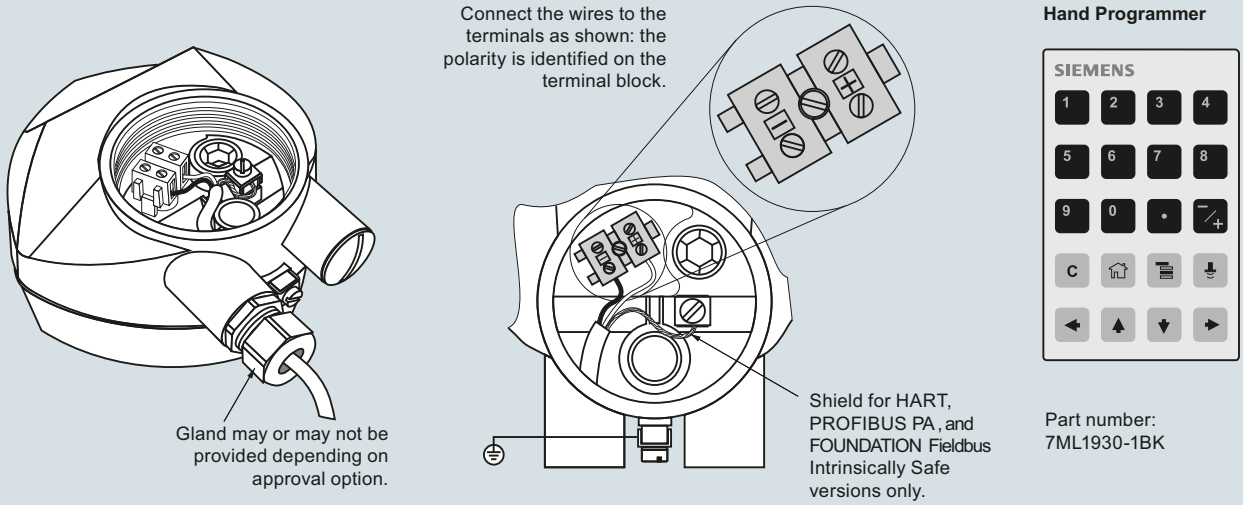
## Circuit diagrams




**Notes:**

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

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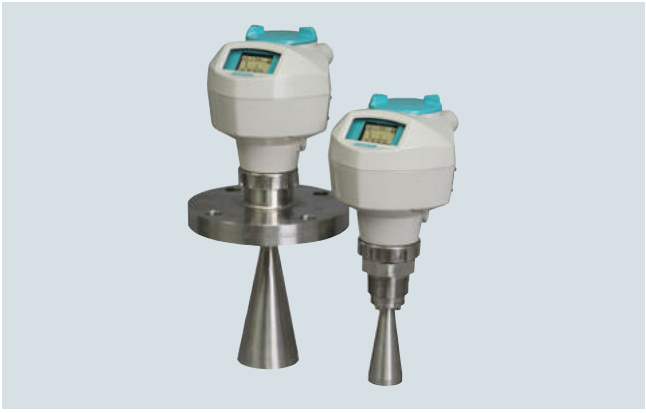
## Overview



SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).

## Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small antennas for easy mounting in nozzles
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1
- Suitable for API 2350

## Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

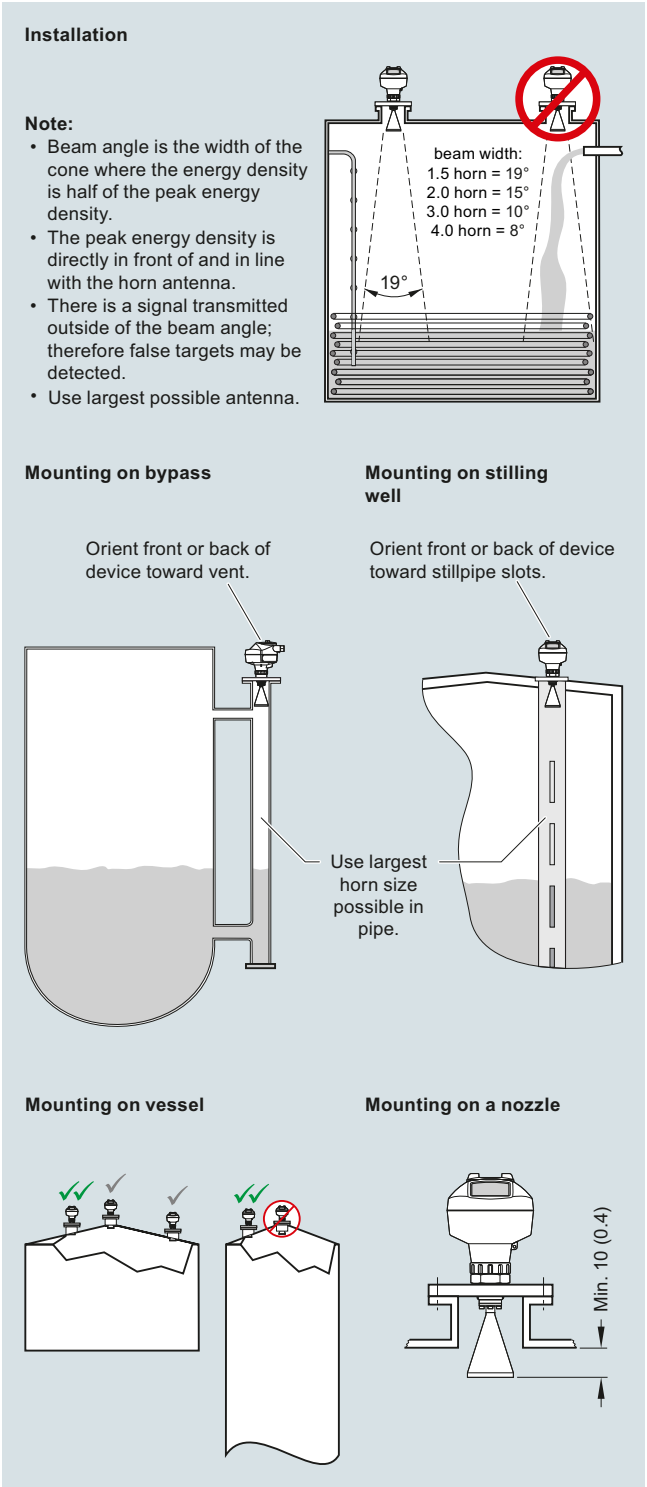
The 25 GHz frequency creates a narrow, focused beam allowing for smaller horn antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without saving to open the instrument's lid.

SITRANS LR250 measures superbly on low dielectric media, and in small vessels, as well as tall and narrow vessels.

- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

## Configuration




SITRANS LR250 installation, dimensions in mm (inch)

© Siemens 2020



## Technical specifications

| | |
|---|---|
| **Mode of operation** | |
| Measuring principle | Radar level measurement |
| Frequency | K-band (25.0 GHz) |
| Minimum measuring range | 50 mm (2 inch) from end of antenna |
| Maximum measuring range | 20 m (65 ft), antenna dependent |
| **Output** | |
| HART | Version 5.1 |
| • Analog output | 4 ... 20 mA |
| • Accuracy | ± 0.02 mA |
| • Fail-safe | • Programmable as high low or hold (loss of echo)<br>• NE 43 programmable |
| PROFIBUS PA | Profile 3.01 |
| • Function blocks | 2 Analog Input (AI) |
| FOUNDATION Fieldbus | H1 |
| • Functionality | Basic or LAS |
| • Version | ITK 5.2.0 |
| • Function blocks | 2 Analog Input (AI) |
| **Performance (according to reference conditions IEC60770-1)** | |
| Maximum measured error | 3 mm (0.118 inch) |
| Influence of ambient temperature | < 0.003 %/K |
| **Rated operating conditions** | |
| Installation conditions | |
| • Location | Indoor/outdoor |
| Ambient conditions (enclosure) | |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Installation category | I |
| • Pollution degree | 4 |
| **Medium conditions** | |
| Dielectric constant $\varepsilon_r$ | > 1.6, antenna and application dependent |
| Process temperature | -40 ... +200 °C (-40 ... +392 °F) (at process connection with FKM O-ring)<br>-20 ... +200 °C (-4 ... +392 °F) (at process connection with FFKM O-ring) |
| Process pressure | Up to 40 bar g (580 psi g), process connection and temperature dependent.<br>See Pressure/Temperature curves for more information |
| **Design** | |
| Enclosure | |
| • Material | Aluminum, polyester powder-coated |
| • Cable inlet | 2 x M20 x 1.5 or 2 x ½" NPT |
| Degree of protection | Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 |
| Weight | < 3 kg (6.6 lb) 3.75 mm (1½ inch) threaded connection with 1½" horn antenna |
| Display (local) | Graphic local user interface including quick start wizard and echo profile display |
| Antenna | |
| • Material | 316L stainless steel |
| • Dimensions (nominal horn sizes) | Standard 1.5 inch (40 mm), 2 inch (48 mm), 3 inch (75 mm), 4 inch (95 mm) horn, and optional 100 mm (4 inch) horn extension |
| Process connections | |
| • Process connection | 1½", 2" or 3" NPT [(Taper), ANSI/ASME B1.20.1]<br>R 1½", 2" or 3" [(BSPT), EN 10226]<br>G 1½", 2" or 3" [(BSPP), EN ISO 228-1] |
| • Flange connection | 2", 3", 4" (ANSI 150, 300 lb),<br>50, 80, 100 mm (PN 16, 40, JIS 10K) |

| | |
|---|---|
| **Power supply** | |
| 4 ... 20 mA/HART | Nominal 24 V DC (max. 30 V DC) with max. 550 Ω |
| PROFIBUS PA | • 15 mA<br>• Per IEC 61158-2 |
| FOUNDATION Fieldbus | • 20.0 mA<br>• Per IEC 61158-2 |
| **Certificates and approvals** | |
| General | $CSA_{US/C}$, CE, FM, RCM |
| Radio | FCC, Industry Canada, RED, RCM |
| Hazardous | |
| • Explosion Proof (Brazil) | INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Increased Safety (Brazil) | INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Intrinsically Safe (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Non-incendive (Canada/USA) | CSA/FM Class I, Div. 2, Groups A, B, C, D T5 |
| • Flame Proof/Increased Safety (China) | NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C |
| • Intrinsically Safe (China) | NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C |
| • Non-sparking (China) | NEPSI Ex nA IIC T4 Gc |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 Ga<br>ATEX II 1D Ex ia IIIC T100 °C Da |
| • Non-sparking (Europe) | ATEX II 3G Ex nA IIC T4 Gc |
| • Flame Proof (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da |
| • Increased Safety (International/Europe) | IECEx/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (International) | IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da |
| • Explosion Proof (Russia/Kazakhstan) | EAC Ex d |
| • Increased Safety (Russia/Kazakhstan) | EAC Ex e |
| • Intrinsically Safe (Russia/Kazakhstan) | EAC Ex ia |
| • Marine | • Lloyd's Register of Shipping<br>• ABS Type Approval<br>• Bureau Veritas |
| • Functional Safety | SIL-2 suitable in accordance with IEC 61508/61511 |
| **Programming** | |
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld programmer | IS model:<br>ATEX II 1 GD Ex ia IIC T4 Ga<br>Ex ia D 20 T135 °C $T_a$ = -20 ... +50 °C<br>CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 $T_a$ = +50 °C<br>IECEx SIR 09.0073 |
| Handheld communicator | HART communicator 375/475 |
| PC | • SIMATIC PDM<br>• Emerson AMS<br>• SITRANS DTM (for connection into FDT such as PACTware or Fieldcare) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile displays |

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## Selection and ordering data

| | Article No. |
|---|---|
| **SITRANS LR250 Radar level transmitter** ↗ | **7ML5431-** |
| Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. | ■ ■ ■ ■ **0** - ■ ■ ■ ■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Process Connection and Antenna Material** | |
| 316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FKM seal[1] | **0** |
| 316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal[1] | **1** |
| **Process Connection Type** | |
| Threaded connection 316L | |
| 1½" NPT (ASME B1.20.1) (tapered thread)[3] | **A A** |
| R 1½" [(BSPT), EN 10226-1] (tapered thread)[3] | **A B** |
| G 1½" [(BSPP), EN ISO 228-1] (parallel thread)[3] | **A C** |
| 2" NPT (ASME B1.20.1) (tapered thread)[4] | **A D** |
| R 2" [(BSPT), EN 10226-1] (tapered thread)[4] | **A E** |
| G 2" [(BSPP), EN ISO 228-1] (parallel thread)[4] | **A F** |
| 3" NPT (ASME B1.20.1) (tapered thread)[4] | **A G** |
| R 3" [(BSPT), EN 10226-1] (tapered thread)[4] | **A H** |
| G 3" [(BSPP), EN ISO 228-1] (parallel thread)[4] | **A J** |
| Flanged connection 316L | |
| 2" Class 150 ASME B16.5, raised face[4] | **B D** |
| 3" Class 150 ASME B16.5, raised face[4] | **B E** |
| 4" Class 150 ASME B16.5, raised face[4] | **B F** |
| 2" Class 300 ASME B16.5, raised face[4] | **C D** |
| 3" Class 300 ASME B16.5, raised face[4] | **C E** |
| 4" Class 300 ASME B16.5, raised face[4] | **C F** |
| 50A 10K JIS B 2220 flat face[4] | **F A** |
| 80A 10K JIS B 2220 flat face[4] | **F B** |
| 100A 10K JIS B 2220 flat face[4] | **F C** |
| DN 50 PN 16 EN 1092-1 Type B1 raised face[4] | **G A** |
| DN 80 PN 16 EN 1092-1 Type B1 raised face[4] | **G B** |
| DN 100 PN 16 EN 1092-1 Type B1 raised face[4] | **G C** |
| DN 150 PN 16 EN 1092-1 Type B1 raised face[4] | **G D** |
| DN 50 PN 40 EN 1092-1 Type B1 raised face[4] | **H A** |
| DN 80 PN 40 EN 1092-1 Type B1 raised face[4] | **H B** |
| DN 100 PN 40 EN 1092-1 Type B1 raised face[4] | **H C** |
| DN 150 PN 40 EN 1092-1 Type B1 raised face[4] | **H D** |
| **Communication/Output** | |
| PROFIBUS PA[5] | **1** |
| 4 ... 20 mA, HART, start-up at < 3.6 mA | **2** |
| FOUNDATION Fieldbus[5] | **3** |
| **Enclosure/Cable inlet** | |
| Aluminum, Epoxy painted | |
| 2 x ½" NPT | **0** |
| 2 x M20 x 1.5 | **1** |
| **Antenna** | |
| 1½" horn | **A** |
| 2" horn (fits 2" ASME or DN 50 nozzles) | **B** |
| 3" horn (fits 3" ASME or DN 80 nozzles) | **C** |
| 4" horn (fits 4" ASME or DN 100 nozzles) | **D** |
| 1½" horn with 100 mm extension | **E** |
| 2" horn with 100 mm extension | **F** |
| 3" horn with 100 mm extension | **G** |
| 4" horn with 100 mm extension | **H** |

| | Article No. |
|---|---|
| **SITRANS LR250 Radar level transmitter** | **7ML5431-** |
| Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. | ■ ■ ■ ■ **0** - ■ ■ ■ ■ |
| **Approvals** | |
| General Purpose, CE, CSA, FM, FCC, RED, RCM | **A** |
| Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada | **B** |
| Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, RED, RCM | **C** |
| Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada | **D** |
| Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, RED, RCM | **E** |
| Increased Safety: IECEx/ATEX II 1/2 GD,1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[6] | **F** |
| Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[6] | **G** |
| Explosion proof: CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[6] | **H** |
| Non Sparking: NEPSI Ex nA IIC T4 Gc | **K** |
| Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C | **L** |
| Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[6] | **M** |
| Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C[6] | **N** |
| **Pressure rating** | |
| Rating per Pressure/Temperature curves in manual | **0** |
| 0.5 bar g (7.25 psi g) maximum[7] | **1** |

[1] Available with process connection options AA ... HD and Antenna Versions A ... H only.

[2] Available with process connection options JA ... MH and Antenna Versions J ... P only.

[3] Not available with Antenna options B, C, D, F, G, H.

[4] Not available with Antenna options A and E.

[5] Available with Approval options A, B, C, D, K, and L.

[6] Available only with Communications option 2.

[7] Available with Process Connection and Antenna Material 0, 1, 2, and 3 only.

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## SITRANS LR250 Horn Antenna

### Selection and ordering data

| | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code(s). | |
| Plug M12 with mating Connector[1)2)3)] | **A50** |
| Plug 7/8" with mating Connector[2)3)4)] | **A55** |
| Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text | **Y15** |
| Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000 | **C11** |
| Material inspection certificate 3.1 of EN 10204 | **C12** |
| Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[3)5)] | **C20** |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[5)] | **N07** |
| ***Operating Instructions*** | |
| All literature is available to download for free, in a range of languages, at | |

http://www.siemens.com/processinstrumentation/documentation

| | Article No |
|---|---|
| ***Accessories*** | |
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| HART modem/USB (for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required) | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required)[6)] | **7ML1930-1AQ** |
| FDA approved FKM O-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F) | **7ML1830-3AN** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-.....-.** |
| SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 | **7ML5742-.....-....** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-.....-..** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-.....-..** |
| For applicable back up point level switch - see point level measurement section | |

1) Available with enclosure option 1 only.
2) To be used with communication options 1 and 3 only. Connector has IP67 rating.
3) Available with approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex.
4) Available with enclosure option 0 only.
5) Applicable to communication option 2 only.
6) For use with communication options 1 and 3 only.

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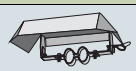
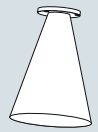
## Selection and ordering data

### *SITRANS LR250 Spare parts*

| | Article No. |
|---|---|
| **SITRANS LR250 horn version enclosures (PROFIBUS PA models)** | |
| SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E01156836** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E01156838** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection | **A5E01156841** |
| SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection | **A5E01156843** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection | **A5E01156844** |
| SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS communication, no process connection | **A5E01156846** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection | **A5E01156848** |
| **SITRANS LR250 horn version enclosures (FOUNDATION Fieldbus models)** | |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection | **A5E03769538** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection | **A5E03769539** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection | **A5E03769543** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection | **A5E02654608** |
| SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E02653792** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E02653793** |
| SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection | **A5E02654606** |

| | Article No. |
|---|---|
| **SITRANS LR250 horn version enclosures (< 3.6 mA start-up HART)** | |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E02956317** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection | **A5E02956319** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection | **A5E02956320** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection | **A5E02956322** |
| SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection | **A5E02956323** |
| LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E03441096** |
| LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection | **A5E03441097** |
| LR250 horn version enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection | **A5E03441099** |
| **Sun shield for SITRANS LR250 enclosure, stainless steel** |  |
| | **A5E39142556** |
| **SITRANS LR250 horn antenna and extension kits** |  |
| 38 mm (1.5 inch) horn antenna kit, 1.5 inch Process Connections only | **A5E01151539** |
| 100 mm (4 inch) horn antenna extension kit, 1.5 inch process connections only | **A5E01151553** |
| 50 mm (2 inch) stainless steel 316L horn antenna kit | **A5E01151569** |
| 75 mm (3 inch) stainless steel 316L horn antenna kit | **A5E01151571** |
| 100 mm (4 inch) stainless steel 316L horn antenna kit | **A5E01151573** |
| 100 mm (4 inch) horn antenna extension kit, 50 mm (2 inch), 75 mm (3 inch), and 100 mm (4 inch) process connection | **A5E01151577** |
| 5 Dupont 1Gr Polyback, PTFE grease kit | **A5E01151626** |
| SITRANS LR250 lid with O-ring | **A5E02465410** |
| **Ex-proof plugs** | |
| Ex-proof plugs kit, 1/2" NPT, qty 5 | **A5E39979991** |
| Ex-proof plugs kit, M20, qty 5 | **A5E39979992** |

For special requests please consult a local sales person.
For more information, please visit
http://www.automation.siemens.com/aspa_app.

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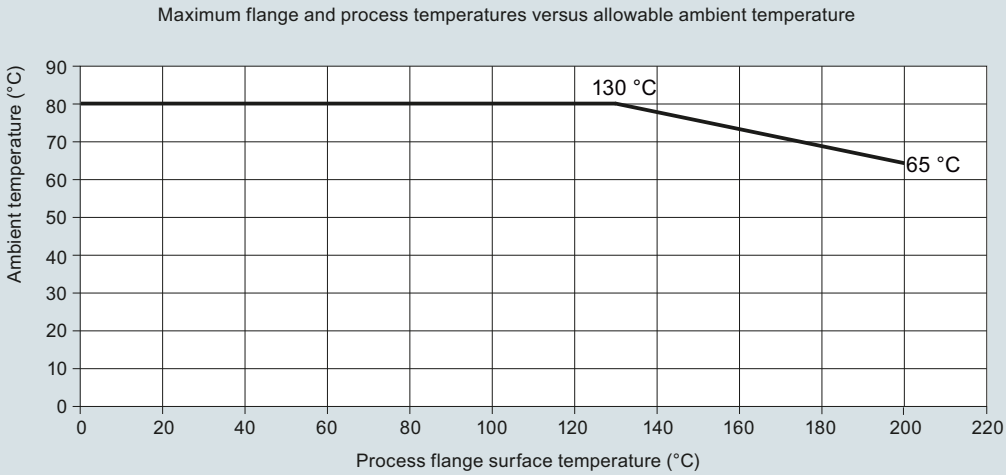
## Characteristic curves




SITRANS LR250 ambient/process flange surface temperature curve

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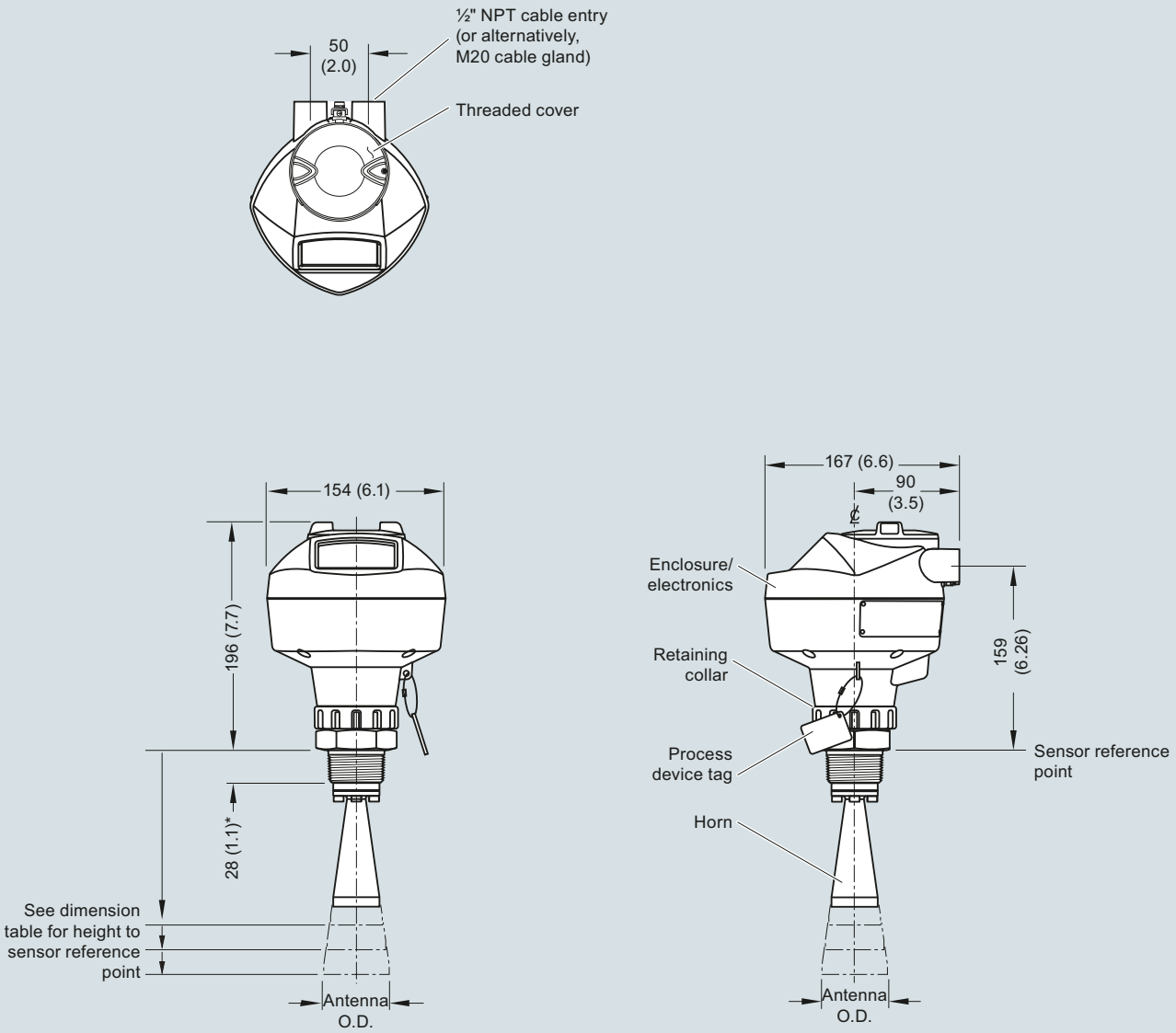
## Dimensional drawings

**Threaded Horn Antenna**




*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

| Antenna Type | Antenna O.D. | Height to sensor reference point | | | Beam angle | Measurement range |
|---|---|---|---|---|---|---|
| | | 1-1/2" threaded connection | 2" threaded connection | 3" threaded connection | | |
| 1.5" horn | 39.8 (1.57) | 135 (5.3) | N/A | N/A | 19 degrees | 10 m (32.8 ft) |
| 2" horn | 47.8 (1.88) | N/A | 166 (6.55) | 180 (7.09) | 15 degrees | 20 m (65.6 ft) |
| 3" horn | 74.8 (2.94) | N/A | 199 (7.85) | 213 (8.39) | 10 degrees | 20 m (65.6 ft) |
| 4" horn | 94.8 (3.73) | N/A | 254 (10) | 268 (10.55) | 8 degrees | 20 m (65.6 ft) |

SITRANS LR250 Threaded Horn Antenna, dimensions in mm (inch)

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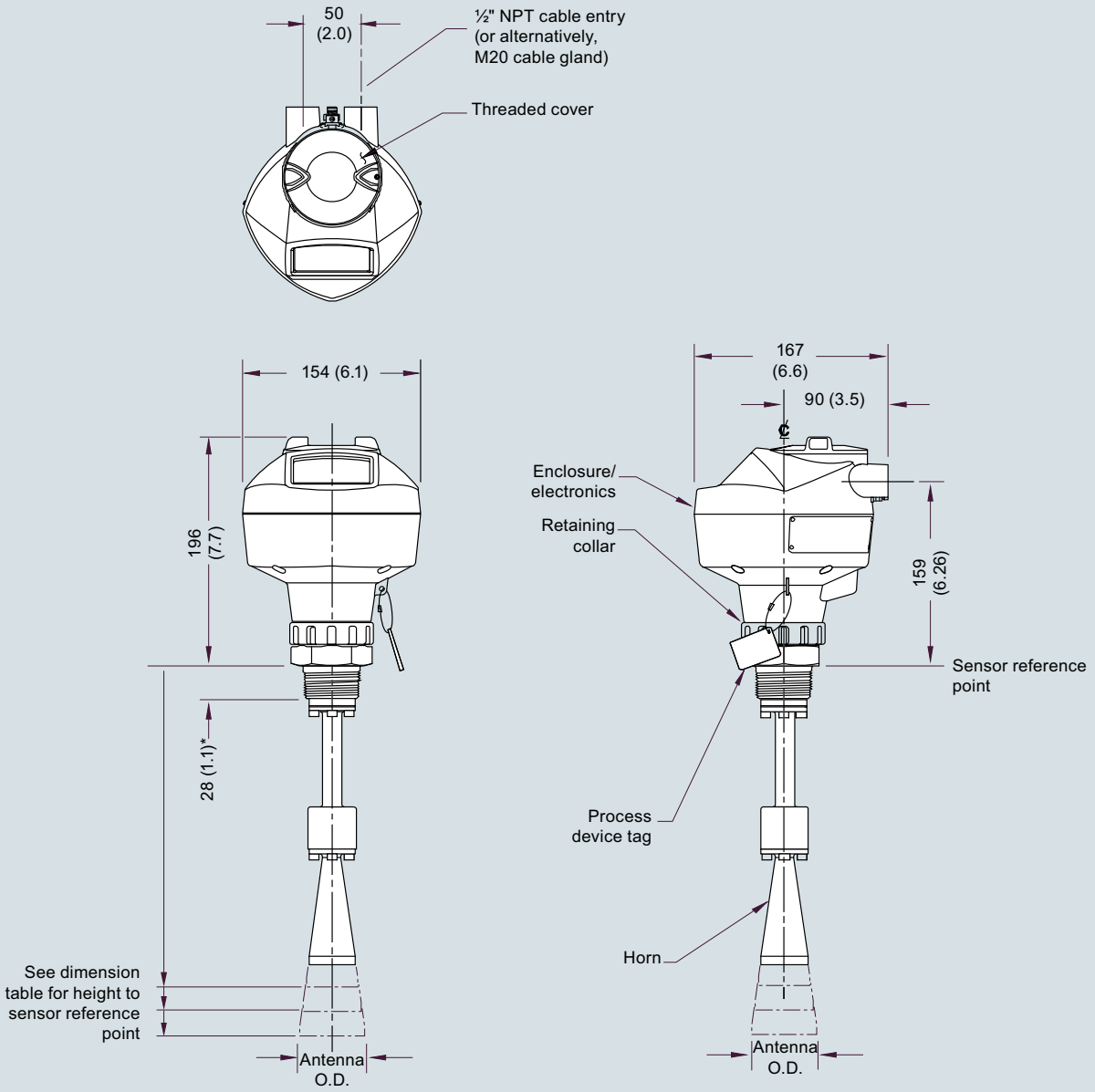
## Dimensional drawings (continued)

**Threaded Horn Antenna with Extension**




*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

| Antenna Type | Antenna O.D. | Height to sensor reference point | | | Beam angle | Measurement range |
|---|---|---|---|---|---|---|
| | | 1-1/2" threaded connection | 2" threaded connection | 3" threaded connection | | |
| 1.5" horn | 39.8 (1.57) | 235 (9.3) | N/A | N/A | 19 degrees | 10 m (32.8 ft) |
| 2" horn | 47.8 (1.88) | N/A | 266 (10.47) | 280 (11.02) | 15 degrees | 20 m (65.6 ft) |
| 3" horn | 74.8 (2.94) | N/A | 299 (11.77) | 313 (12.32) | 10 degrees | 20 m (65.6 ft) |
| 4" horn | 94.8 (3.73) | N/A | 354 (13.94) | 368 (14.49) | 8 degrees | 20 m (65.6 ft) |

SITRANS LR250 Threaded Horn Antenna with extension, dimensions in mm (inch)

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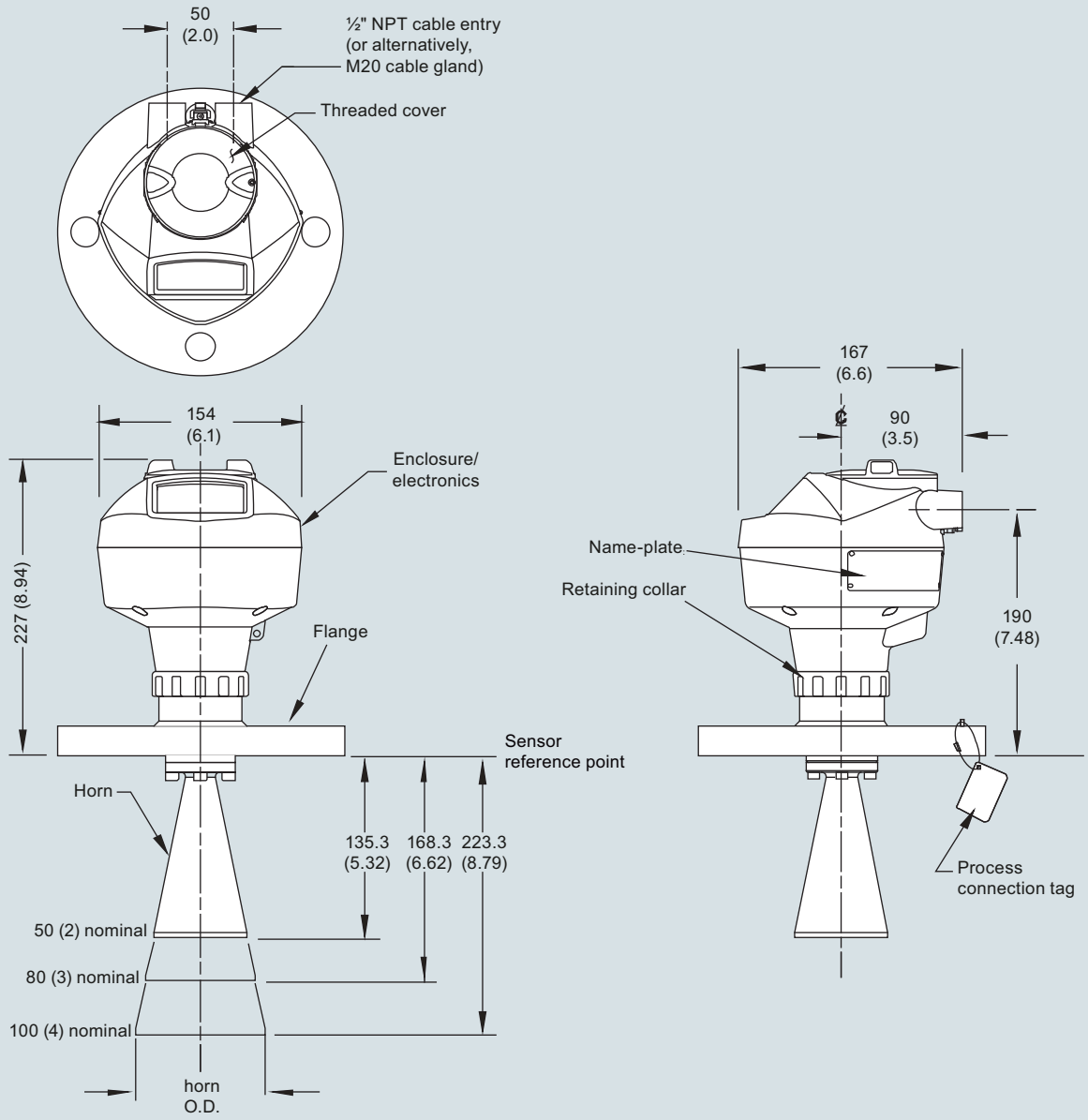
## Dimensional drawings (continued)

**Flanged Horn**




| Nominal Horn Size | Horn O.D. | Height to sensor reference point | | Beam angle | Measurement range |
|---|---|---|---|---|---|
| | | Stainless steel flange raised or flat-faced | Optional alloy flange | | |
| 50 (2) | 47.8 (1.88) | 135.3 (5.32) | 138.3 (5.44) | 15 degrees | 20 m (65.6 ft) |
| 80 (3) | 74.8 (2.94) | 168.3 (6.62) | 171.3 (6.74) | 10 degrees | 20 m (65.6 ft) |
| 100 (4) | 94.8 (3.73) | 223.3 (8.79) | 226.3 (8.90) | 8 degrees | 20 m (65.6 ft) |

SITRANS LR250 Flanged Horn Antenna, dimensions in mm (inch)

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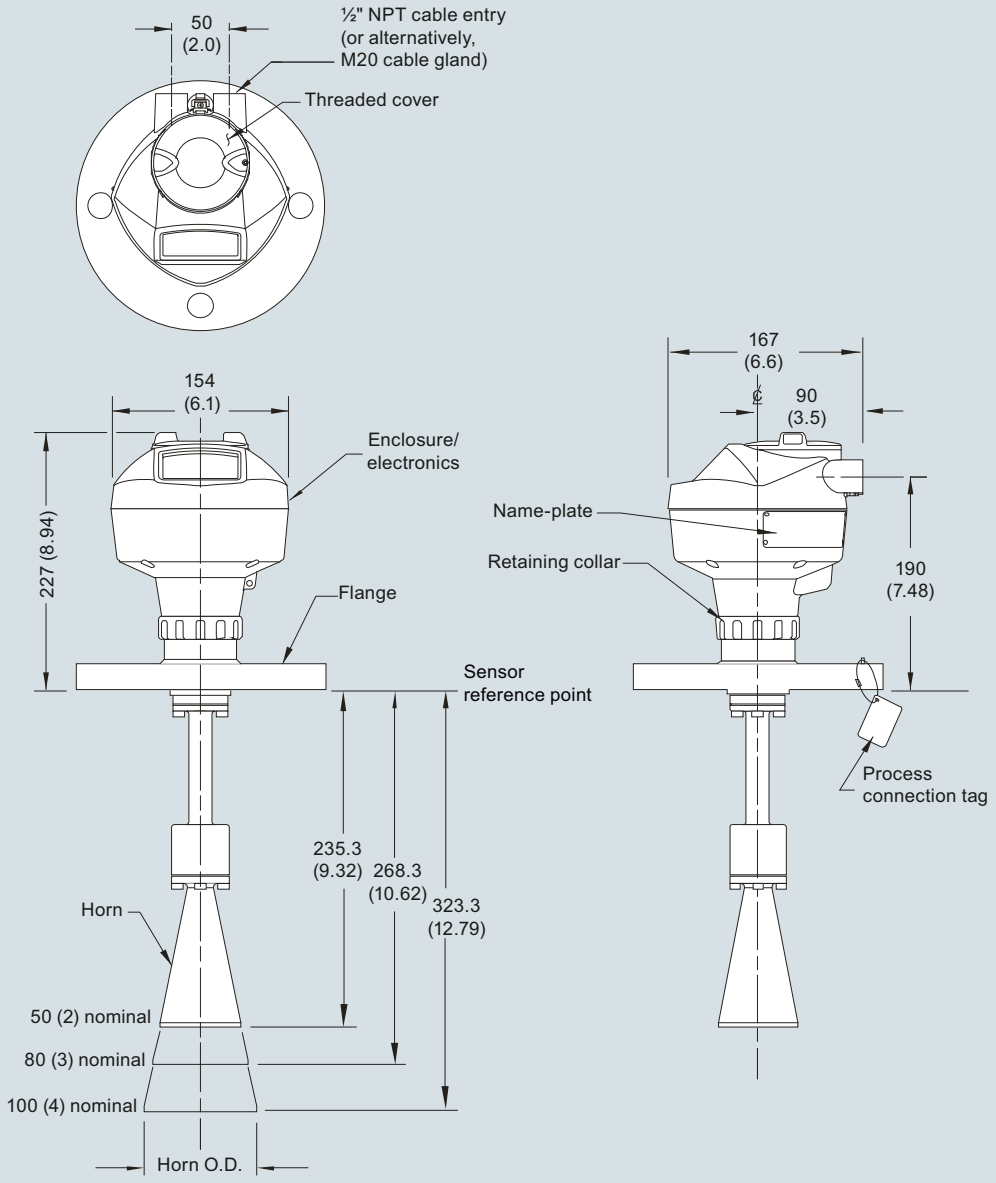
## Dimensional drawings (continued)

**Flanged Horn with Extension**




| Nominal Horn Size | Horn O.D. | Height to sensor reference point | | Beam angle | Measurement range |
|---|---|---|---|---|---|
| | | Stainless steel flange raised or flat-faced | Optional alloy flange | | |
| 50 (2) | 47.8 (1.88) | 235.3 (9.26) | 238.3 (9.38) | 15 degrees | 20 m (65.6 ft) |
| 80 (3) | 74.8 (2.94) | 268.3 (10.56) | 271.3 (10.68) | 10 degrees | 20 m (65.6 ft) |
| 100 (4) | 94.8 (3.73) | 323.3 (12.73) | 326.3 (12.85) | 8 degrees | 20 m (65.6 ft) |

SITRANS LR250 Flanged Horn Antenna with extension, dimensions in mm (inch)

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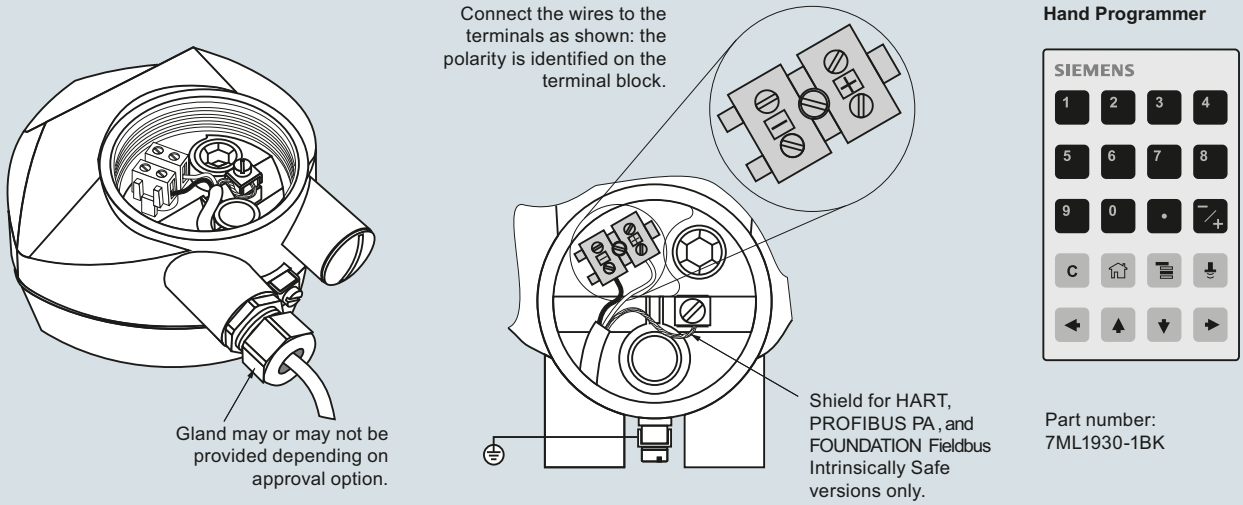
## Circuit diagrams




**Notes:**

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

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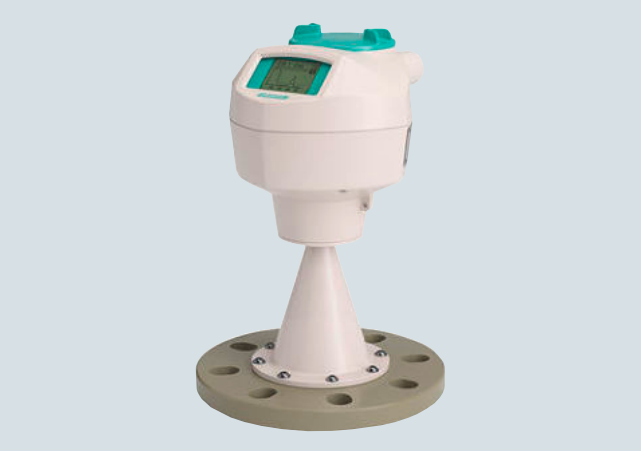
## SITRANS LR250 Polypropylene Lens Antenna

### Overview



SITRANS LR250 Polypropylene lens antenna is a 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosive materials to a range of 20 m (65.6 ft).

### Benefits

- For use in chemical environments where aggressive and corrosive materials are present.
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared, Intrinsically Safe, handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1

### Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, corrosive and aggressive materials.

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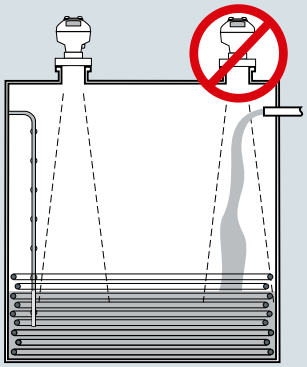
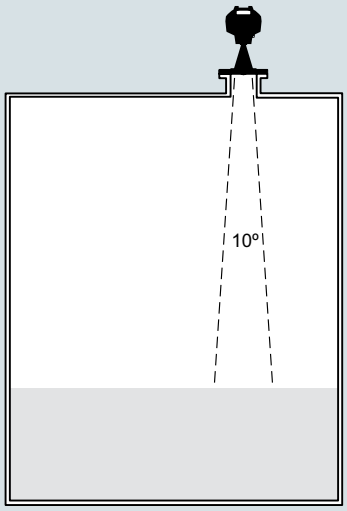
## Configuration

**Installation of SITRANS LR250 Level Probing Radar**

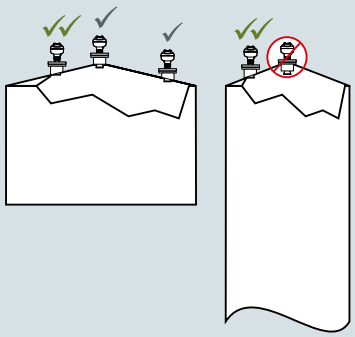
Note:
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



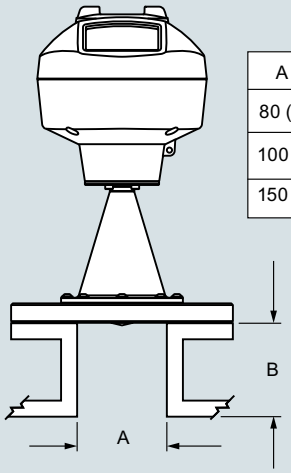
Polypropylene lens antenna




Mounting on vessel



SITRANS LR250 Polypropylene lens antenna installation




| A | B |
|---|---|
| 80 (3) | 500 (20) max. |
| 100 (4) | 500 (20) max. |
| 150 (6) | 500 (20) max. |

SITRANS LR250 Polypropylene lens antenna, mounting on a nozzle, dimensions in mm (inch)

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## SITRANS LR250 Polypropylene Lens Antenna

### Technical specifications

| | |
|---|---|
| **Mode of operation** | |
| Measuring principle | Radar level measurement |
| Frequency | K-band (25.0 GHz) |
| Minimum measuring range | 50 mm (2 inch) from end of antenna |
| Maximum measuring range | 20 m (66 ft) |
| **Output** | |
| HART | Version 5.1 |
| • Analog output | 4 ... 20 mA |
| • Accuracy | ± 0.02 mA |
| • Fail-safe | • Programmable as high, low or, hold (loss of echo)<br>• NE 43 programmable |
| PROFIBUS PA | Profile 3.1 |
| • Function blocks | 2 Analog Input (AI) |
| FOUNDATION Fieldbus | H1 |
| • Functionality | Basic or LAS |
| • Version | ITK 5.2.0 |
| • Function blocks | 2 Analog Input (AI) |
| **Performance (according to reference conditions IEC 60770-1)** | |
| Maximum measured error | • > 500 mm from sensor reference point: 3 mm (0.118 inch)<br>• < 500 mm from sensor reference point: 25 mm (1 inch) |
| Influence of ambient temperature | < 0.003 %/K |
| **Rated operating conditions** | |
| Installation conditions | |
| • Location | Indoor/outdoor |
| Ambient conditions (enclosure) | |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Installation category | I |
| • Pollution degree | 4 |
| **Medium conditions** | |
| Dielectric constant $\varepsilon_r$ | > 1.6 |
| Process temperature | -40 ... +80 °C (-40 ... +176 °F) at process connection |
| Process pressure | Up to 5 bar g (72 psi g) temperature dependent. |
| **Design** | |
| Enclosure | |
| • Material | Aluminum, polyester powder-coated |
| • Cable inlet | 2 x M20 x 1.5 or 2 x ½" NPT |
| Degree of protection | Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 |
| Weight | Polypropylene lens antenna with 3 inch (80 mm) polypropylene flange<br>• Approximately 3.4 kg (7.5 lb) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile display |
| Polypropylene lens antenna | |
| • Materials | • Polyester powder coated exterior<br>• 3 inch cast aluminum<br>• Polypropylene lens<br>• FKM seal |
| • Process connections | |
| - Material | Polypropylene |
| - Dimensions | Universal flange: 3 inch (80 mm), 4 inch (100 mm), 6 inch (150 mm) |

| | |
|---|---|
| **Power supply** | |
| 4 ... 20 mA/HART | Nominal 24 V DC (max. 30 V DC) with max. 550 Ω |
| PROFIBUS PA | • 15 mA<br>• per IEC 61158-2 |
| FOUNDATION Fieldbus | • 20.0 mA<br>• per IEC 61158-2 |
| **Certificates and approvals** | |
| General | $CSA_{US/C}$, CE, FM, RCM |
| Radio | FCC, Industry Canada, RED, RCM |
| Hazardous | |
| • Explosion Proof (Brazil) | INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Increased Safety (Brazil) | INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da |
| • Explosion Proof (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Intrinsically Safe (Canada/USA) | CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Non-incendive (Canada/USA) | CSA/FM Class I, Div. 2, Groups A, B, C, D T5 |
| • Flame Proof/Increased Safety (China) | Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 $T_A$90 °C |
| • Intrinsically Safe (China) | Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 $T_A$90 °C |
| • Non-sparking (China) | NEPSI Ex nA IIC T4 Gc |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 Ga, ATEX II 1D Ex ia ta IIC T100 °C Da |
| • Non-sparking/Energy Limited (Europe) | ATEX II 3G Ex nA IIC T4 Gc |
| • Flame Proof (International/Europe) | IECEx/ATEX II ½ GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da |
| • Increased Safety (International/Europe) | IECEx/ATEX II ½ GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da |
| • Intrinsically Safe (International) | IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 ° C Da |
| • Explosion Proof (Russia/Kazakhstan) | EAC Ex d |
| • Increased Safety (Russia/Kazakhstan) | EAC Ex e |
| • Intrinsically Safe (Russia/Kazakhstan) | EAC Ex ia |
| • Marine | • Lloyd's Register of Shipping<br>• ABS Type Approval<br>• Bureau Veritas |
| **Programming** | |
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld programmer | IS model: ATEX II 1 GD Ex ia IIC T4 Ga, Ex ia D 20 T135 °C $T_a$ = -20 ... +50 °C, CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6, $T_a$ = +50 °C, IECEx SIR 09.0073 |
| Handheld communicator | HART communicator 375/475 |
| PC | • SIMATIC PDM<br>• Emerson AMS<br>• SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare) |
| Display (local) | Graphic local user interface including quick start wizard and echo profile displays. |

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## Selection and ordering data

| | Article No. |
|---|---|
| **SITRANS LR250 Radar level transmitter** ↗ | **7ML5431-** |
| Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. | ■ ■ ■ ■ **0** - ■ ■ ■ ■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Process Connection and Antenna Material** | |
| Painted aluminum 3" horn antenna[1] | **5** |
| **Process Connection Type** | |
| Engineered polymer flange connections | |
| Without flange, without mounting bracket, no polypropylene lens | **Q A** |
| Without flange, with mounting bracket, no polypropylene lens | **Q B** |
| Universal polymeric flange, flat face, with polypropylene lens, FKM seal | |
| DN80 PN16, ANSI 3", 150 lb, DN80 PN16/10K | **Q C** |
| DN100 PN16, ANSI 4", 150 lb, DN100 PN16/10K | **Q D** |
| DN150 PN16, ANSI 6", 150 lb, DN150 PN16/10K | **Q E** |
| **Communication/Output** | |
| PROFIBUS PA | **1** |
| 4 ... 20 mA, HART, start-up at < 3.6 mA | **2** |
| FOUNDATION Fieldbus | **3** |
| **Enclosure/Cable inlet** | |
| Aluminum, Epoxy painted | |
| 2 x ½" NPT | **0** |
| 2 x M20 x 1.5 | **1** |
| **Antenna** | |
| 3 inch (80 mm) polypropylene lens antenna | **S** |
| **Approvals** | |
| General Purpose, CE, CSA, FM, FCC, RED, RCM | **A** |
| Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada | **B** |
| Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, RED, RCM | **C** |
| Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada | **D** |
| Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, RED, RCM | **E** |
| Increased Safety: IECEx/ATEX II ½ GD,1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[2] | **F** |
| Flameproof: IECEx/ATEX II ½ GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM[2] | **G** |
| Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[2] | **H** |
| Non Sparking: NEPSI Ex nA IIC T4 Gc | **K** |
| Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 $T_A$90 °C | **L** |
| Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 $T_A$90 °C[2] | **M** |
| Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 $T_A$90 °C[2] | **N** |
| **Pressure rating** | |
| 0.5 bar (7.25 psi g) max. | **1** |
| Rating per Pressure/Temperature curves in manual[3] | **2** |

| | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code(s). | |
| Plug M12, incl. cable socket, IP68[4)5)6)] | **A50** |
| Plug 7/8", incl. cable socket, IP68[5)6)7)] | **A55** |
| Long tag (device parameter, max. 27 characters) plate stainless steel 304/1.4301 | **Y15** |
| Factory test certificate - M to DIN 55350, Part 18 | **C11** |
| Inspection certificate 3.1 (EN 10204) - material of pressure-containing and wetted parts | **C12** |
| Namur NE43 compliant: device preset to failsafe < 3.6 mA[2] | **N07** |
| ***Operating Instructions*** | |
| All literature is available to download for free, in a range of languages, at | |
| http://www.siemens.com/processinstrumentation/documentation | |

| ***Accessories*** | Article No. |
|---|---|
| Mounting bracket suitable for wall or ceiling mounting, for aluminum painted horn versions only | **A5E46342367** |
| Polypropylene lens replacement kit, polypropylene lens antenna and polymeric flange versions | **A5E46342366** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART[9] | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus | **7ML1930-1AQ** |
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| HART modem/USB (for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| FDA approved FKM o-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F) | **7ML1830-3AN** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-.....-.** |
| SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 | **7ML5742-.....-....** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-.....-..** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-.....-..** |
| For applicable back up point level switch - see point level measurement section | |

1) Available only with Process connection options QA ... QE and Antenna option S.
2) Available only with Communication option 2 and Process connection and antenna material option 4.
3) Available only with Process connection and Antenna material option 5 and Process connection type option QC.
4) Available only with Enclosure option 1.
5) Available only with Communication options 1 and 3.
6) Available only with Approval options A, B, C, and L.
7) Available only with Enclosure option 0.
8) Available only with Approval options A, B, C, D, E, K, and L.
9) Product shipped with plastic cable gland, rated to -20 °C (-4 °F). If -40 °C (-40 °F) rating required, then metallic cable gland is recommended.

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## SITRANS LR250 Polypropylene Lens Antenna

### Selection and ordering data

### *SITRANS LR250 Polypropylene Lens Antenna Specials*

| | Article No. |
|---|---|
| **SITRANS LR250 threaded PVDF antenna version enclosures (PROFIBUS PA models)** | |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E03588171** |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection | **A5E03588253** |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection | **A5E03588512** |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection | **A5E03589260** |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection | **A5E03589262** |
| SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection | **A5E03589264** |
| SITRANS LR250 threaded PVDF antenna version enclosures (FOUNDATION Fieldbus models) | |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E03589266** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection | **A5E03589275** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection | **A5E03589277** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection | **A5E03589280** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection | **A5E03589281** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection | **A5E03589283** |
| SITRANS LR250 threaded PVDF antenna version enclosures (< 3.6 mA start-up HART models) | |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E03569747** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection | **A5E03586807** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection | **A5E03586854** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection | **A5E03586887** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection | **A5E03586961** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection | **A5E03587012** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection | **A5E03587132** |
| SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection | **A5E03587223** |
| SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection | **A5E03588125** |
| SITRANS LR250 threaded PVDF antenna kits | |
| Antenna kit 2" NPT threaded PVDF | **A5E03528941** |
| Antenna kit 2" R (BSPT) threaded PVDF | **A5E03528943** |
| Antenna kit 2" G (BSPP) threaded PVDF | **A5E03528947** |
| Kit of hardware parts for LR250 threaded PVDF antenna: consists of O-rings, screws, wavewasher, and loctite | **A5E03528948** |
| Ex-proof plugs | |
| Ex-proof plugs kit, 1/2" NPT, qty 5 | **A5E39979991** |
| Ex-proof plugs kit, M20, qty 5 | **A5E39979992** |

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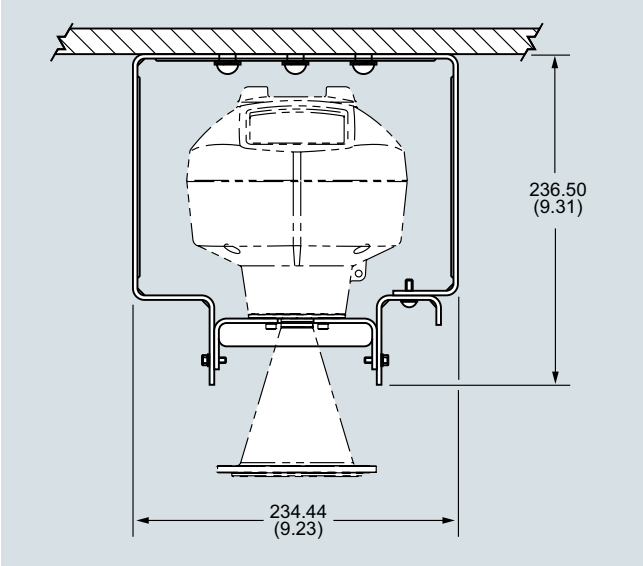
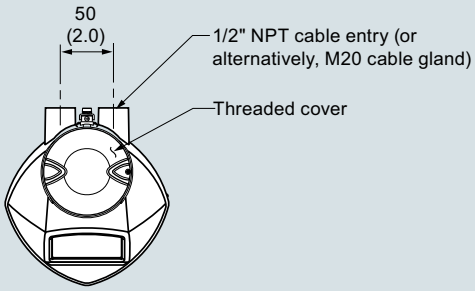
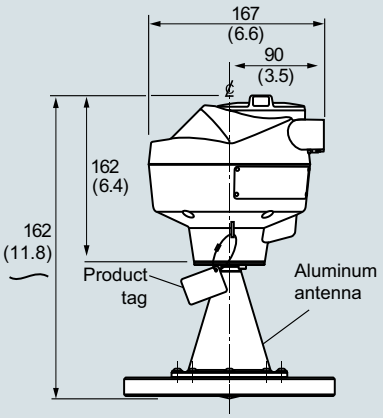
## Options




SITRANS LR250 Polypropylene lens antenna, wall/ceiling mount

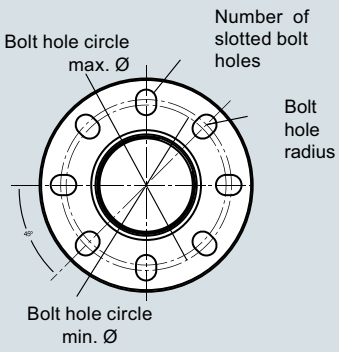
## Dimensional drawings




| Nominal pipe size | OD ± 1 | B.C.D. max. for slotted holes (bmax.) ± 0.75 | B.C.D. min. for slotted holes (bmin.) ± 0.75 | Bolt hole radius ± 0.25 | Number of slotted holes |
|---|---|---|---|---|---|
| 3 | 200 | 160 | 150 | R 9.5 | 8 |
| 4 | 229 | 191 | 175 | R 9.5 | 8 |
| 6 | 285 | 242 | 240 | R 11.5 | 8 |

**Polypropylene Flange**




SITRANS LR250 Polypropylene lens antenna, dimensions in mm (inch)

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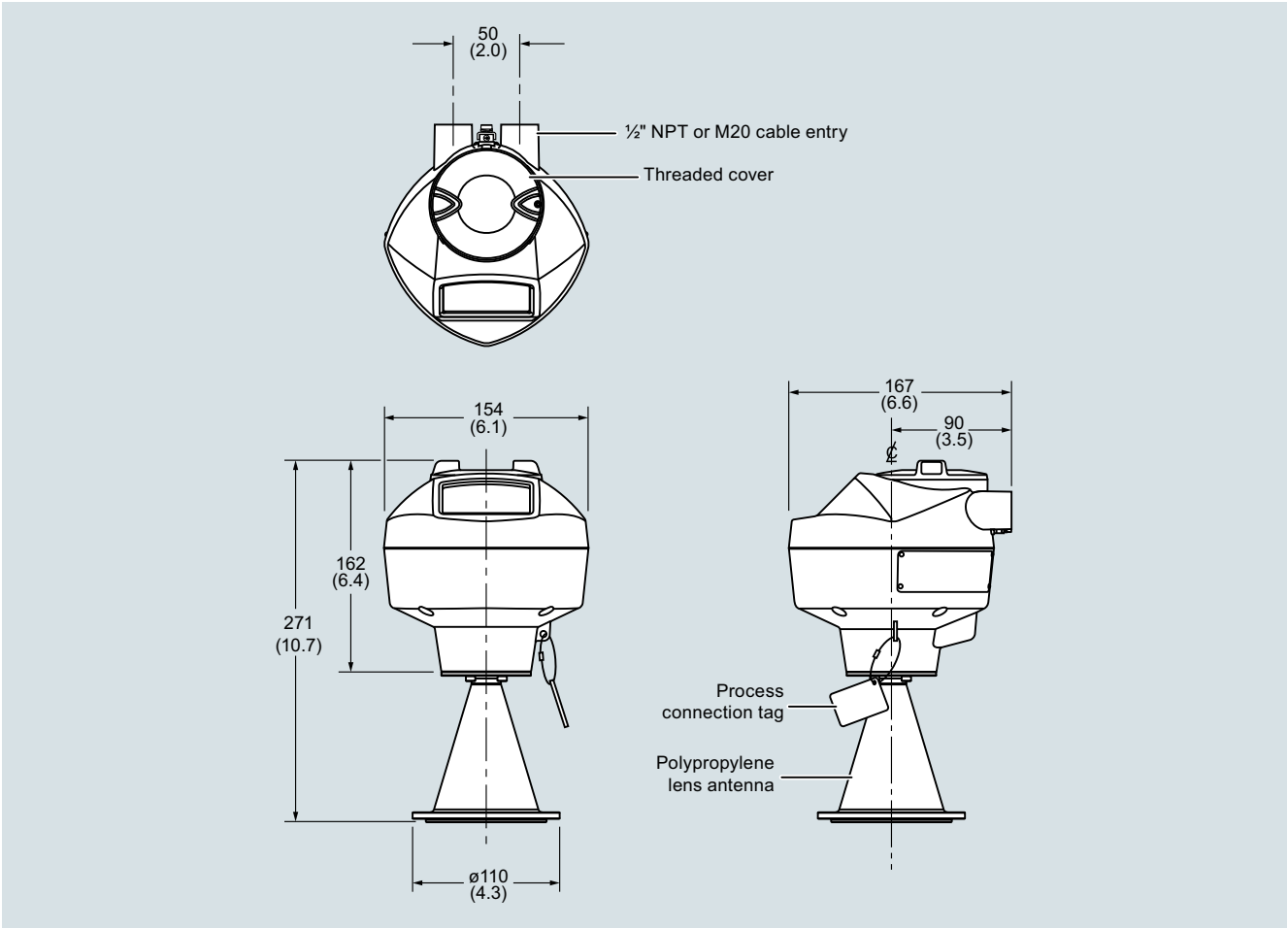
4

## **Dimensional drawings** (continued)




SITRANS LR250 Polypropylene lens antenna, dimensions in mm (inch)

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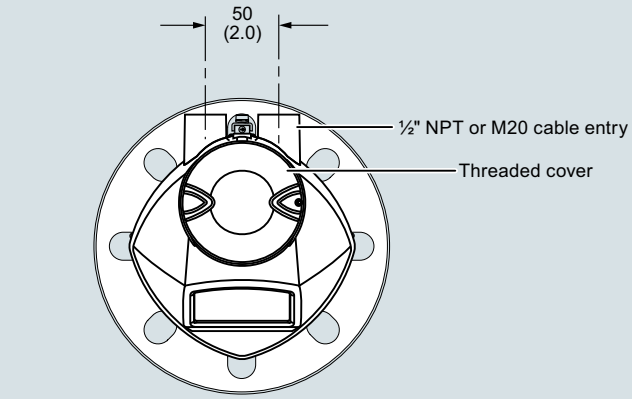
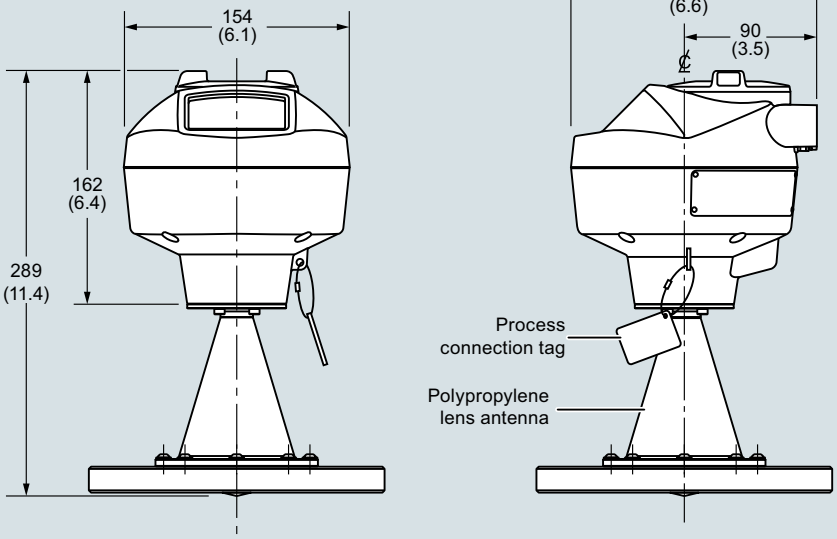
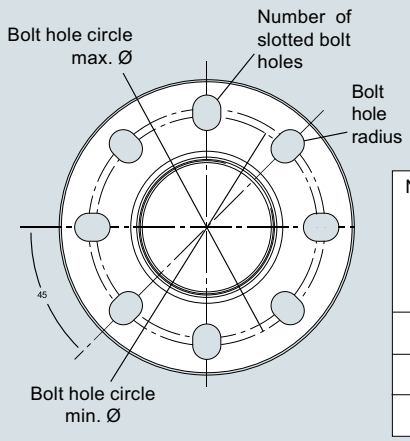
## Dimensional drawings (continued)




**Universal polymeric flange**




| Nominal pipe size | OD ± 1 | B.C.D. max. for slotted holes (bmax.) ± 0.75 | B.C.D. min. for slotted holes (bmin.) ± 0.75 | Bolt hole radius ± 0.25 | # of slotted holes |
|---|---|---|---|---|---|
| 3 (80) | 7.87 (200) | 6.30 (160) | 5.91 (150) | 0.37 (9.5) | 8 |
| 4 (100) | 9.00 (229) | 17.52 (191) | 6.89 (175) | 0.37 (9.5) | 8 |
| 6 (150) | 11.22 (285) | 9.53 (242) | 9.45 (140) | 0.45 (11.5) | 8 |

SITRANS LR250 Polypropylene lens antenna with universal polymeric flange, dimensions in mm (inch)

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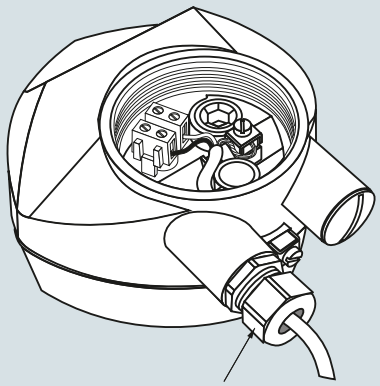
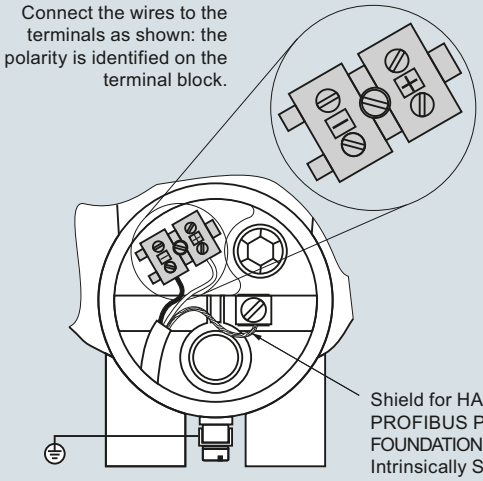
## Circuit diagrams



Gland may or may not be provided depending on approval option.




**Hand Programmer**

Part number:
7ML1930-1BK

**Notes:**

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections