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

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. Start-up 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.

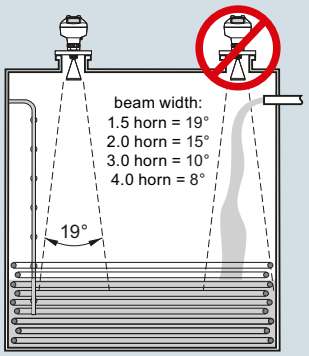
- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

Configuration

Installation

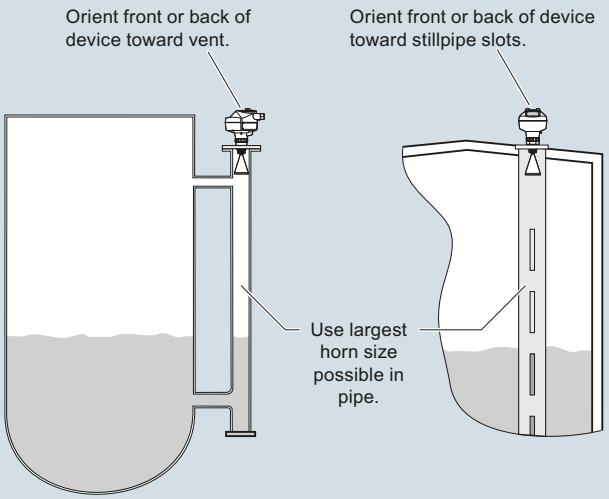
Note:

- 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 horn antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.
- Use largest possible antenna.



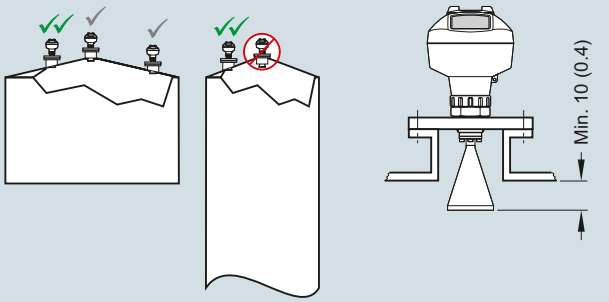
Mounting unit on bypass

Mounting unit on stilling well



Mounting unit on vessel

Mounting on a nozzle



SITRANS LR250 installation, dimensions in mm (inch)

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) • 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)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ε_r	> 1.6, antenna and application dependent
Process temperature	-40 ... +200 °C (-40 ... +392 °F) (at process connection with FKM O-ring) -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. See Pressure/Temperature curves for more information
Design	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 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 [optional alloy N06022/2.4602 (Hastelloy C-22 or equivalent)]
• 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] R 1½", 2" or 3" [(BSPT), EN 10226] G 1½", 2" or 3" [(BSPP), EN ISO 228-1]
• Flange connection	2", 3", 4" (ANSI 150, 300 lb), 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 • Per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • Per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, NE 21, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, 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 20 T90 IP67 DIP A20 T_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °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 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)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia
• Marine	• Lloyd's Register of Shipping • ABS Type Approval • 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 • Emerson AMS • 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

SITRANS LR250 Horn Antenna

Selection and Ordering data		Article No.
SITRANS LR250 horn antenna	↗	**7ML5431-**
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) (antenna dependent). Ideal for small vessels and low dielectric media.		**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**
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FKM seal[2]		**2**
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FFKM seal[2]		**3**
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)	⬟	**A D**
R 2" [(BSPT), EN 10226-1] (tapered thread)	⬟	**A E**
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	⬟	**A F**
3" NPT (ASME B1.20.1) (tapered thread)		**A G**
R 3" [(BSPT), EN 10226-1] (tapered thread)		**A H**
G 3" [(BSPP), EN ISO 228-1] (parallel thread)		**A J**
Flanged connection 316L		
2" Class 150 ASME B16.5 flat faced[4]	⬟	**B A**
3" Class 150 ASME B16.5 flat faced[4]	⬟	**B B**
4" Class 150 ASME B16.5 flat faced[4]	⬟	**B C**
2" Class 300 ASME B16.5 flat faced[4]		**C A**
3" Class 300 ASME B16.5 flat faced[4]		**C B**
4" Class 300 ASME B16.5 flat faced[4]		**C C**
DN 50 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D A**
DN 80 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D B**
DN 100 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D C**
DN 50 PN 40 EN 1092-1 Type A flat faced[4]		**E A**
DN 80 PN 40 EN 1092-1 Type A flat faced[4]		**E B**
DN 100 PN 40 EN 1092-1 Type A flat faced[4]		**E C**
50A 10K JIS B 2220 flat faced[4]	⬟	**F A**
80A 10K JIS B 2220 flat faced[4]	⬟	**F B**
100A 10K JIS B 2220 flat faced[4]	⬟	**F C**
DN 50 PN 16 DIN EN 1092-1 Type B1 raised face		**G A**
DN 80 PN 16 DIN EN 1092-1 Type B1 raised face		**G B**
DN 100 PN 16 DIN EN 1092-1 Type B1 raised face		**G C**
DN 150 PN 16 DIN EN 1092-1 Type B1 raised face		**G D**
DN 50 PN 40 DIN EN 1092-1 Type B1 raised face		**H A**
DN 80 PN 40 DIN EN 1092-1 Type B1 raised face		**H B**
DN 100 PN 40 DIN EN 1092-1 Type B1 raised face		**H C**
DN 150 PN 40 DIN EN 1092-1 Type B1 raised face		**H D**

Selection and Ordering data		Article No.
SITRANS LR250 horn antenna		**7ML5431-**
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) (antenna dependent). Ideal for small vessels and low dielectric media.		**0 -**
Flanged connection Hastelloy C		
2" Class 150 ASME B16.5 raised faced[4]		**J A**
3" Class 150 ASME B16.5 raised faced[4]		**J B**
4" Class 150 ASME B16.5 raised faced[4]		**J C**
2" Class 300 ASME B16.5 raised faced[4]		**J D**
3" Class 300 ASME B16.5 raised faced[4]		**J E**
4" Class 300 ASME B16.5 raised faced[4]		**J F**
DN 50 PN 16 EN 1092-1 Type B1 raised faced[4]		**K A**
DN 80 PN 16 EN 1092-1 Type B1 raised faced[4]		**K B**
DN 100 PN 16 EN 1092-1 Type B1 raised faced[4]		**K C**
DN 50 PN 40 EN 1092-1 Type B1 raised faced[4]		**K D**
DN 80 PN 40 EN 1092-1 Type B1 raised faced[4]		**K E**
DN 100 PN 40 EN 1092-1 Type B1 raised faced[4]		**K F**
50A 10K JIS B 2220 raised faced[4]		**L A**
80A 10K JIS B 2220 raised faced[4]		**L B**
100A 10K JIS B 2220 raised faced[4]		**L C**
DN 50 PN 16 EN 1092-1 Type B1 raised face		**M A**
DN 80 PN 16 EN 1092-1 Type B1 raised face		**M B**
DN 100 PN 16 EN 1092-1 Type B1 raised face		**M C**
DN 150 PN 16 EN 1092-1 Type B1 raised face		**M D**
DN 50 PN 40 EN 1092-1 Type B1 raised face		**M E**
DN 80 PN 40 EN 1092-1 Type B1 raised face		**M F**
DN 100 PN 40 EN 1092-1 Type B1 raised face		**M G**
DN 150 PN 40 EN 1092-1 Type B1 raised face		**M H**
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 M20x1.5	⬟	**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**
Hastelloy C22 (or equivalent)		
2" horn (fits 2" ASME or DN 50 nozzles)		**J**
3" horn (fits 3" ASME or DN 80 nozzles)		**K**
4" horn (fits 4" ASME or DN 100 nozzles)		**L**
2" horn (fits 2" ASME or DN 50 nozzles) with 100 mm extension		**M**
3" horn (fits 3" ASME or DN 80 nozzles) with 100 mm extension		**N**
4" horn (fits 4" ASME or DN 100 nozzles) with 100 mm extension		**P**

Selection and Ordering data	Article No.							
SITRANS LR250 horn antenna	**7ML5431-**							
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) (antenna dependent). Ideal for small vessels and low dielectric media.				**0**	**-**			
Approvals								
General Purpose, CE, CSA, FM, FCC, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, RCM[5] ⬟						**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, R&TTE, RCM[5] ⬟						**G**		
Explosion proof: CSA/FM Class I, II and III, Div.1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[5] ⬟						**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_A90 °C ⬟						**L**		
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[5] ⬟						**M**		
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[5] ⬟						**N**		
Pressure rating								
Rating per Pressure/Temperature curves in manual ⬟							**0**	
0.5 bar g (7.25 psi g) maximum ⬟							**1**	

1) Available with process connection options AA ... HD & Antenna Versions A ... H only

2) Available with process connection options JA ... MH & Antenna Versions J ... P only

3) Available For antenna versions A and E only, max. range 10 m (32.8 ft), dk > 3. Can measure dk >1.6 [20 m (65.6 ft)] when mounted in a stillpipe/ bypass.

4) Siemens Milltronics type flange (flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard), see operating instructions for details

5) Applicable with communication option 2 only

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

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**
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 for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for HART/mA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469191**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33469171**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		
Operating Instructions for PROFIBUS PA device		
English		**A5E32221386**
German		**A5E32376094**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for PROFIBUS PA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469239**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33472685**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		

Selection and Ordering data	Article No.
Operating Instructions for FOUNDATION Fieldbus device	
English	**A5E32221411**
German	**A5E32376112**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for FOUNDATION Fieldbus device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33472700**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33472738**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
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 M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required)	**7ML1930-1AP**
One metallic cable gland M20x1.5, 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 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-...**
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	**7ML5750-...**
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.

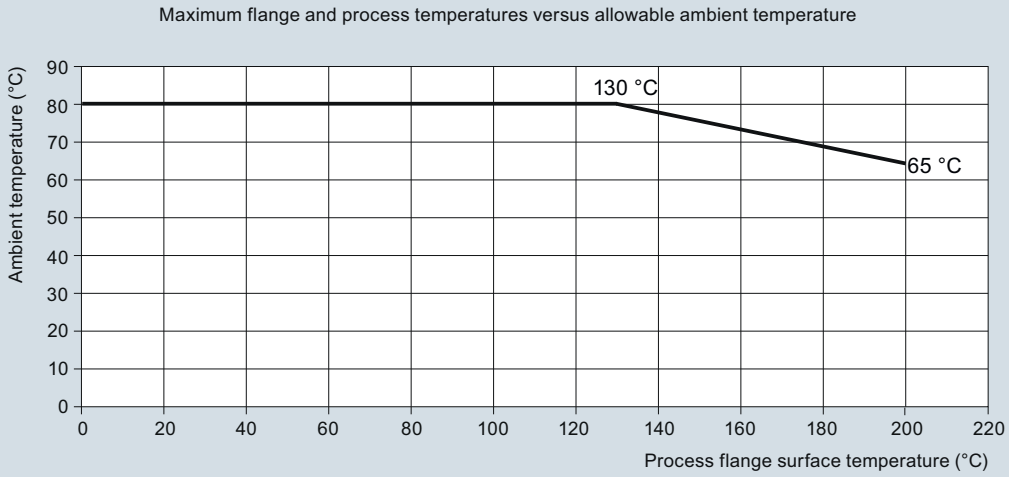
4) Available with enclosure option 0 only

5) Applicable to communication option 2 only

6) For use with communication option 1 and 3 only

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

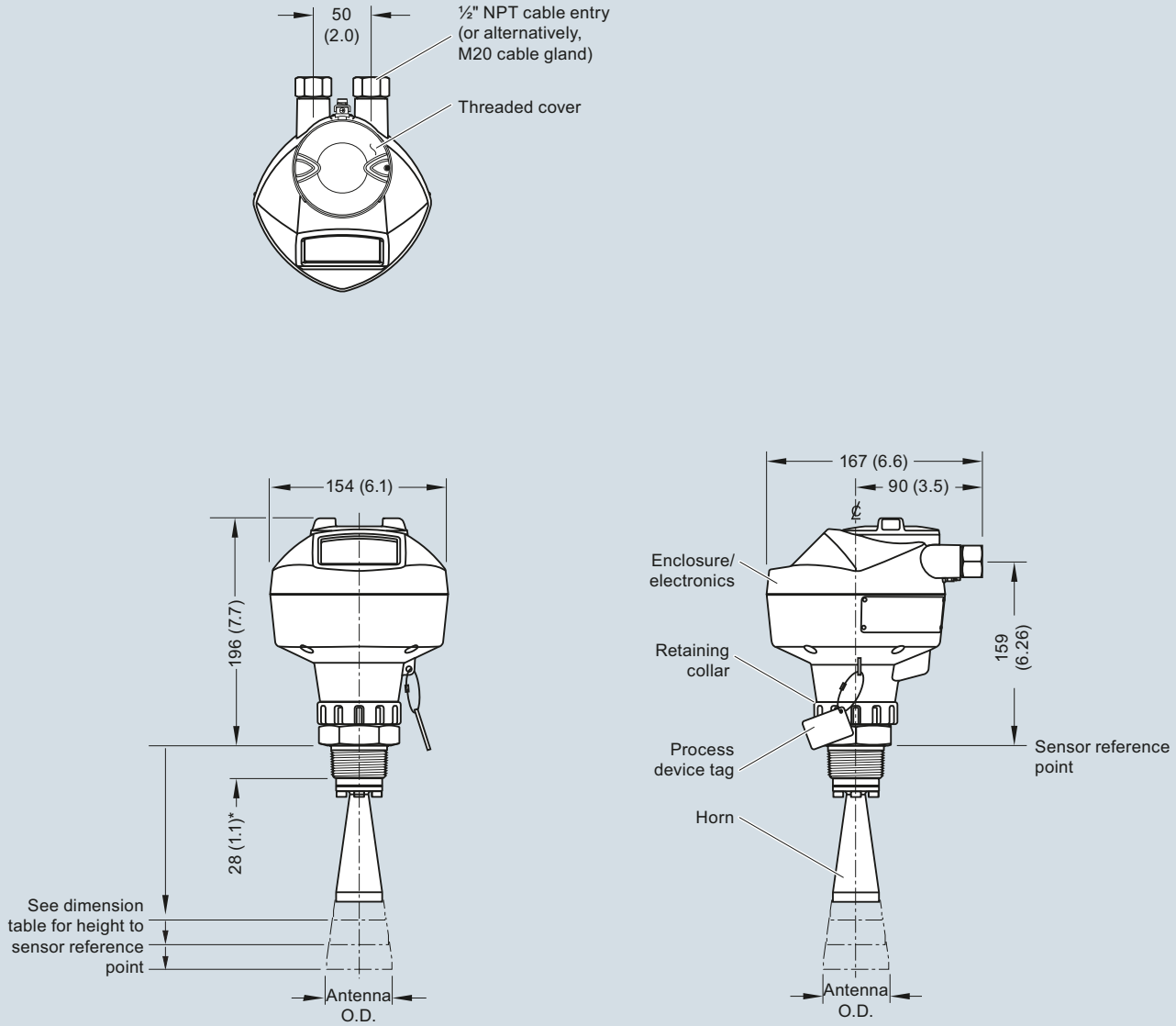
Characteristic curves



SITRANS LR250 Ambient/Process Flange Surface Temperature Curve

Dimensional drawings

Threaded Horn Antenna

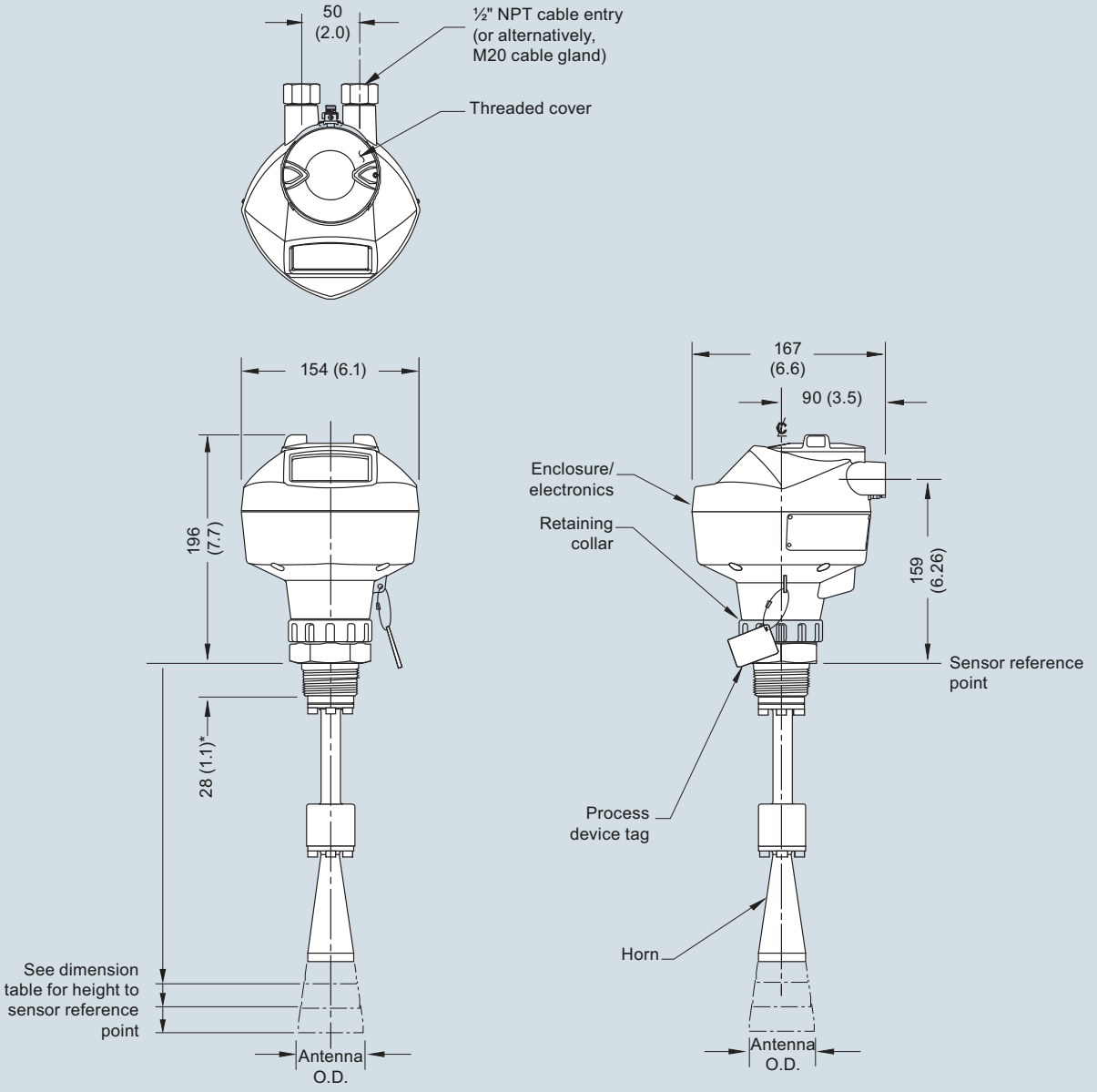


*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

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)

Threaded Horn Antenna with Extension



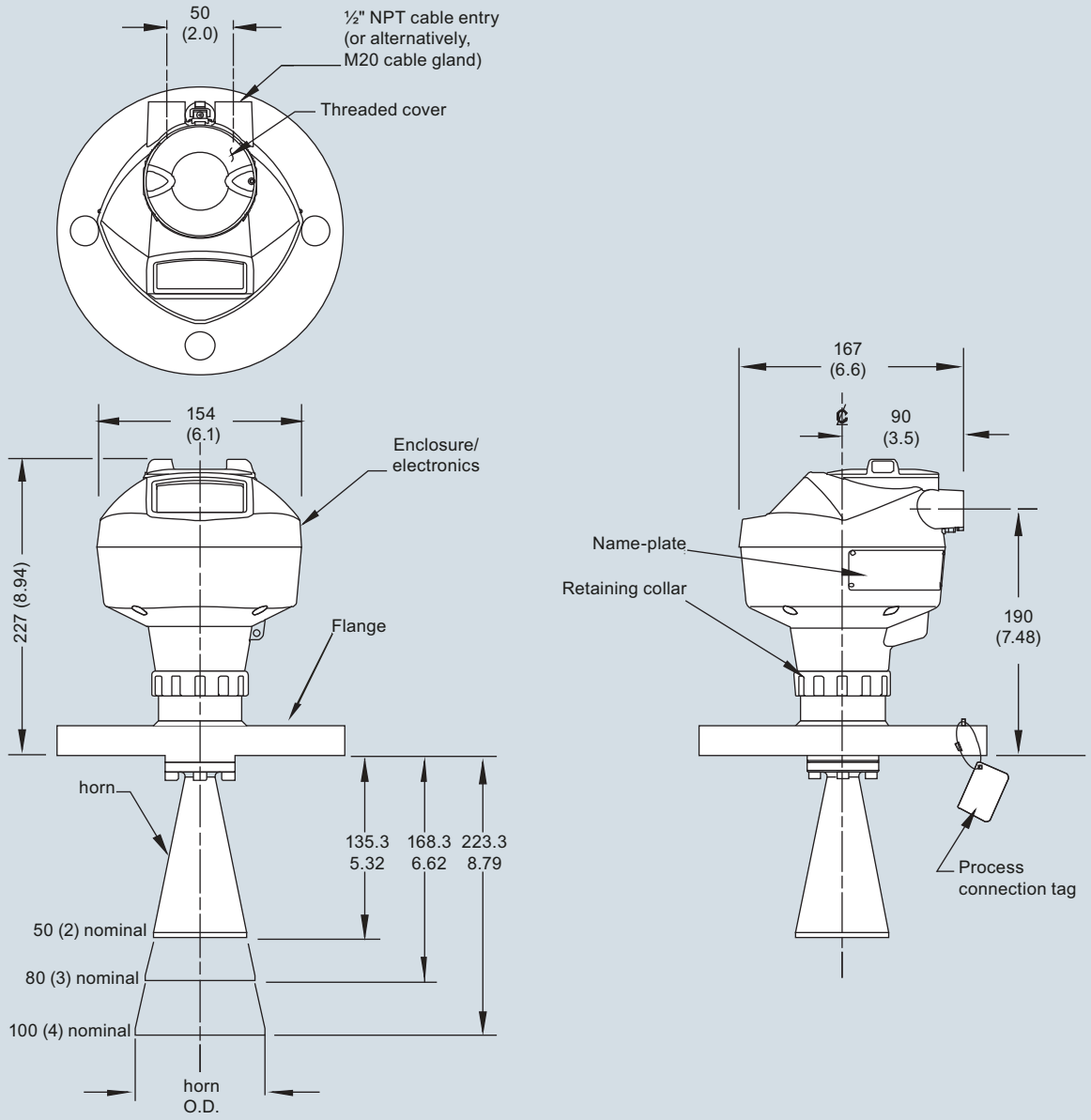
*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

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	139.8 (5.57)	235 (9.3)	N/A	N/A	19 degrees	10 m (32.8 ft)
2" horn	147.8 (5.88)	N/A	266 (10.55)	280 (11.09)	15 degrees	20 m (65.6 ft)
3" horn	174.8 (6.94)	N/A	299 (11.85)	313 (12.39)	10 degrees	20 m (65.6 ft)
4" horn	194.8 (7.73)	N/A	354 (14)	368 (14.55)	8 degrees	20 m (65.6 ft)

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

SITRANS LR250 Horn Antenna

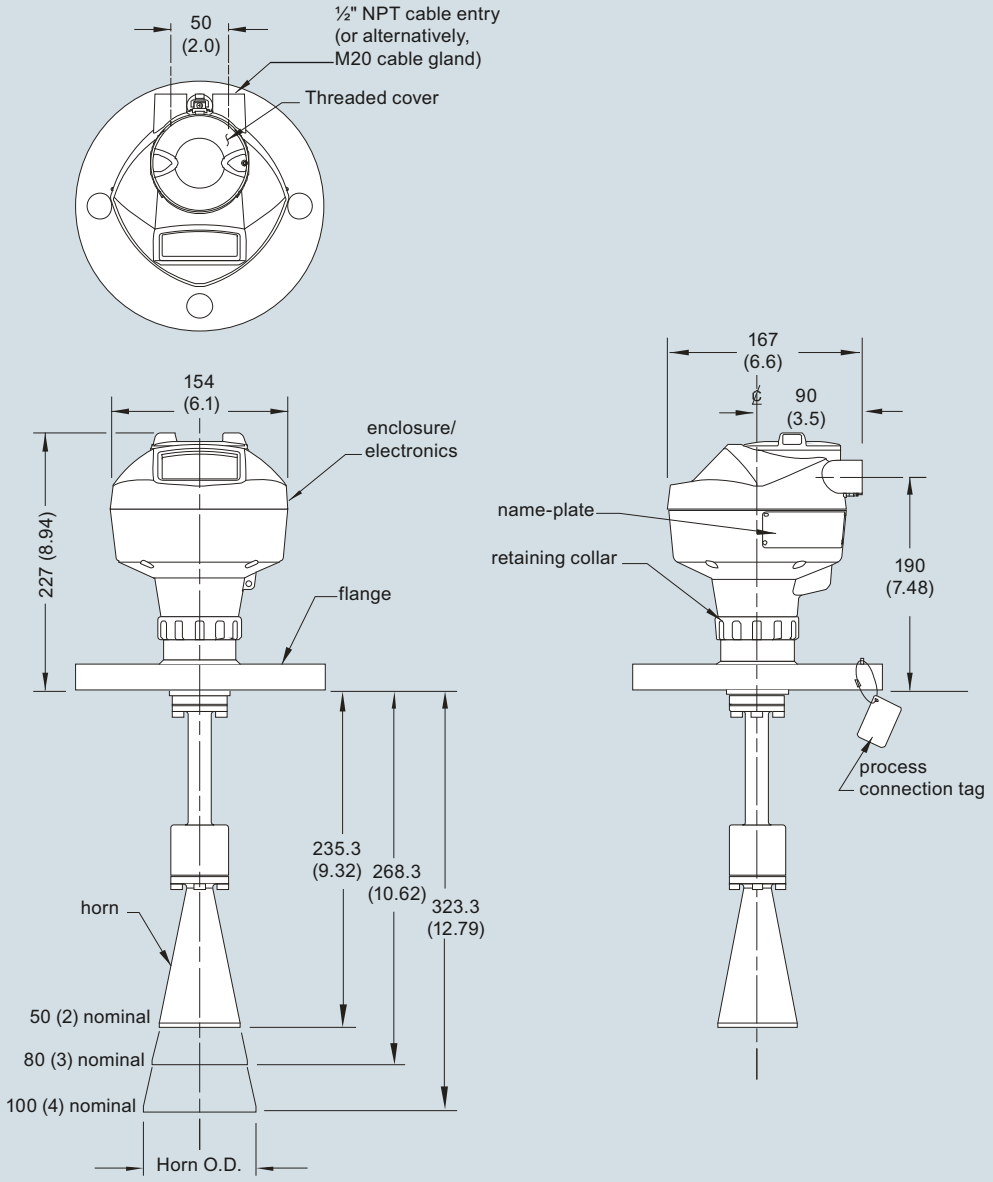
Flanged Horn



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)	19 degrees	10 m (32.8 ft)
80 (3)	74.8 (2.94)	168.3 (6.62)	171.3 (6.74)	15 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	223.3 (8.79)	226.3 (8.90)	10 degrees	20 m (65.6 ft)

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

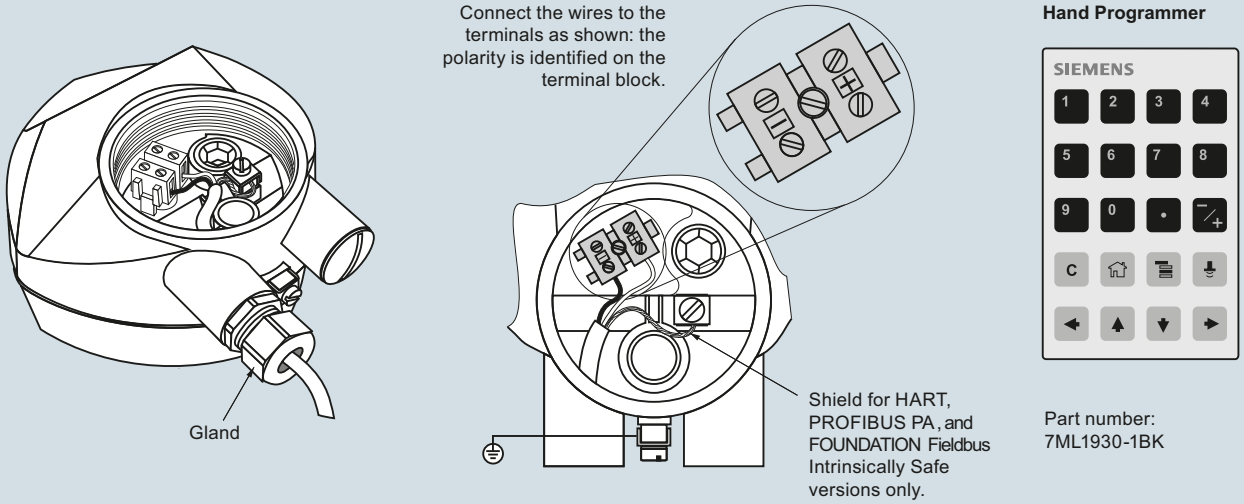
Flanged Horn with Extension



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 (9.32)	238.3 (9.44)	19 degrees	10 m (32.8 ft)
80 (3)	74.8 (2.94)	268.3 (10.62)	271.3 (10.74)	15 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	323.3 (12.79)	326.3 (12.90)	10 degrees	20 m (65.6 ft)

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

Schematics



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

Selection and ordering data

SITRANS LR250 Specials	Article No.
SITRANS LR250 horn version enclosures (PROFIBUS PA models)	
LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E01156836**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E01156838**
LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	**A5E01156839**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection	**A5E01156841**
LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection	**A5E01156843**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	**A5E01156844**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	**A5E01156846**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection	**A5E01156848**
LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION FIELDBUS communication, no process connection	**A5E03769538**
LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION FIELDBUS communication, no process connection	**A5E03769539**
LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION FIELDBUS communication, no process connection	**A5E03769543**
SITRANS LR250 horn version enclosures (FOUNDATION Fieldbus models)	
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	**A5E02654608**
LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E02653792**
LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E02653793**
LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	**A5E02654606**

SITRANS LR250 Specials	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 D, with HART communication start-up at < 3.6 mA, no process connection	**A5E03441098**
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**
SITRANS LR250 horn antenna and extension kits	
38 mm (1.5 inch) horn antenna kit, 1.5" Process Connections only	**A5E01151539**
100 mm (4 inch) horn antenna extension kit, 1.5" 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**
50 mm (2 inch) horn antenna kit, Hastelloy C-22	**A5E01151584**
75 mm (3 inch) horn antenna kit, Hastelloy C-22	**A5E01151585**
100 mm (4 inch) horn antenna kit, Hastelloy C-22	**A5E01151587**
5 Dupont 1Gr Polyback, PTFE grease kit	**A5E01151626**
LR250 lid with O-ring	**A5E02465410**

SITRANS LR250 threaded PVDF antenna

Overview

SITRANS LR250 with threaded PVDF 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 10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe.

Benefits

- Fully insulated PVDF antenna design 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 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 or 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.
- Suitable for use in Safety Related Systems in accordance with IEC 61508/61511 (SIL-2)
- 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. Start-up 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 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.

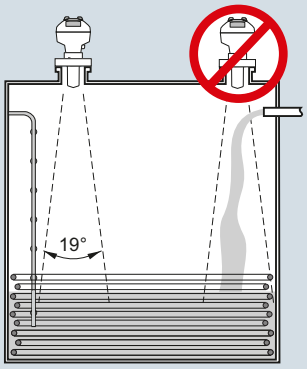
SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 10 m (32 ft) on materials with dk > 3 or 20 m (66 ft) when used in a stilling pipe with dk ≥ 1.6.

- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 80 °C (176 °F), corrosive and aggressive materials and applications requiring functional safety

Configuration

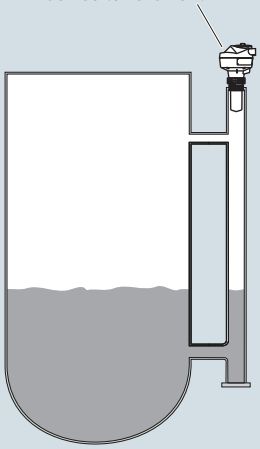
Installation

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.



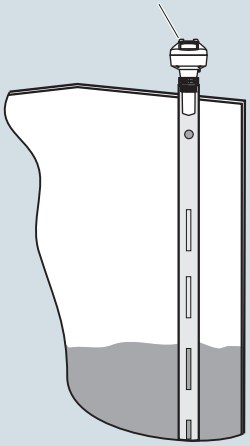
Mounting unit on bypass

Orient front or back of device toward vent.

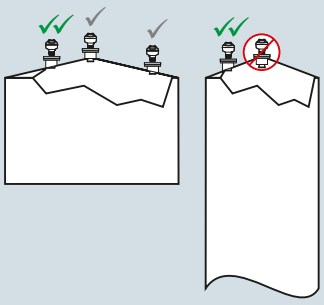


Mounting unit on stilling well

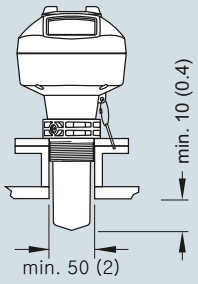
Orient front or back of device toward stillpipe slots.



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 PVDF antenna installation, dimensions in mm (inch)

SITRANS LR250 threaded PVDF 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	10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe with dk ≥ 1.6
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) • 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 IEC60770-1)	
Maximum measured error	• > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 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)
Installation category	I
Pollution degree	4
Medium conditions	
Dielectric constant ε_r	≥ 3 (1.6 in stillpipe)
Process temperature	-40 ... +80 °C (-40 ... +176 °F) at process connection (Is suitable for CIP at 120 °C for 1/2 hr max.)
Process pressure	Up to 5 bar g (72 psi g) temperature dependent. See Pressure/Temperature curves for more information
Design	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	approximately 3.3 kg (7.27 lb)
Display (local)	Graphic local user interface including quick start wizard and echo profile display
Antenna	
• Material	PVDF (Polyvinylidene fluoride)
• Dimensions (nominal sizes)	2 inch (48 mm)
Process connections	
Process connection	2" NPT [(Taper), ASME B1.20.1] 2" [(BSPT), EN 10226] 2" [(BSPP), EN ISO 228-1]

Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	• 15 mA • per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, NE 21, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, 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_A90 °C
• Intrinsically Safe (China)	Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °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 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)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia
• Marine	• Lloyd's Register of Shipping • ABS Type Approval • 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 • Emerson AMS • 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

Selection and Ordering data		Article No.
SITRANS LR250 threaded PVDF antenna	↗	**7ML5431-**
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 10 m (32.8 ft) or 20m (66ft) when used in a stilling pipe.		**0 -**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process Connection and Antenna Material		
Threaded PVDF antenna	⬟	**4**
Process Connection Type		
Threaded connections PVDF		
2" NPT (ASME B1.20.1) (tapered thread)	⬟	**P A**
R 2" [(BSPT), EN 10226-1] (tapered thread)	⬟	**P B**
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	⬟	**P C**
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 M20x1.5	⬟	**1**
Antenna		
2 inch(50 mm) threaded PVDF antenna	⬟	**R**
Approvals		
General Purpose, CE, CSA, FM, FCC, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, RCM[1)]	⬟	**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, R&TTE, RCM[1)]	⬟	**G**
Explosion proof: CSA/FM Class I, II and III, Div.1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[1)]	⬟	**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_A90 °C	⬟	**L**
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[1)]	⬟	**M**
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[1)]	⬟	**N**
Pressure rating		
Rating per Pressure/Temperature curves in manual	⬟	**2**

[1)] Applicable to Communication option 2 only

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

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**
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 for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for HART/mA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469191**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33469171**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		
Operating Instructions for PROFIBUS PA device		
English		**A5E32221386**
German		**A5E32376094**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for PROFIBUS PA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469239**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33472685**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

SITRANS LR250 threaded PVDF antenna

Selection and Ordering data	Article No.
Operating Instructions for FOUNDATION Fieldbus device	
English	**A5E32221411**
German	**A5E32376112**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for FOUNDATION Fieldbus device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33472700**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33472738**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	

Selection and Ordering data	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 M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus[2)]	**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 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-...**
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	**7ML5750-...**
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.

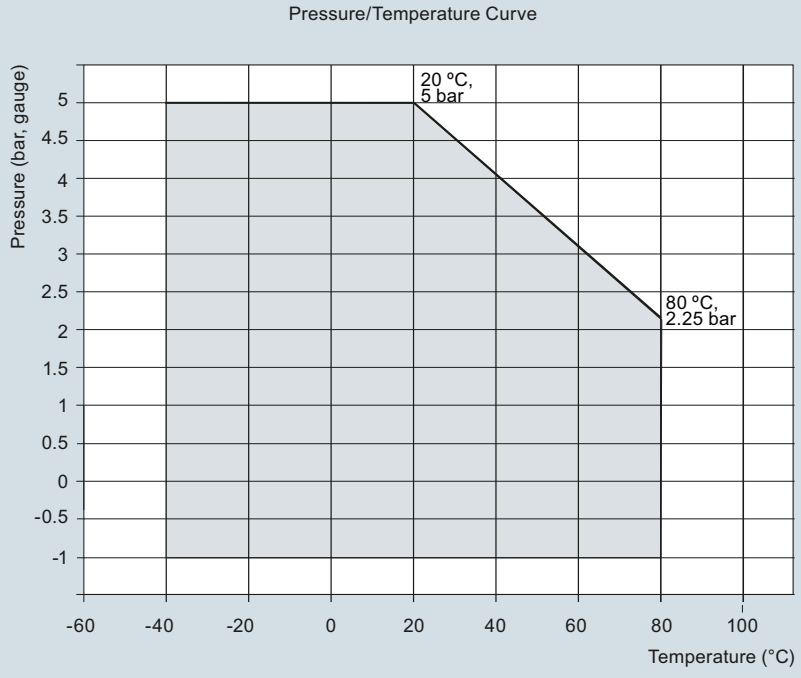
3) Available with Approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex.

4) Available with Enclosure option 0 only

5) Available with communication option 2 only

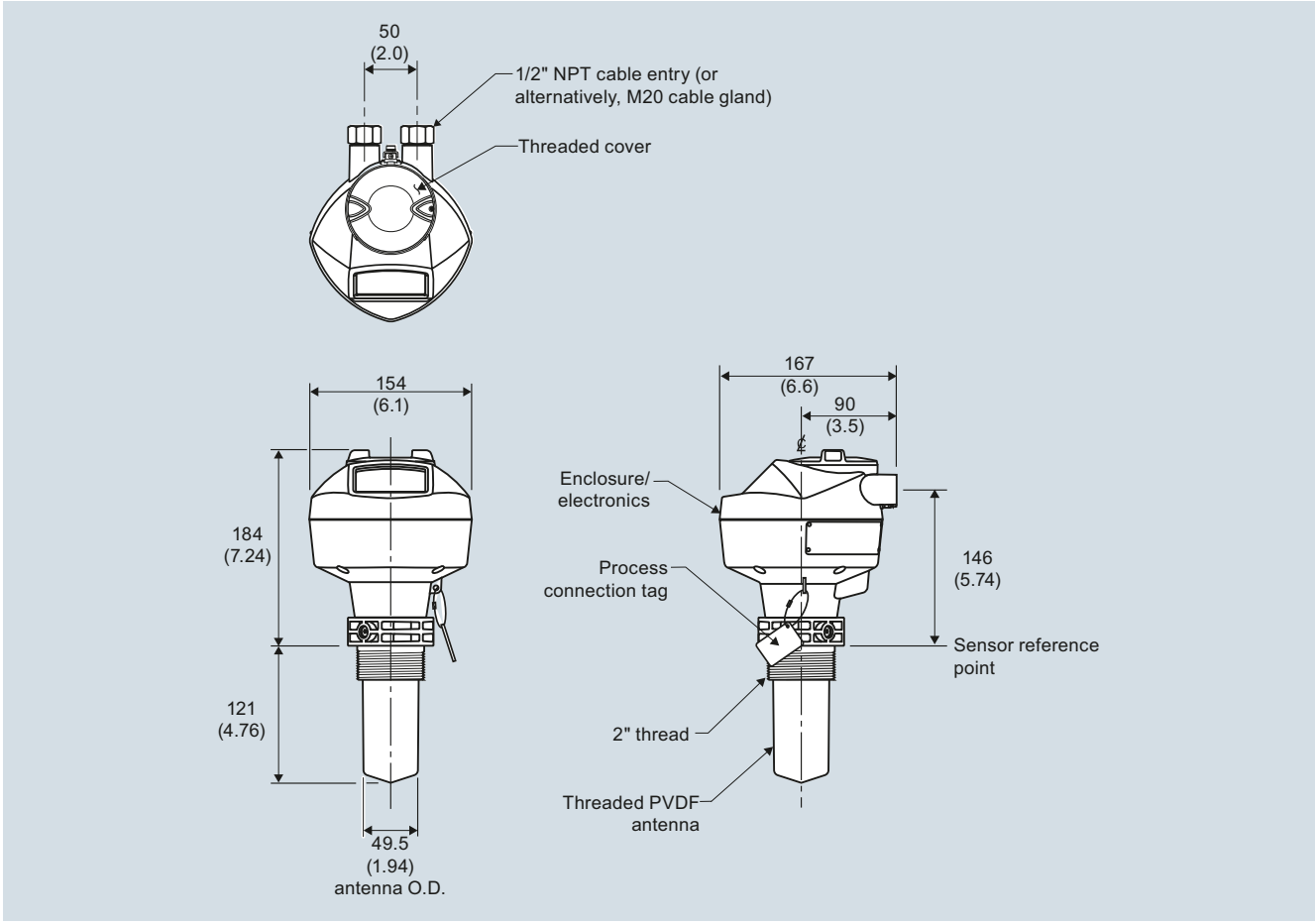
6) Available with approval options A ... E only

Characteristic curves



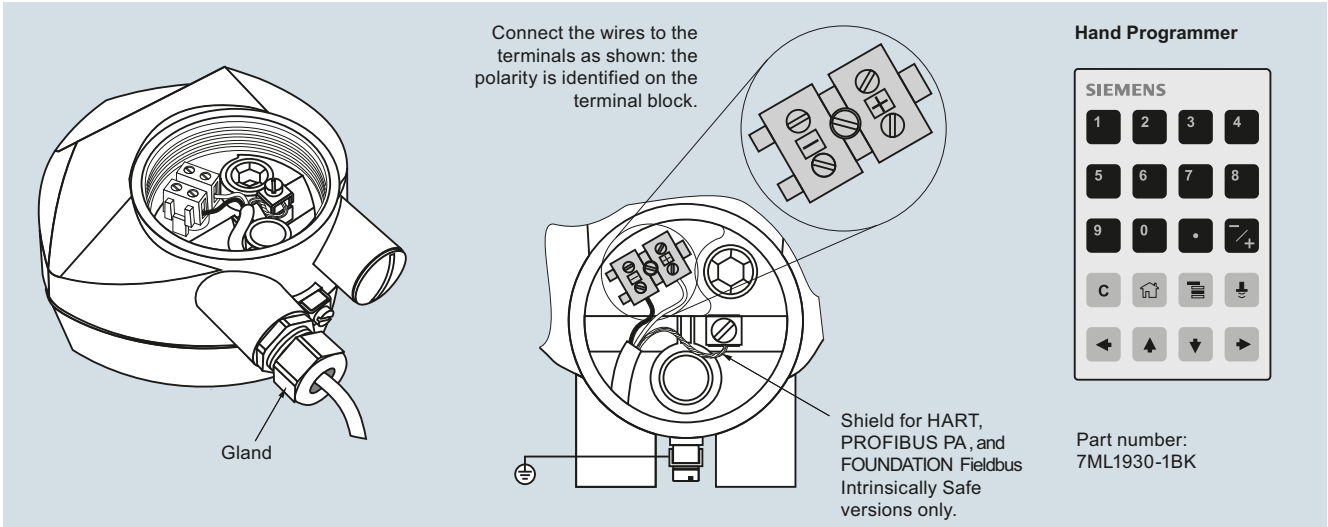
SITRANS LR250 PVDF antenna pressure/temperature curve

Dimensional drawings



SITRANS LR250 PVDF antenna, dimensions in mm (inch)

Schematics



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

SITRANS LR250 threaded PVDF Specials

Selection and ordering data

SITRANS LR250 threaded PVDF Specials	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (PROFIBUS PA models)	
LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E03588171**
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E03588253**
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	**A5E03588512**
LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	**A5E03589260**
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	**A5E03589262**
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)	
LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E03589266**
LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E03589275**
LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	**A5E03589277**
LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	**A5E03589280**
LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	**A5E03589281**
LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	**A5E03589283**

SITRANS LR250 threaded PVDF Specials	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (< 3.6 mA start-up HART models)	
LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	**A5E03569747**
LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	**A5E03586807**
LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	**A5E03586854**
LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	**A5E03586887**
LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	**A5E03586961**
LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587012**
LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587132**
LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587223**
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**

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

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. Start-up 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.

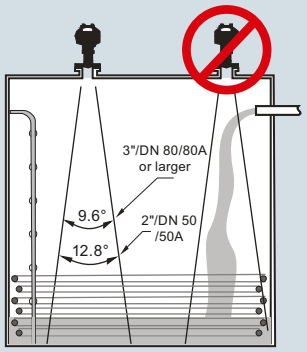
SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with dk > 1.6.

- 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.

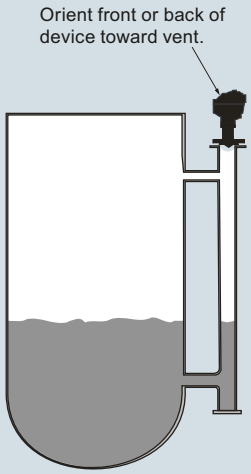
Configuration

Installation

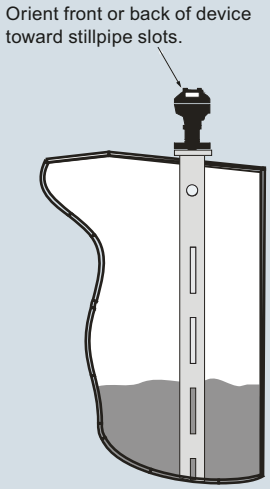
Note:
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



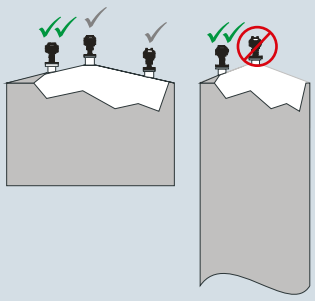
Mounting unit on bypass



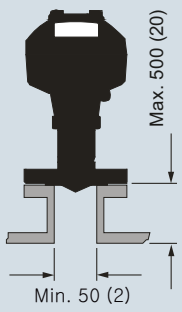
Mounting unit on stilling well



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 flanged encapsulated antenna installation, dimensions in mm (inch)

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) • 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) • < 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)
Installation category	I
Pollution degree	4
Medium conditions	
Dielectric constant ε_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 4/237)
Design	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 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) • 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 • 2, 3, 4, 6" Class 150 ASME B16.5 • 50A, 80A, 100A, 150A 10K JIS B 2220 • 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 • Per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • Per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, NE 21, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, 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 20 T90 IP67 DIP A20 T_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C
• Non-sparking/Energy Limited (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/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)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia
• Marine	• Lloyd's Register of Shipping • ABS Type Approval • 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 • Emerson AMS • 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

Selection and Ordering data		Article No.
SITRANS LR250 flanged encapsulated antenna	↗	**7ML5432-**
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) (antenna dependant). Ideal for corrosive, aggressive and low dielectric media.		**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)]	⬟	**B F**
3" Class 150 ASME B16.5 raised face	⬟	**B G**
4" Class 150 ASME B16.5 raised face	⬟	**B H**
6" Class 150 ASME B16.5 raised face		**B J**
50A 10K JIS B 2220 raised face[1)]		**F D**
80A 10K JIS B 2220 raised face		**F E**
100A 10K JIS B 2220 raised face		**F F**
150A 10K JIS B 2220 raised face		**F G**
DN 50 PN 10/16 EN 1092-1 type B1 raised face[1)]	⬟	**G A**
DN 80 PN 10/16 EN 1092-1 type B1 raised face	⬟	**G B**
DN 100 PN 10/16 EN 1092-1 type B1 raised face	⬟	**G C**
DN 150 PN 10/16 EN 1092-1 type B1 raised face		**G D**
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 M20x1.5	⬟	**1**
Antenna lens material		
TFM 1600 PTFE Flush Lens	⬟	**A**
Approvals		
General Purpose, CE, CSA, FM, FCC, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, 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_A90 °C	⬟	**L**
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[2)]	⬟	**M**
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °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

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

SITRANS LR250 Flanged Encapsulated 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**
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 for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for HART/mA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469191**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33469171**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		
Operating Instructions for PROFIBUS PA device		
English		**A5E32221386**
German		**A5E32376094**
Note: The Operating Instructions should be ordered as a separate line item on the order.		
Compact Operating Instructions for PROFIBUS PA device		
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish		**A5E33469239**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		**A5E33472685**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		

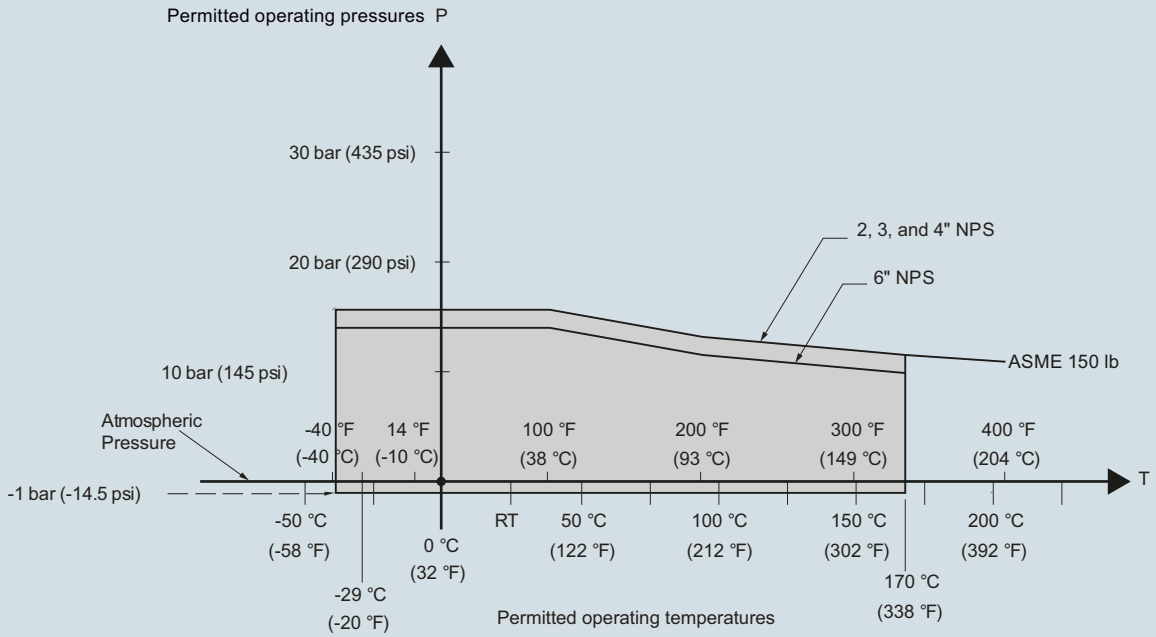
Selection and Ordering data	Article No.
Operating Instructions for FOUNDATION Fieldbus device	
English	**A5E32221411**
German	**A5E32376112**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for FOUNDATION Fieldbus device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33472700**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33472738**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
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 M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (2 are required)[6)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, 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 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-...**
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	**7ML5750-...**
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

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

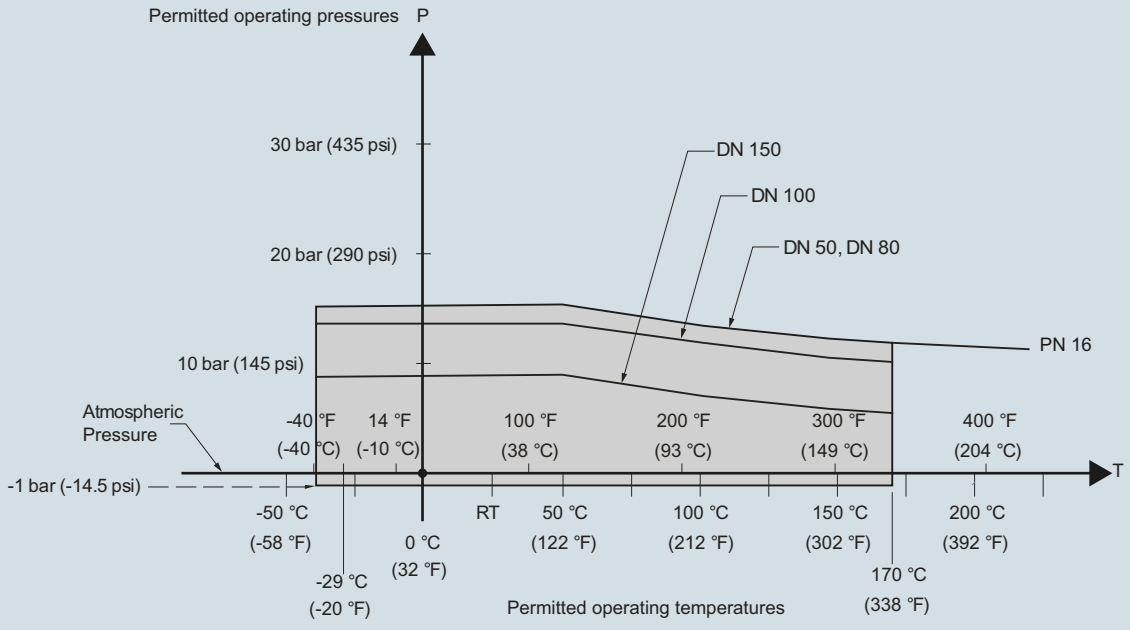
Characteristic curves

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



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

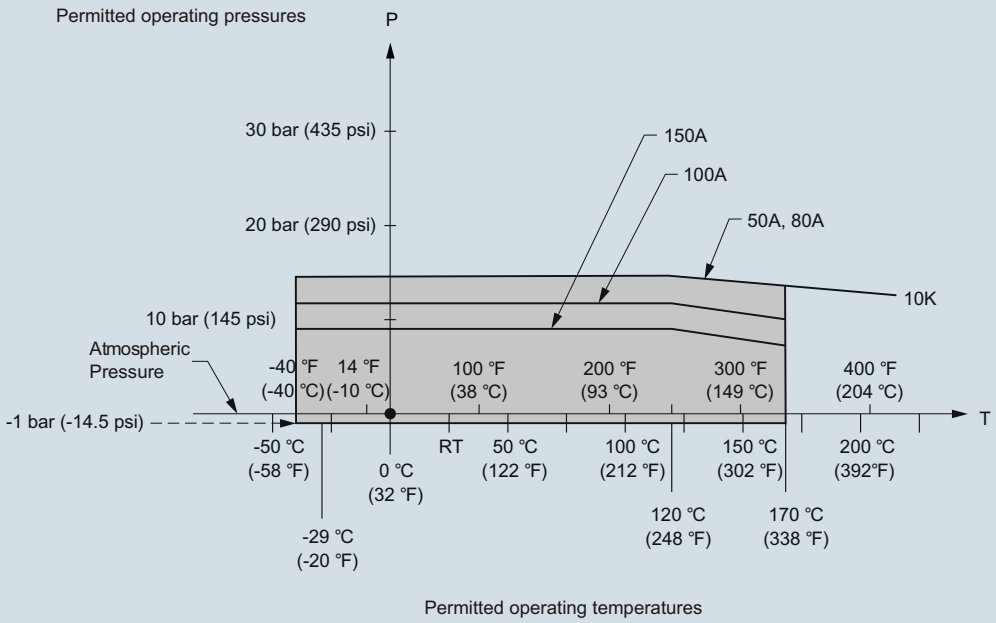
**Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
EN 1092-1 flanged process connections
(7ML5432)**



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

SITRANS LR250 Flanged Encapsulated Antenna

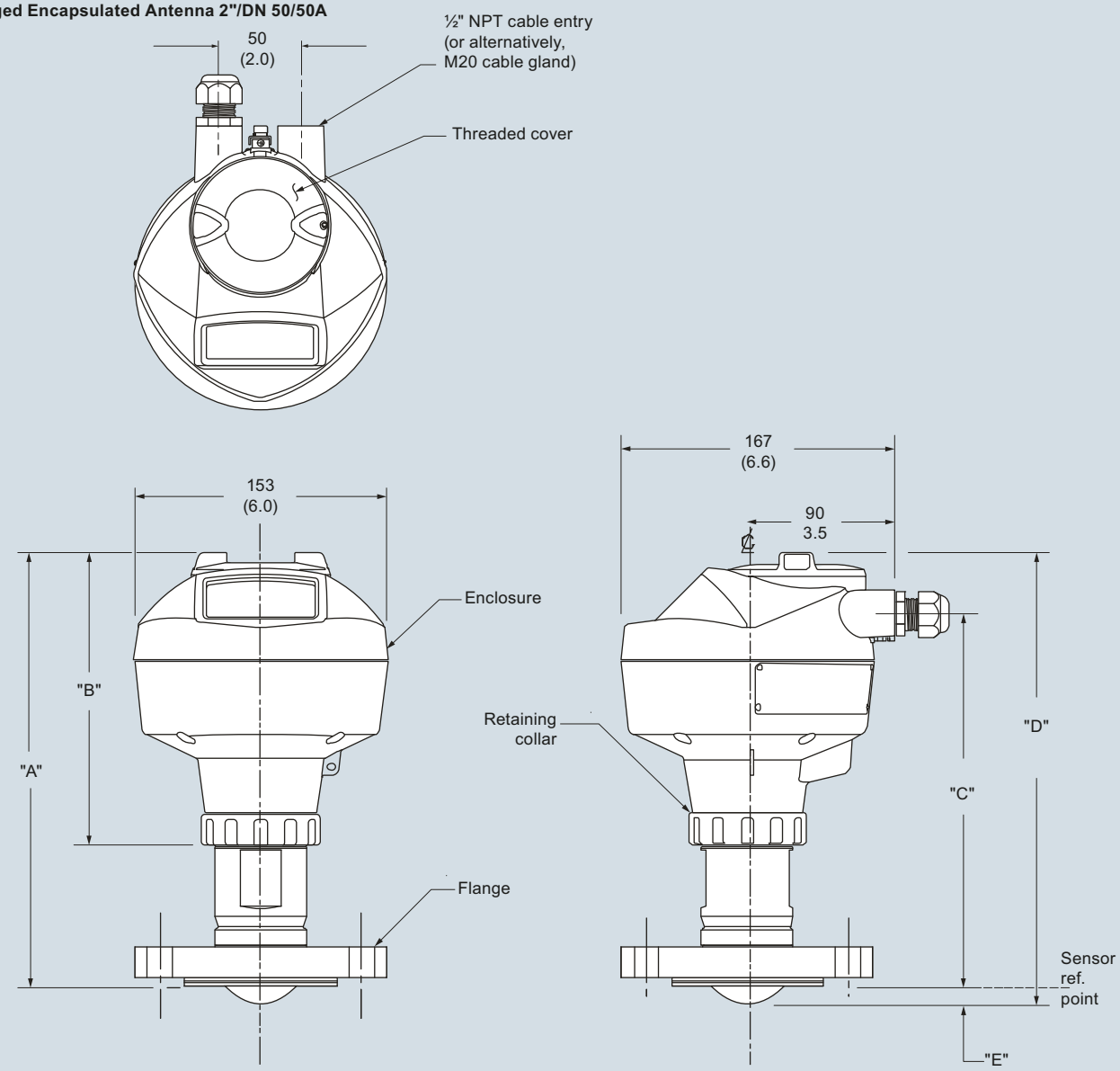
Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
JIS B 2220 flanged process connections
(7ML5432)



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

Dimensional drawings

Flanged Encapsulated Antenna 2"/DN 50/50A



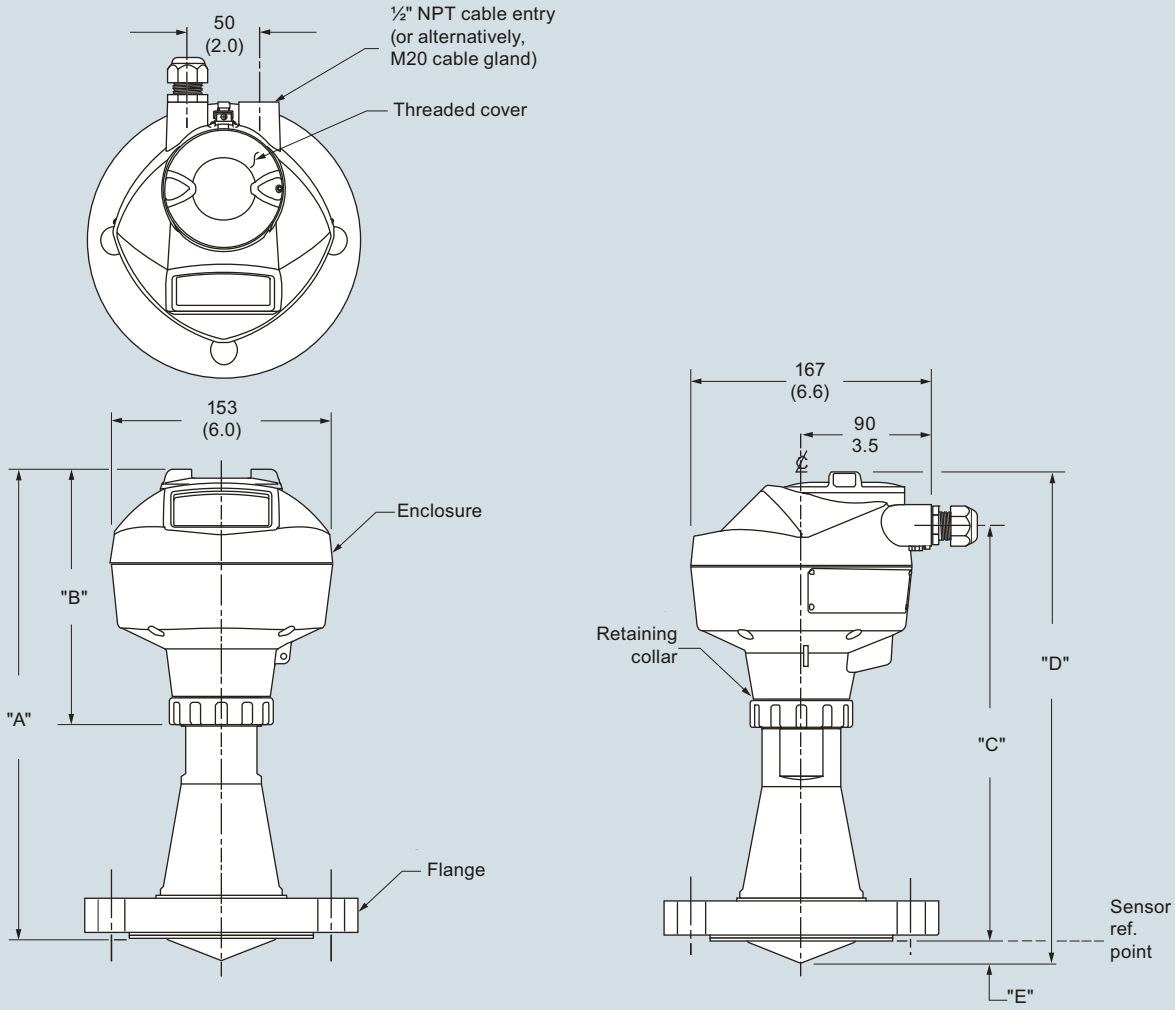
Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E[1)]	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
2"	150 lb	152 (5.98)	50 (1.97)	11 (0.43)	12.8°	10 m (32.8 ft)	263 (10.35)	178 (7)	223 (8.78)	274 (10.79)
DN 50	PN 10/16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

SITRANS LR250 Flanged Encapsulated Antenna

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

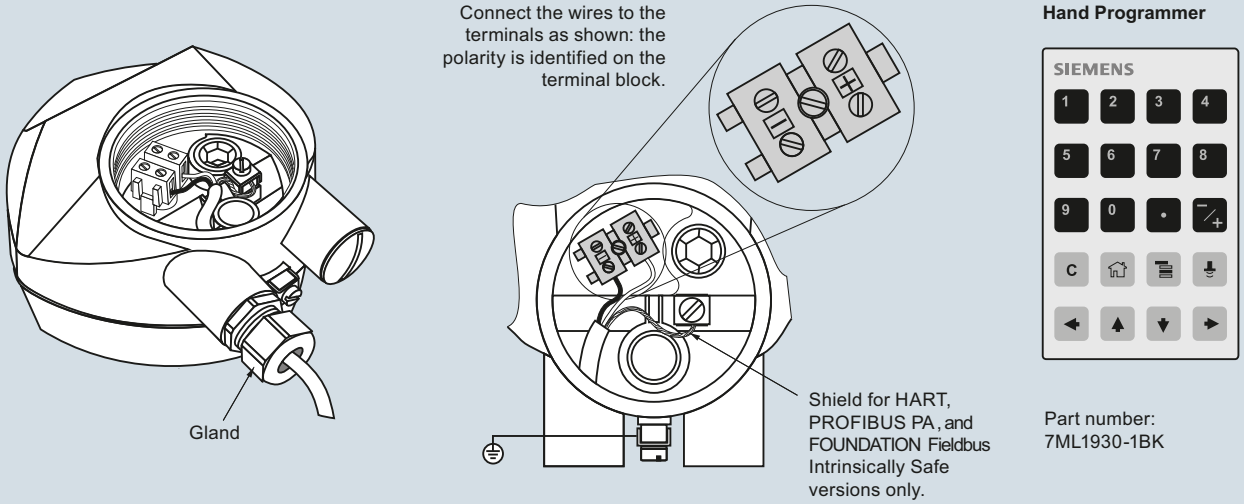


Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E[1)]	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
3"	150 lb	190 (7.48)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.54)
DN 80	PN 10/16	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)

Schematics



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

4

Selection and ordering data

SITRANS LR250 flanged encapsulated Specials	Article No.
SITRANS LR250 flanged encapsulated antenna version enclosures (PROFIBUS PA models)	
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E32462853**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	**A5E32462854**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	**A5E32462855**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	**A5E32462856**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	**A5E32462857**
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)	
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E32462859**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	**A5E32462860**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	**A5E32462861**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	**A5E32462862**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	**A5E32462863**
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	**A5E32462864**
SITRANS LR250 flanged encapsulated antenna version enclosures (< 3.6 mA start-up HART models)	
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**
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 Specials	Article No.
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**
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**
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**
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**
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**
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**
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**
SITRANS LR250 flanged encapsulated antenna lens kits	
Replacement TFM 1600 Lens and Spring Washer Kit for 2" Class 150 ASME B16.5 raised face	**A5E32462817**
Replacement TFM 1600 Lens and Spring Washer Kit for 3" Class 150 ASME B16.5 raised face	**A5E32462819**
Replacement TFM 1600 Lens and Spring Washer Kit for 4" Class 150 ASME B16.5 raised face	**A5E32462820**
Replacement TFM 1600 Lens and Spring Washer Kit for 6" Class 150 ASME B16.5 raised face	**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 DN 50 PN 10/16 EN 1092-1 type B1 raised face	**A5E32462826**
Replacement TFM 1600 Lens and Spring Washer Kit for DN 80 PN 10/16 EN 1092-1 type B1 raised face	**A5E32462827**
Replacement TFM 1600 Lens and Spring Washer Kit for DN 100 PN 10/16 EN 1092-1 type B1 raised face	**A5E32462828**
Replacement TFM 1600 Lens and Spring Washer Kit for DN 150 PN 10/16 EN 1092-1 type B1 raised face	**A5E32462829**

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. Start-up is easy using the Quick Start wizard with few parameters required for basic operation.

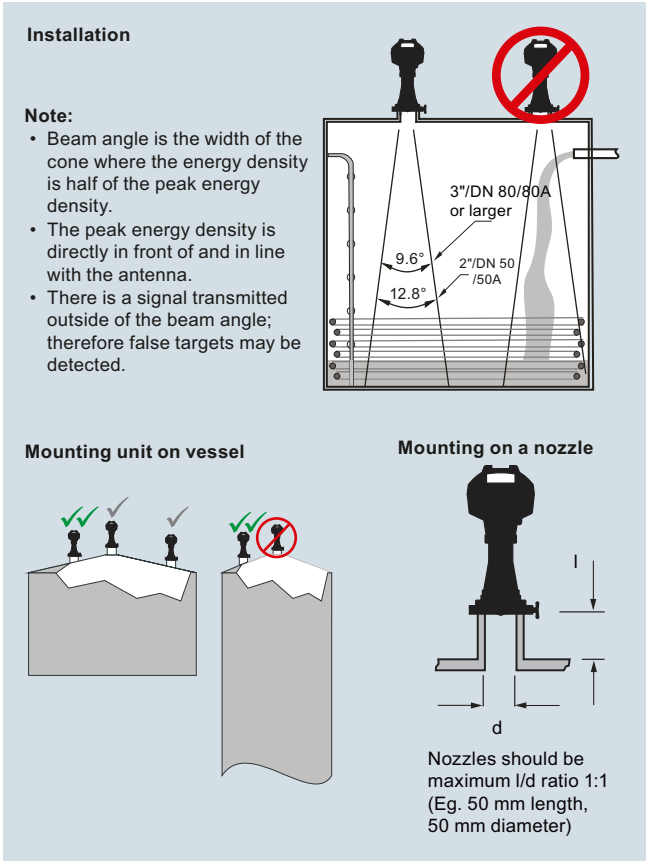
The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

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 install/clean flush antennas are preferable, such as ice cream, fruit juice, milk, beer, and pharmaceutical or chemical additives and ingredients.

Configuration



SITRANS LR250 Hygienic Encapsulated Antenna Installation, dimensions in mm (inch)

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) • 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) • < 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)
Installation category	I
Pollution degree	4
Medium conditions	
Dielectric constant ε_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 M20x1.5 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) • 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 • DN 50, DN 80 & DN 100 Aseptic/ Hygienic threaded to DIN 11864-1 [Form A] • DN 50, DN 80 & DN 100 Aseptic/ Hygienic flanged to DIN 11864-2 [Form A] • DN 50, DN 80 & DN 100 Aseptic/ Hygienic Clamp according to DIN 11864-3 [Form A] • DN 50, DN 80 & DN 100 Hygienic Union according to DIN 11851 • 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 • Per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • Per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, NE 21, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, 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 20 T90 IP67 DIP A20 T_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °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)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia
Hygienic/Sanitary	EHEDG EL Class I EHEDG EL Aseptic Class I

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 Ta = 50 °C IECEx SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	• SIMATIC PDM • Emerson AMS • 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

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna ↗	**7ML5433-**
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, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
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)[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
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 °C ... 120 °C (-40 °F ... 248 °F)][5]	F C
Type N (68 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 °C ... 120 °C (-40 °F ... 248 °F)][5]	F D
Type F (50 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 °C ... 170 °C (-4 °F ... 338 °F)][5]	F E
Type N (68 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 °C ... 170 °C (-4 °F ... 338 °F)][5]	F F
EXCLUDE Process Connection - Electronics Head assembly spare only (select all other options as normal)	Y Y

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna	**7ML5433-**
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, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
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, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, 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, R&TTE, 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 20 T90 IP67 DIP A20 TA 90 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 TA 90 °C[6]	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 TA 90 °C[6]	N
Pressure Rating	
Rating per pressure/temperature curves in instruction manual	0

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

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**
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**

	Article No.
Operating Instructions for HART/mA device	
English	**A5E32220602**
German	**A5E32376088**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for HART/mA device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33469191**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33469171**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
Operating Instructions for PROFIBUS PA device	
English	**A5E32221386**
German	**A5E32376094**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for PROFIBUS PA device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33469239**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33472685**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	

Selection and Ordering data	Article No.
Operating Instructions for FOUNDATION Fieldbus device	
English	**A5E32221411**
German	**A5E32376112**
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Compact Operating Instructions for FOUNDATION Fieldbus device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	**A5E33472700**
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	**A5E33472738**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
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 M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required)[6)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, 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 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-...**
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	**7ML5750-...**
For applicable back up point level switch - see point level measurement section	

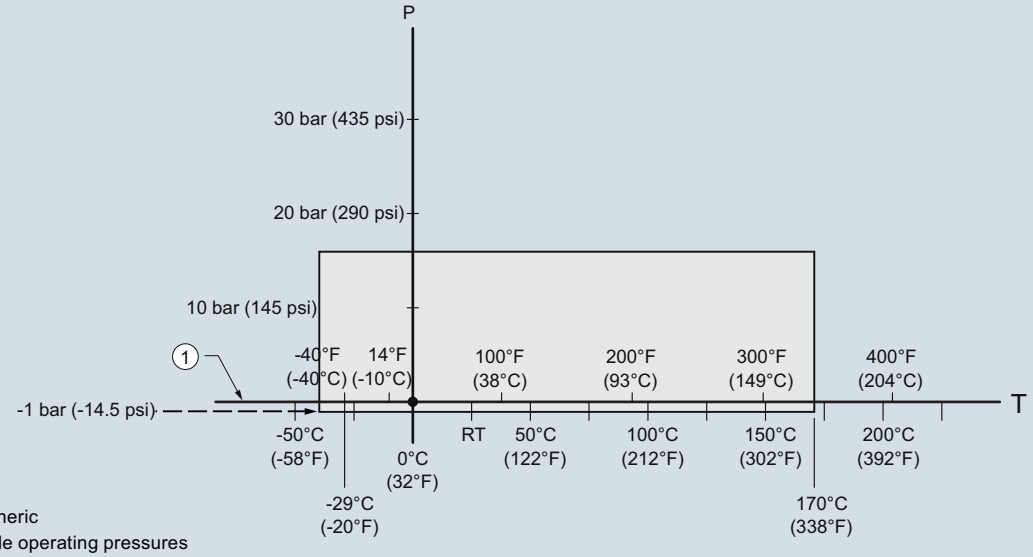
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

1) Available with process connection options AA ... FB & YY only
2) Available with Approval options A, B, C, L only
3) Available with Process connection FC ... FF only
4) Available with process connection options AA ... EC & YY 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 & 3 only.
9) Available with Enclosure option 0 only
10) Available with Approval options A, B, C, D, E, K, L only

4

Characteristic curves

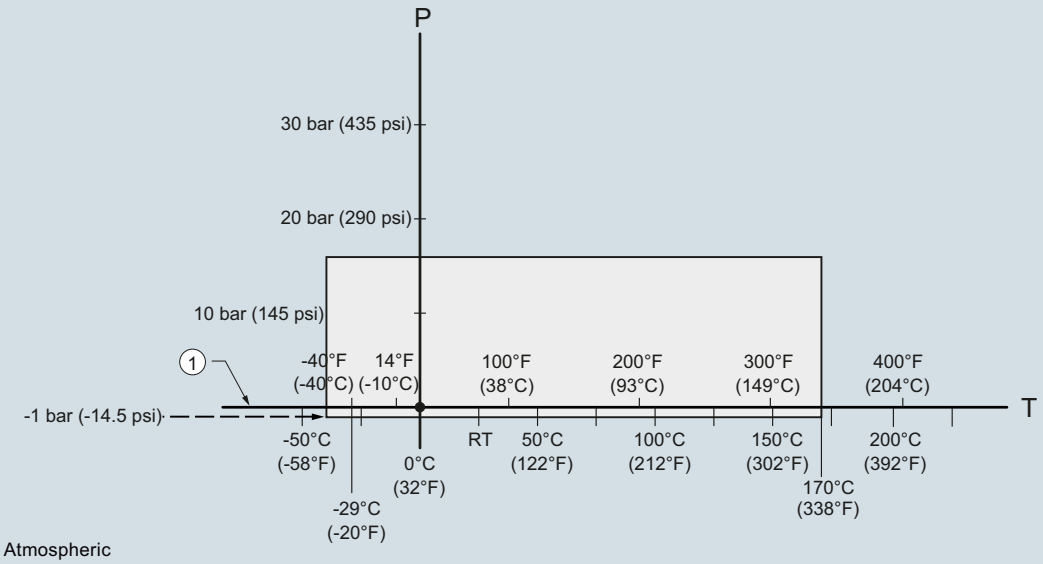
DIN 11851 Sanitary/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100
DIN 11864-1 Aseptic/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100



(1) Atmospheric
P Allowable operating pressures
T Allowable operating temperatures

SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

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

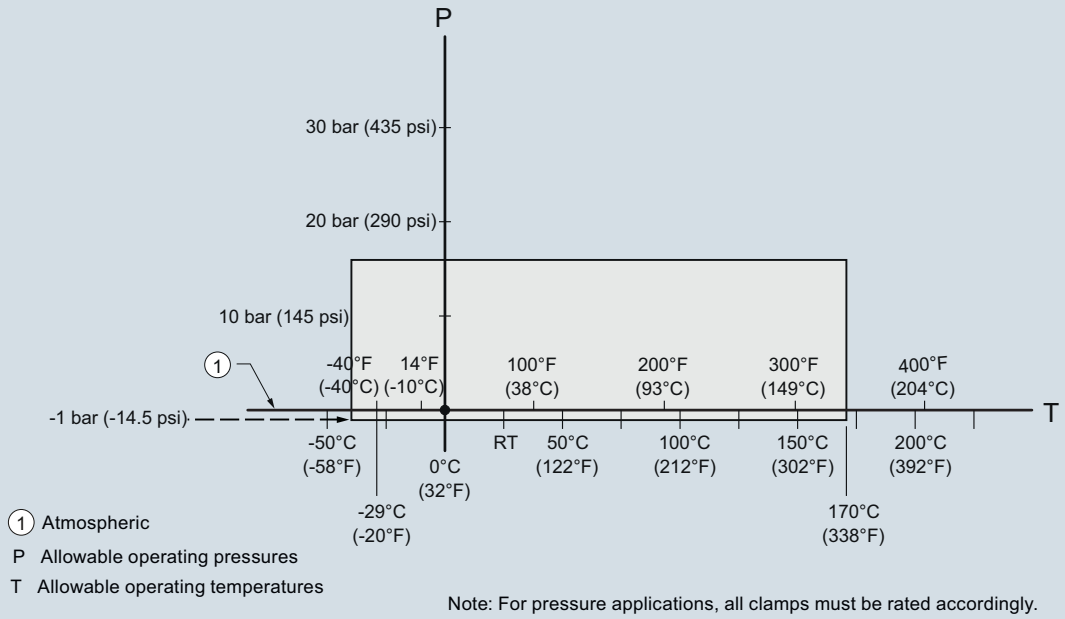


(1) Atmospheric
P Allowable operating pressures
T Allowable operating temperatures

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

SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

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)

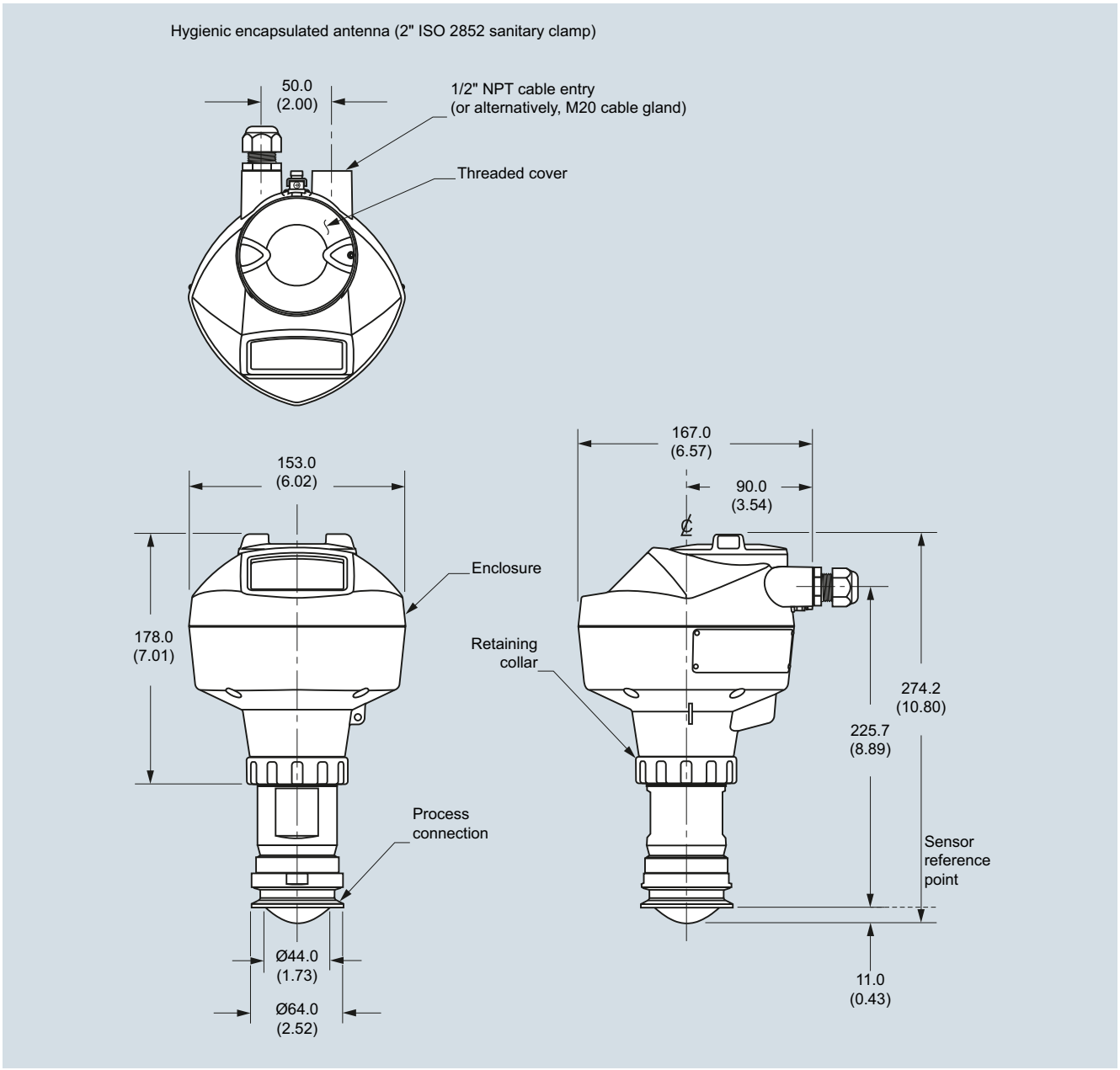


Note: For pressure applications, all clamps must be rated accordingly.

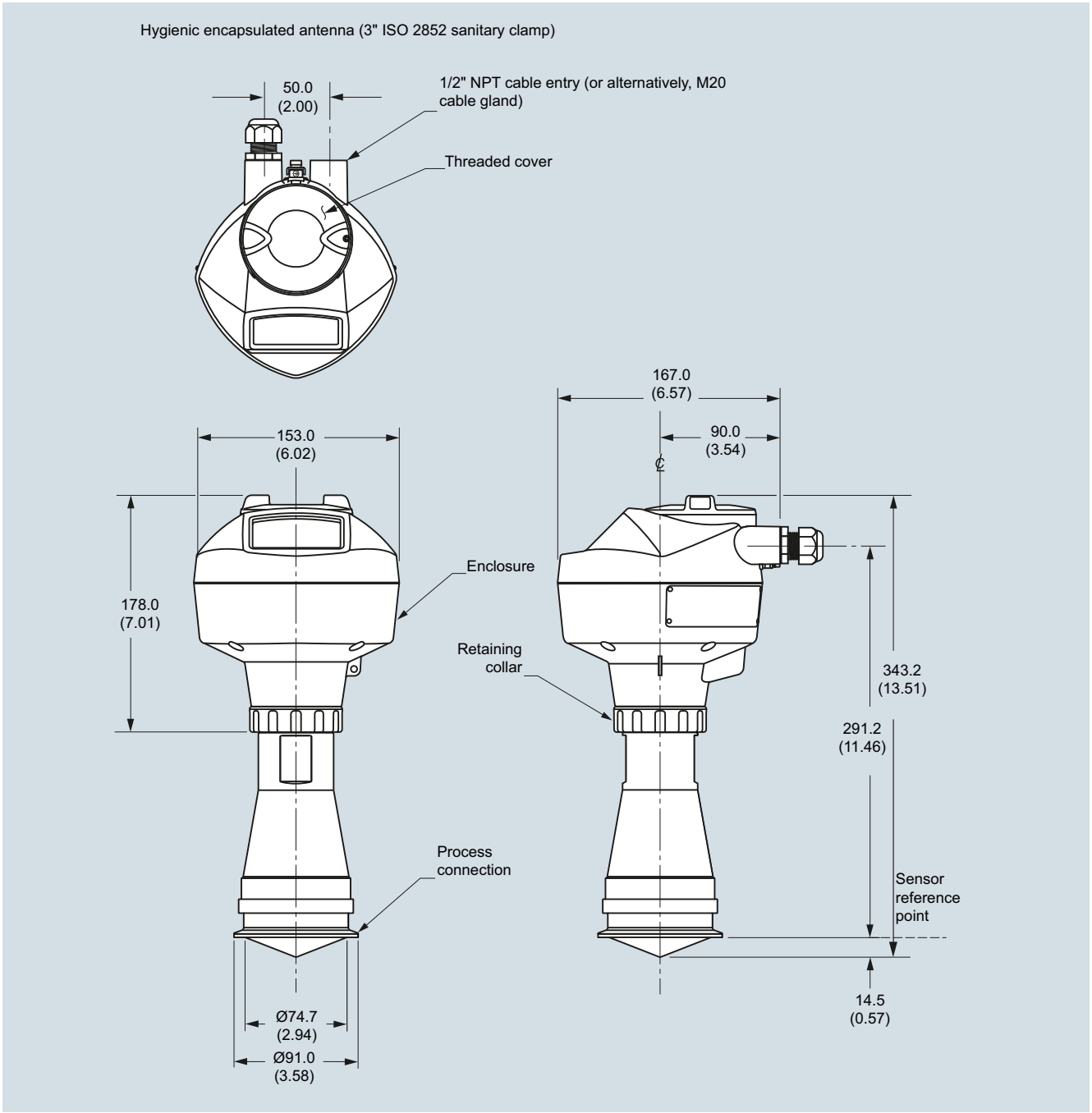
SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings



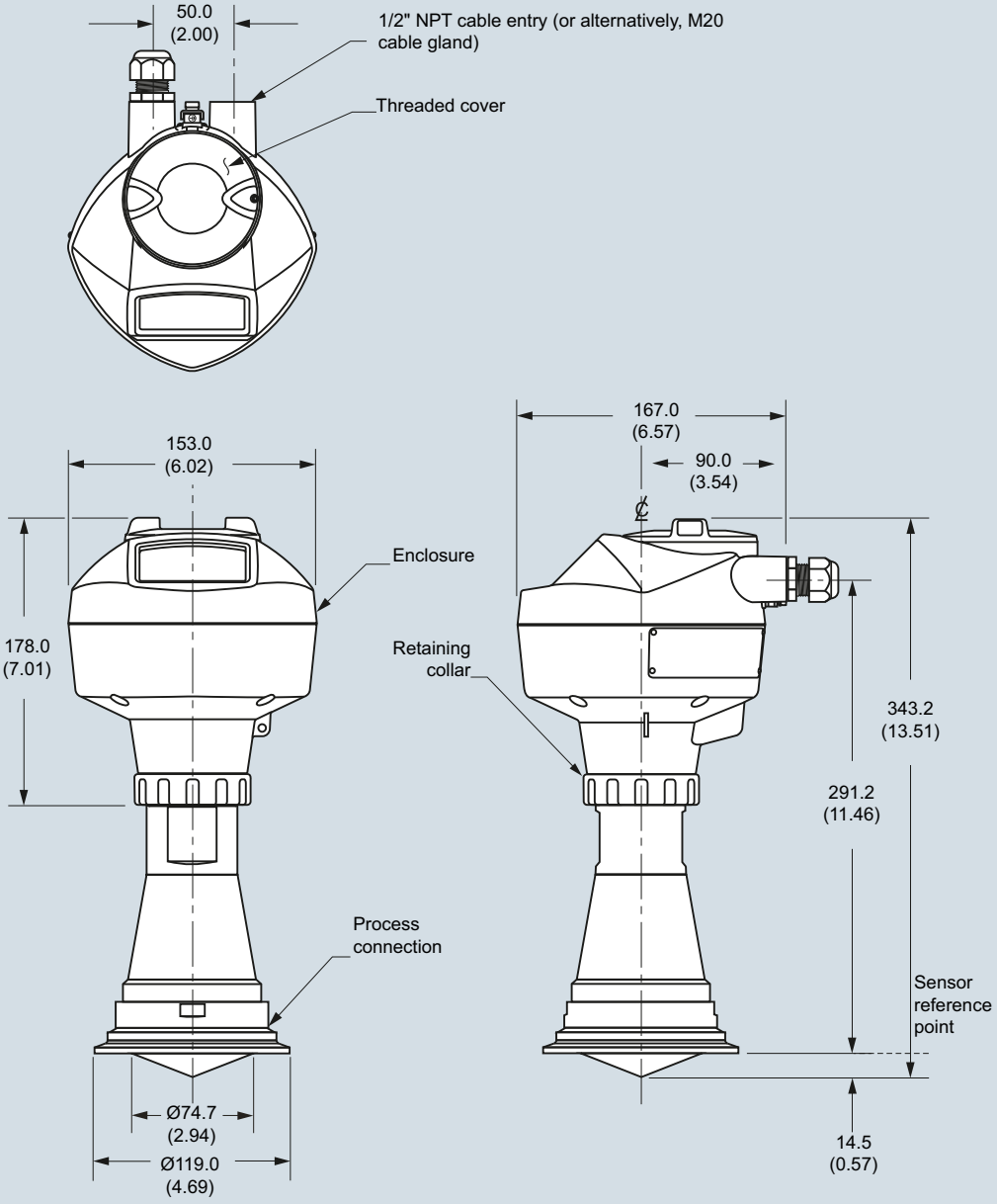
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)



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

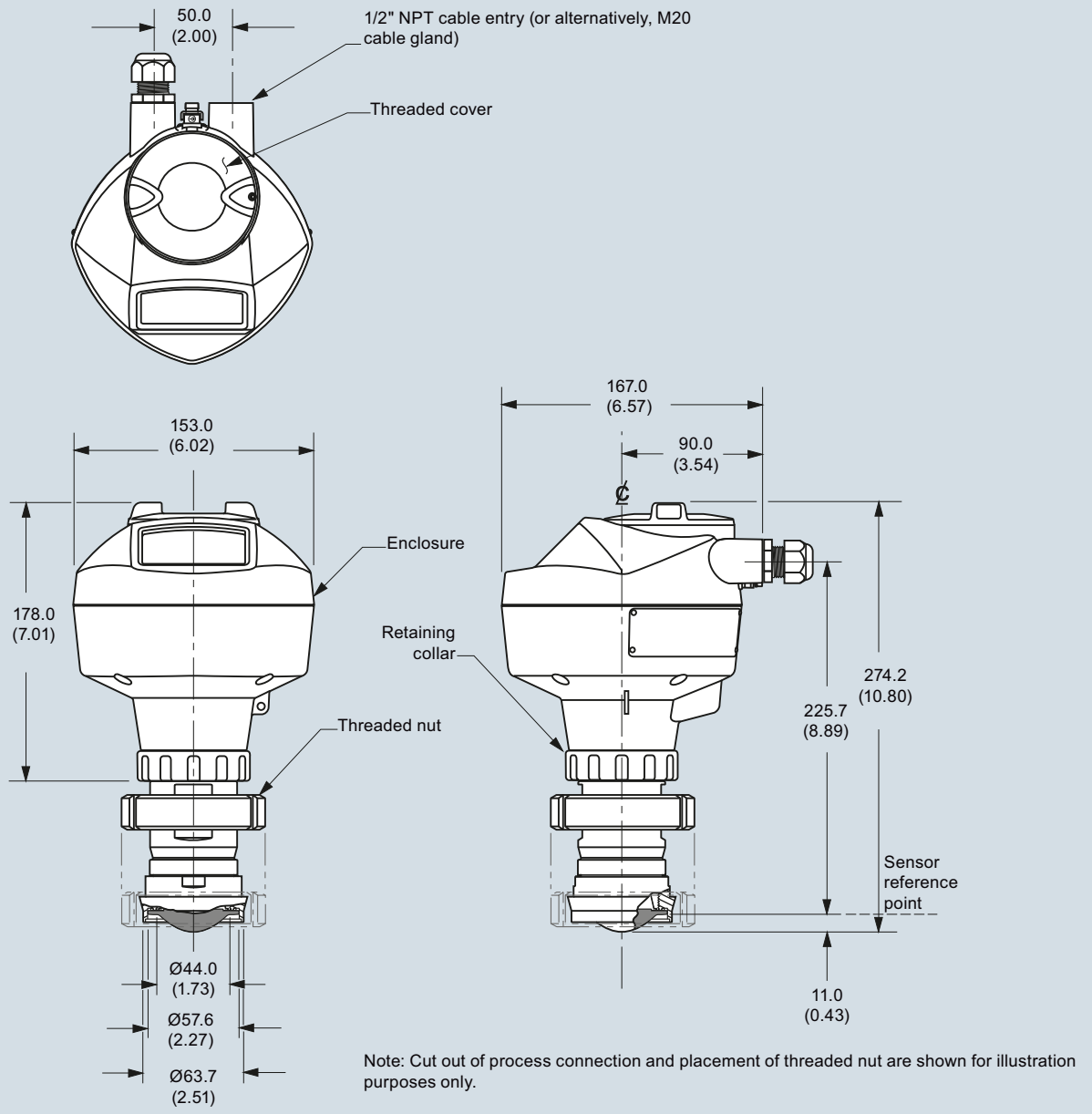
SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (4" ISO 2852 sanitary clamp)



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

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

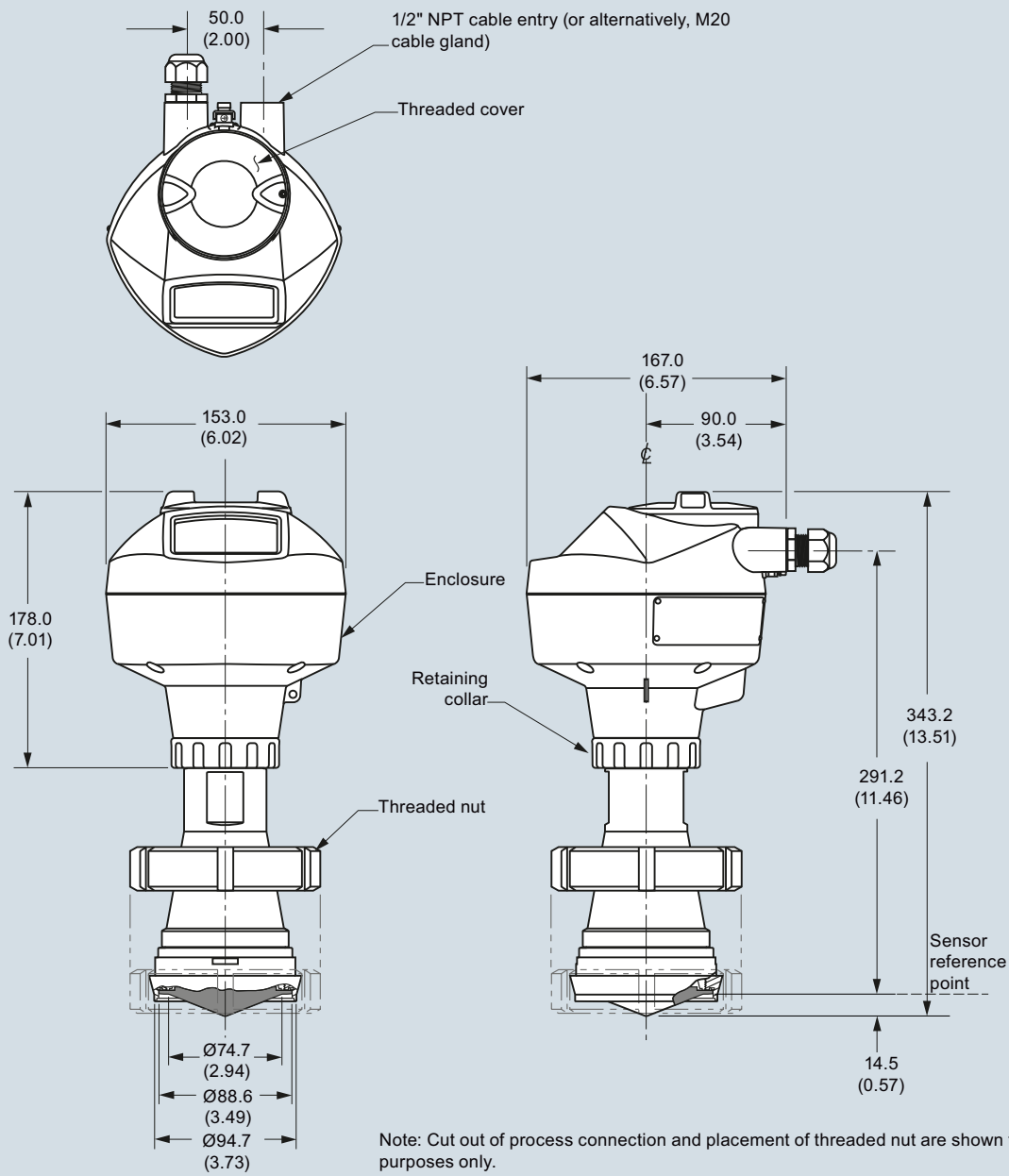


Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

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

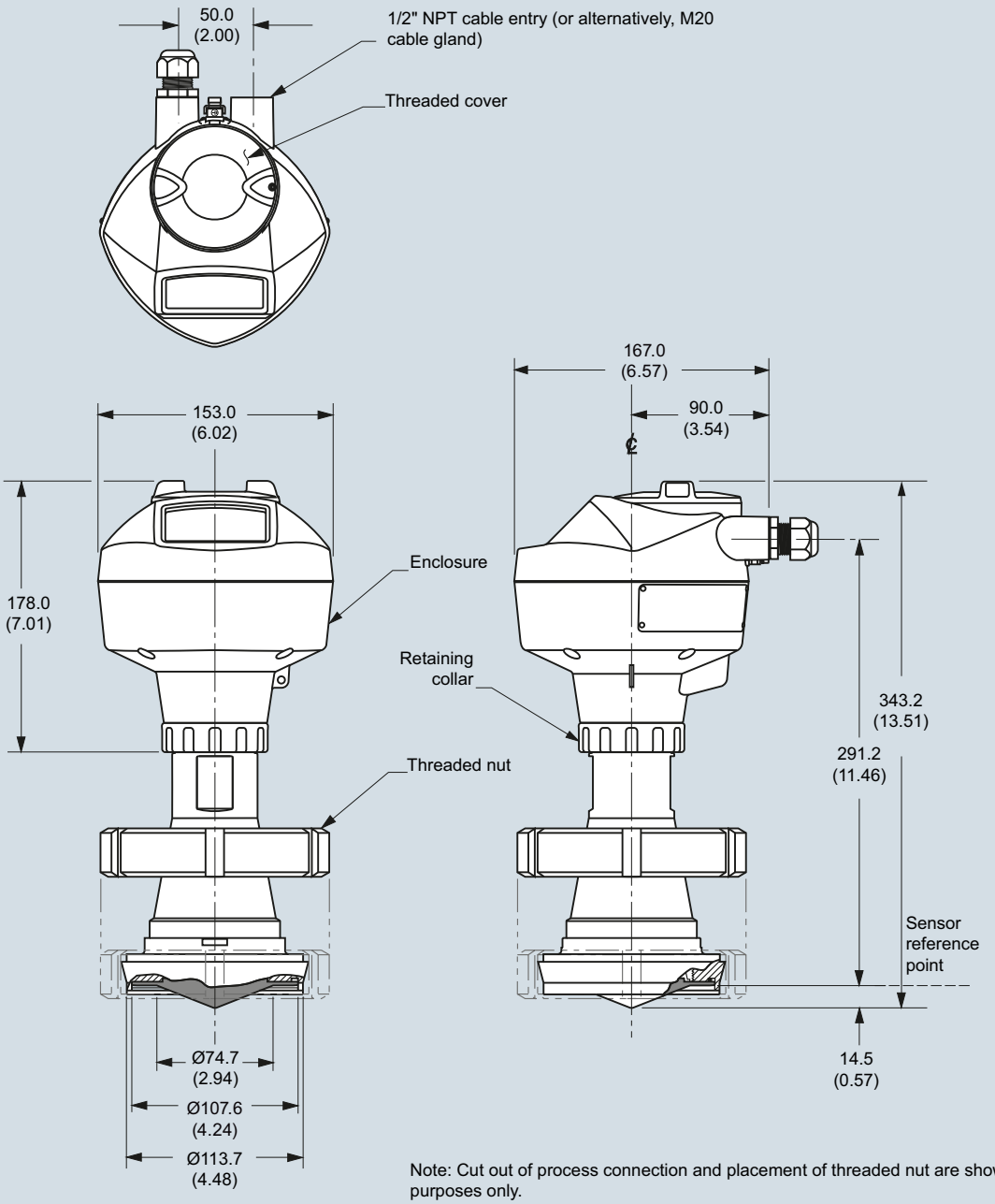
SITRANS LR250 Hygienic Encapsulated Antenna

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



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

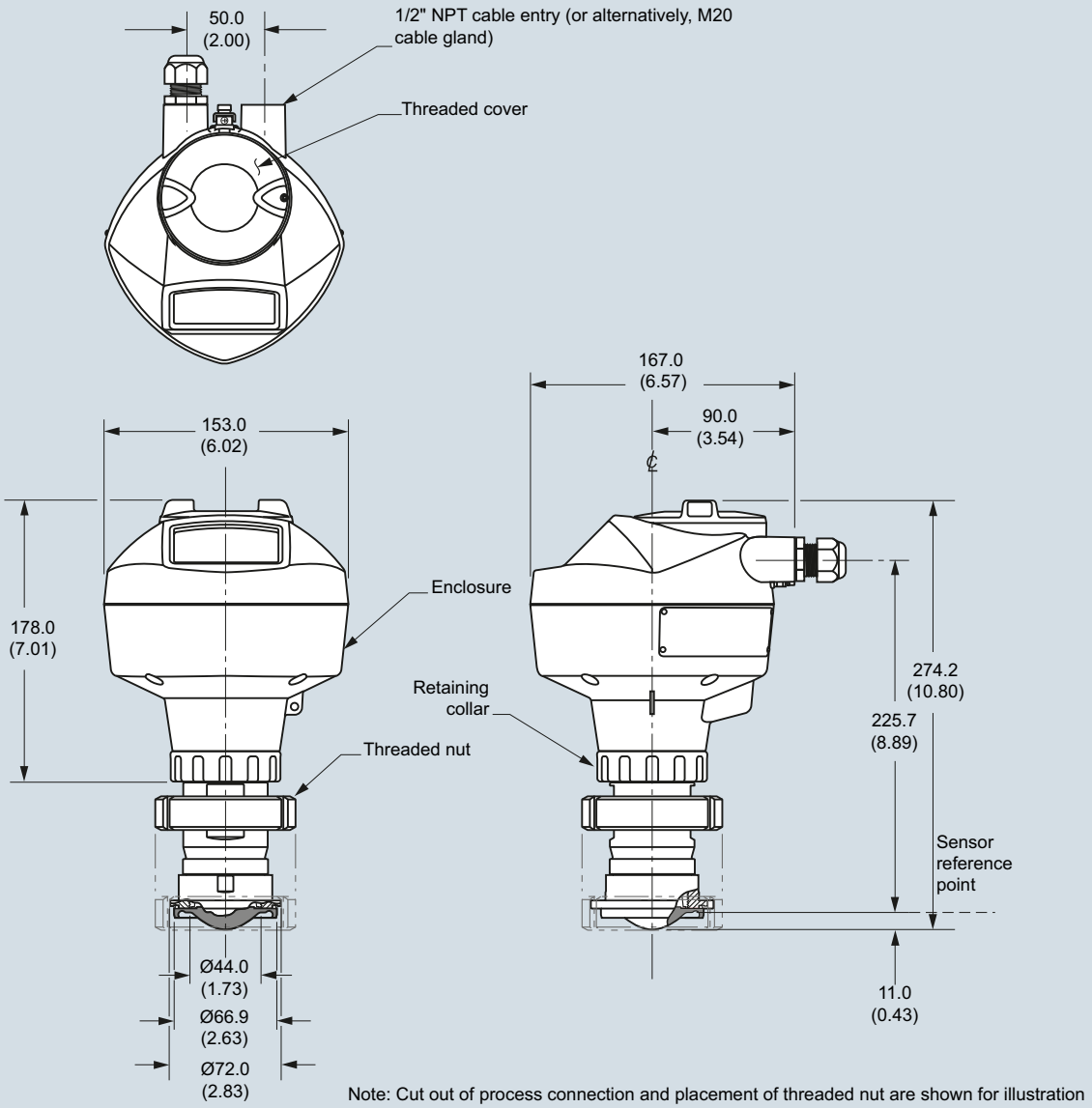
Hygienic encapsulated antenna (DN 100 nozzle/slotted nut to DIN 11851)



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

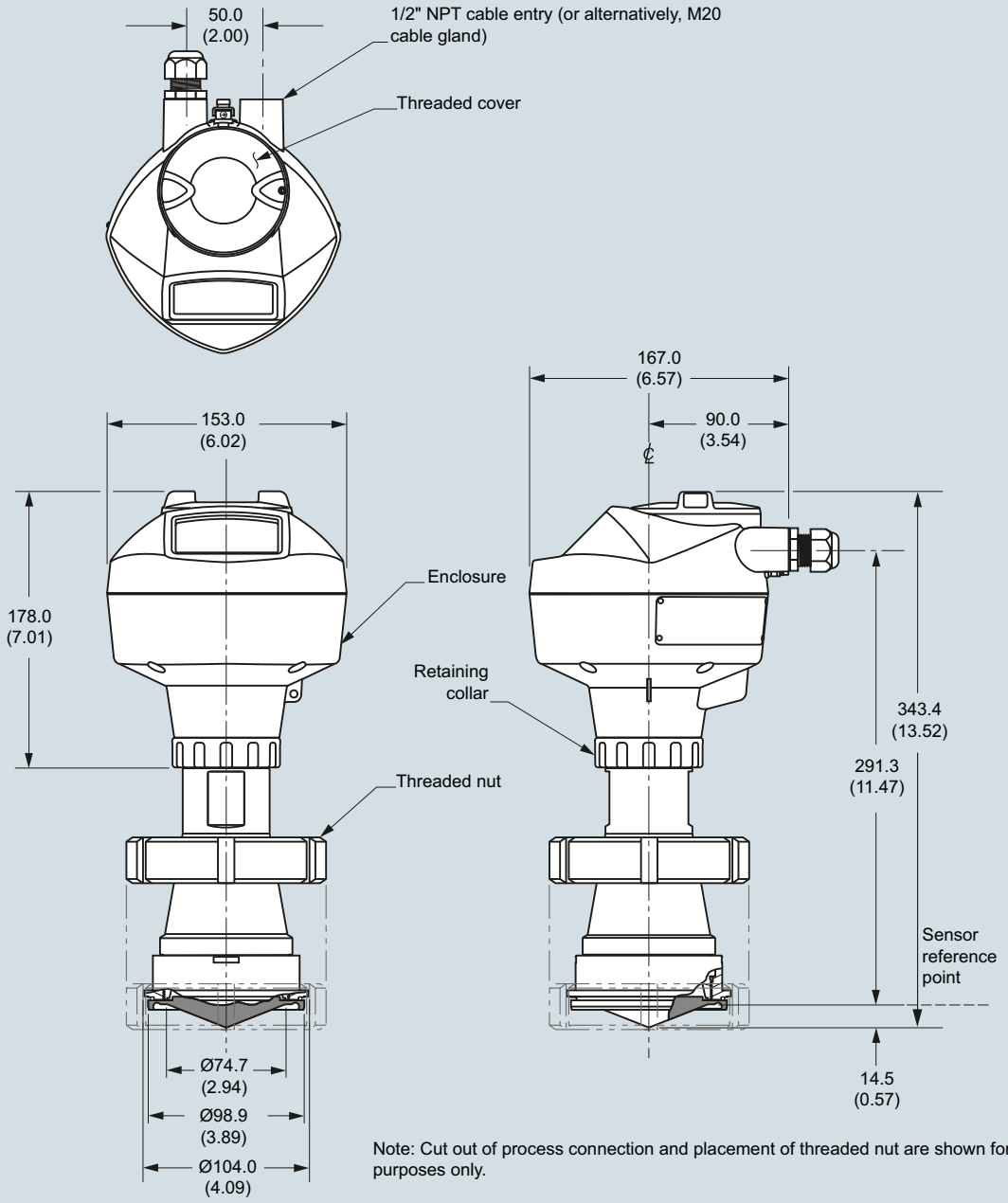
SITRANS LR250 Hygienic Encapsulated Antenna

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



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

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

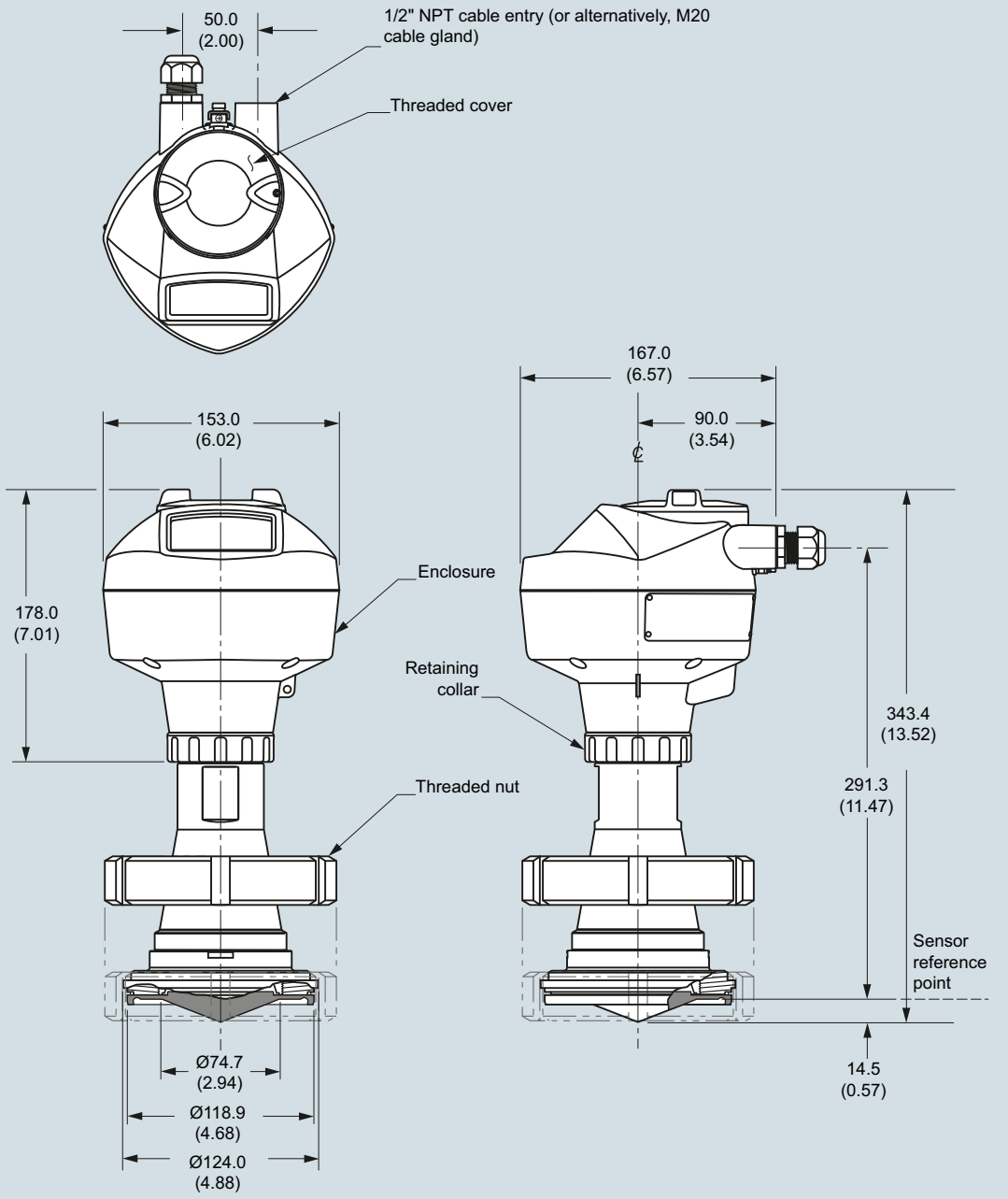


Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

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

SITRANS LR250 Hygienic Encapsulated Antenna

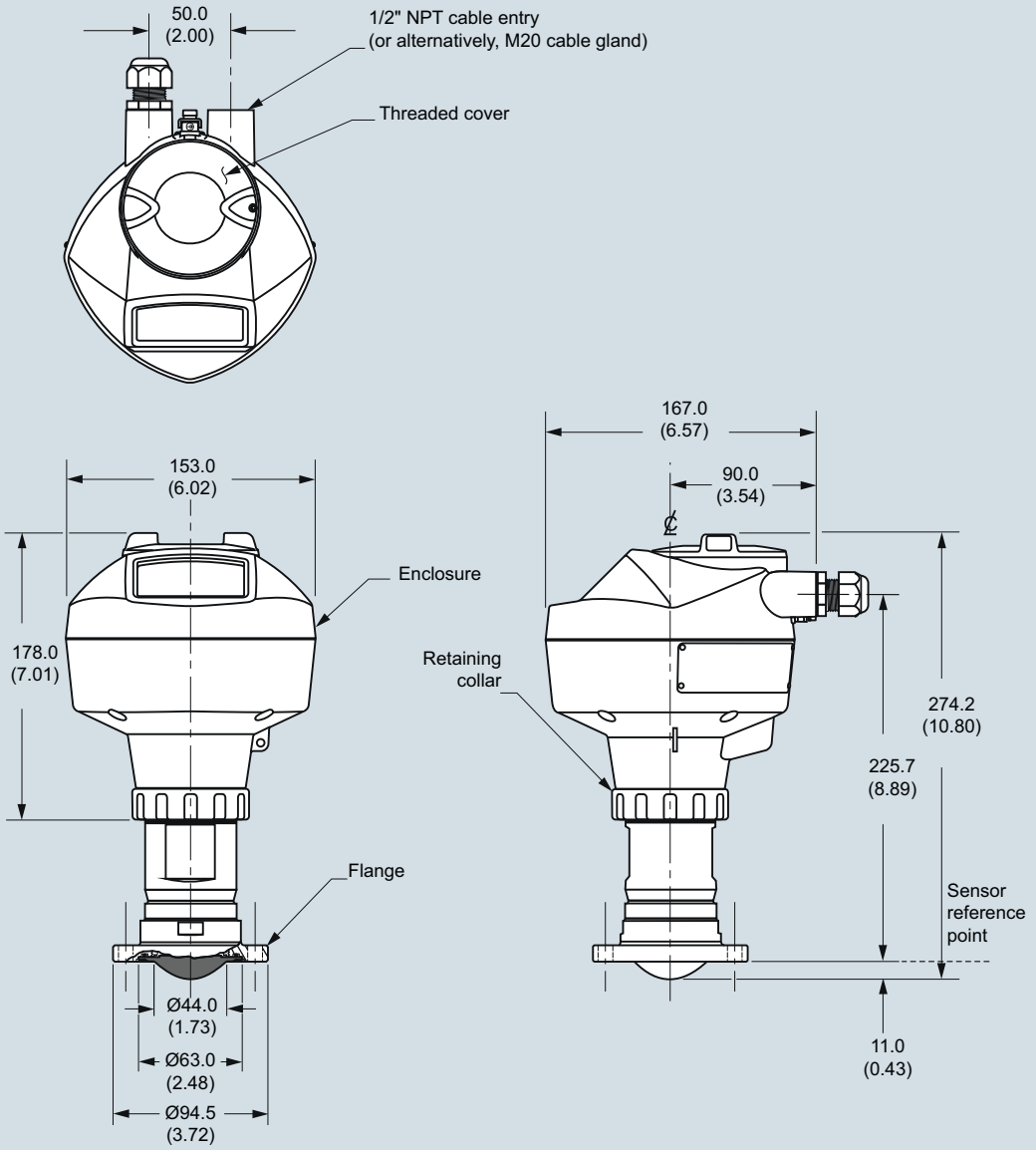
Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-1)



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

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

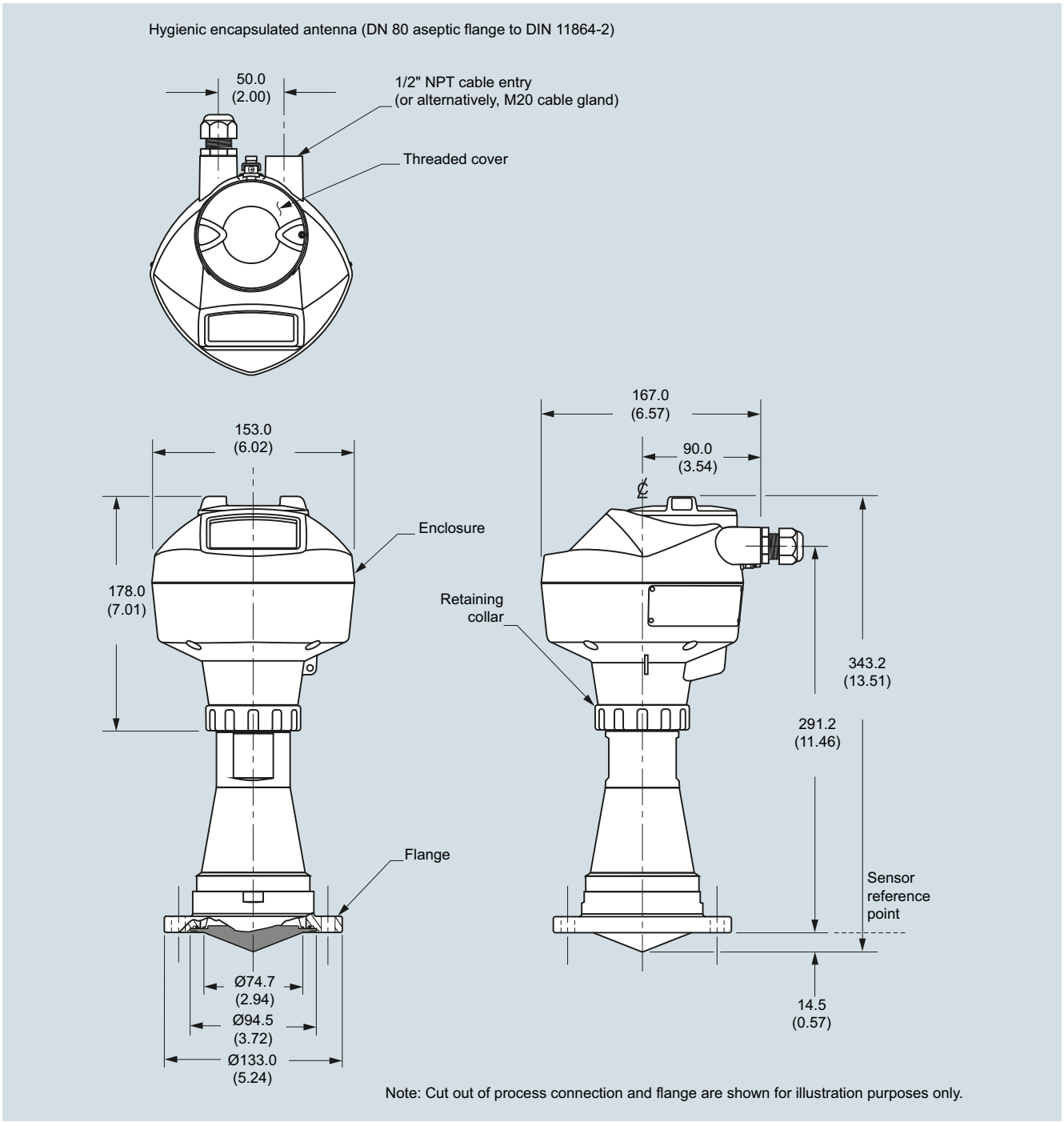
Hygienic encapsulated antenna (DN 50 aseptic flange to DIN 11864-2)



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

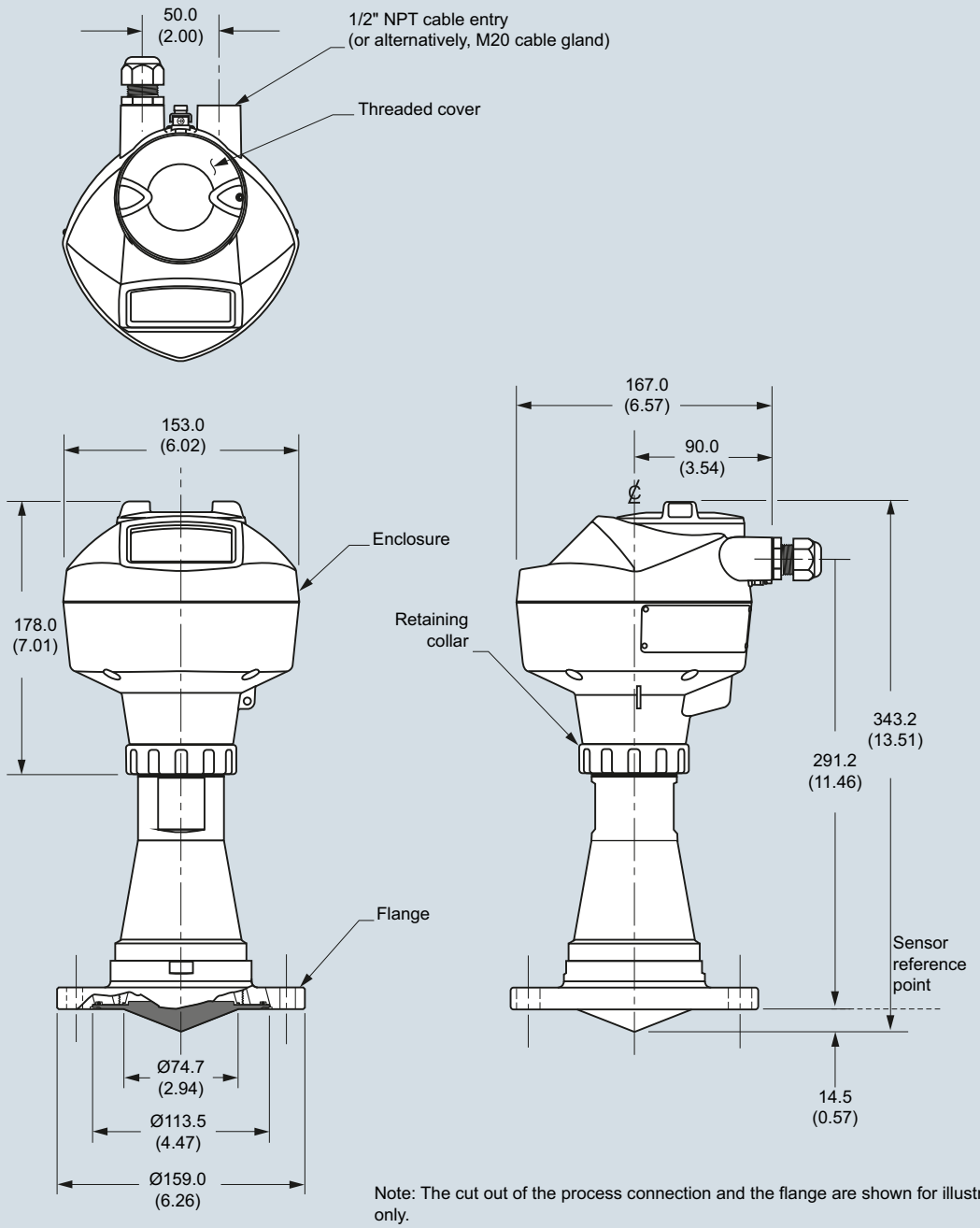
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna



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

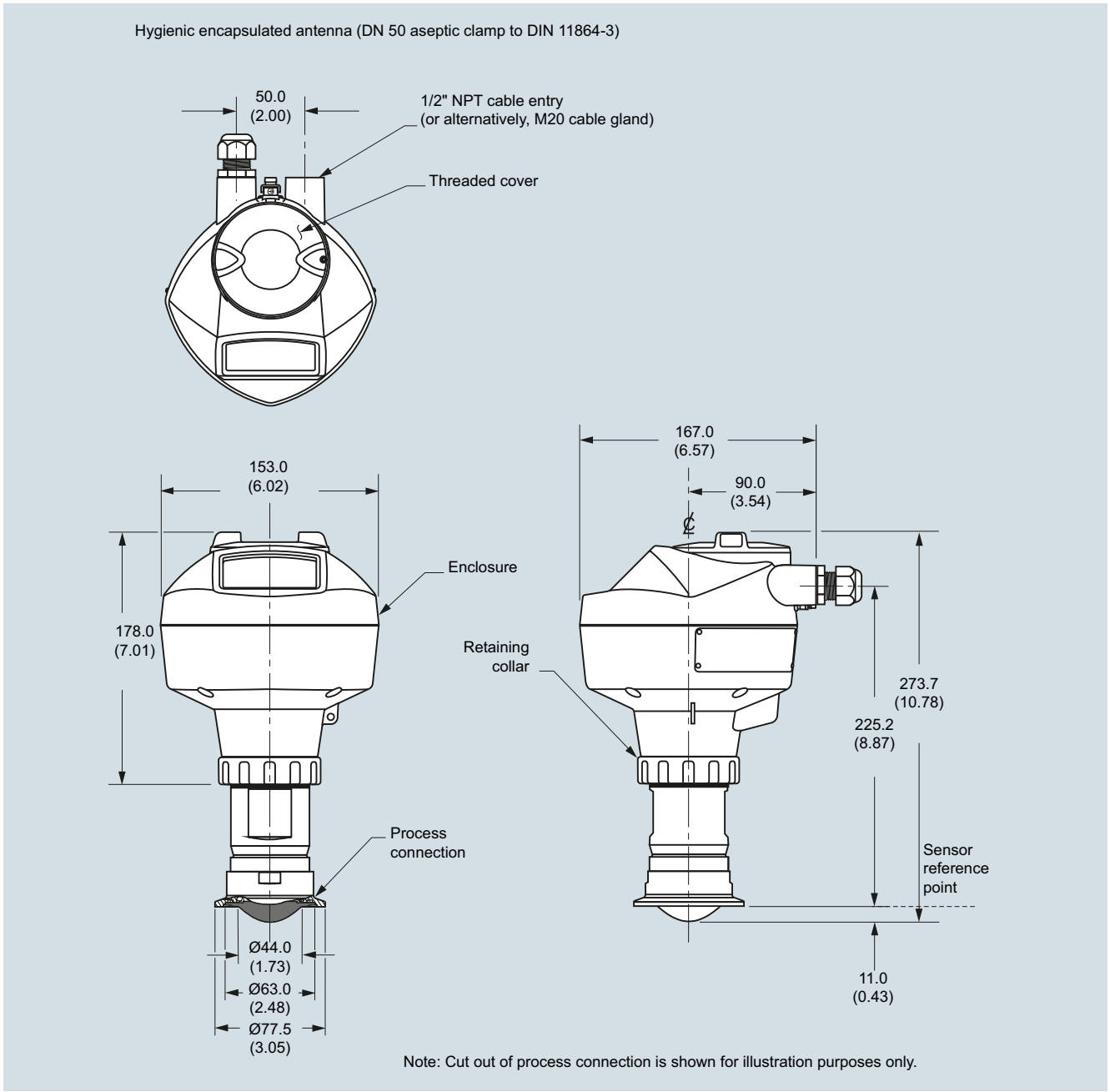
Hygienic encapsulated antenna (DN 100 aseptic flange to DIN 11864-2)



Note: The cut out of the process connection and the flange are shown for illustration purposes only.

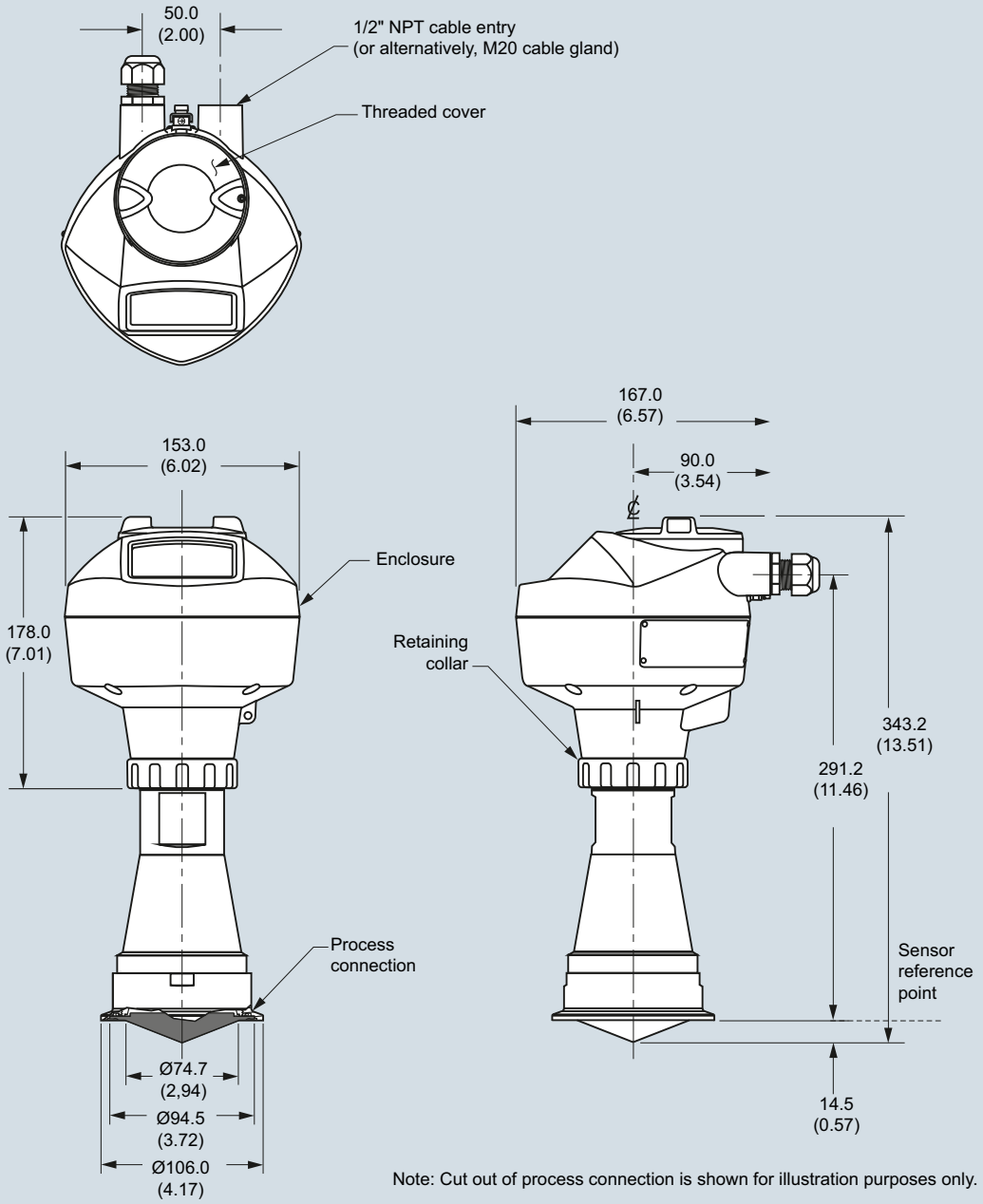
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna



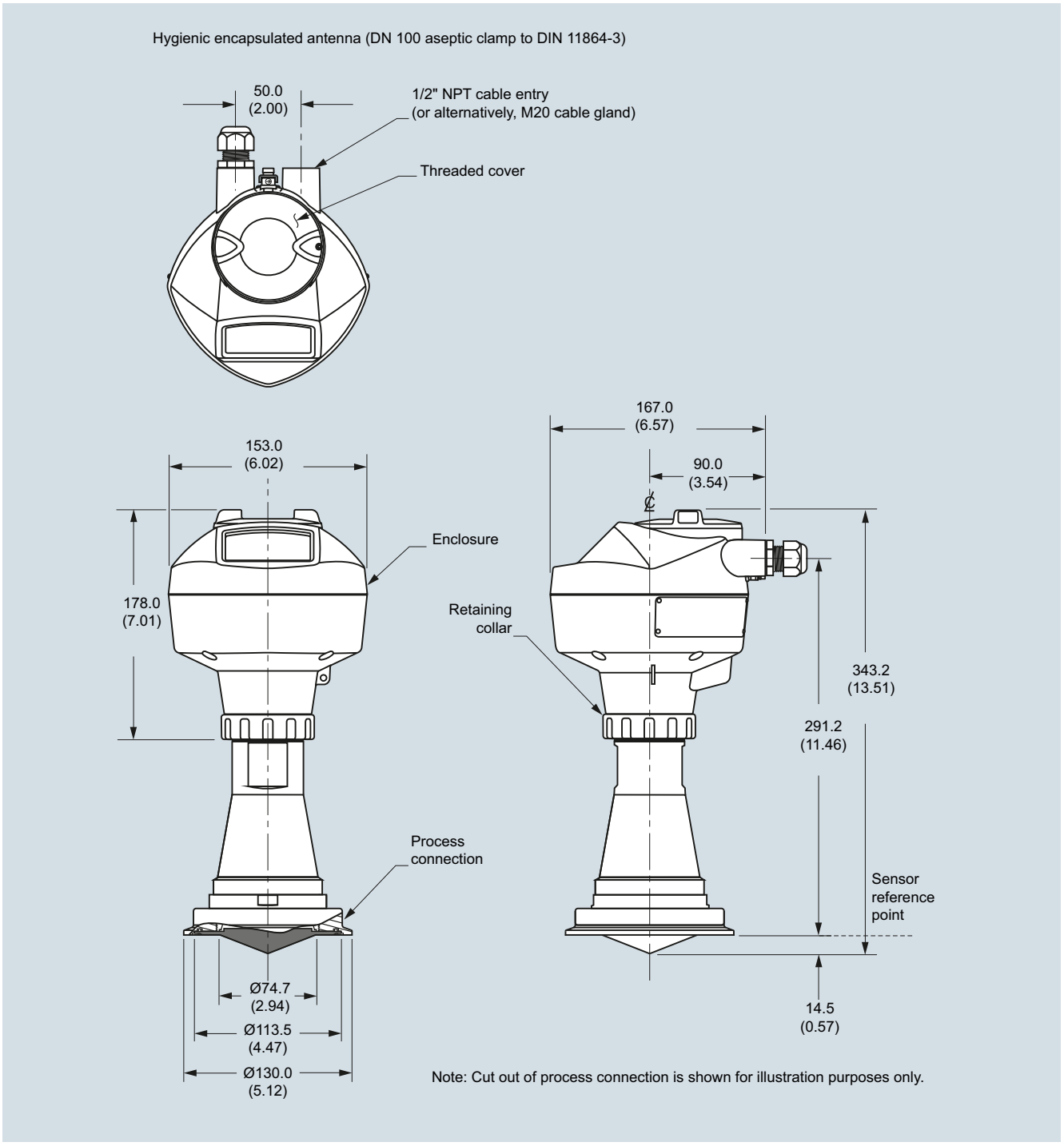
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-3)



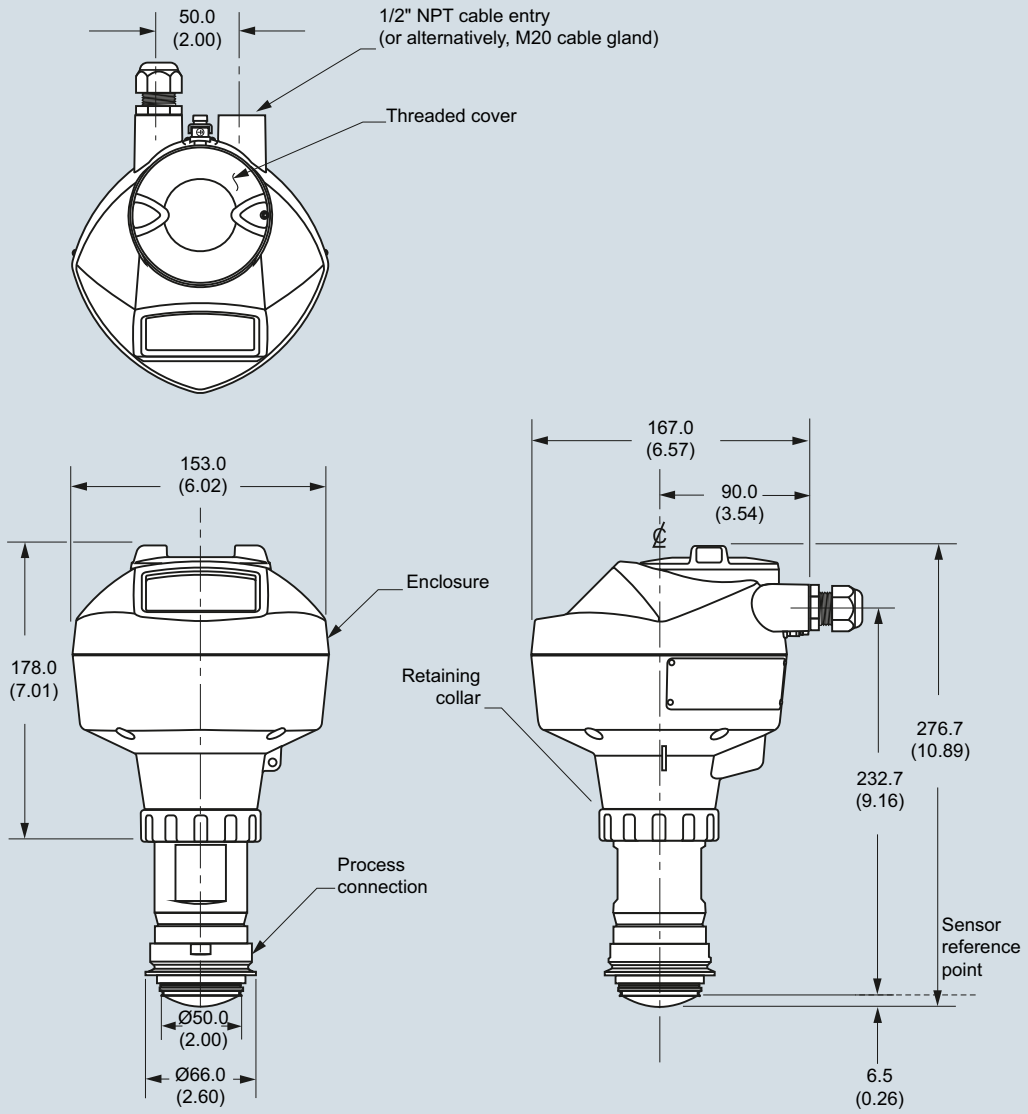
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna



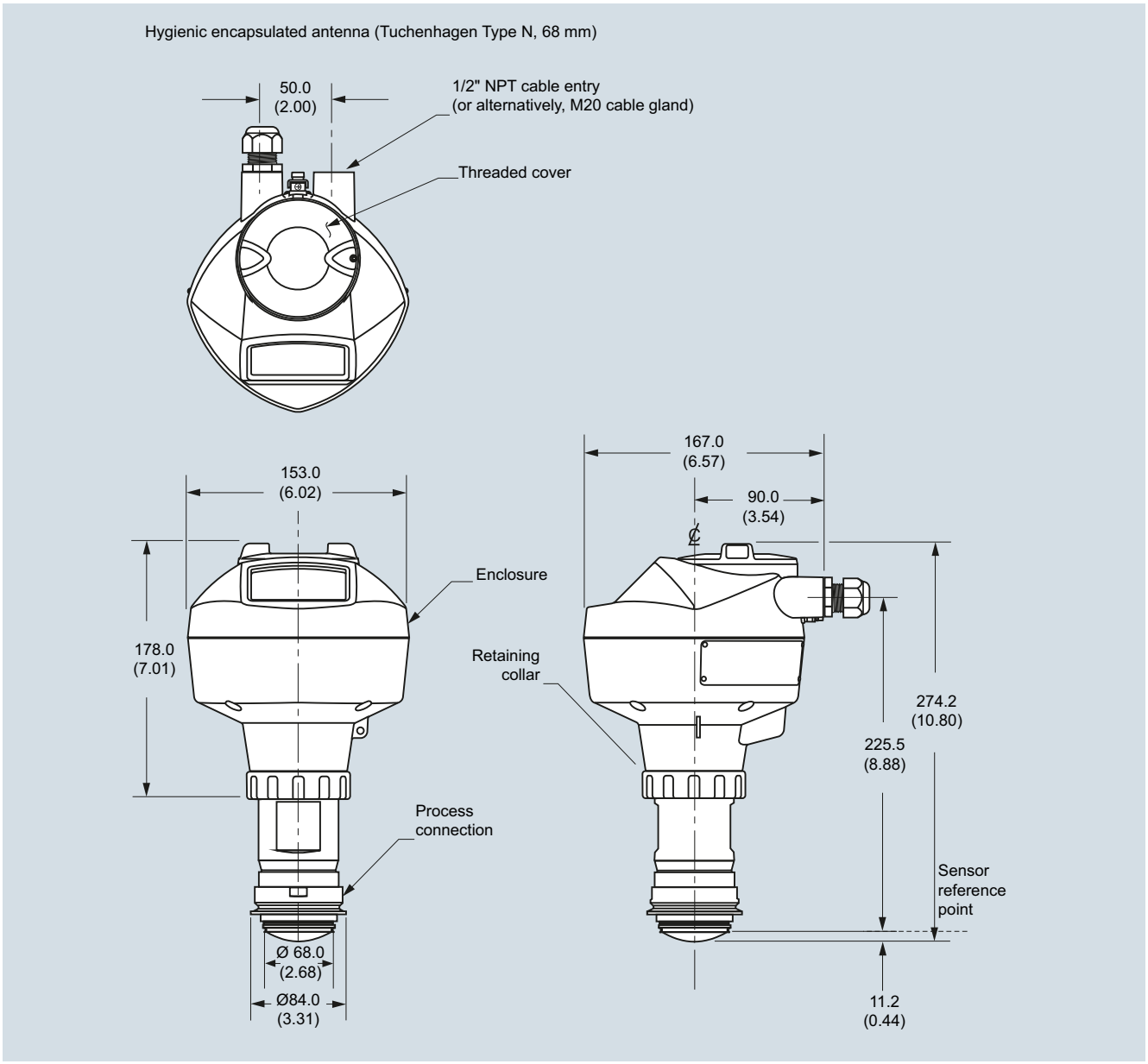
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Hygienic encapsulated antenna (Tuchenhagen Type F, 50 mm)



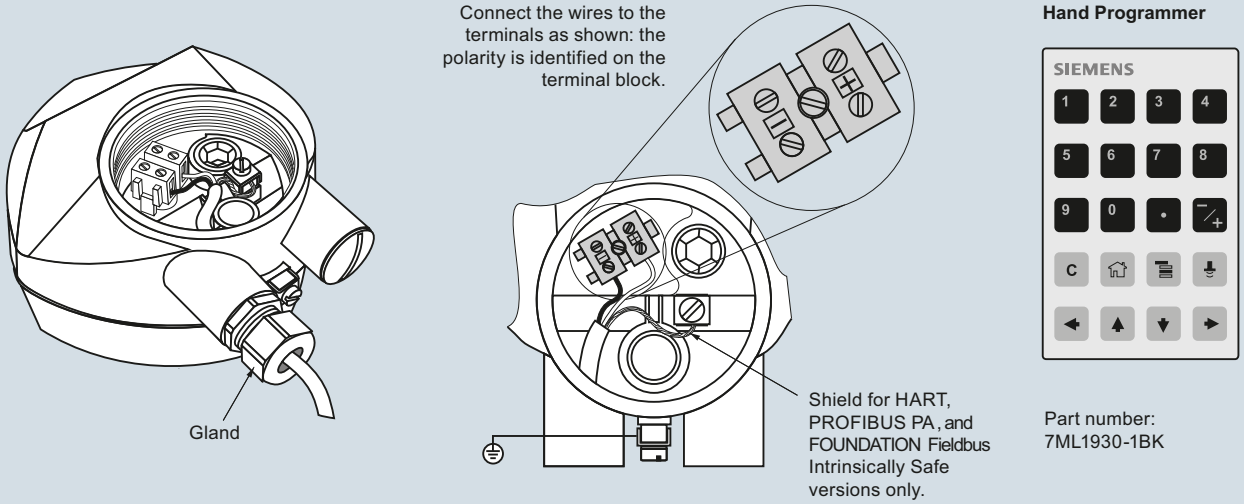
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna



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

Schematics



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

4

Selection and ordering data

SITRANS LR250 hygienic encapsulated Specials	Article No.
For "Electronics Head only" follow the standard configuration and choose YY option on positions 9 and 10 of the full part number. **For example: 7ML5433-1YY20-1AA0 will order an electronics head for the following:** **EHEDG EL Class 1 approval, 4 ... 20mA HART, M20 cable entries, General purpose Haz Loc approval, pressure rating as per manual.**	
Spare Lens Kits (Lens and O-ring)	
Kit, 2 inch, ISO2852, HEA, Lens, silicone secondary O-ring	**A5E32572731**
Kit, 3 inch, ISO2852, HEA, Lens, silicone secondary O-ring	**A5E32572745**
Kit, 4 inch, ISO2852, HEA, Lens, silicone secondary O-ring	**A5E32572747**
Kit, DN 50, DIN11851, HEA, Lens, silicone secondary O-ring	**A5E32572758**
Kit, DN 80, DIN11851, HEA, Lens, silicone secondary O-ring	**A5E32572770**
Kit, DN 100, DIN11851, HEA, Lens, silicone secondary O-ring	**A5E32572772**
Kit, DN 50, DIN11864-1, HEA, Lens, silicone secondary O-ring	**A5E32572773**
Kit, DN 80, DIN11864-1, HEA, Lens, silicone secondary O-ring	**A5E32572779**
Kit, DN 100, DIN11864-1, HEA, Lens, silicone secondary O-ring	**A5E32572782**
Kit, DN 50, DIN11864-2/3, 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 DN 50 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	**A5E32910638**
Kit, DN 80 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	**A5E32910649**
Kit, DN 100 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	**A5E32910657**
Kit DN 50 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	**A5E32910658**
Kit, DN 80 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	**A5E32910671**
Kit, DN 100 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	**A5E32910681**
Kit 2" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	**A5E32910686**

SITRANS LR250 hygienic encapsulated Specials	Article No.
Kit 3" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	**A5E32910697**
Kit 4" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	**A5E32910708**
Kit DN 50 DIN 11851 SC tank connection, EPDM Seal Class II[11)]	**A5E32910746**
Kit DN 80 DIN 11851 SC tank connection, EPDM Seal Class II[11)]	**A5E32910771**
Kit DN 100 DIN 11851 SC tank connection, EPDM Seal Class II[11)]	**A5E32910780**
Kit DN 50 DIN 11851 SC tank connection, FKM Seal Class II	**A5E32910784**
Kit DN 80 DIN 11851 SC tank connection, FKM Seal Class II	**A5E32910789**
Kit DN 100 DIN 11851 SC tank connection, FKM Seal Class II	**A5E32910790**
Kit DN 50 DIN 11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), EPDM Seal Class II	**A5E32910791**
Kit DN 80 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	**A5E32910793**
Kit DN 100 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	**A5E32910799**
Kit DN 50 DIN 11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), FKM Seal Class I	**A5E32910805**
Kit DN 80 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	**A5E32910809**
Kit DN 100 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	**A5E32910812**
Kit DN 50 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	**A5E32910813**
Kit DN 80 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	**A5E32910814**
Kit DN 100 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	**A5E32910815**
Kit DN 50 DIN 11864-3 Form A tank connection, Clamp, FKM Seal Class I	**A5E32910816**
Kit DN 80 DIN 11864-3 Form A tank connection, Clamp, FKM Seal Class I	**A5E32910817**
Kit DN 100 DIN 11864-3 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**

[11)] Class II for low fat applications when EPMD seal used on DIN 11851.