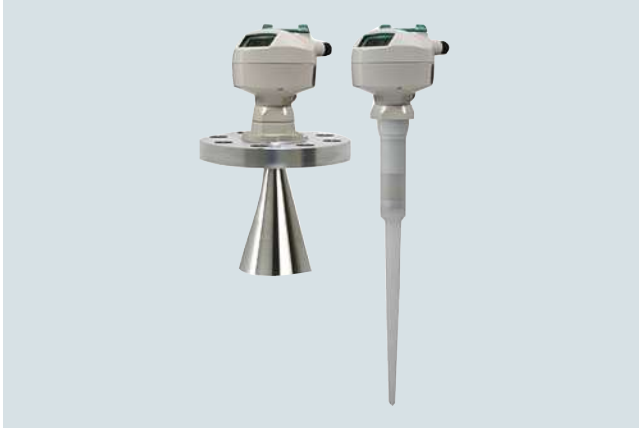


Overview



SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 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
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR200's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It also features a built-in alphanumeric display in four languages.

The SITRANS LR200 has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna features an internal, integrated shield that eliminates vessel nozzle interference.

Startup is easy with as few as two parameters for basic operation. Installation is simplified as the electronics are mounted on a rotating head that swivels, allowing the instrument to line up with conduit or wiring connections or simply to adjust the position for easy viewing. SITRANS LR200 features Process Intelligence signal-processing technology for superior reliability.

- Key Applications: liquid process vessels with agitators, vaporous liquids, high temperatures, asphalt

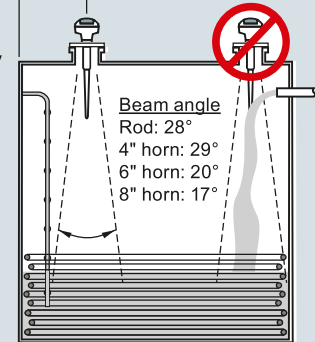
Configuration

Installation

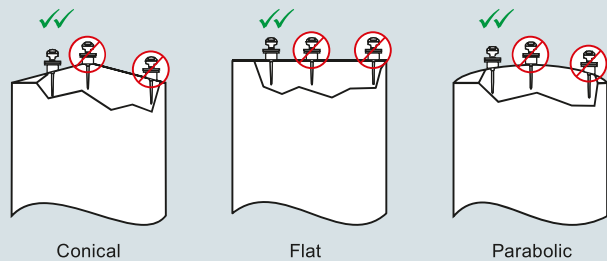
Min. 300 mm (1 ft) for every 3 m (10 ft) of vessel wall.

Note:

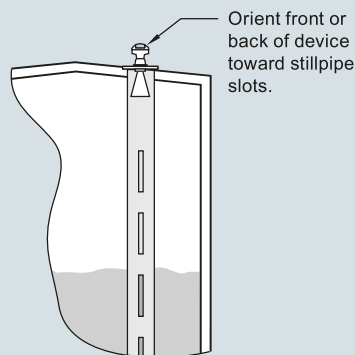
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- Beam angle for horn antenna dependent on horn size
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore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



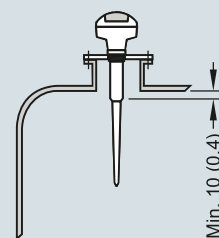
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



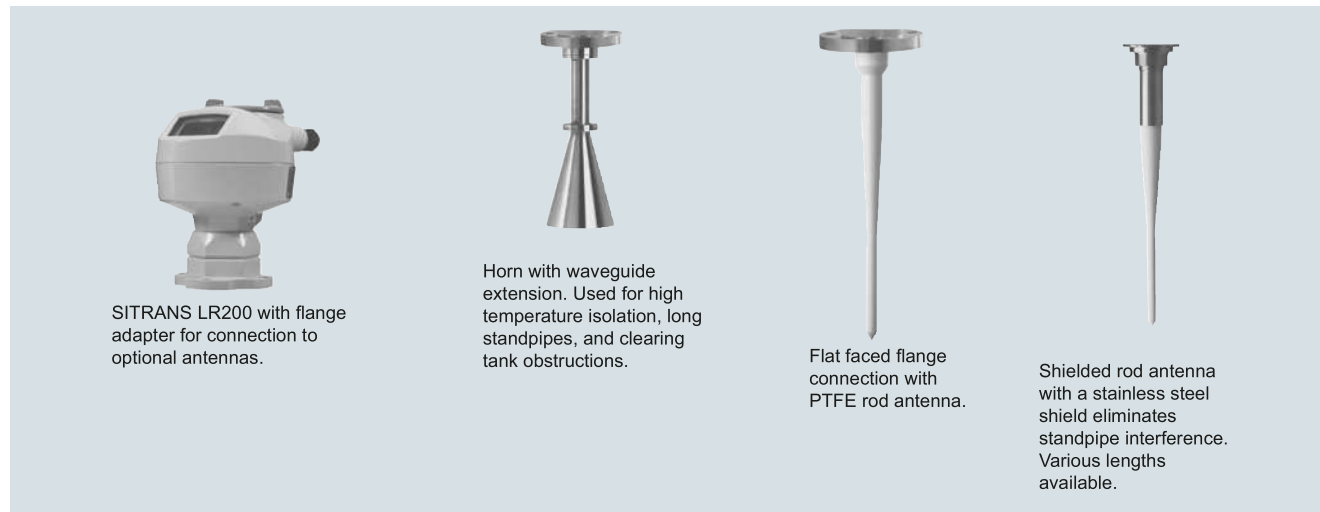
SITRANS LR200 installation, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR200

Integration



Antenna configurations for SITRANS LR200

Antenna types	Flat Faced Flange with Rod	Shielded Rod	Horn (4", 6", 8" sizes available)
Connection type	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)	Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4 inch)	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)
Wetted parts	PTFE	PTFE, 316L stainless steel, FKM O-ring	316L stainless steel PTFE, FKM O-ring
Extensions	50 or 100 mm (2 or 4 inch) PTFE or UHMW-PE	100, 150, 200 or 250 mm (4, 6, 8 or 10 inch) standard shield length	Use waveguide for extensions to 6 m (20 ft) long
Dielectric constant	> 3	> 3	> 3
Insertion length (max.)	41 cm (16.3 inch)	Variable	Variable with extension
Purging option (liquid or gas)	No	No	Yes
Sliding waveguide option for digesters¹⁾	Yes	No	Yes
Weight²⁾	6.5 kg (14.3 lb)	5.0 kg (11 lb)	7.5 kg (16.5 lb)

¹⁾ Maximum pressure 0.5 bar g at 60 °C (7.25 psi g at 140 °F)

²⁾ Not including extensions, includes SITRANS LR200 and smallest process connection

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	C-band, approx. 6 GHz
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
Output	
Analog output	4 ... 20 mA
Accuracy	± 0.02 mA
Span	Proportional or inversely proportional
Communications	HART Optional: PROFIBUS PA (Profile 3.0, Class B)
Fail-safe	Programmable as high, low or hold (Loss of Echo)
Performance (according to reference conditions IEC60770-1)	
From end of antenna to 600 mm	40 mm (1.57 inch)
Remainder of range	10 mm (0.4 inch) or 0.1 % of span (whichever is greater)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)
Vessel temperature and pressure	Varies with connection type; see Pressure/Temperature curves for more information
Design	
Enclosure	
• Material	Aluminum, polyester powder coated
• Cable inlet	2 x M20 x 1.5 or 2 x ½" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	< 2.82 kg (6.21 lb) (polypropylene rod antenna)
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Antenna	
• Material	Polypropylene rod, hermetically sealed construction, optional PTFE
• Dimensions	Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield
• Optional rods and horn	Refer to SITRANS LR200 Antennas for optional rods and horns
Process connections	
• Process connection	1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226], or G 1½" [(BSPP), EN ISO 228-1] (polypropylene rod antenna) Refer to SITRANS LR200 Antennas for more connections
• Flange connection	

Power supply	
4 ... 20 mA/HART	
• General Purpose, Non-incendive, Intrinsically Safe	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
• Flame proof, Increased safety, Explosion proof	Nominal 24 V DC (max. 30 V DC) with max. 250 Ω
PROFIBUS PA	• 10.5 mA • Per IEC 61158-2
Certificates and approvals	
General	CSA _{US/C} , CE, FM, RCM
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada, and European (RED), RCM
Hazardous	
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• 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 (USA)	FM, Class I, Div. 2, Groups A, B, C, D, T5
• Flame Proof/Increased Safety (China)	NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4
• Flame Proof (Europe)	ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb
• Increased Safety (Europe)	ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4
• Intrinsically Safe (International)	IECEx Ex ia IIC T4
• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C
Handheld communicator	HART communicator 375
PC	• SIMATIC PDM • AMS • SITRANS DTM (for connecting to FDT such as PACTware or Fieldcare)
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

Level measurement

Continuous level measurement Radar level transmitters

SITRANS LR200

Selection and ordering data

Article No.

Order code

SITRANS LR200 Radar level transmitter with polypropylene rod

Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Enclosure/Cable inlet

Aluminum, epoxy painted

2 x ½" NPT

2 x M20 x 1.5

Polypropylene antenna type - (Max. 3 Bar pressure and 80 °C)

1½" NPT [(Taper), ANSI/ASME B1.20.1],

c/w integral 100 mm shield

R 1½" [(BSPT), EN 10226],

c/w integral 100 mm shield

G 1½" [(BSPP), EN ISO 228-1],

c/w integral 100 mm shield

1½" NPT [(Taper), ANSI/ASME B1.20.1],

c/w integral 250 mm shield

R 1½" [(BSPT), EN 10226],

c/w integral 250 mm shield

G 1½" [(BSPP), EN ISO 228-1],

c/w integral 250 mm shield

Approvals

General Purpose, CE, RED, RCM

General Purpose, CSA, FM, Industry Canada, FCC

Intrinsically Safe, CSA Class I, II, Div. 1,

Groups A, B, C, D, E, F, G, Industry Canada

Intrinsically Safe, FM Class I, II, Div. 1,

Groups A, B, C, D, E, F, G, FCC

Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4,

INMETRO Ex ia IIC T4, CE, RED, RCM; EAC

Non incandive, FM Class I, Div. 2,

Groups A, B, C, D, FCC¹⁾

Increased Safety, ATEX II ½G

Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC²⁾³⁾

Flame Proof, ATEX II ½G Ex d mb ia IIC T4 Ga/Gb,

CE, RED, RCM; EAC³⁾

Explosion Proof, CSA/FM Class I, II, III,

Groups A, B, C, D, E, F, G, Industry Canada,

FCC¹⁾³⁾

Communication/Output

PROFIBUS PA

4 ... 20 mA, HART, start-up at < 3.6 mA

¹⁾ Available with enclosure option 2 only.

²⁾ Available with enclosure option 3 only.

³⁾ Available with communication option 3 only.

Article No.	Order code
7ML5422-0	
2	Y15
3	C11
A	N07
B	
C	
D	
E	
F	
A	
B	
C	
D	
E	
F	
G	
H	
J	
2	
3	

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Namur NE43 compliant, device preset to failsafe < 3.6 mA¹⁾

Operating Instructions

All literature is available to download for free, in a range of languages, at

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

Accessories

Handheld programmer, Intrinsically safe, EEx ia

HART modem/USB (for use with a PC and SIMATIC PDM)

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART²⁾

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA²⁾

One general purpose polymeric cable gland M20 x 1.5, rated -20 ... +80 °C (-40 ... +176 °F)

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

For applicable back up point level switch - see point level measurement section

¹⁾ Available with communication option 3 only.

²⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Article No.

7ML1930-1BK

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML1930-1AM

7ML5741-.....-

7ML5742-.....-

7ML5740-.....-

7ML5744-.....-

Level measurement

Continuous level measurement

Radar level transmitters

SITRANS LR200

Selection and ordering data	Article No.	Article No.
SITRANS LR200 Radar level transmitter with PTFE rod Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5423-	7ML5423-
Antenna material (uses antenna adapter) PTFE, uses antenna adapter and additional process connection below	1	2 3
Process connection (refer to Pressure/Temperature curves, page 4/259) Flanges (316L stainless steel) DN 50 PN 16, Type A, flat faced DN 80 PN 16, Type A, flat faced DN 100 PN 16, Type A, flat faced DN 150 PN 16, Type A, flat faced 2" ASME 150 lb, flat faced 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced DN 50 PN 40, flat faced DN 80 PN 40, flat faced DN 100 PN 40, flat faced DN 150 PN 40, flat faced 2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing 3" ASME 300 lb, flat faced 4" ASME 300 lb, flat faced 6" ASME 300 lb, flat faced JIS DN 50 10K JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.) Threaded connection (316L stainless steel) 1½" NPT [(Taper), ANSI/ASME B1.20.1] 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] R 2" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1] G 2" [(BSPP), EN ISO 228-1]	A A B A C A D A F B G B H B J B A C B C C C D C F D G D H D J D A E B E C E D E	B C B C D E F G H J
Antenna extensions or Inactive shield length No antenna extension 50 mm (2 inch) extension, PTFE 100 mm (4 inch) extension, PTFE 100 mm (4 inch) extension, 316L stainless steel shield ¹⁾ 150 mm (6 inch) extension, 316L stainless steel shield ¹⁾ 200 mm (8 inch) extension, 316L stainless steel shield ¹⁾ 250 mm (10 inch) extension, 316L stainless steel shield ¹⁾	0 1 2 3 4 5 6	
Process seal/gasket Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6 FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	0 1	
SITRANS LR200 Radar level transmitter with PTFE rod Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. Enclosure/Cable inlet Aluminum, Epoxy painted 2 x ½" NPT 2 x M20 x 1.5 Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA Approvals General Purpose, CE, RED, RCM General Purpose, CSA, FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, RED, RCM; EAC Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC ²⁾ Increased Safety, ATEX II ½G Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC ³⁾⁴⁾ Flame Proof, ATEX II ½G Ex d mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC ⁴⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ²⁾⁴⁾ Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum		0 1
		¹⁾ Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only. ²⁾ Available with enclosure option 2 only. ³⁾ Available with enclosure option 3 only. ⁴⁾ Available with communication option C only.

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR200

Selection and ordering data

Order code

Article No

Further designs

Please add **"-Z"** to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters); specify in plain text

Y15

Manufacturer's test certificate: M to DIN 55350,
Part 18 and to ISO 9000

C11

Material inspection Certificate Type 3.1 per
EN 10204

C12

Namur NE43 compliant, device preset to failsafe
< 3.6 mA³⁾

N07

Operating Instructions

All literature is available to download for free, in a
range of languages, at

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

Accessories

Handheld programmer, Intrinsically safe, EEx ia

7ML1930-1BK

Antenna, rod, PTFE

7ML1830-1HC

Antenna extension, 50 mm (2 inch), PTFE

7ML1830-1CH

Antenna extension, 100 mm (4 inch), PTFE

7ML1830-1CG

HART modem / USB (for use with PC and
SIMATIC PDM)

7MF4997-1DB

Metallic cable gland M20 x 1.5,
rated -40 °C (-40 °F) ... 80 °C (176 °F),
HART (two are required)

7ML1930-1AP

Metallic cable gland M20 x 1.5,
rated -40 °C (-40 °F) ... 80 °C (176 °F),
PROFIBUS PA (two required)

7ML1930-1AQ

One General Purpose polymeric cable gland
M20 x 1.5, rating for -20 °C (-4°F) ... + 80 °C (176 °F)

7ML1930-1AM

SITRANS RD100, loop powered display -
see Chapter 7

7ML5741-.....-

SITRANS RD150, remote digital display for
4 ... 20 mA and HART devices - see Chapter 7

7ML5742-.....-

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

7ML5740-.....-

SITRANS RD300, dual line display with totalizer and
linearization curve and Modbus conversion -
see Chapter 7

7ML5744-.....-

For applicable back up point level switch - see
point level measurement section

Selection and ordering data	Article No.	Article No.	
SITRANS LR200 Radar level transmitter with horn Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5425-	7ML5425-	
Antenna material (uses antenna adapter) 316L stainless steel with PTFE cone emitter 316L stainless steel with PTFE cone emitter and purge connection with 1/8" NPT inlet ¹⁾	0 1		
Process connection (refer to Pressure/Temperature curves, page 4/259) Flanges (316L stainless steel) DN 50 PN 16 EN 1092-1 Type A flat faced ¹⁾ DN 80 PN 16 EN 1092-1 Type A flat faced DN 100 PN 16 EN 1092-1 Type A flat faced DN 150 PN 16 EN 1092-1 Type A flat faced DN 200 PN 16 EN 1092-1 Type A flat faced DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face ²⁾ DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾ DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾ DN 200 PN 16 DIN EN 1092-1 Type B1 raised face ³⁾ 2" ASME 150 lb, flat faced ¹⁾ 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced 8" ASME 150 lb, flat faced DN 50 PN 40, flat faced ³⁾ DN 80 PN 40, flat faced ³⁾ DN 100 PN 40, flat faced ³⁾ DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ 2" ASME 300 lb, flat faced ¹⁾³⁾ 3" ASME 300 lb, flat faced ³⁾ 4" ASME 300 lb, flat faced ³⁾ JIS DN 50 10K ¹⁾ JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K JIS DN 200 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	AA BA CA DA EA BF CF DF EF FB GB HB JB KB AC BC CC CG DG EG FD GD HD AE BE CE DE EE	Process seal/gasket FKM (-40 ... +200 °C)	0
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT 2 x M20 x 1.5		2 3	
Horn size/Waveguide options 80 mm (3 inch) horn ³⁾ 100 mm (4 inch) horn ⁴⁾ 150 mm (6 inch) horn 200 mm (8 inch) horn 100 mm (4 inch) horn with 100 mm (4 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 150 mm (6 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 200 mm (8 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 250 mm (10 inch) waveguide extension ⁴⁾ 150 mm (6 inch) horn with 100 mm (4 inch) waveguide extension 150 mm (6 inch) horn with 150 mm (6 inch) waveguide extension 150 mm (6 inch) horn with 200 mm (8 inch) waveguide extension 150 mm (6 inch) horn with 250 mm (10 inch) waveguide extension 200 mm (8 inch) horn with 100 mm (4 inch) waveguide extension 200 mm (8 inch) horn with 150 mm (6 inch) waveguide extension 200 mm (8 inch) horn with 200 mm (8 inch) waveguide extension 200 mm (8 inch) horn with 250 mm (10 inch) waveguide extension		B C D E F G H J K L M N P Q R S	
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA	1 2		

Level measurement

Continuous level measurement Radar level transmitters

SITRANS LR200

Selection and ordering data

Article No.

Order code

SITRANS LR200 Radar level transmitter with horn

Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries.

Approvals

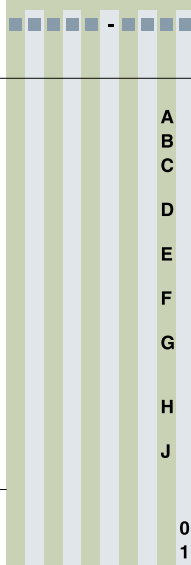
General Purpose, CE, RED, RCM
 General Purpose, CSA, FM, Industry Canada, FCC
 Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada
 Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC
 Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, RED, RCM; EAC
 Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC⁴⁾
 Increased Safety, ATEX II ½G Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC⁵⁾⁶⁾
 Flame Proof, ATEX II ½G Ex d mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC⁷⁾
 Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC⁵⁾⁷⁾

Pressure rating

Rating per Pressure/Temperature curves in manual
 0.5 bar g (7.25 psi g) maximum

- 1) Available with pressure rating option 1 only.
- 2) Available with Antenna Material options 0 and 1 only.
- 3) For stillpipe applications only.
- 4) Available with enclosure option 2 only.
- 5) Available with enclosure option 3 only.
- 6) Available with communication option 2 only.
- 7) Available with Communication/Output option 2 only.

7ML5425-



Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
 Measuring-point number/identification (max. 27 characters); specify in plain text

Y15

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

C11

Material inspection Certificate Type 3.1 per EN 10204

C12

Namur NE43 compliant, device preset to failsafe < 3.6 mA¹⁾

N07

Operating Instructions

All literature is available to download for free, in a range of languages, at

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

Accessories

Handheld programmer, Intrinsically safe, EEx ia
 HART modem/USB (for use with a PC and SIMATIC PDM)

Article No.

7ML1930-1BK

7MF4997-1DB

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART²⁾

7ML1930-1AP

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA³⁾

7ML1930-1AQ

One general purpose polymeric cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F)

7ML1930-1AM

SITRANS RD100, loop powered display - see Chapter 7

7ML5741-.....-

SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7

7ML5742-.....-

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7


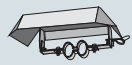

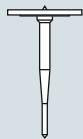


7ML5740-.....-

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

7ML5744-.....-

For applicable back up point level switch - see point level measurement section

- 1) Available with communication option 2 only.
- 2) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.
- 3) Available with enclosure option 2 only.

Selection and ordering data	Article No.		Article No.
SITRANS LR200 Specials			
SITRANS LR200 PROFIBUS PA aluminum enclosure kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna	 A5E01483420 A5E01483440 A5E01483456 A5E01483547 A5E01483559	Sun shield for SITRANS LR200 enclosure, stainless steel  A5E39142556	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection.		SITRANS LR200 horn antenna kits with mounting screws (no emitter supplied)  80 mm (3 inch) horn antenna kit PBD-25500K02A 100 mm (4 inch) horn antenna kit PBD-25500K03A 150 mm (6 inch) horn antenna kit PBD-25500K05A	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection.		SITRANS LR200 Extension Kits for Horn Antenna with mounting screw 100 mm (4 inch) extension kit for horn antenna PBD-25501K0100A 150 mm (6 inch) extension kit for horn antenna PBD-25501K0150A 200 mm (8 inch) extension kit for horn antenna PBD-25501K0200A 250 mm (10 inch) extension kit for horn antenna PBD-25501K0250A 500 mm (20 inch) extension kit for horn antenna PBD-25501K0500A 1 000 mm (40 inch) extension kit for horn antenna PBD-25501K1000A	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection.		SITRANS LR200 flanged rod antenna kit with 316L stainless steel flat faced flanges  PBD-51003K020AAAA	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection.		SITRANS LR200 PTFE rod antenna kit with 316L stainless steel 1½" pipe thread process connection  PBD-51004K2AAA PBD-51004K3AAA	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection.		SITRANS LR200 HART aluminum enclosure kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna  A5E02956419 A5E02956420 A5E02956421 A5E02956422 A5E03617085 A5E03617086 A5E03617087 A5E03617088	Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾ Flanged PTFE rod antenna kit, DN 50 PN16. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾ Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾ PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring. See drawing 51004 on http://www.siemens.com/radar . ⁴⁾ PTFE rod antenna kit, 1½" G 316L stainless steel process connection, FKM O-ring. See drawing 51004 on http://www.siemens.com/radar . ⁴⁾
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection.	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection.

Level measurement

Continuous level measurement
Radar level transmitters

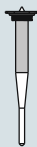
SITRANS LR200

Selection and ordering data

Article No.

Article No.

SITRANS LR200 PTFE rod antenna kit with 316L stainless steel 2" pipe thread process connection



PTFE rod antenna kit, 2" NPT 316L stainless steel process connection, FKM O-ring. See drawing 51005 on <http://www.siemens.com/radar.4>

PBD-51005K1AAA

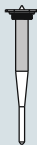
PTFE rod antenna kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring. See drawing 51005 on <http://www.siemens.com/radar.4>

PBD-51005K2AAA

PTFE rod antenna kit, 2" G 316L stainless steel process connection, FKM O-ring. See drawing 51005 on <http://www.siemens.com/radar.4>

PBD-51005K3AAA

SITRANS LR200 PTFE rod antenna kit (100 mm shield) with 316L stainless steel 2" pipe thread process connection



PTFE rod antenna shielded kit, 2" NPT 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on <http://www.siemens.com/radar.34>

PBD-51002K0100AAA

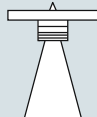
PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on <http://www.siemens.com/radar.34>

PBD-51002K0100BAA

PTFE rod antenna shielded kit, 2" G 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on <http://www.siemens.com/radar.34>

PBD-51002K0100CAA

SITRANS LR200 horn antenna kit with 316L stainless steel flat faced flange, with PTFE emitter (without waveguide)



Horn antenna kit, 2" ASME 316L stainless steel flange 3" horn, PTFE emitter ¹⁾⁴⁾

PBD-51006K020AAA

Horn antenna kit, 2" ASME 316L stainless steel flange 4" horn, PTFE emitter ¹⁾²⁾

PBD-51006K020AABA

Horn antenna kit, 2" ASME 316L stainless steel flange 6" horn, PTFE emitter ¹⁾²⁾

PBD-51006K020AACA

Horn antenna kit, 2" ASME 316L stainless steel flange 8" horn, PTFE emitter ¹⁾²⁾

PBD-51006K020AADA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter ¹⁾²⁾

PBD-51006K050AJAA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter ¹⁾²⁾

PBD-51006K050AJBA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter ¹⁾²⁾

PBD-51006K050AJCA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter ¹⁾²⁾

PBD-51006K050AJDA

SITRANS LR200 PTFE flanged rod antenna kit with 316L stainless steel shield and 316L stainless steel flat faced flange



PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0100AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0100EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0150AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0150EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0200AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0200EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0250AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD-51014K0250EJA

PTFE paste

Kit, PTFE paste, Tube, 250 mL

PBD-51036065

Cable gland

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART

7ML1930-1AP

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA

7ML1930-1AQ

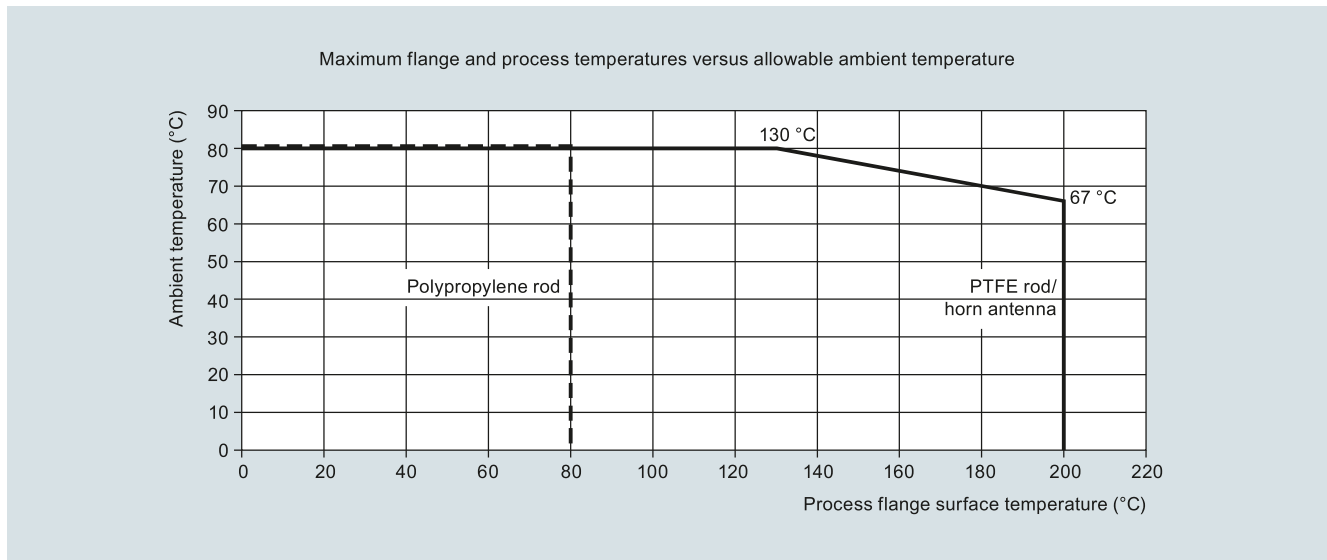
¹⁾ Available in flange sizes including ASME, DIN and JIS. Please consult a local sales person for details.

²⁾ Available with no pressure rating. Please consult a local sales person for details.

³⁾ Available in other shield lengths. Please consult a local sales person for details.

⁴⁾ Available with Pressure rating. Please consult a local sales person for details.

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Characteristic curves

SITRANS LR200 ambient/process flange surface temperature curve

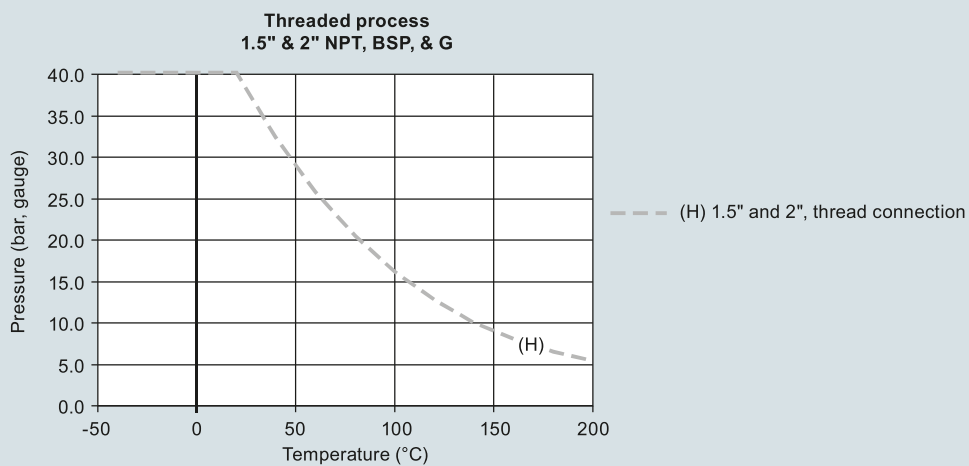
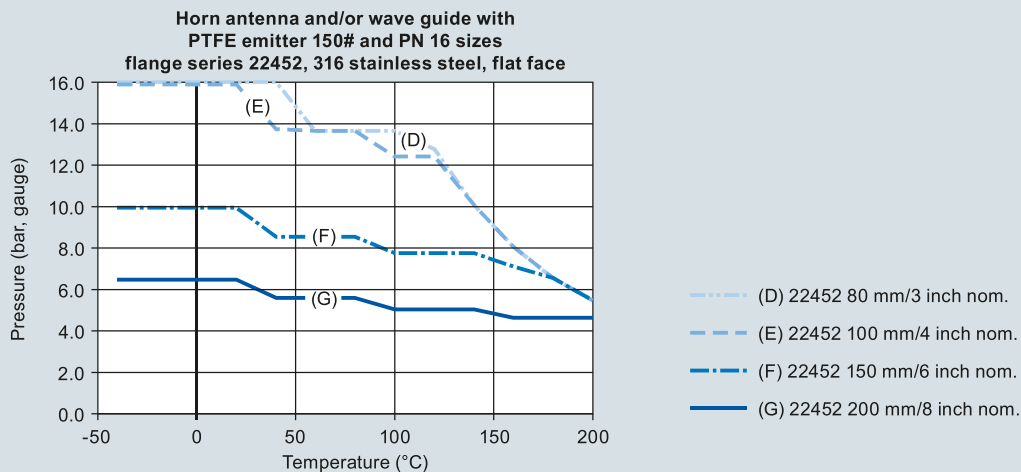
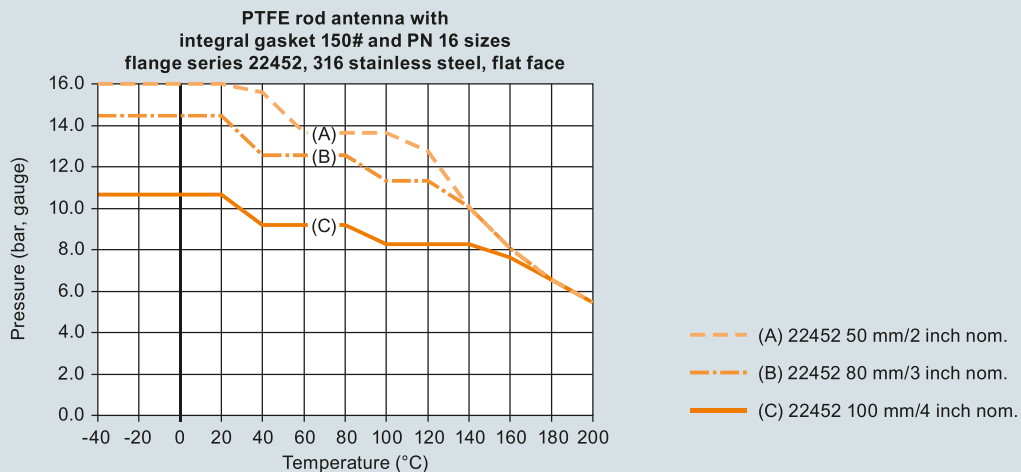
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR200

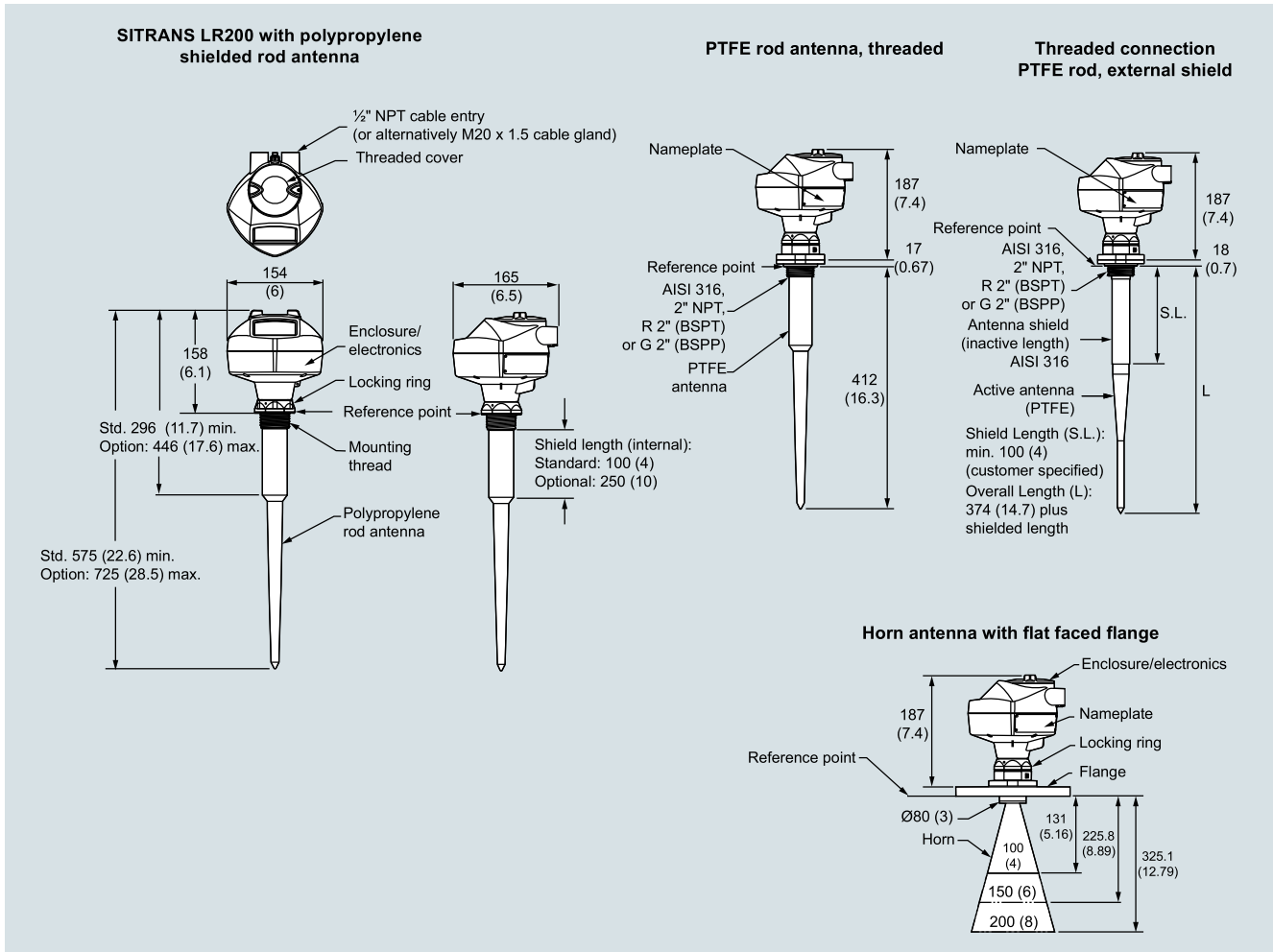
Characteristic curves (continued)

4



SITRANS LR200 process pressure/temperature derating curves

Dimensional drawings



SITRANS LR200, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR200

Circuit diagrams

4

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Shield for HART and PROFIBUS PA intrinsically safe versions only.

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

Hand programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	+/-
C	↶	↷	↵
←	↑	↓	→

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from an SELV source in accordance with IEC 1010-1 Annex H.
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 LR200 connections

Level measurement

Continuous level measurement

Radar level transmitters

SITRANS LR250 Horn Antenna

Overview



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

Benefits

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

Application

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

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

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

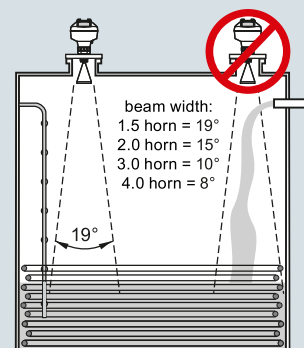
- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

Configuration

Installation

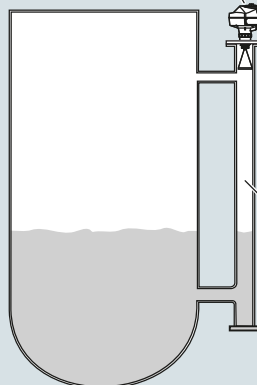
Note:

- 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.



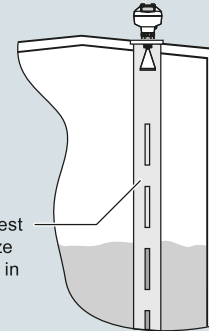
Mounting on bypass

Orient front or back of device toward vent.

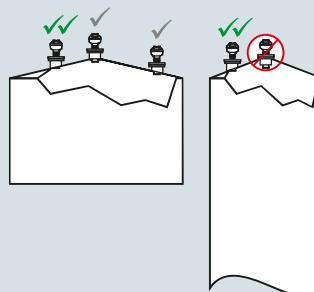


Mounting on stilling well

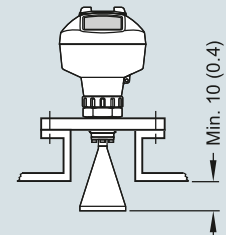
Orient front or back of device toward stillpipe slots.



Mounting on vessel



Mounting on a nozzle



SITRANS LR250 installation, dimensions in mm (inch)

Level measurement

Continuous level measurement Radar level transmitters

SITRANS LR250 Horn 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 (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)		
• Storage 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 M20 x 1.5 or 2 x 1/2" NPT		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	< 3 kg (6.6 lb) 3.75 mm (1/2 inch) threaded connection with 1/2" horn antenna		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Antenna			
• Material	316L stainless steel		
• Dimensions (nominal horn sizes)	Standard 1.5 inch (40 mm), 2 inch (48 mm), 3 inch (75 mm), 4 inch (95 mm) horn, and optional 100 mm (4 inch) horn extension		
Process connections			
• Process connection	1 1/2", 2" or 3" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2", 2" or 3" [(BSPT), EN 10226] G 1 1/2", 2" or 3" [(BSPP), EN ISO 228-1] 2", 3", 4" (ANSI 150, 300 lb), 50, 80, 100 mm (PN 16, 40, JIS 10K)		
• Flange connection			
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, RCM	
Radio		FCC, Industry Canada, RED, RCM	
Hazardous			
• Explosion Proof (Brazil)		INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da	
• Increased Safety (Brazil)		INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da	
• Intrinsically Safe (Brazil)		INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da	
• Explosion Proof (Canada/USA)		CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G; Class III T4	
• Intrinsically Safe (Canada/USA)		CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G; Class III T4	
• Non-incendive (Canada/USA)		CSA/FM Class I, Div. 2, Groups A, B, C, D T5	
• Flame Proof/Increased Safety (China)		NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C	
• Intrinsically Safe (China)		NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C	
• Non-sparking (China)		NEPSI Ex nA IIC T4 Gc	
• Intrinsically Safe (Europe)		ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia IIIC T100 °C Da ATEX II 3G Ex nA IIC T4 Gc	
• Non-sparking (Europe)		IECEX/ATEX II 1/2 GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da	
• Flame Proof (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	
• Increased Safety (International/Europe)		IECEX/ATEX II 1G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da	
• Intrinsically Safe (International)		IECEX/ATEX II 1G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da	
• Explosion Proof (Russia/Kazakhstan)		EAC Ex d	
• Increased Safety (Russia/Kazakhstan)		EAC Ex e	
• Intrinsically Safe (Russia/Kazakhstan)		EAC Ex ia	
• Marine		• Lloyd's Register of Shipping • 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	

Level measurement

Continuous level measurement

Radar level transmitters

SITRANS LR250 Horn Antenna

Selection and ordering data	Article No.	Article No.
SITRANS LR250 Radar level transmitter Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5431- 0 -	SITRANS LR250 Radar level transmitter Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries.
Process Connection and Antenna Material 316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FKM seal ¹⁾ 316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal ¹⁾	0 1	Approvals General Purpose: CE, CSA, FM, FCC, RED, RCM 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 Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, RED, RCM Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, RED, RCM Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM ⁶⁾ Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, RED, RCM ⁶⁾ Explosion proof: CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ^{b)} Non Sparking: NEPSI Ex nA IIC T4 Gc Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex ia d tD A20 IP67 T100 °C Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex ia d tD A20 IP67 T100 °C ⁶⁾ Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex ia d tD A20 IP67 T100 °C ⁶⁾
Process Connection Type <u>Threaded connection 316L</u> 1½" NPT (ASME B1.20.1) (tapered thread) ³⁾ R 1½" [(BSPT), EN 10226-1] (tapered thread) ³⁾ G 1½" [(BSPP), EN ISO 228-1] (parallel thread) ³⁾ 2" NPT (ASME B1.20.1) (tapered thread) ⁴⁾ R 2" [(BSPT), EN 10226-1] (tapered thread) ⁴⁾ G 2" [(BSPP), EN ISO 228-1] (parallel thread) ⁴⁾ 3" NPT (ASME B1.20.1) (tapered thread) ⁴⁾ R 3" [(BSPT), EN 10226-1] (tapered thread) ⁴⁾ G 3" [(BSPP), EN ISO 228-1] (parallel thread) ⁴⁾ <u>Flanged connection 316L</u> 2" Class 150 ASME B16.5, raised face ⁴⁾ 3" Class 150 ASME B16.5, raised face ⁴⁾ 4" Class 150 ASME B16.5, raised face ⁴⁾ 2" Class 300 ASME B16.5, raised face ⁴⁾ 3" Class 300 ASME B16.5, raised face ⁴⁾ 4" Class 300 ASME B16.5, raised face ⁴⁾ 50A 10K JIS B 2220 flat face ⁴⁾ 80A 10K JIS B 2220 flat face ⁴⁾ 100A 10K JIS B 2220 flat face ⁴⁾ DN 50 PN 16 EN 1092-1 Type B1 raised face ⁴⁾ DN 80 PN 16 EN 1092-1 Type B1 raised face ⁴⁾ DN 100 PN 16 EN 1092-1 Type B1 raised face ⁴⁾ DN 150 PN 16 EN 1092-1 Type B1 raised face ⁴⁾ DN 50 PN 40 EN 1092-1 Type B1 raised face ⁴⁾ DN 80 PN 40 EN 1092-1 Type B1 raised face ⁴⁾ DN 100 PN 40 EN 1092-1 Type B1 raised face ⁴⁾ DN 150 PN 40 EN 1092-1 Type B1 raised face ⁴⁾	AA AB AC AD AE AF AG AH AJ BD BE BF CD CE CF FA FB FC GA GB GC GD HA HB HC HD	A B C D E F G H K L M N
Communication/Output PROFIBUS PA ⁵⁾ 4 ... 20 mA, HART, start-up at < 3.6 mA FOUNDATION Fieldbus ⁵⁾	1 2 3	
Enclosure/Cable inlet <u>Aluminum, Epoxy painted</u> 2 x 1½" NPT 2 x M20 x 1.5	0 1	
Antenna 1½" horn 2" horn (fits 2" ASME or DN 50 nozzles) 3" horn (fits 3" ASME or DN 80 nozzles) 4" horn (fits 4" ASME or DN 100 nozzles) 1½" horn with 100 mm extension 2" horn with 100 mm extension 3" horn with 100 mm extension 4" horn with 100 mm extension	A B C D E F G H	
		Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum ⁷⁾
		0 1

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

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

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

4) Not available with Antenna options A and E.

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

6) Available only with Communications option 2.

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

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Horn Antenna

Selection and ordering data

Order code

Article No

Further designs

Please add **"-Z"** to Article No. and specify Order code(s).

Plug M12 with mating Connector¹⁾²⁾³⁾

A50

Plug 7/8" with mating Connector²⁾³⁾⁴⁾

A55

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text

Y15

Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000

C11

Material inspection certificate 3.1 of EN 10204

C12

Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511³⁾⁵⁾

C20

Namur NE43 compliant, device preset to failsafe < 3.6 mA⁵⁾

N07

Operating Instructions

All literature is available to download for free, in a range of languages, at

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

Accessories

Handheld programmer, Intrinsically safe, EEx ia

7ML1930-1BK

HART modem/USB (for use with a PC and SIMATIC PDM)

7MF4997-1DB

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required)

7ML1930-1AP

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required)⁶⁾

7ML1930-1AQ

FDA approved FKM O-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F)

7ML1830-3AN

SITRANS RD100, loop powered display - see Chapter 7

7ML5741-.....-

SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7

7ML5742-.....-

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

7ML5740-.....-

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

7ML5744-.....-

For applicable back up point level switch - see point level measurement section

¹⁾ Available with enclosure option 1 only.




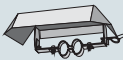

²⁾ To be used with communication options 1 and 3 only. Connector has IP67 rating.

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

⁴⁾ Available with enclosure option 0 only.

⁵⁾ Applicable to communication option 2 only.

⁶⁾ For use with communication options 1 and 3 only.

Selection and ordering data	Article No.		Article No.
SITRANS LR250 Spare parts			
SITRANS LR250 horn version enclosures (PROFIBUS PA models)		SITRANS LR250 horn version enclosures (< 3.6 mA start-up HART)	
			
SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E01156836	SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with 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 A, with PROFIBUS PA communication, no process connection	A5E01156838	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 B, with PROFIBUS PA communication, no process connection	A5E01156841	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, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E01156843	SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option 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 C, with PROFIBUS PA communication, no process connection	A5E01156844	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
SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS communication, no process connection	A5E01156846	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
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E01156848	LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E03441097
		LR250 horn version enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E03441099
SITRANS LR250 horn version enclosures (FOUNDATION Fieldbus models)		Sun shield for SITRANS LR250 enclosure, stainless steel	
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	A5E03769538		A5E039142556
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	A5E03769539	SITRANS LR250 horn antenna and extension kits	
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	A5E03769543	38 mm (1.5 inch) horn antenna kit, 1.5 inch Process Connections only	A5E01151539
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E02654608	100 mm (4 inch) horn antenna extension kit, 1.5 inch process connections only	A5E01151553
SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E02653792	50 mm (2 inch) stainless steel 316L horn antenna kit	A5E01151569
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E02653793	75 mm (3 inch) stainless steel 316L horn antenna kit	A5E01151571
SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E02654606	100 mm (4 inch) stainless steel 316L horn antenna kit	A5E01151573
		100 mm (4 inch) horn antenna extension kit, 50 mm (2 inch), 75 mm (3 inch), and 100 mm (4 inch) process connection	A5E01151577
		5 Dupont 1Gr Polyback, PTFE grease kit	A5E01151626
		SITRANS LR250 lid with O-ring	A5E02465410
		Ex-proof plugs	
		Ex-proof plugs kit, 1/2" NPT, qty 5	A5E39979991
		Ex-proof plugs kit, M20, qty 5	A5E39979992

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

Level measurement

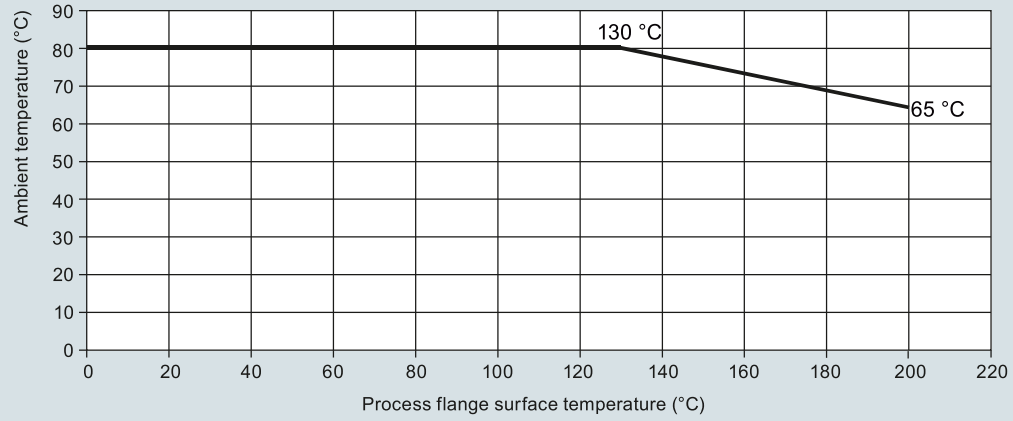
Continuous level measurement

Radar level transmitters

SITRANS LR250 Horn Antenna

Characteristic curves

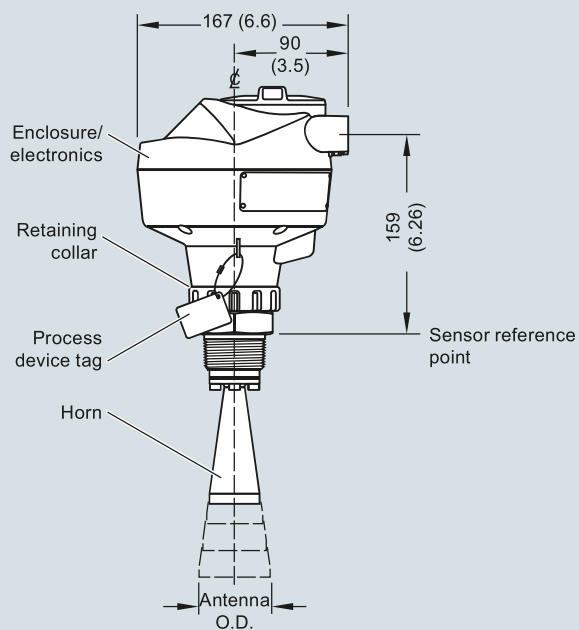
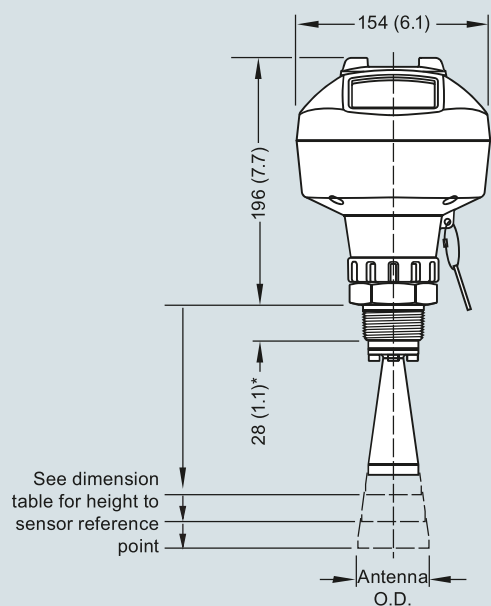
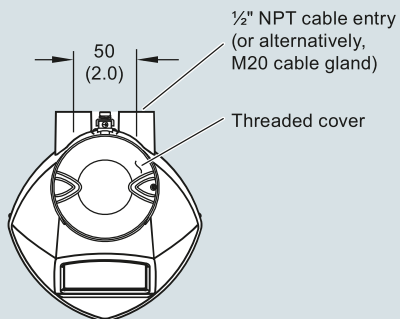
Maximum flange and process temperatures versus allowable ambient temperature



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)

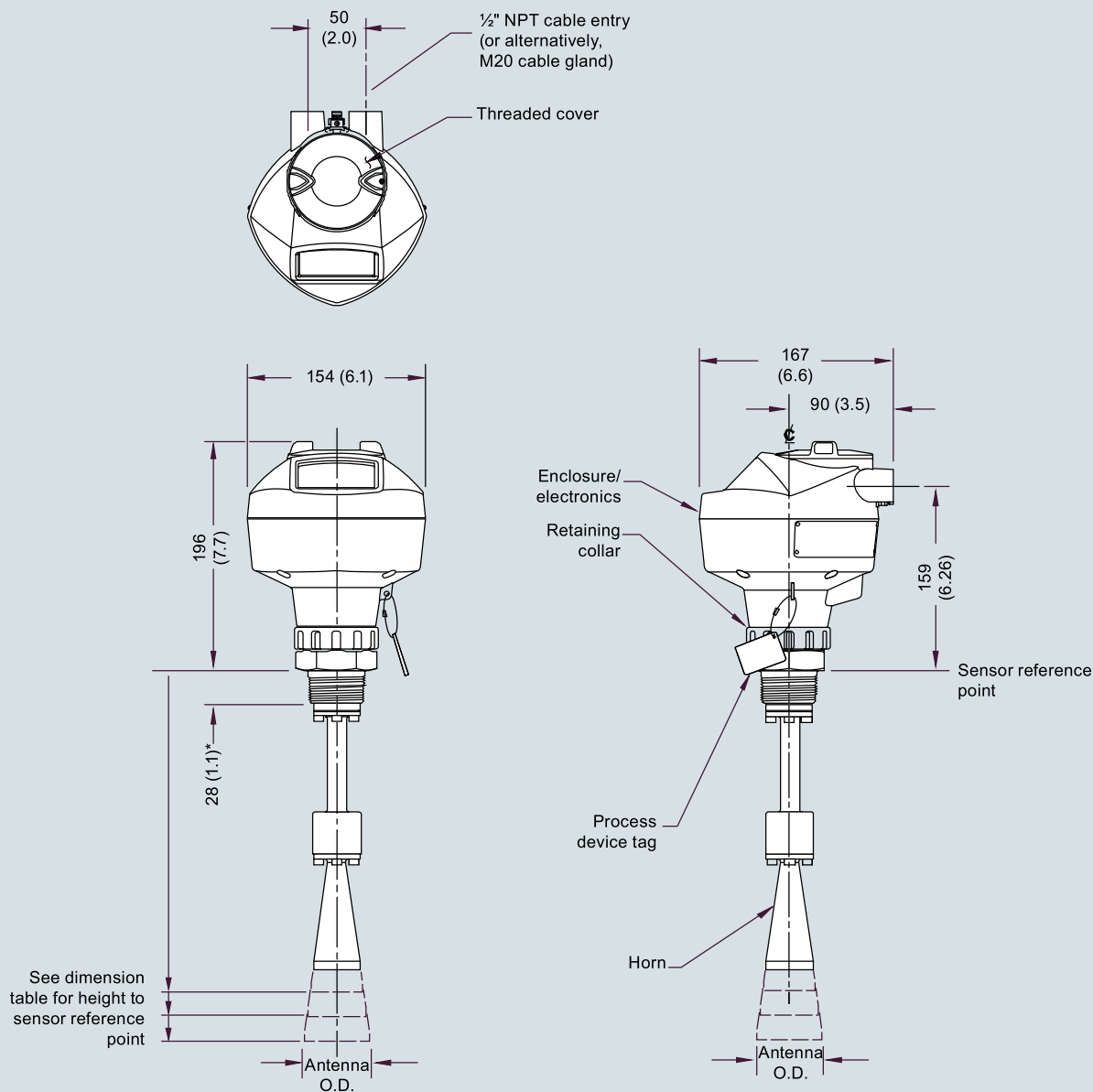
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Horn Antenna

Dimensional drawings (continued)

Threaded Horn Antenna with Extension



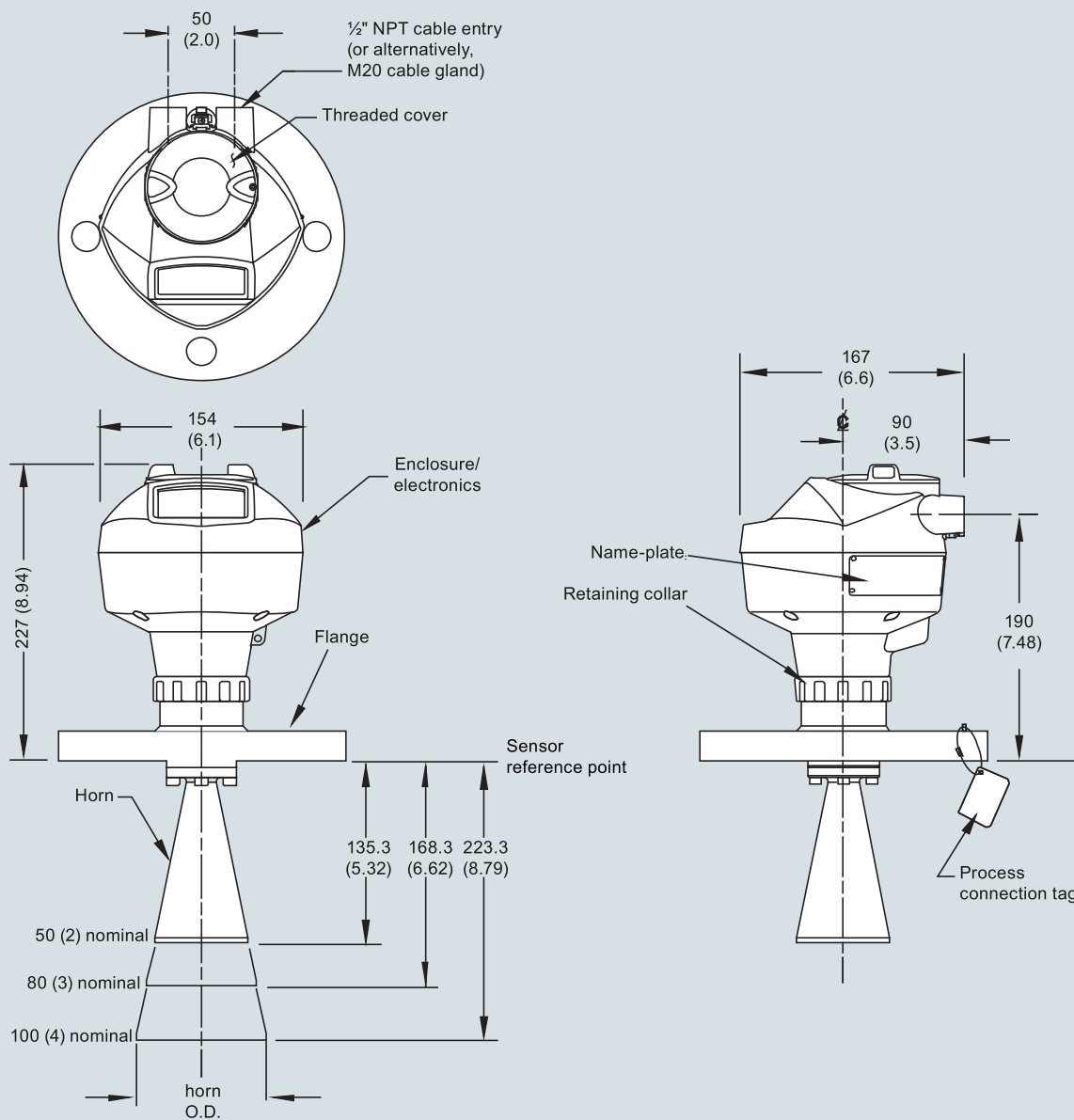
*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

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

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

Dimensional drawings (continued)

Flanged Horn



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

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

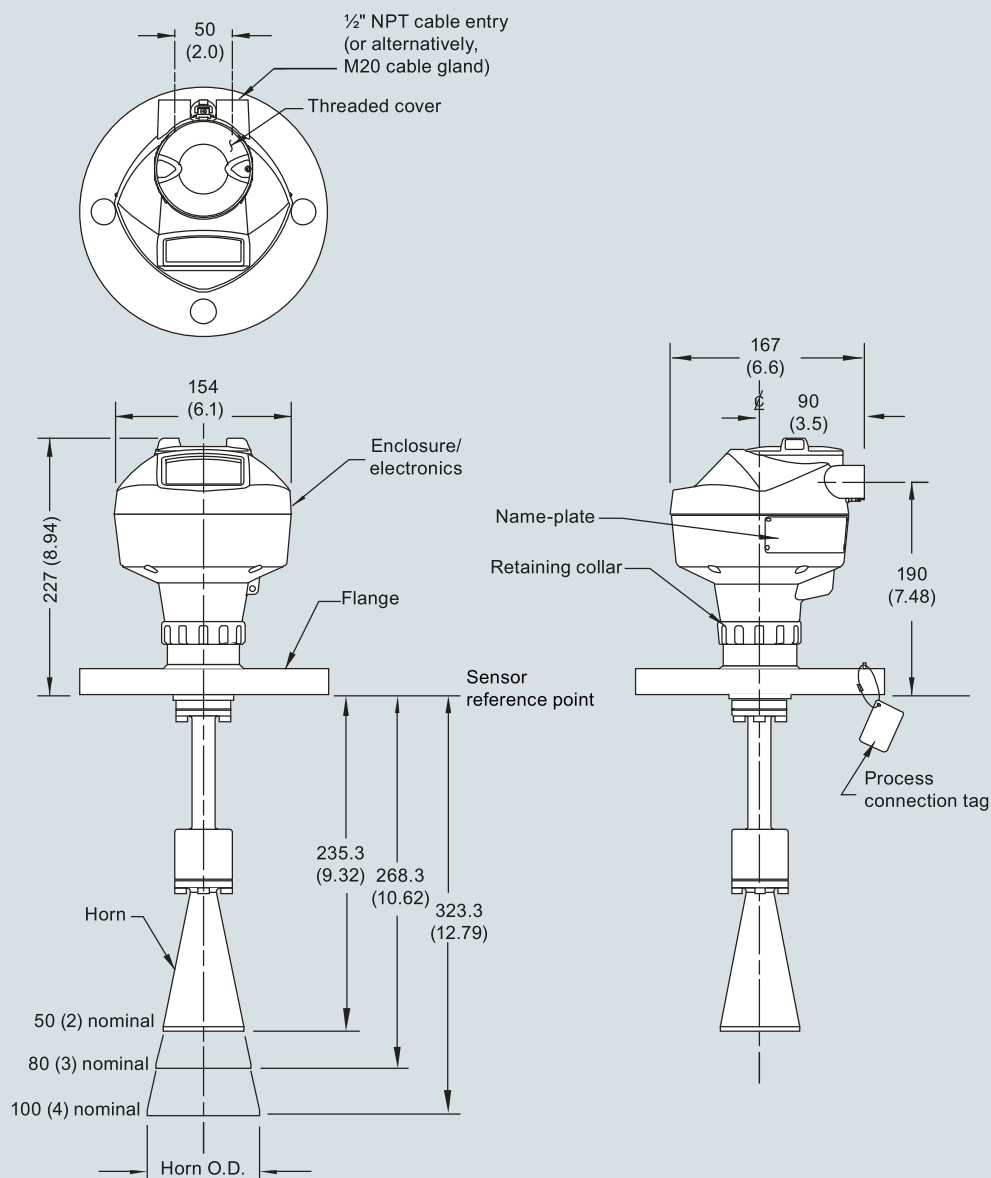
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Horn Antenna

Dimensional drawings (continued)

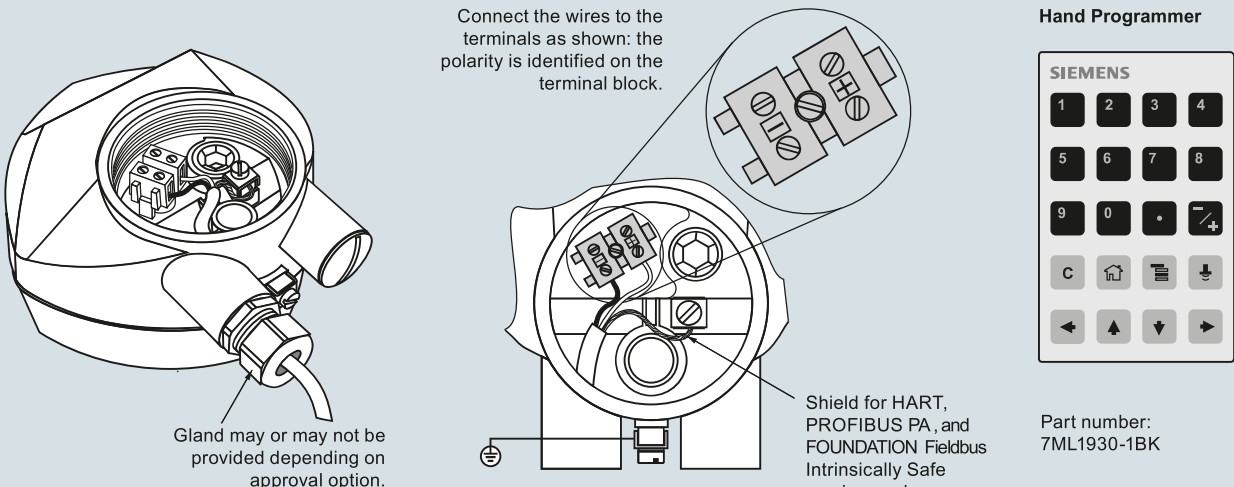
Flanged Horn with Extension



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

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

Circuit diagrams



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

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

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	/+
C	⏪	⏩	⏴
←	↑	↓	→

Part number:
7ML1930-1BK

Notes:

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

SITRANS LR250 connections

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Polypropylene Lens Antenna

Overview



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

Benefits

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

Application

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

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

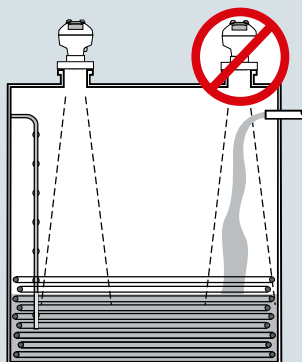
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, corrosive and aggressive materials.

Configuration

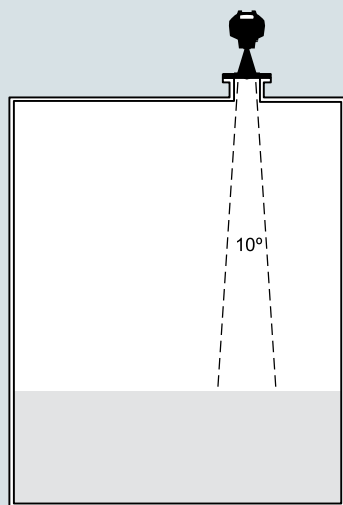
Installation of SITRANS LR250 Level Probing Radar

Note:

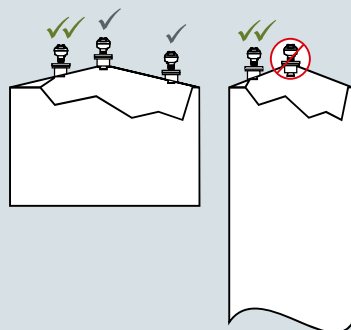
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



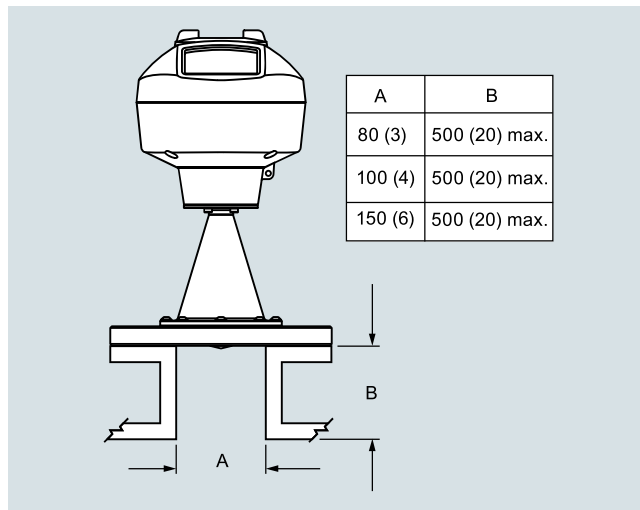
Polypropylene lens antenna



Mounting on vessel



SITRANS LR250 Polypropylene lens antenna installation



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

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Polypropylene Lens Antenna

Technical specifications

Mode of operation		Power supply	
Measuring principle	Radar level measurement	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Frequency	K-band (25.0 GHz)	PROFIBUS PA	<ul style="list-style-type: none"> 15 mA per IEC 61158-2
Minimum measuring range	50 mm (2 inch) from end of antenna	FOUNDATION Fieldbus	<ul style="list-style-type: none"> 20.0 mA per IEC 61158-2
Maximum measuring range	20 m (66 ft)		
Output		Certificates and approvals	
HART	Version 5.1	General	CSA _{US/C} , CE, FM, RCM
<ul style="list-style-type: none"> Analog output Accuracy Fail-safe 	4 ... 20 mA ± 0.02 mA <ul style="list-style-type: none"> Programmable as high, low or, hold (loss of echo) NE 43 programmable 	Radio	FCC, Industry Canada, RED, RCM
PROFIBUS PA	Profile 3.1	Hazardous	
<ul style="list-style-type: none"> Function blocks 	2 Analog Input (AI)	<ul style="list-style-type: none"> Explosion Proof (Brazil) 	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
FOUNDATION Fieldbus	H1	<ul style="list-style-type: none"> Increased Safety (Brazil) 	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
<ul style="list-style-type: none"> Functionality Version Function blocks 	Basic or LAS ITK 5.2.0 2 Analog Input (AI)	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) 	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
Performance (according to reference conditions IEC 60770-1)		<ul style="list-style-type: none"> 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
Maximum measured error	<ul style="list-style-type: none"> > 500 mm from sensor reference point: 3 mm (0.118 inch) < 500 mm from sensor reference point: 25 mm (1 inch) 	<ul style="list-style-type: none"> 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
Influence of ambient temperature	< 0.003 %/K	<ul style="list-style-type: none"> Non-incendive (Canada/USA) 	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
Rated operating conditions		<ul style="list-style-type: none"> Flame Proof/Increased Safety (China) 	Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
Installation conditions		<ul style="list-style-type: none"> Intrinsically Safe (China) 	Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
<ul style="list-style-type: none"> Location 	Indoor/outdoor	<ul style="list-style-type: none"> Non-sparking (China) Intrinsically Safe (Europe) 	NEPSI Ex nA IIC T4 Gc
Ambient conditions (enclosure)		<ul style="list-style-type: none"> Non-sparking/Energy Limited (Europe) Flame Proof (International/Europe) 	ATEX II 1G Ex ia IIC T4 Ga, ATEX II 1D Ex ia ta IIC T100 °C Da ATEX II 3G Ex nA IIC T4 Gc
<ul style="list-style-type: none"> Ambient temperature Storage temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) -40 ... +80 °C (-40 ... +176 °F) I 4	<ul style="list-style-type: none"> Increased Safety (International/Europe) 	IECEX/ATEX II ½ GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
Medium conditions		<ul style="list-style-type: none"> Intrinsically Safe (International) 	IECEX/ATEX II ½ GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Dielectric constant ϵ_r	> 1.6	<ul style="list-style-type: none"> Explosion Proof (Russia/Kazakhstan) Increased Safety (Russia/Kazakhstan) Intrinsically Safe (Russia/Kazakhstan) Marine 	IECEX/ATEX II 1G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da
Process temperature	-40 ... +80 °C (-40 ... +176 °F) at process connection		EAC Ex d
Process pressure	Up to 5 bar g (72 psi g) temperature dependent.		EAC Ex e
Design			EAC Ex ia
Enclosure			<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval Bureau Veritas
<ul style="list-style-type: none"> Material Cable inlet 	Aluminum, polyester powder-coated 2 x M20 x 1.5 or 2 x ½" NPT		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	Polypropylene lens antenna with 3 inch (80 mm) polypropylene flange <ul style="list-style-type: none"> Approximately 3.4 kg (7.5 lb) 		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Polypropylene lens antenna			
<ul style="list-style-type: none"> Materials 	<ul style="list-style-type: none"> Polyester powder coated exterior 3 inch cast aluminum Polypropylene lens FKM seal 		
<ul style="list-style-type: none"> Process connections 			
<ul style="list-style-type: none"> Material Dimensions 	Polypropylene Universal flange: 3 inch (80 mm), 4 inch (100 mm), 6 inch (150 mm)		
		Programming	
		Intrinsically Safe Siemens handheld programmer	Infrared receiver
		<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Polypropylene Lens Antenna

Selection and ordering data

Article No.

Article No.

SITRANS LR250 Polypropylene Lens Antenna Specials

SITRANS LR250 threaded PVDF antenna version enclosures (PROFIBUS PA models)

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E03588171

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E03588253

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection

A5E03588512

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection

A5E03589260

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection

A5E03589262

SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection

A5E03589264

SITRANS LR250 threaded PVDF antenna version enclosures (FOUNDATION Fieldbus models)

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E03589266

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E03589275

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection

A5E03589277

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection

A5E03589280

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection

A5E03589281

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection

A5E03589283

SITRANS LR250 threaded PVDF antenna version enclosures (< 3.6 mA start-up HART models)

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E03589747

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E03586807

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection

A5E03586854

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection

A5E03586887

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection

A5E03586961

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection

A5E03587012

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection

A5E03587132

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection

A5E03587223

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection

A5E03588125

SITRANS LR250 threaded PVDF antenna kits

Antenna kit 2" NPT threaded PVDF

A5E03528941

Antenna kit 2" R (BSPT) threaded PVDF

A5E03528943

Antenna kit 2" G (BSPP) threaded PVDF

A5E03528947

Kit of hardware parts for LR250 threaded PVDF antenna: consists of O-rings, screws, wavewasher, and loctite

A5E03528948

Ex-proof plugs

Ex-proof plugs kit, 1/2" NPT, qty 5

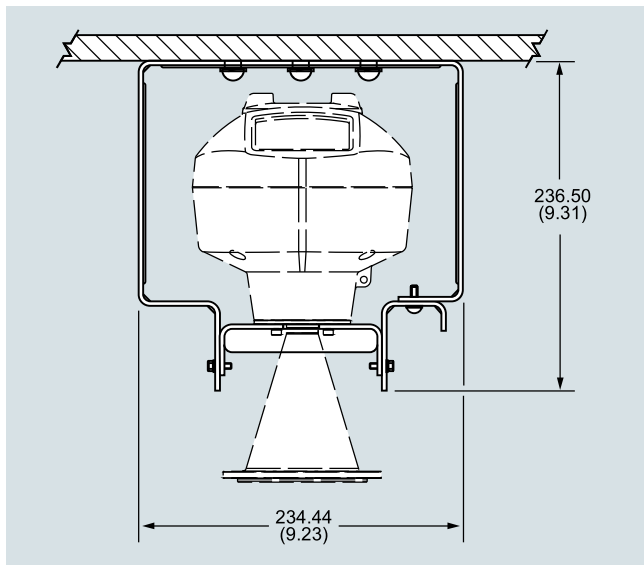
A5E39979991

Ex-proof plugs kit, M20, qty 5

A5E39979992

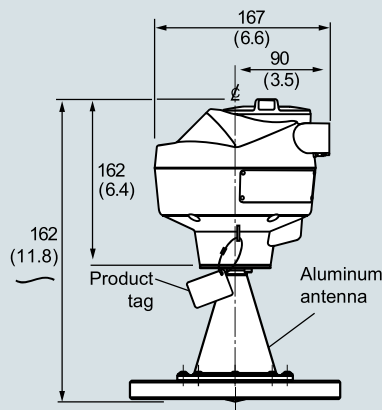
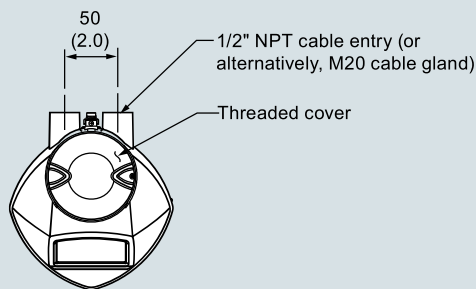
SITRANS LR250 Polypropylene Lens Antenna

Options



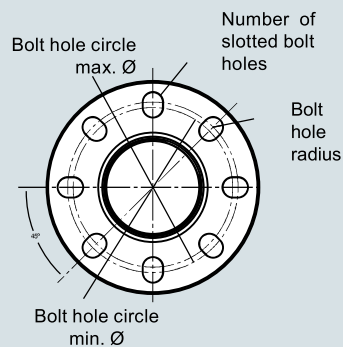
SITRANS LR250 Polypropylene lens antenna, wall/ceiling mount

Dimensional drawings



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

Polypropylene Flange



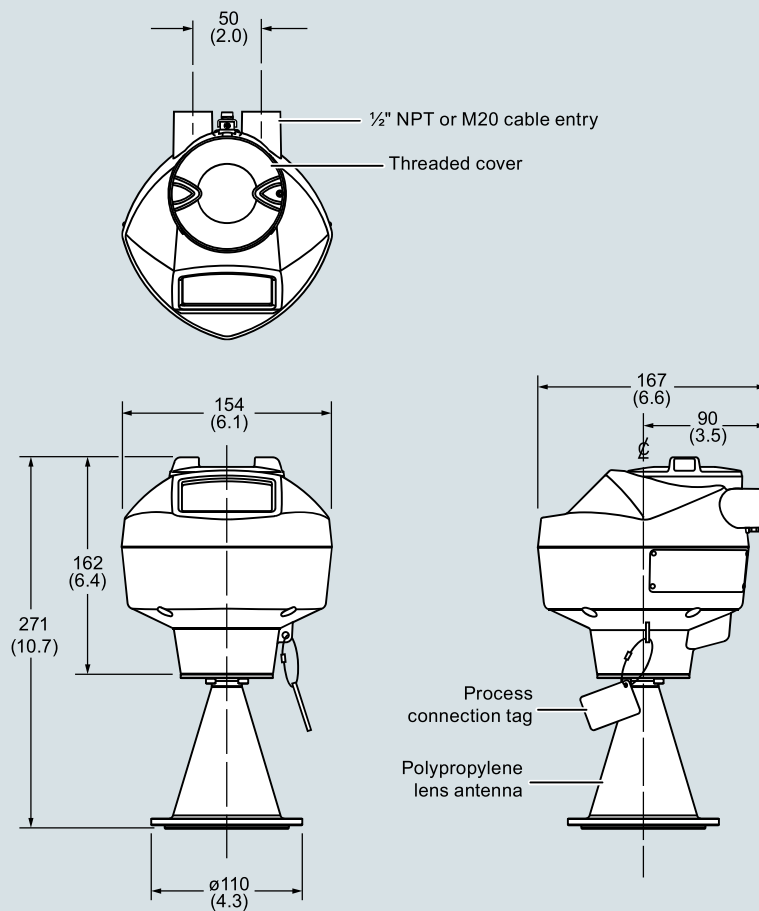
SITRANS LR250 Polypropylene lens antenna, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Polypropylene Lens Antenna

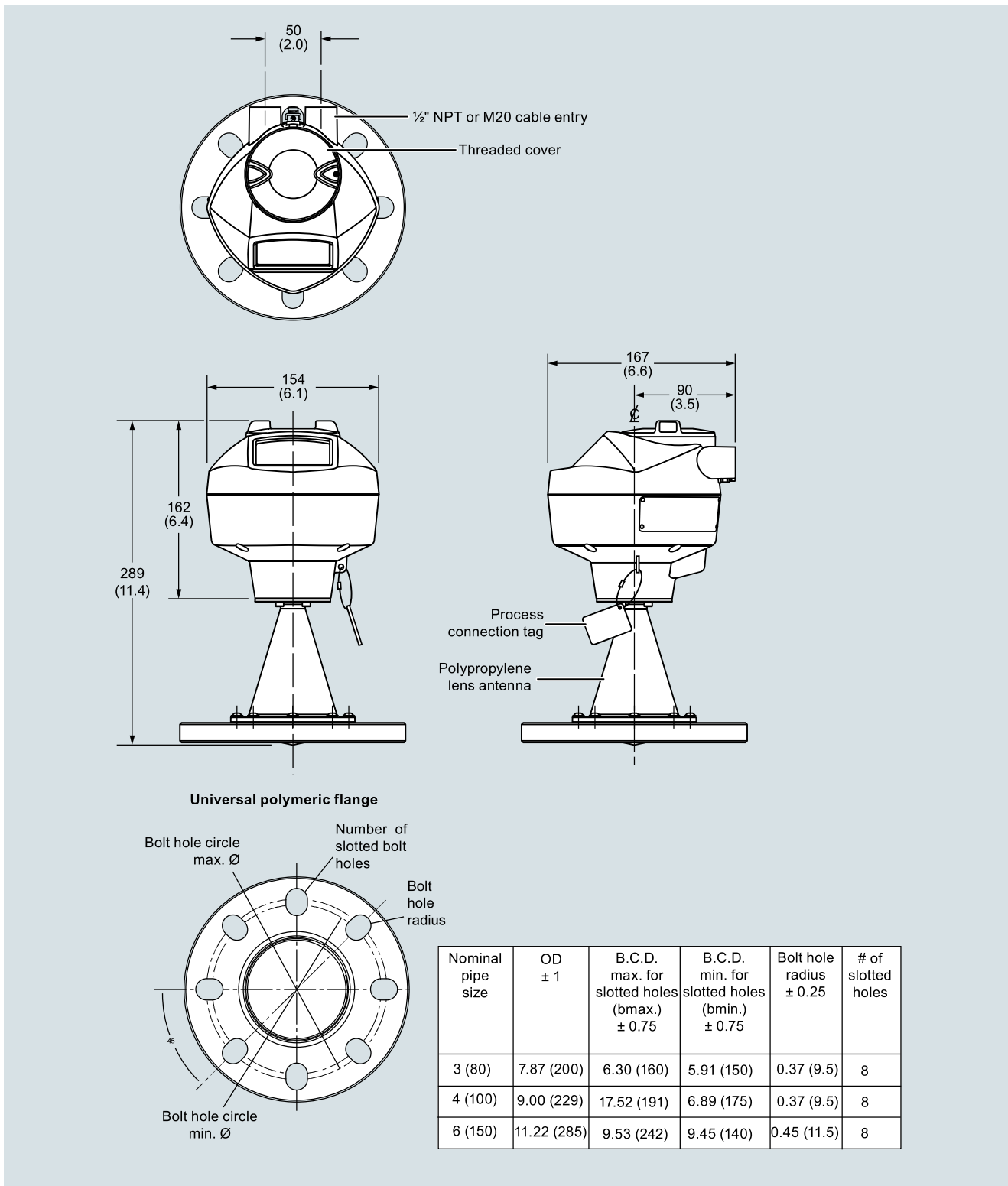
Dimensional drawings (continued)



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

SITRANS LR250 Polypropylene Lens Antenna

Dimensional drawings (continued)



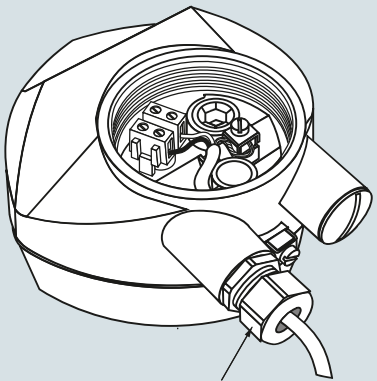
SITRANS LR250 Polypropylene lens antenna with universal polymeric flange, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

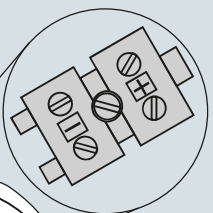
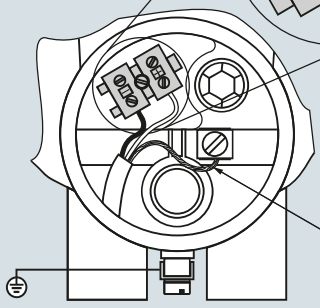
SITRANS LR250 Polypropylene Lens Antenna

Circuit diagrams



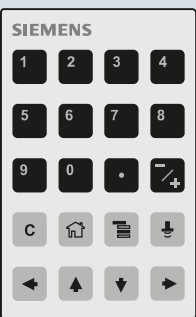
Gland may or may not be provided depending on approval option.

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer



Part number:
7ML1930-1BK

Notes:

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

SITRANS LR250 connections

Level measurement

Continuous level measurement

Radar level transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Overview



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

Benefits

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

Application

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

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

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

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

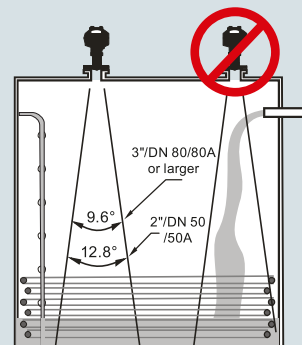
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 170 °C (338 °F), corrosive and aggressive materials and applications where ease of cleaning is required such as food or fine chemicals

Configuration

Installation

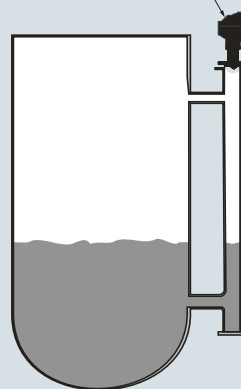
Note:

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



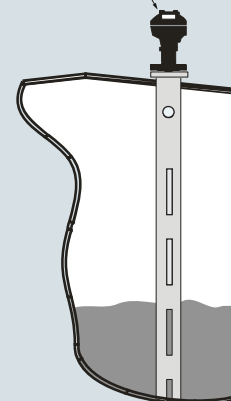
Mounting on bypass

Orient front or back of device toward vent.

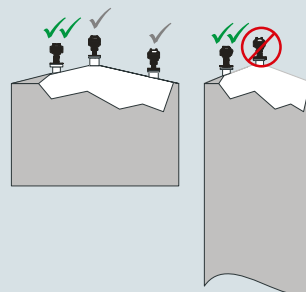


Mounting on stilling well

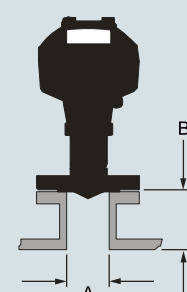
Orient front or back of device toward stillpipe slots.



Mounting on vessel



Mounting on a nozzle



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

*Reference conditions

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

Level measurement

Continuous level measurement
Radar level transmitters

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)	
• Storage 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 4/233)	
Design		
Enclosure		
• Material	Aluminum, polyester powder-coated	
• Cable inlet	2 x M20 x 1.5 or 2 x 1/2" 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, RCM
Radio		FCC, Industry Canada, RED, RCM
Hazardous		
• Explosion Proof (Brazil)		INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Increased Safety (Brazil)		INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Intrinsically Safe (Brazil)		INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
• Explosion Proof (Canada/USA)		CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
• Intrinsically Safe (Canada/USA)		CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
• Non-incendive (Canada/USA)		CSA/FM Class I, Div. 2, Groups A, B, C, D T5
• Flame Proof/Increased Safety (China)		NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C
• Intrinsically Safe (China)		NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C
• Non-sparking/Energy Limited (China)		NEPSI Ex nA IIC T4 Gc
• Intrinsically Safe (Europe)		ATEX II 1G Ex ia IIC T4 Ga
• Non-sparking/Energy Limited (Europe)		ATEX II 1D Ex ia ta IIIC T100 °C Da
• Flame Proof (International/Europe)		ATEX II 3G Ex nA IIC T4 Gc
• Increased Safety (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
• Intrinsically Safe (International)		IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Explosion Proof (Russia/Kazakhstan)		IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da
• Increased Safety (Russia/Kazakhstan)		EAC Ex d
• Intrinsically Safe (Russia/Kazakhstan)		EAC Ex e
• Marine		EAC Ex ia
• Functional Safety		• Lloyd's Register of Shipping • ABS Type Approval • Bureau Veritas 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

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Selection and ordering data

Article No.

Article No.

SITRANS LR250 flanged encapsulated Specials

SITRANS LR250 flanged encapsulated antenna version enclosures (PROFIBUS PA models)



SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E32462853

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E32462854

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection

A5E32462855

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection

A5E32462856

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection

A5E32462857

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection

A5E32462858

SITRANS LR250 flanged encapsulated antenna version enclosures (FOUNDATION Fieldbus models)



SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E32462859

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E32462860

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection

A5E32462861

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection

A5E32462862

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection

A5E32462863

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection

A5E32462864

SITRANS LR250 flanged encapsulated antenna version enclosures (< 3.6 mA start-up HART models)



SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E32462865

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E32462866

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection

A5E32462867

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection

A5E32462868

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection

A5E32462869

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection

A5E32462830

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection

A5E32462831

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection

A5E32462832

SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection

A5E32462833

SITRANS LR250 Flanged Encapsulated Antenna

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

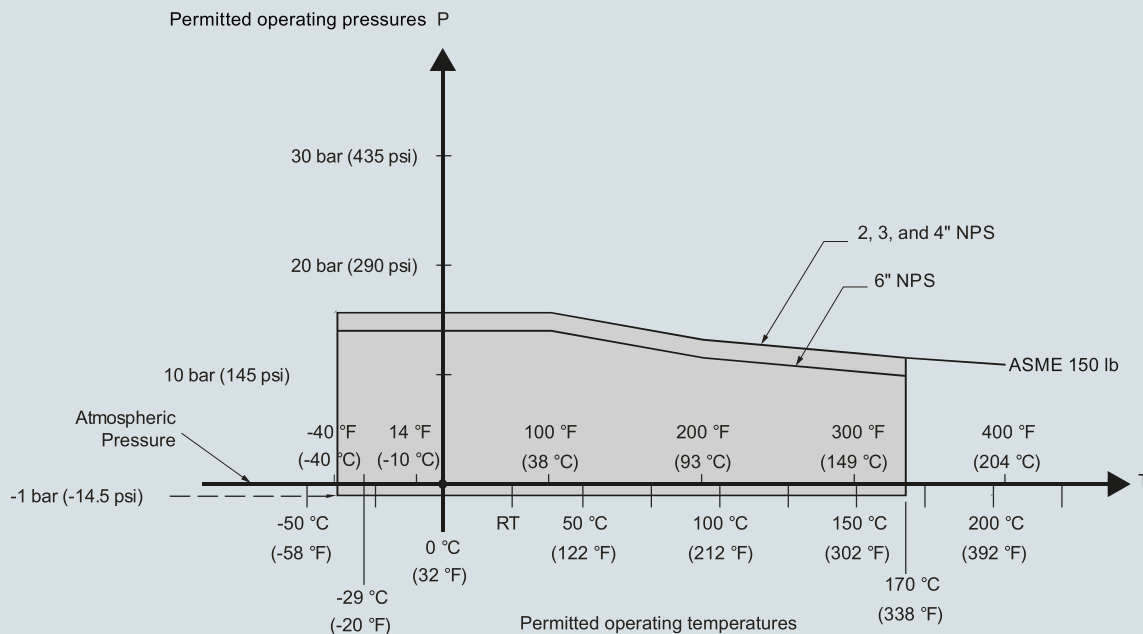
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Characteristic curves

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

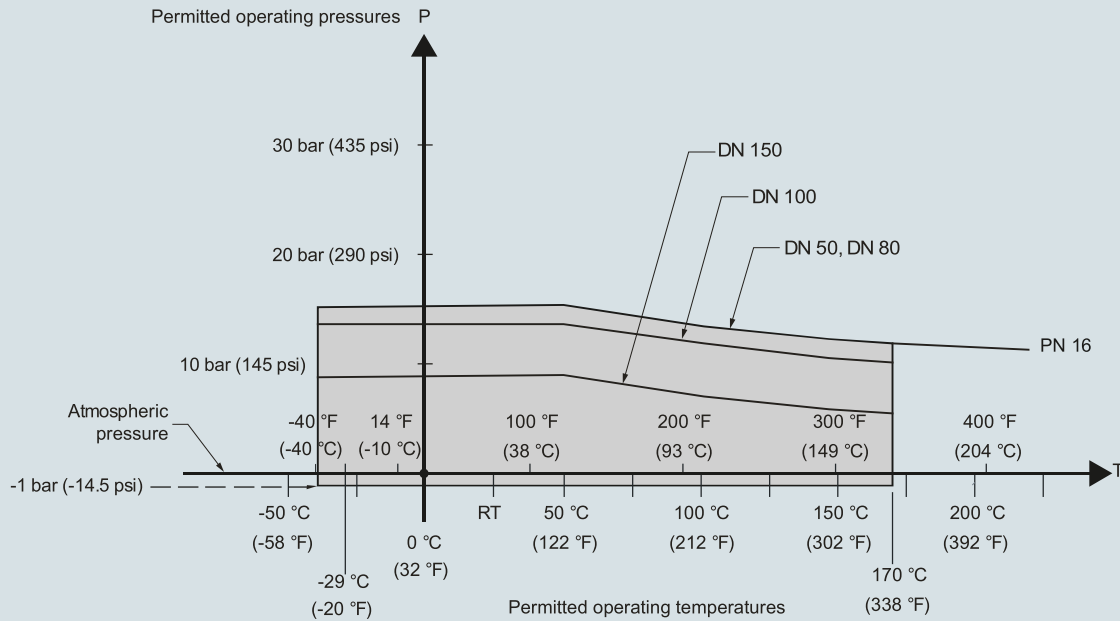


SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

SITRANS LR250 Flanged Encapsulated Antenna

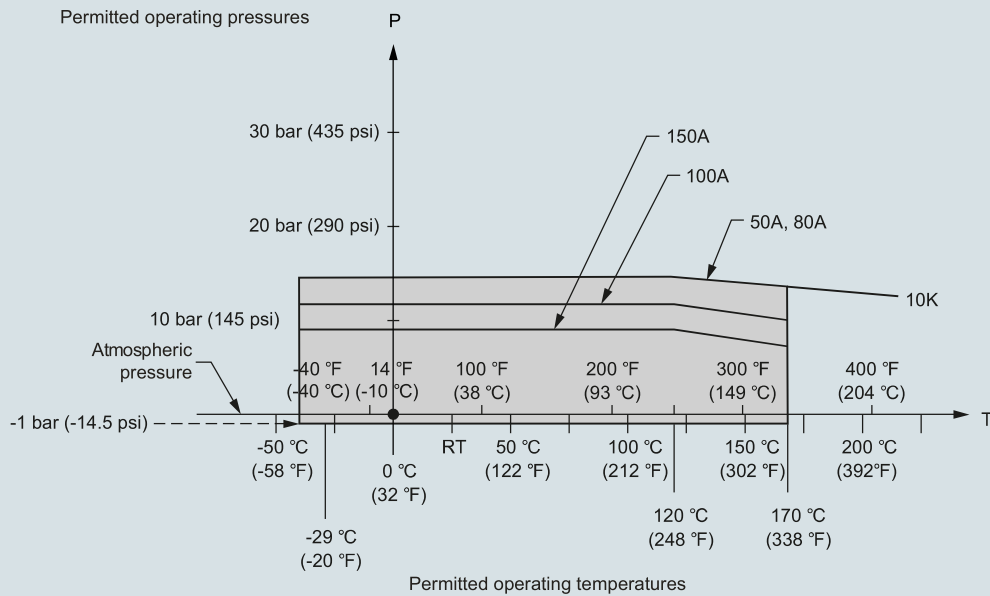
Characteristic curves (continued)

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



SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

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



SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

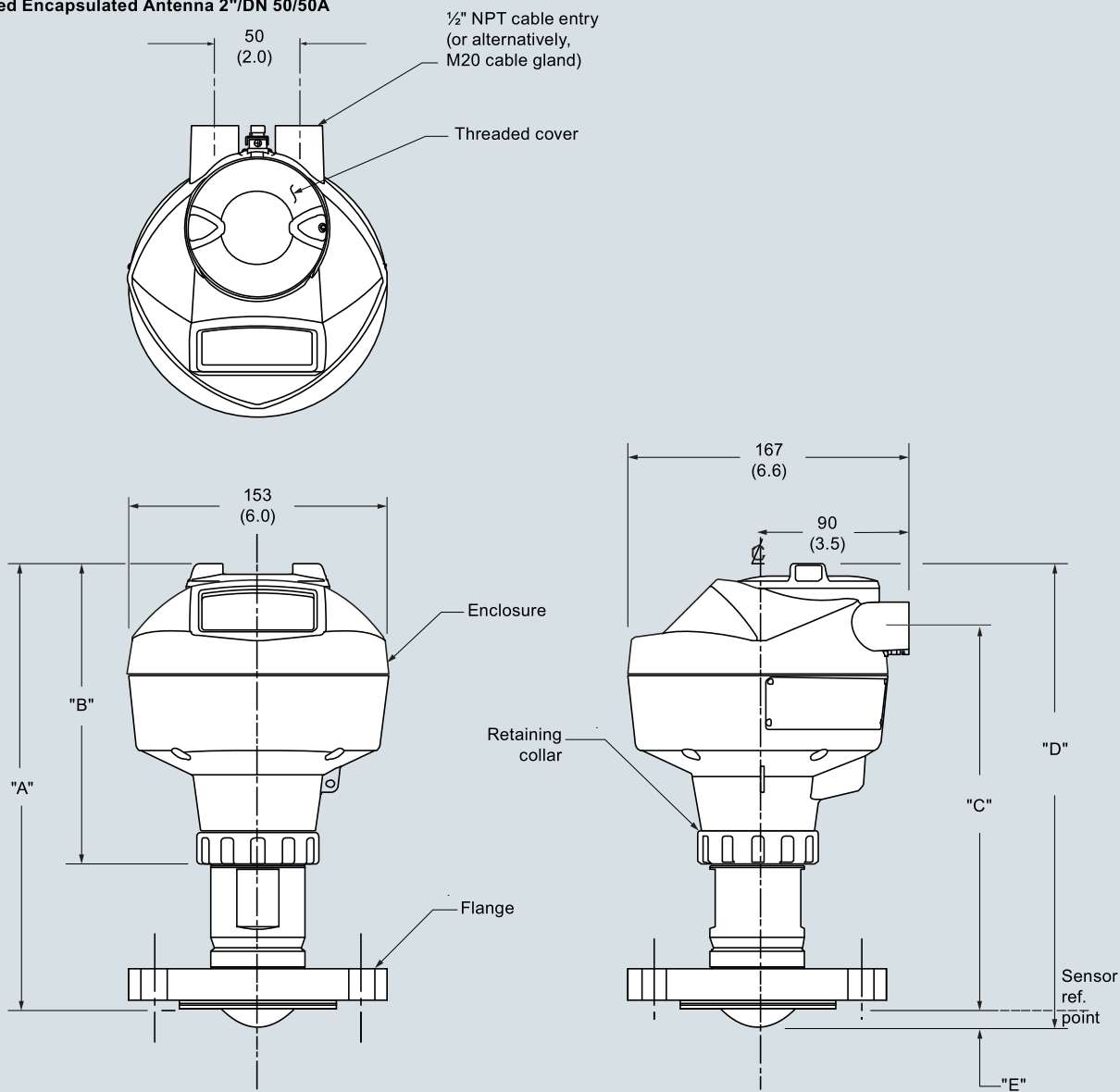
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Flanged Encapsulated Antenna

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)								

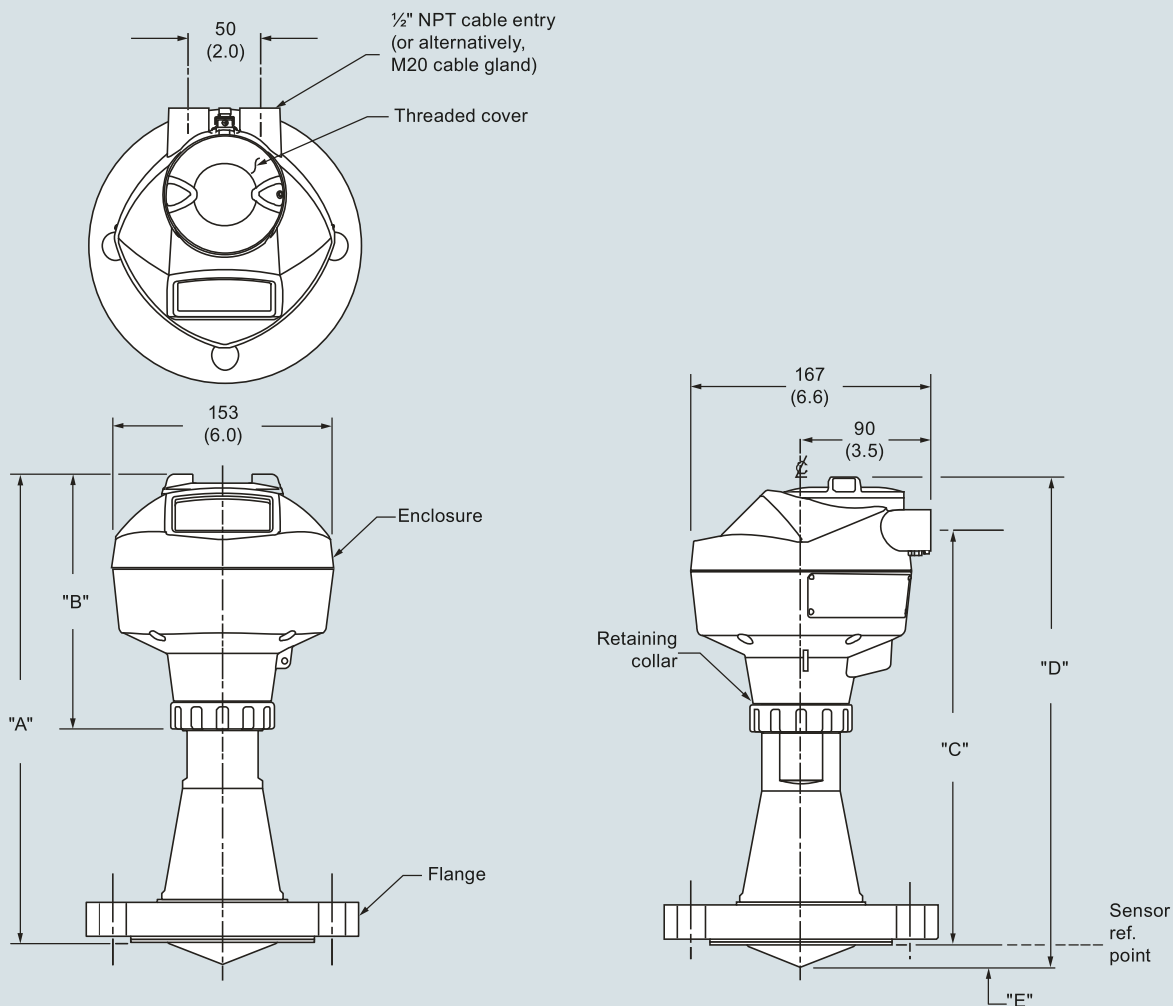
¹⁾ Height from tip of lens to sensor reference point as shown.

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

SITRANS LR250 Flanged Encapsulated Antenna

Dimensional drawings (continued)

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



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

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

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

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Circuit diagrams

4

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

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

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	/+
C	⏪	⏩	⏴
←	↑	↓	→

Part number:
7ML1930-1BK

Notes:

- 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.
- All field wiring must have insulation suitable for rated input voltages.
- Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level measurement

Continuous level measurement

Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

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

Application

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

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

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

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

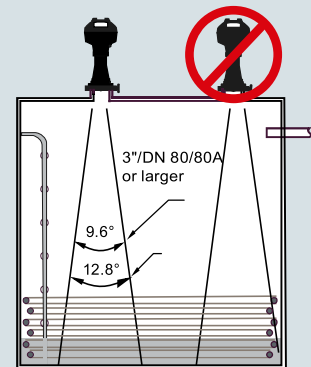
- Key Applications: applications within the food, beverage, chemical and pharmaceutical industries where sanitary, aseptic, or hygienic approvals are required or easy in-stall/clean flush antennas are preferable, such as ice cream, fruit juice, milk, beer, and pharmaceutical or chemical additives and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

Configuration

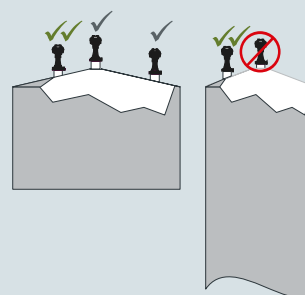
Installation

Note:

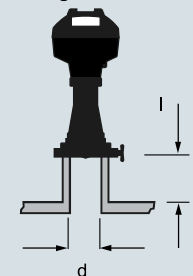
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



Mounting on vessel



Mounting on a nozzle



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

LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • > 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)	
• Storage 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 M20 x 1.5 or 2 x 1/2" NPT	
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68	
Weight (dependent on process connection)	<ul style="list-style-type: none"> • 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 μ m	
Process connections		
Hygienic/Sanitary connections	<ul style="list-style-type: none"> • 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) Tuchenhausen Varivent 	
Power supply		
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω	
PROFIBUS PA	<ul style="list-style-type: none"> • 15 mA • Per IEC 61158-2 	
FOUNDATION Fieldbus	<ul style="list-style-type: none"> • 20.0 mA • Per IEC 61158-2 	
Certificates and approvals		
General	CSA _{US/C} , CE, FM, RCM	
Radio	FCC, Industry Canada, RED, RCM	
Hazardous		
• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da	
• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da	
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da	
• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4	
• Intrinsically Safe (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4	
• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5	
• Flame Proof/Increased Safety (China)	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex ia d tD A20 IP67 T100 °C	
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex ia d tD A20 IP67 T100 °C	
• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc	
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da	
• Non-sparking (Europe)	ATEX II 3G Ex nA IIC T4 Gc	
• Flame Proof (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da	
• Increased Safety (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da	
• Intrinsically Safe (International)	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da	
• Explosion Proof (Russia/Kazakhstan)	EAC Ex d	
• Increased Safety (Russia/Kazakhstan)	EAC Ex e	
• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia	
Hygienic/Sanitary	EHEDG EL Class I EHEDG EL Aseptic Class I	

Technical specifications (continued)

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
<ul style="list-style-type: none"> • Approvals for handheld programmer 	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = 50 °C IECEx SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> • 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	Order code	Article No
Further designs		
Please add "-Z" to Article No. and specify Order code(s).		
Electrical Connection cable entry:		
Plug M12 (IP 67 rating) with mating connector ²⁾⁷⁾⁸⁾	A50	
Plug 7/8" (IP 67 rating) with mating Connector ²⁾⁸⁾⁹⁾	A55	
Test Certificates		
Manufacturer's Test Certificate M to DIN 55350, Part 18 and to ISO 9000	C11	
Material inspection Certificate 3.1 of EN 10204	C12	
Functional Safety		
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁶⁾¹⁰⁾	C20	
Namur		
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁶⁾	N07	
Tagging		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]		
Measuring-point number / identification (max. 27 characters) specify in plain text	Y15	
Operating Instructions		
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		
		Accessories
		Handheld programmer, Intrinsically safe, EEx ia (LUI enabled)
		7ML1930-1BK
		HART modem/USB (for use with a PC and SIMATIC PDM)
		7MF4997-1DB
		One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required) ⁶⁾
		7ML1930-1AP
		One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required) ⁸⁾
		7ML1930-1AQ
		SITRANS RD100, loop powered display - see Chapter 7
		7ML5741-.....-
		SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7
		7ML5742-.....-....
		SITRANS RD200, universal input display with Modbus conversion - see Chapter 7
		7ML5740-.....-..
		SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7
		7ML5744-.....-..
		For applicable back up point level switch - see point level measurement section
		1) Available with Process connection options AA ... FB & FF only.
		2) Available with Approval options A, B, C, L only.
		3) Available with Process connections FC ... FF only.
		4) Available with Process connection options AA ... EC & FF only.
		5) Max. range 10 m (32.8 ft), dk > 3 [20 m (66 ft) and dk > 1.6 if installed in a stillpipe].
		6) Applicable with Communication option 2 only.
		7) Available with Enclosure option 1 only.
		8) Available with Communication options 1 and 3 only.
		9) Available with Enclosure option 0 only.
		10) Available with Approval options A, B, C, D, E, K, L only.

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and ordering data

Article No.

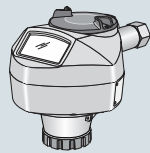
Article No.

SITRANS LR250 hygienic encapsulated Specials

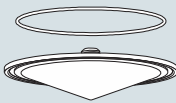
For "Electronics Head only" follow the standard configuration and choose YY option on positions 9 and 10 of the full part number.

For example: 7ML5433-1YY20-1AA0 will order an electronics head for the following:

EHEDG EL Class 1 approval, 4 ... 20 mA HART, M20 cable entries, General purpose Haz Loc approval, pressure rating as per manual.



Spare Lens Kits (Lens and O-ring)



Kit, 2 inch, ISO 2852, HEA, Lens, silicone secondary O-ring

A5E32572731

Kit, 3 inch, ISO 2852, HEA, Lens, silicone secondary O-ring

A5E32572745

Kit, 4 inch, ISO 2852, HEA, Lens, silicone secondary O-ring

A5E32572747

Kit, DN 50, DIN 11851, HEA, Lens, silicone secondary O-ring

A5E32572758

Kit, DN 80, DIN 11851, HEA, Lens, silicone secondary O-ring

A5E32572770

Kit, DN 100, DIN 11851, HEA, Lens, silicone secondary O-ring

A5E32572772

Kit, DN 50, DIN 11864-1, HEA, Lens, silicone secondary O-ring

A5E32572773

Kit, DN 80, DIN 11864-1, HEA, Lens, silicone secondary O-ring

A5E32572779

Kit, DN 100, DIN 11864-1, HEA, Lens, silicone secondary O-ring

A5E32572782

Kit, DN 50, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring

A5E32572785

Kit, DN 80, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring

A5E32572790

Kit, DN 100, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring

A5E32572791

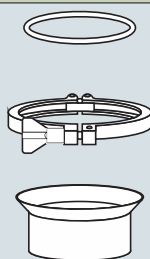
Kit, Tuchenhagen, Type F, HEA, Lens, silicone secondary O-ring

A5E32572794

Kit, Tuchenhagen, Type N, HEA, Lens, silicone secondary O-ring

A5E32572795

Accessories (customer side process connection and FKM and EPDM seal for each size and type)



Kit DN50 DIN11864-1 GS Form A tank connection, EPDM Seal Class II

A5E32910638

Kit, DN80 DIN11864-1 GS Form A tank connection, EPDM Seal Class II

A5E32910649

Kit, DN100 DIN11864-1 GS Form A tank connection, EPDM Seal Class II

A5E32910657

Kit DN50 DIN11864-1 GS Form A tank connection, FKM Seal Class I

A5E32910658

Kit, DN80 DIN11864-1 GS Form A tank connection, FKM Seal Class I

A5E32910671

Kit, DN100 DIN11864-1 GS Form A tank connection, FKM Seal Class I

A5E32910681

Kit 2" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II

A5E32910686

Kit 3" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II

A5E32910697

Kit 4" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II

A5E32910708

Kit 2" ISO2852 tank connection, Clamp, Cleanable FKM Seal

A5E32910718

Kit 3" ISO2852 tank connection, Clamp, Cleanable FKM Seal

A5E32910723

Kit 4" ISO2852 tank connection, Clamp, Cleanable FKM Seal

A5E32910734

Kit DN50 DIN11851 SC Tank connection, EPDM Seal Class II¹⁾

A5E32910746

Kit DN80 DIN11851 SC Tank connection, EPDM Seal Class II¹⁾

A5E32910771

Kit DN100 DIN11851 SC Tank connection, EPDM Seal Class II¹⁾

A5E32910780

Kit DN50 DIN11851 SC Tank connection, FKM Seal Class II

A5E32910784

Kit DN80 DIN11851 SC Tank connection, FKM Seal Class II

A5E32910789

Kit DN100 DIN11851 SC Tank connection, FKM Seal Class II

A5E32910790

Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), EPDM Seal Class II

A5E32910791

Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II

A5E32910793

Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II

A5E32910799

Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), FKM Seal Class I

A5E32910805

Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I

A5E32910809

Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I

A5E32910812

Kit DN50 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II

A5E32910813

Kit DN80 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II

A5E32910814

Kit DN100 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II

A5E32910815

Kit DN50 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I

A5E32910816

Kit DN80 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I

A5E32910817

Kit DN100 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I

A5E32910818

Kit Type F, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection

A5E33489537

Kit Type N, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection

A5E33489543

Kit Type F, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection

A5E33489828

Kit Type N, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection

A5E33489830

Ex-proof plugs

Ex-proof plugs kit, 1/2" NPT, qty 5

A5E39979991

Ex-proof plugs kit, M20, qty 5

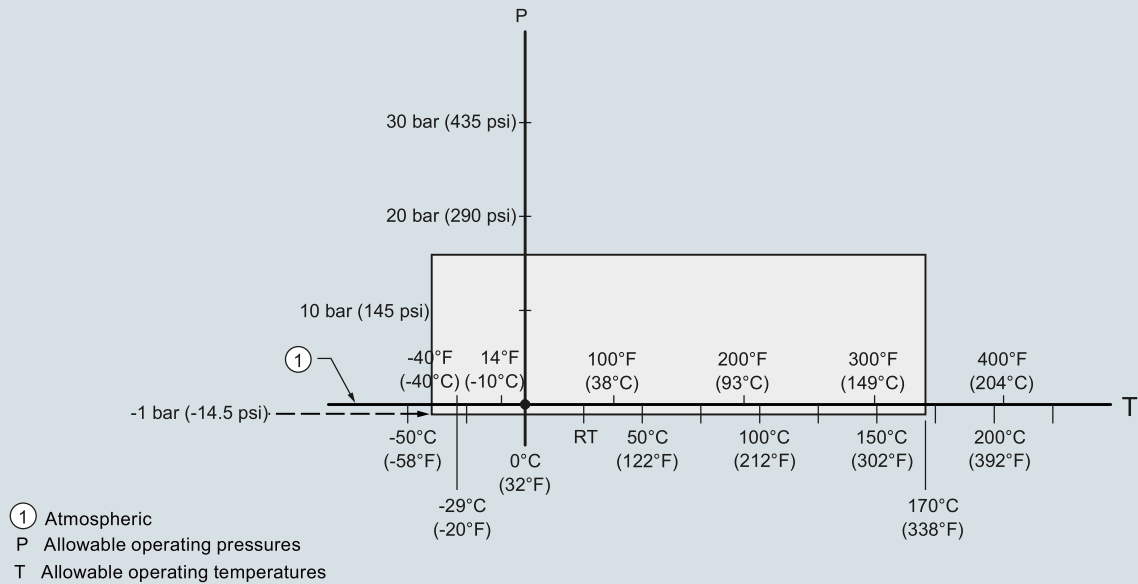
A5E39979992

¹⁾Class II for low fat applications when EPDM seal used on DIN11851

SITRANS LR250 Hygienic Encapsulated Antenna

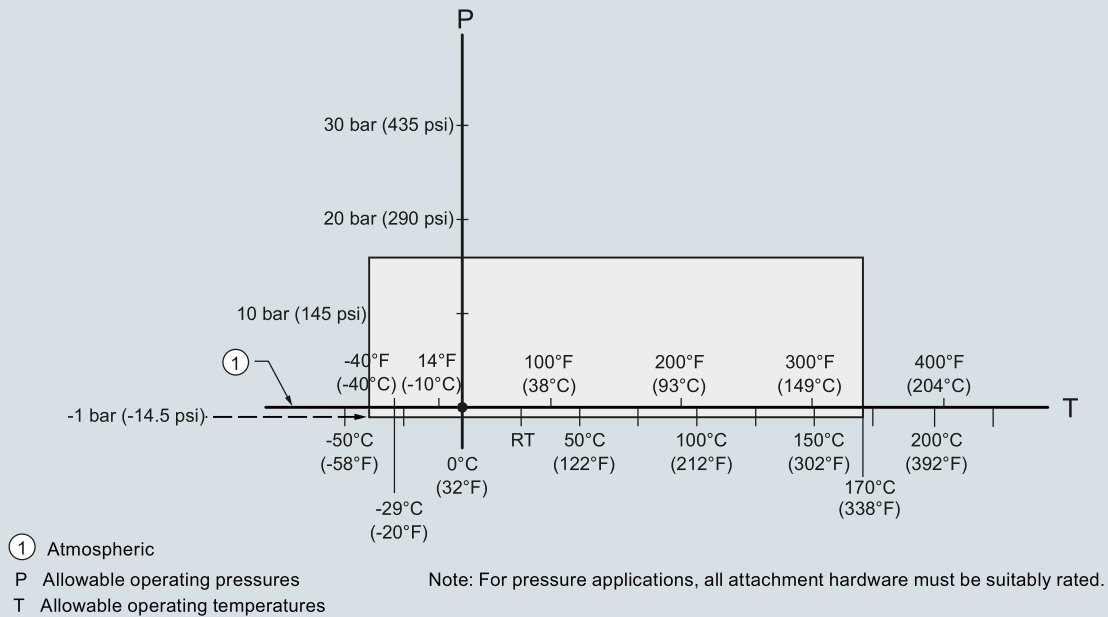
Characteristic curves

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



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

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



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

Level measurement

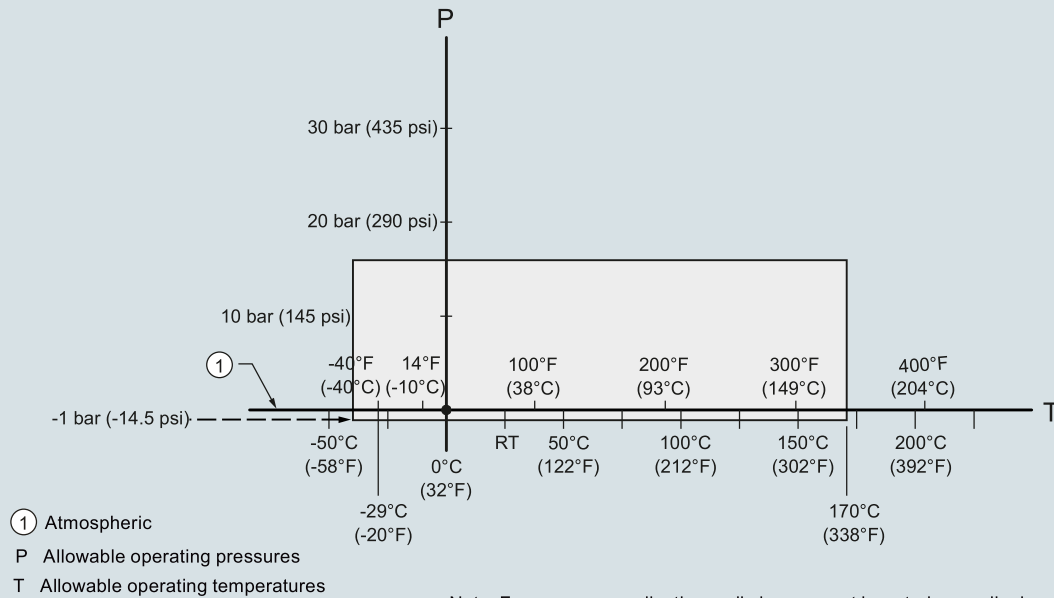
Continuous level measurement

Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Characteristic curves (continued)

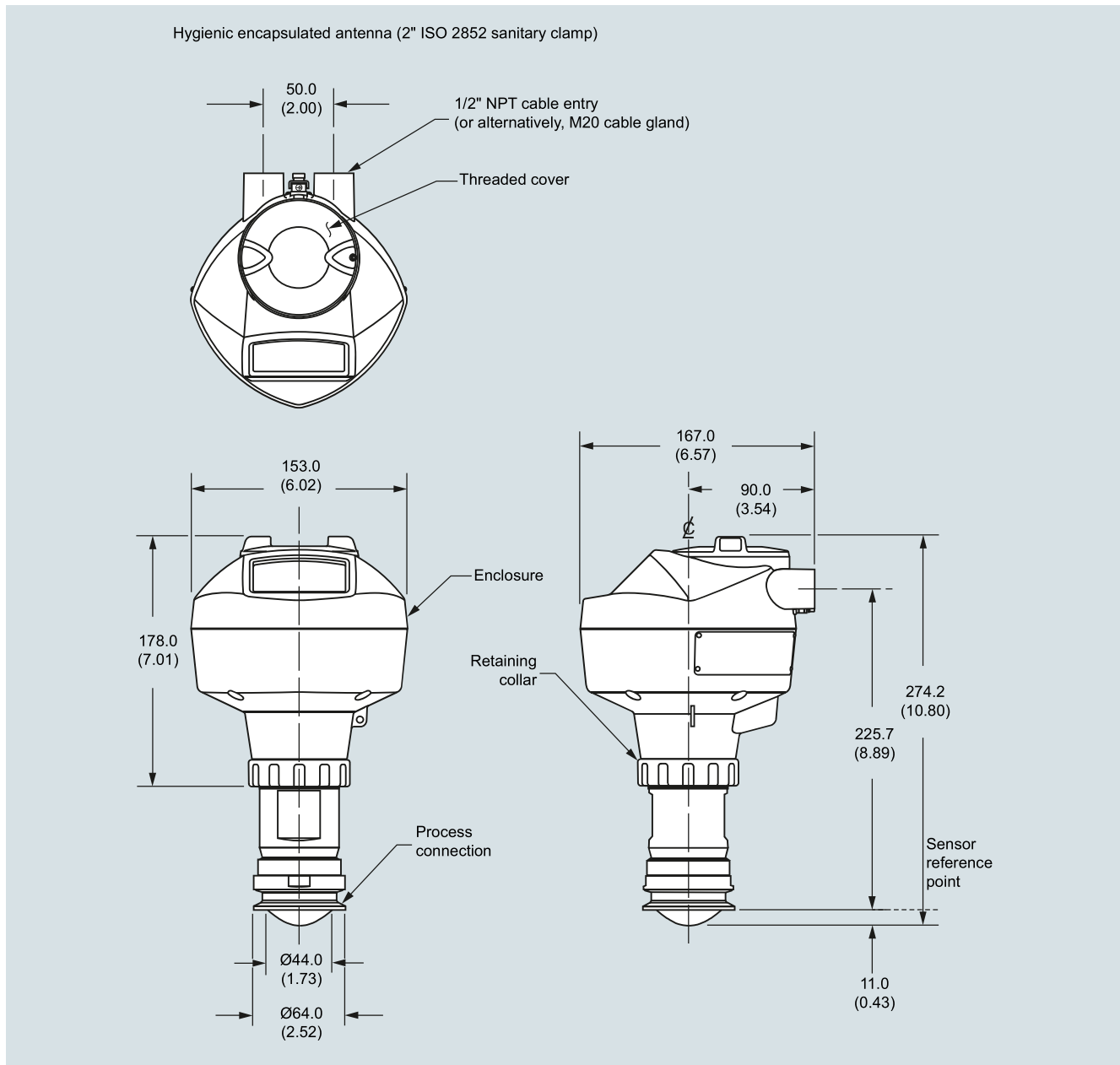
DIN 11864-3 Aseptic/Hygienic clamp: DN 50, DN 80, and DN 100
 ISO 2852 Sanitary/Hygienic clamp: 2", 3", and 4"
 Tuchenhagen Varivent face seal clamp: Type N (68 mm) and Type F (50 mm)



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

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings



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

Level measurement

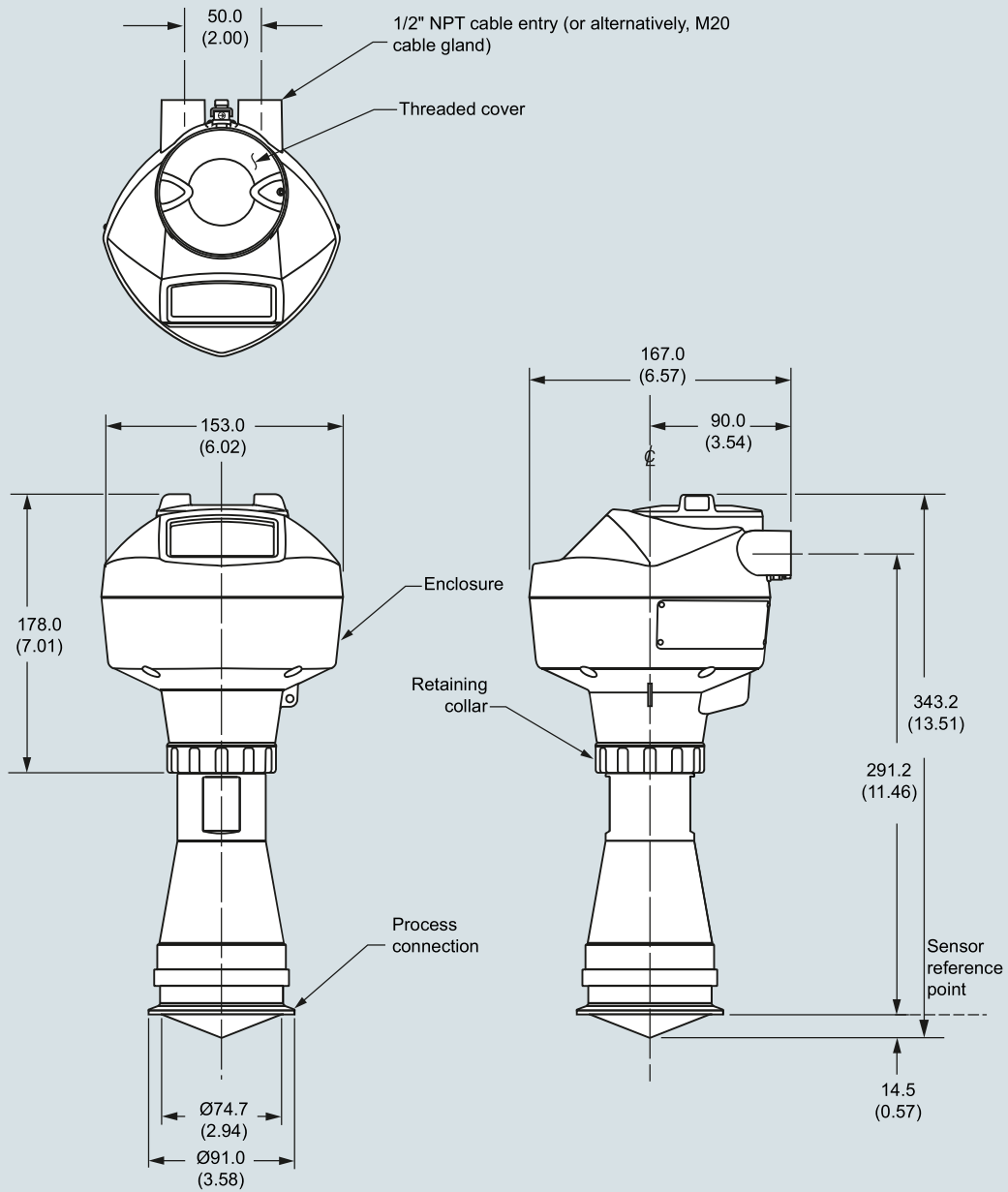
Continuous level measurement

Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

Hygienic encapsulated antenna (3" ISO 2852 sanitary clamp)

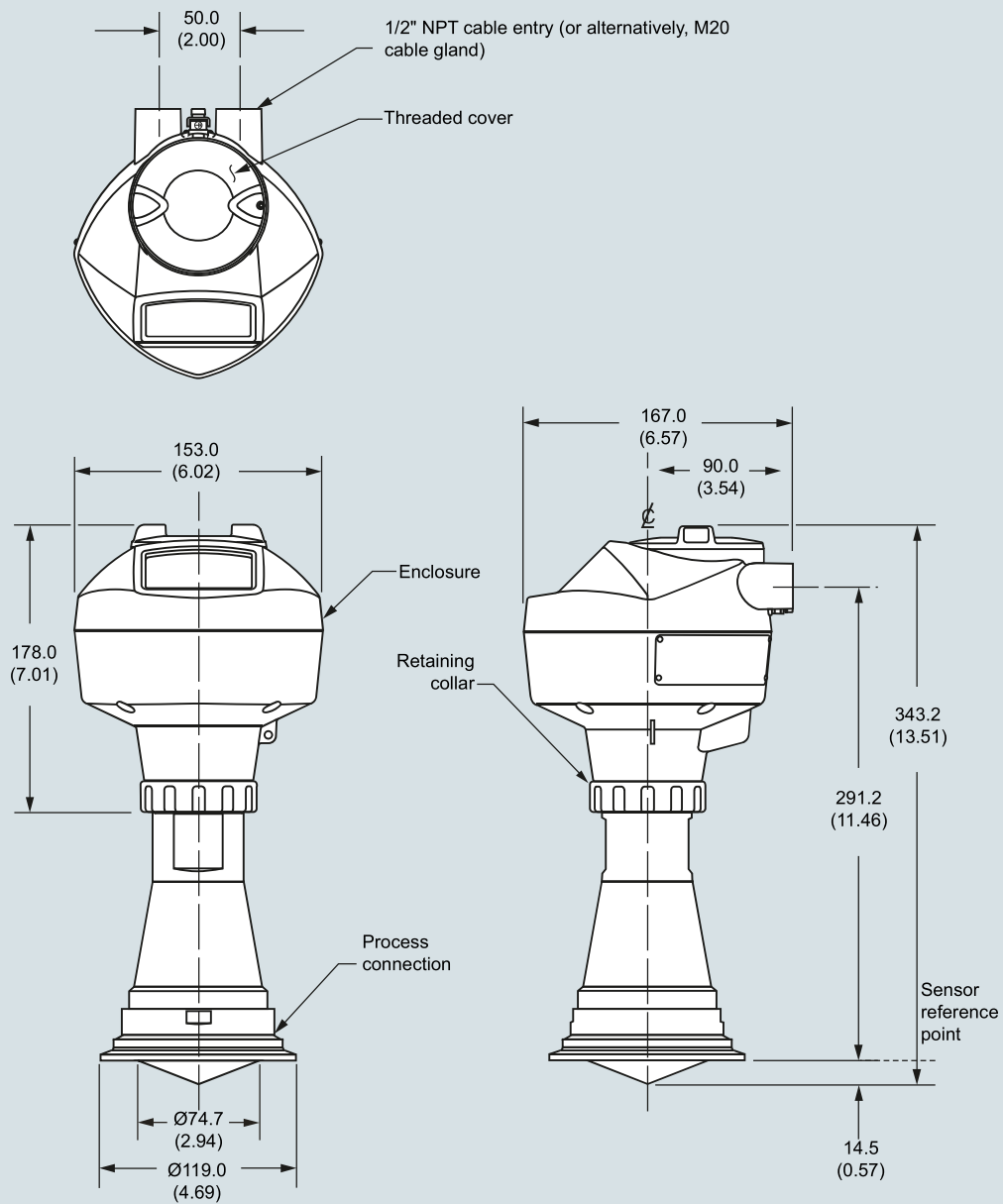


SITRANS LR250 Hygienic Encapsulated Antenna (3" ISO 2852 sanitary clamp), dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

Hygienic encapsulated antenna (4" ISO 2852 sanitary clamp)



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

Level measurement

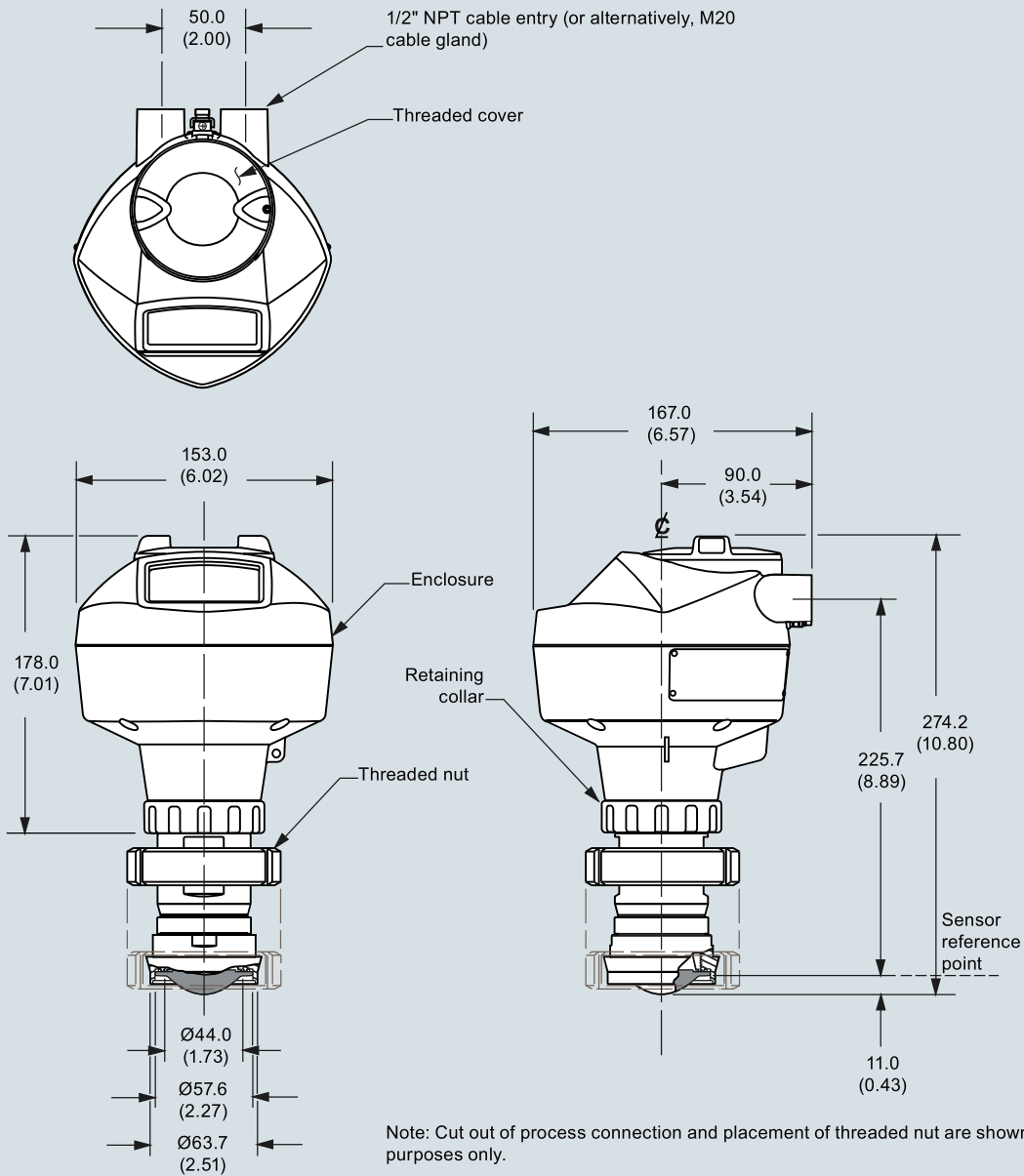
Continuous level measurement

Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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

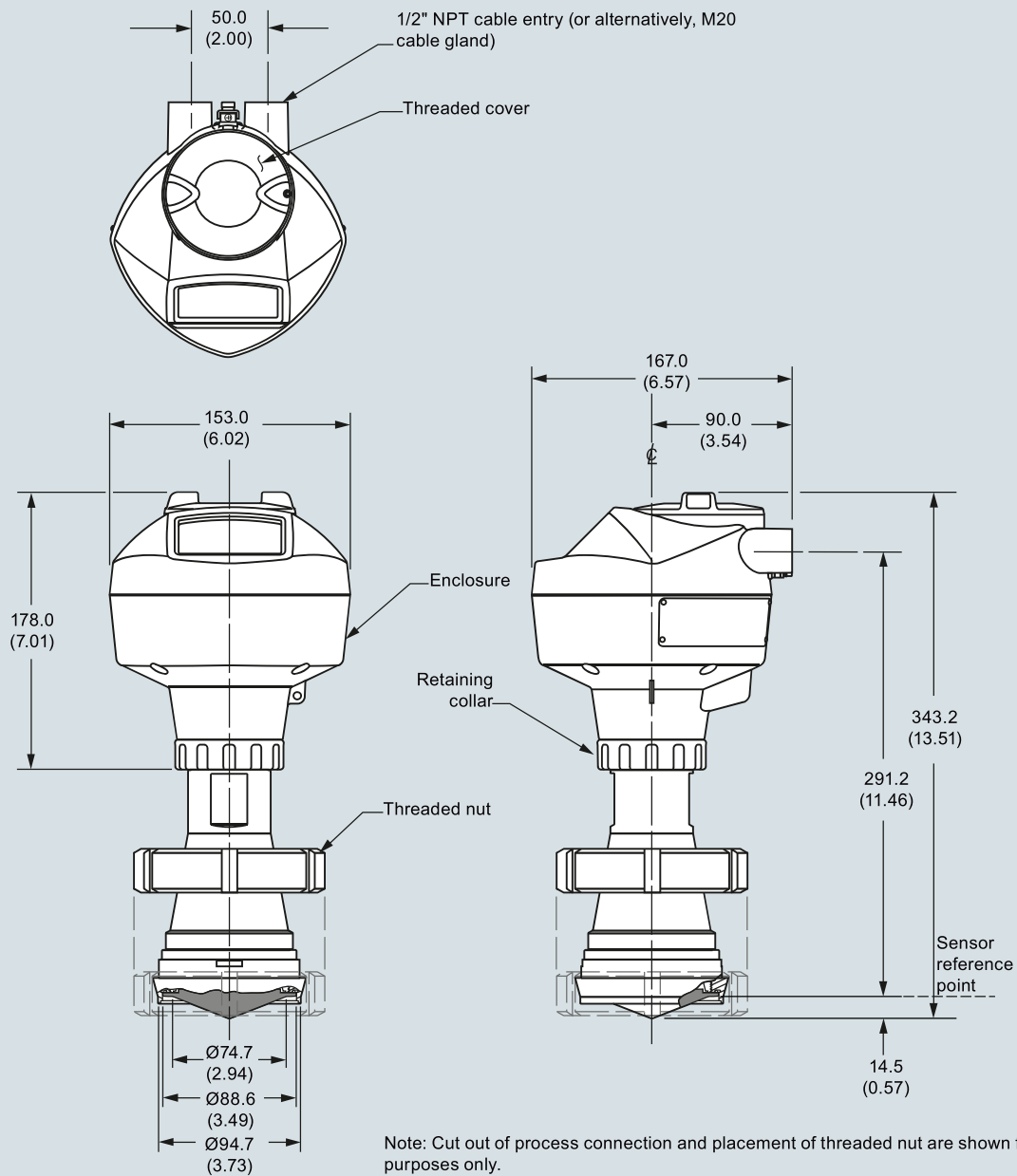


SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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



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

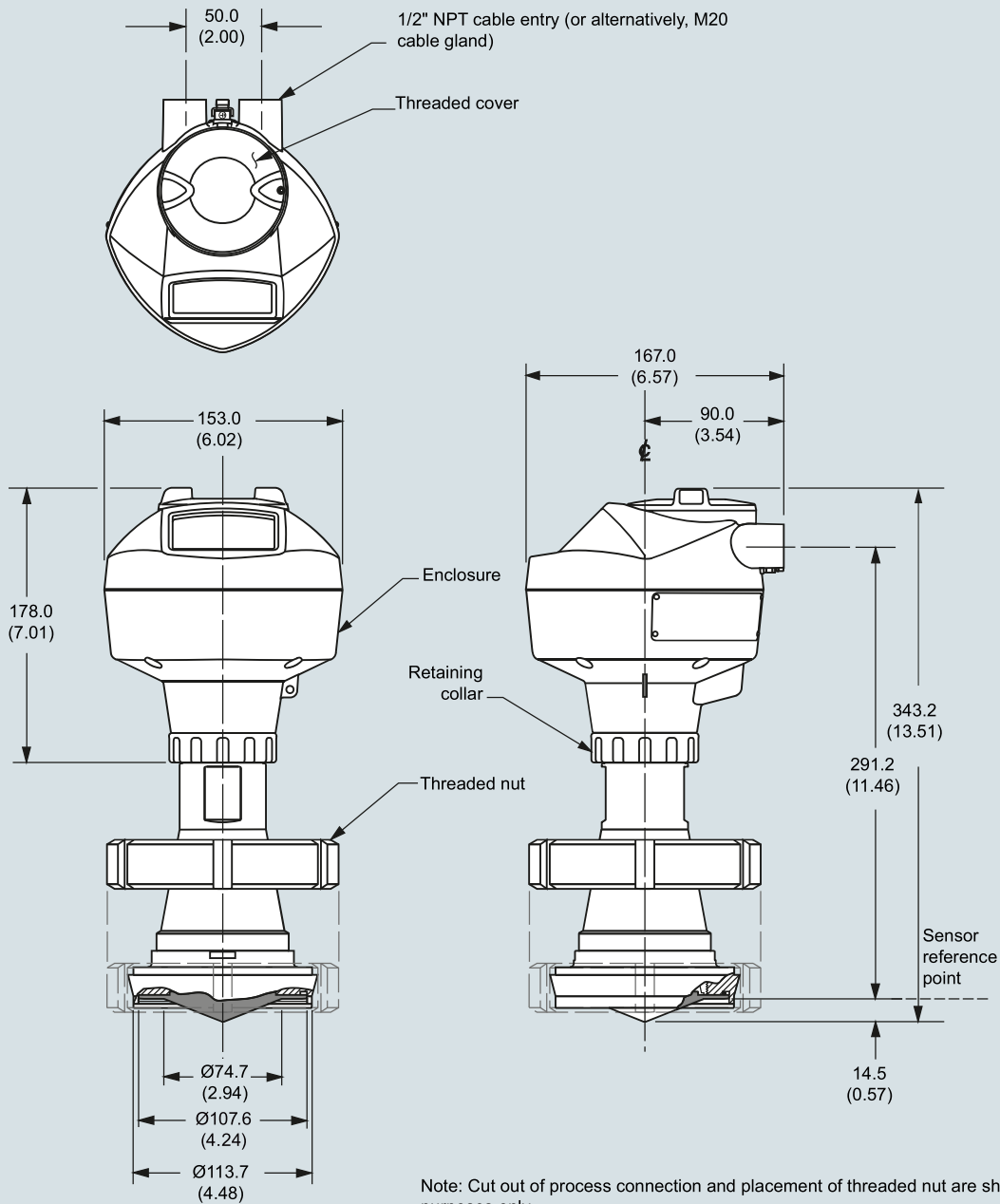
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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

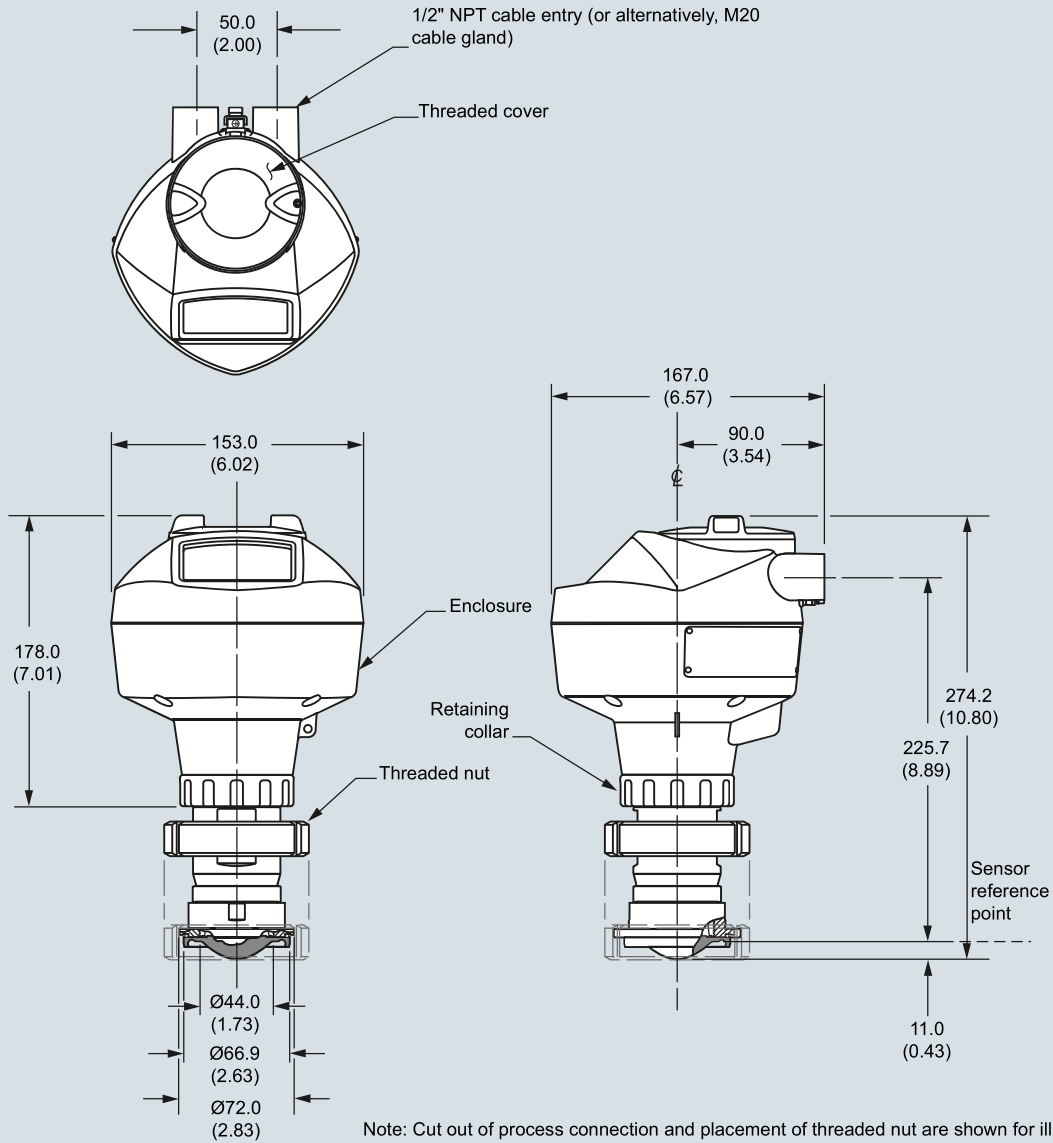


SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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



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

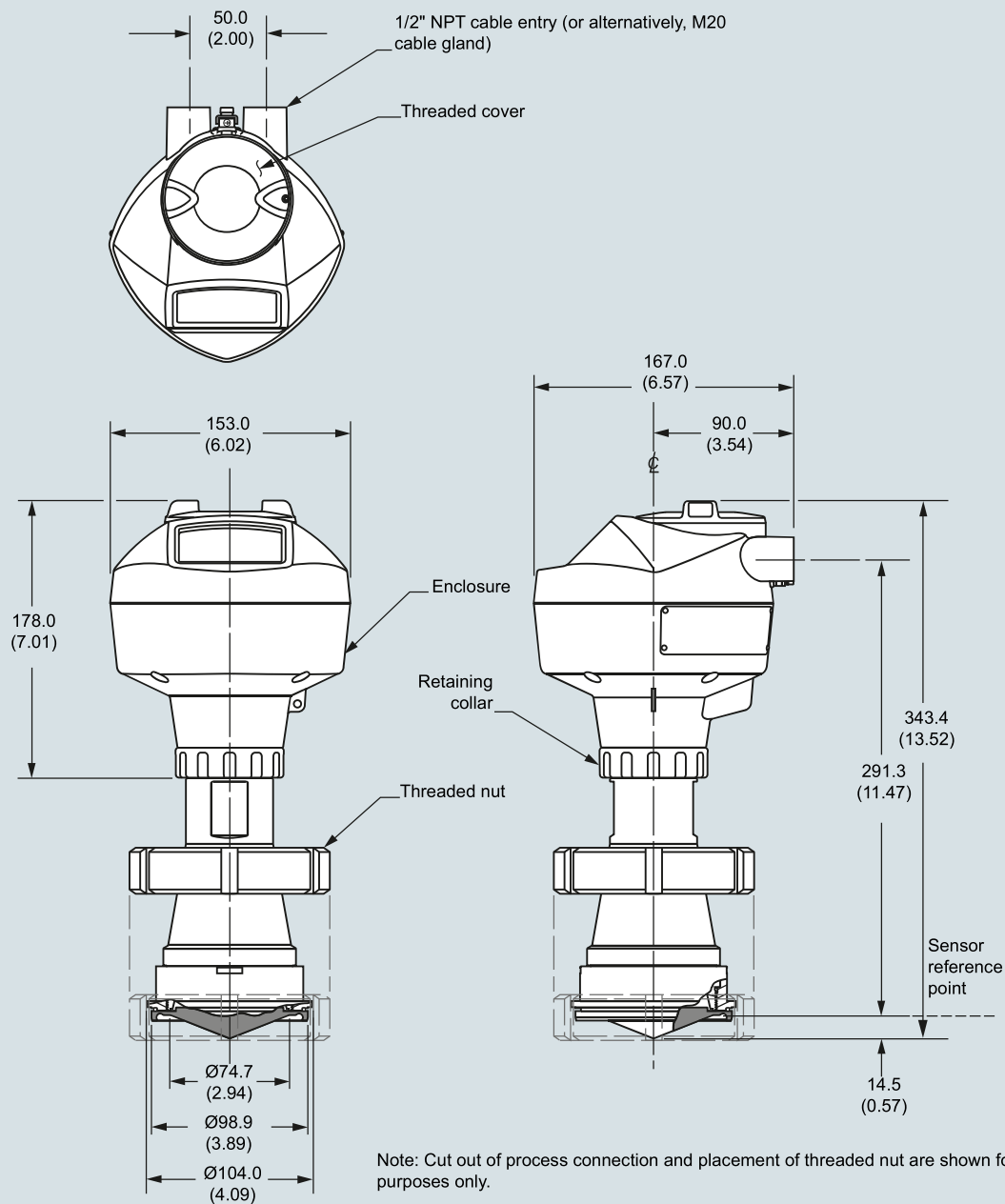
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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

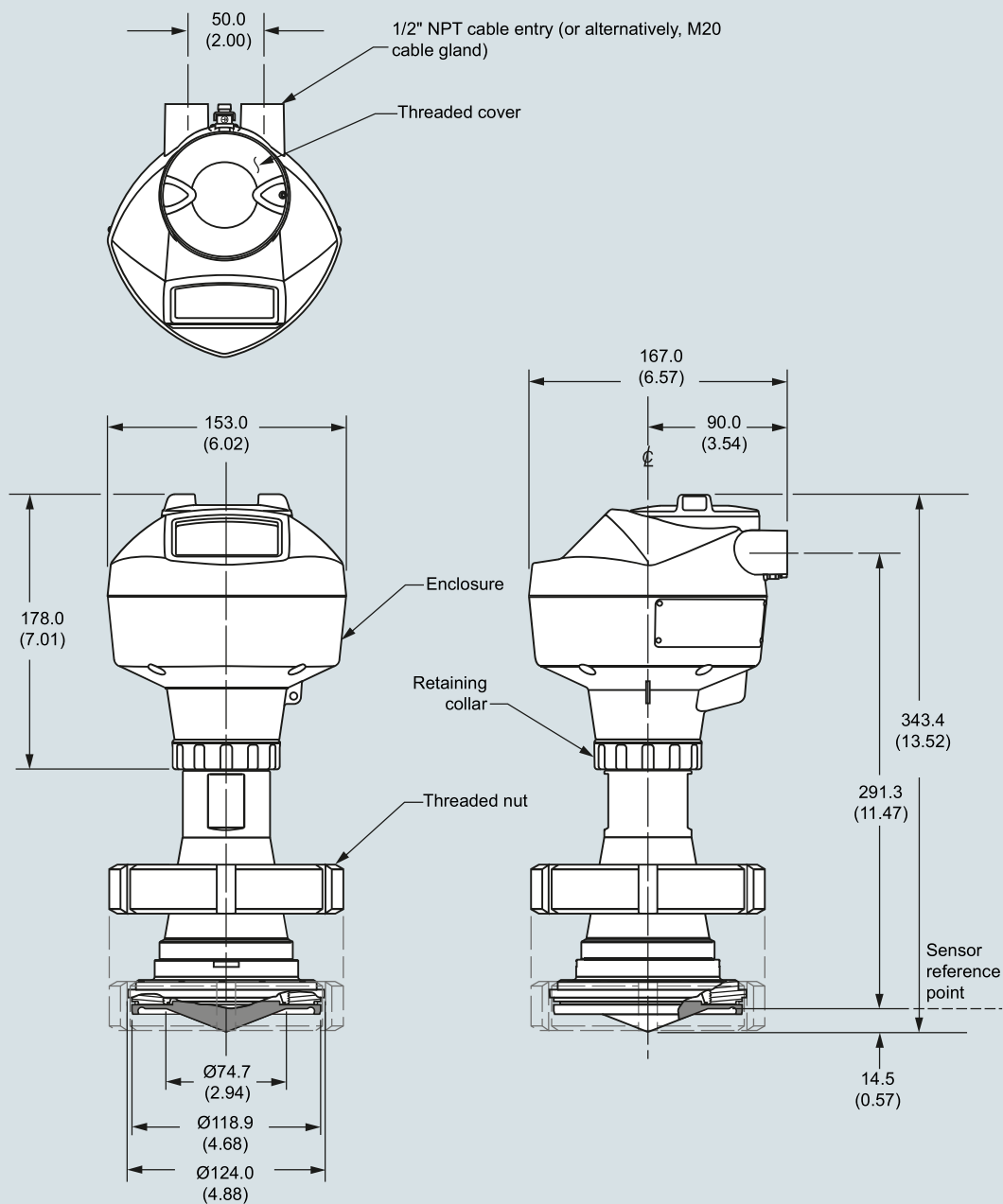


SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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



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

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

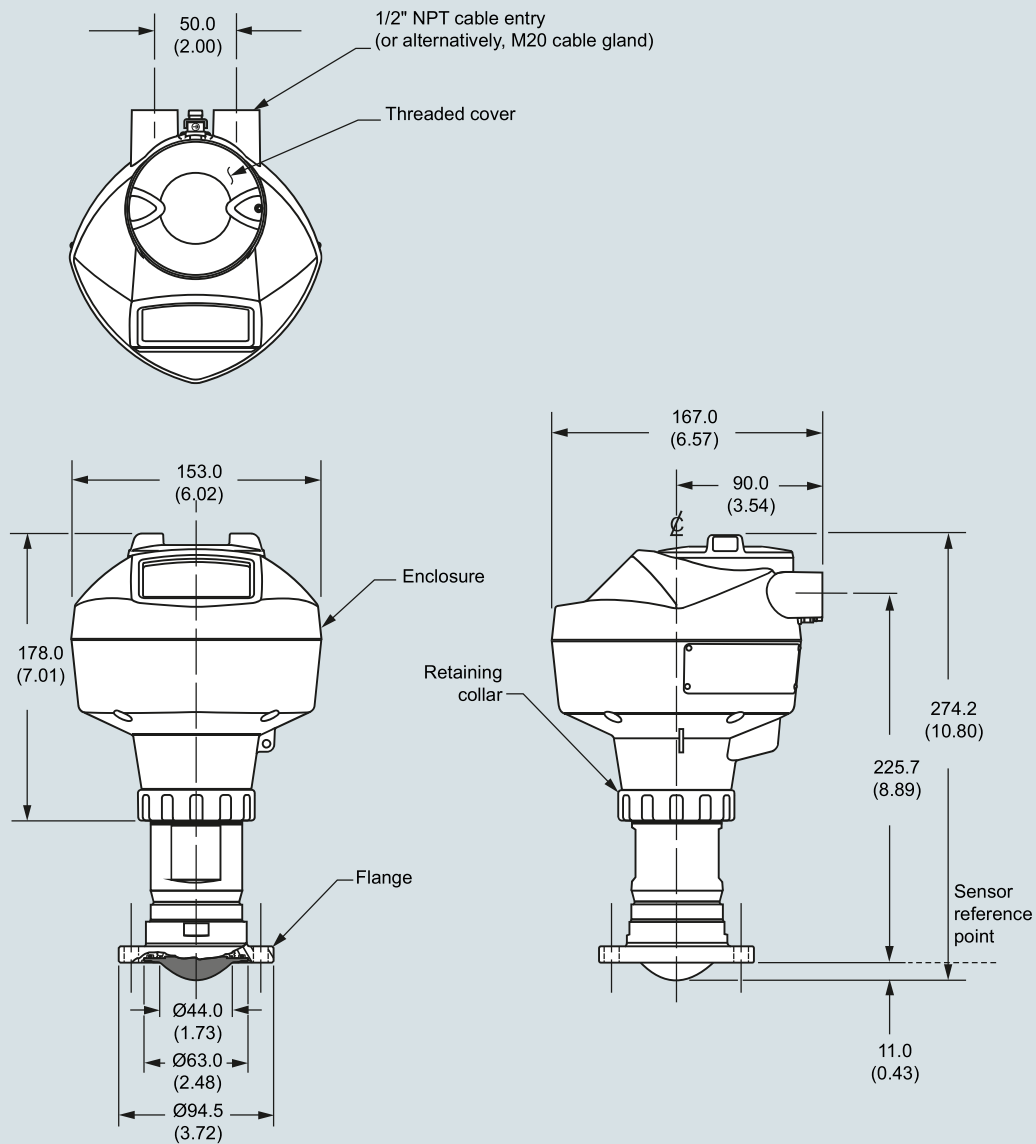
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

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

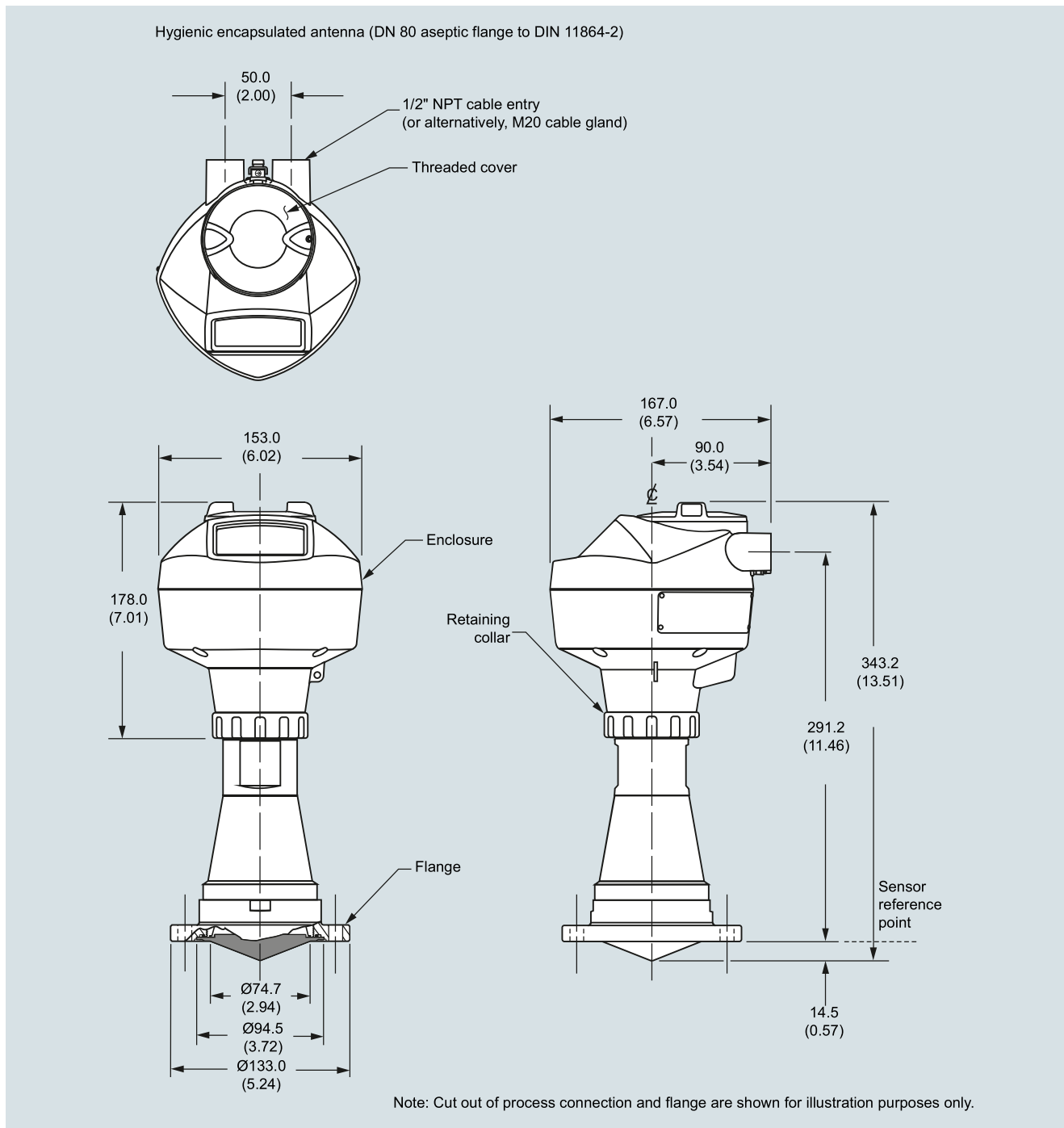


Note: Cut out of process connection and flange are shown for illustration purposes only.

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

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)



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

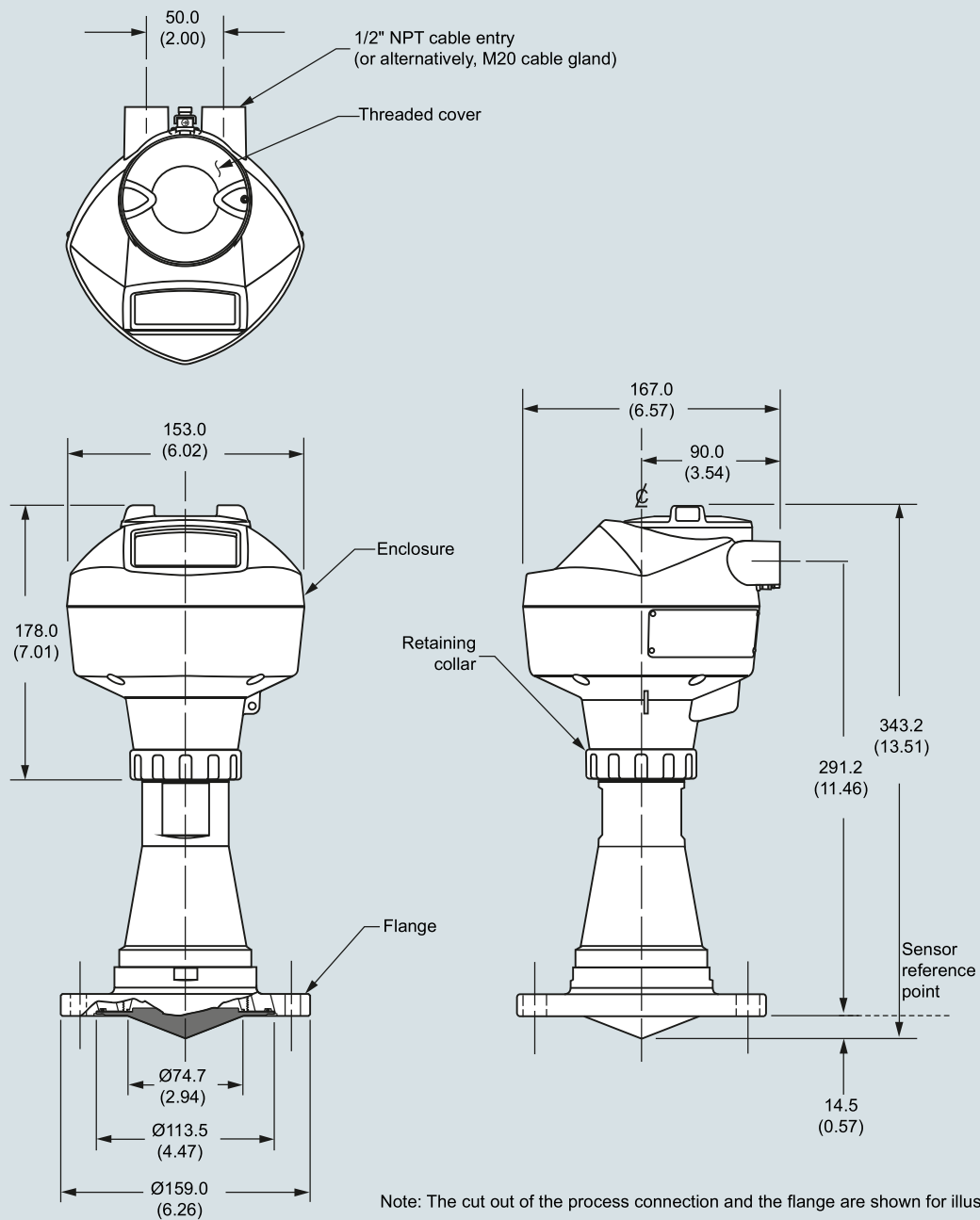
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

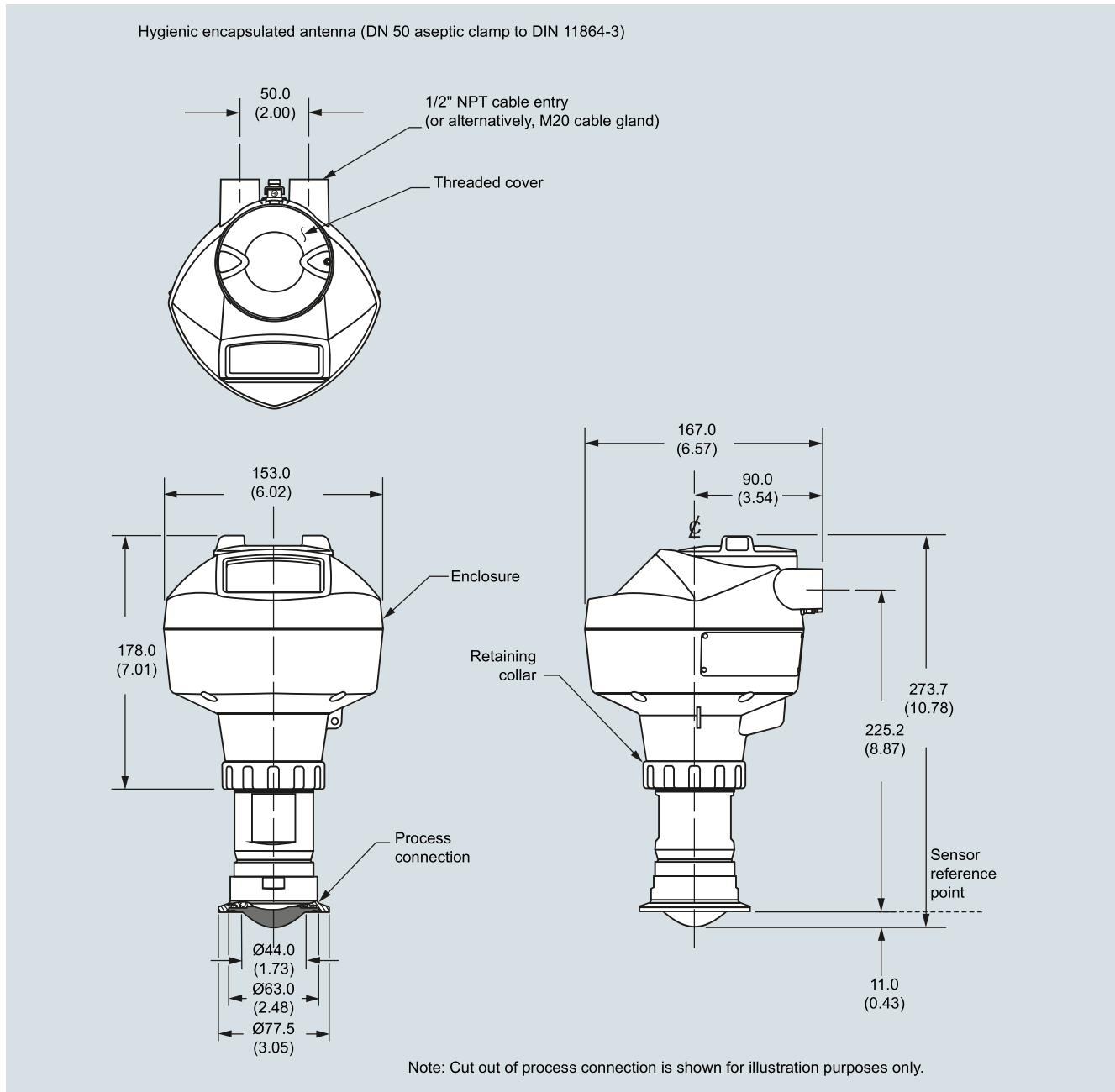
Hygienic encapsulated antenna (DN 100 aseptic flange to DIN 11864-2)



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

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)



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

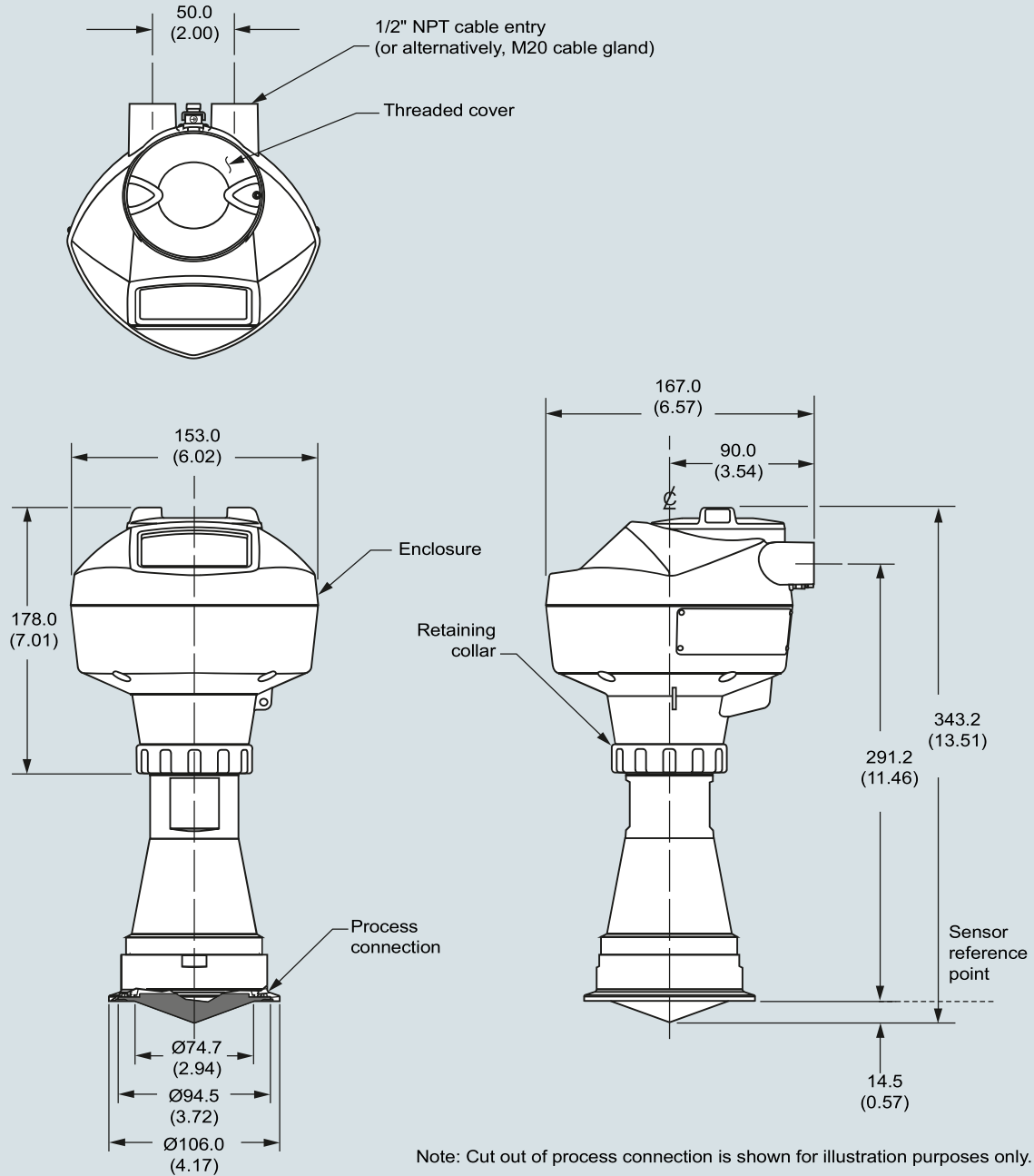
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

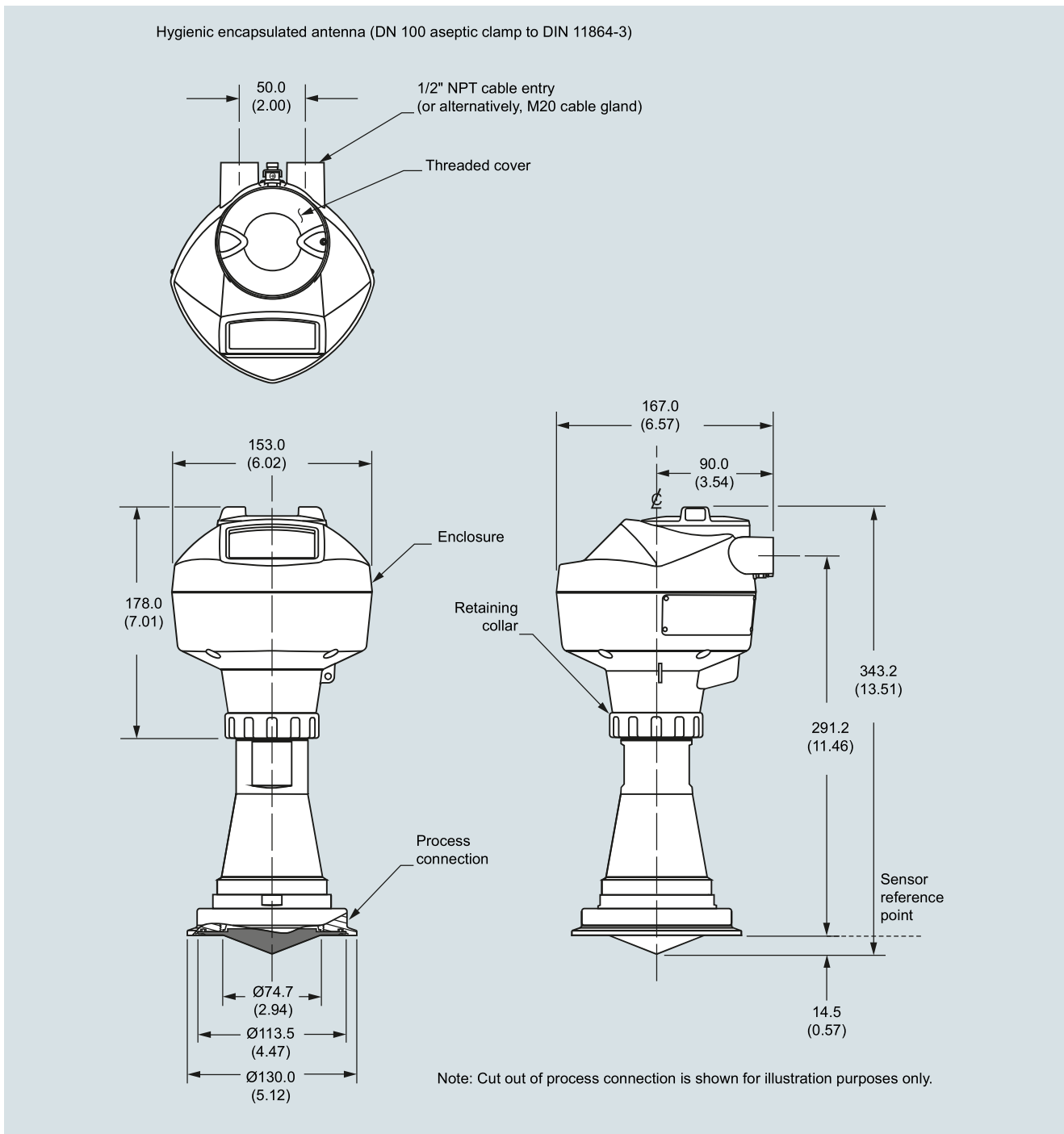
Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-3)



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

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)



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

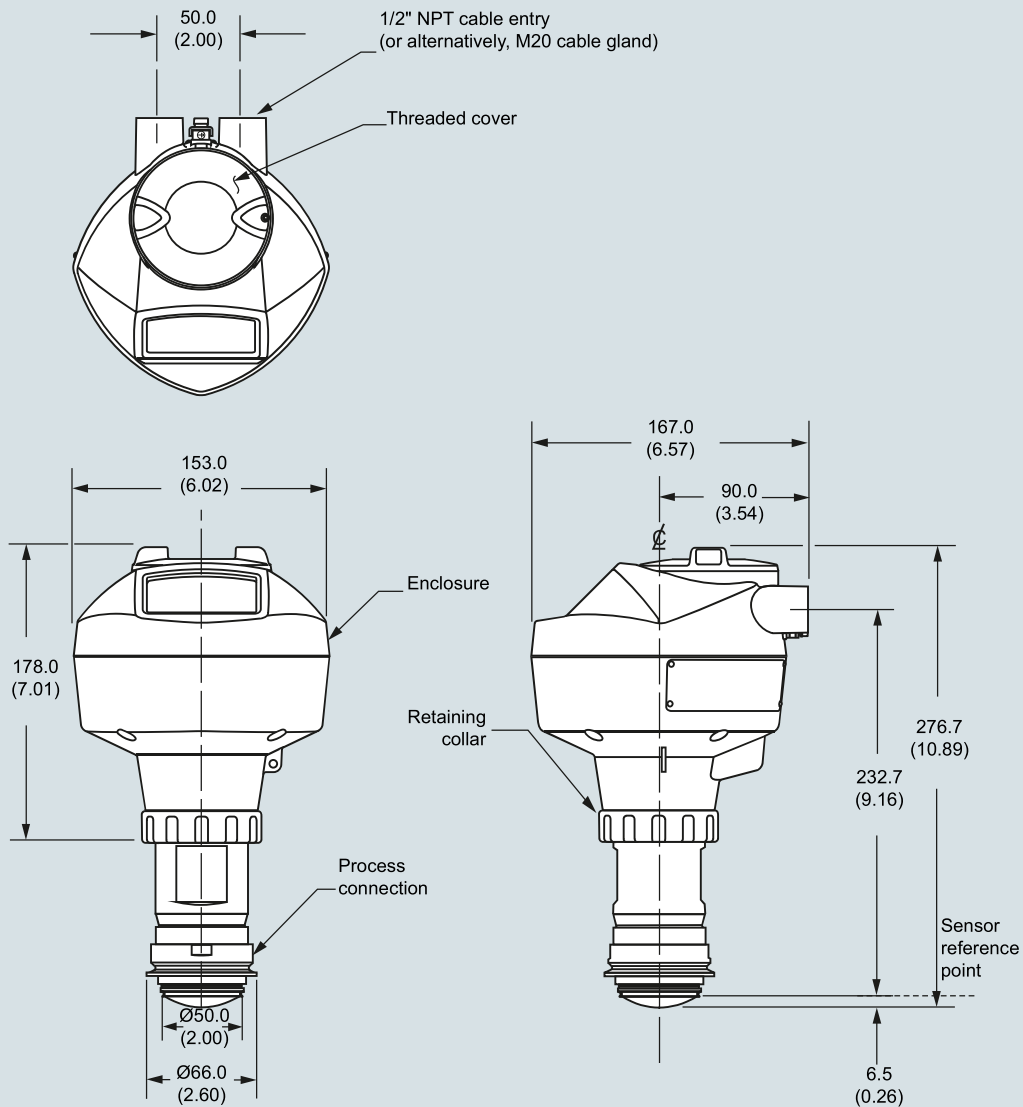
Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)

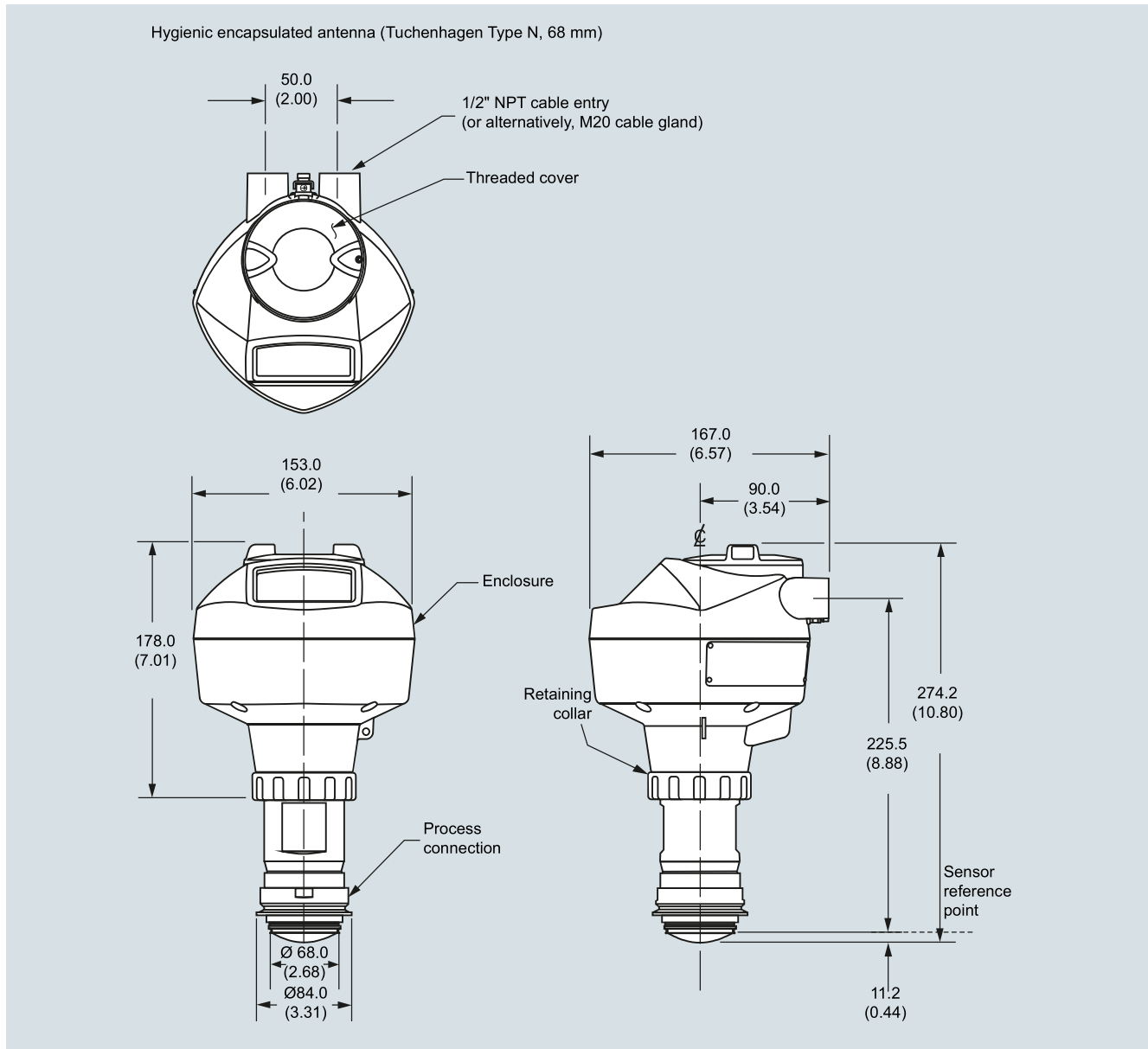
Hygienic encapsulated antenna (Tuchenhagen Type F, 50 mm)



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

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings (continued)



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

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Circuit diagrams

4

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

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

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	/+
C	⏪	⏩	⏴
←	↑	↓	→

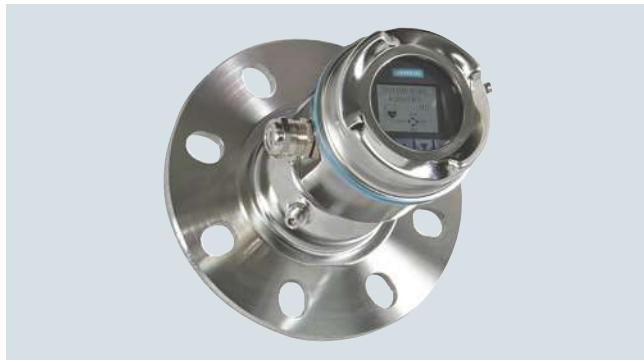
Part number:
7ML1930-1BK

Notes:

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

SITRANS LR250 connections

Overview



SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids to a range of 100 m (328 ft).

Benefits

- Rugged stainless steel design for industrial applications
- 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids
- Aimer option to direct beam to area of interest, such as draw point of cone
- Lens antenna is highly resistant to product buildup
- Air purge connection is included for self-cleaning of extremely sticky solids
- Local display interface (LDI) allows local programming and diagnostics

Application

SITRANS LR560's plug and play performance is ideal for most solids applications and long range liquid applications, including those with extreme dust and high temperatures to 200 °C (392 °F). Unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR560 includes an optional graphical local display interface (LDI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile display for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

SITRANS LR560 measures practically any solids material to a range of 100 m (328 ft).

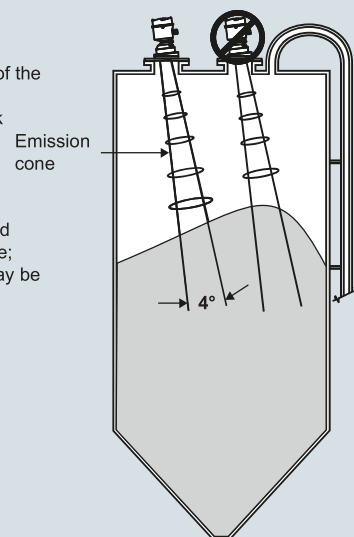
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

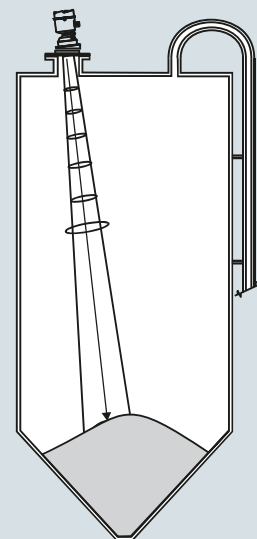
Installation

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 signal transmitted outside of the beam angle; therefore false targets may be detected



Aiming will assist in measuring material in the cone



SITRANS LR560 installation, dimensions in mm (inch)

Level measurement

Continuous level measurement Radar level transmitters

SITRANS LR560

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	78 GHz FMCW
Minimum detectable distance	400 mm (15.75 inch) from sensor reference point
Maximum measuring range ¹⁾	<ul style="list-style-type: none"> • 40 m (131 ft) version • 100 m (328 ft) version
Output	
Analog output	4 ... 20 mA
Communications	<ul style="list-style-type: none"> • HART • Optional: PROFIBUS PA
Fail-safe	<ul style="list-style-type: none"> • Programmable as high, low or hold (Loss of Echo) • NE43 programmable
Performance (according to reference conditions IEC60770-1)	
Maximum measured error (including hysteresis and non-repeatability) ²⁾	5 mm (0.2 inch)
Rated operating conditions (according to reference conditions IEC60770-1)	
Installation conditions	Indoor/outdoor
• Location	
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ϵ_r	> 1.6
Process temperature and pressure	See chart below
Design	
Enclosure	
• Construction	316L/1.4404 stainless steel
• Conduit entry	M20 x 1.5, or ½" NPT via adapter
• Purge inlet	1/8" NPT, 30 cfm at max. 100 psi
• Lens material	<ul style="list-style-type: none"> • 40 m version: PEI • 100 m version: PEEK
	Damage to lens could result from continuous purging/cleaning (due to abrasive solids). Recommended to purge/clean only a few seconds every hour.
• Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP68
• Weight	3.15 kg (6.94 lb) including 3 inch flange
• Optional local display interface	Graphic LCD, with bar graph representing level
Process connections	
• Universal flat-faced flanges ³⁾	<ul style="list-style-type: none"> • 3, 4, 6 inch/80, 100, 150 mm, 304 stainless steel • 3, 4, 6 inch/80, 100, 150 mm, 316L/1.4404 or 316L/1.4435 stainless steel
• Aimer flanges ³⁾	3, 4, 6 inch/80, 100, 150 mm, polyurethane powder-coated cast aluminum

Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	13.5 mA 9 ... 32 V DC, per IEC 61158-2
Certificates and approvals	
General	CSA _{US/C} , CE, FM
Radio	Europe (RED), FCC, Industry Canada, RCM
Hazardous	
• Europe/International	IECEX SIR 09.0149X ATEX II 1D, 1/2D, 2D Ex ta IIIC T139 °C Da ATEX II 3G Ex nA II T4 Gc Ex nL IIC T4 Gc
• US/Canada	FM/CSA Class II, Div. 1, Groups E, F, G Class III T4 FM/CSA Class I, Div. 2, Groups A, B, C, D, T4
• China	NEPSI Ex nA II T4 Ex nL IIC T4 DIP A20 TA, T139 °C
• Brazil	INMETRO Ex na IIC T4 Gc Ex ta IIIC T139 °C Da
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = 50 °C
Handheld communicator	HART communicator 375/475
PC	SIMATIC PDM, AMS, PACTware
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

¹⁾ From sensor reference point

²⁾ Under severe EMI/EMC environments per IEC61326-1 or NAMUR NE21, the device error may increase to a maximum of 25 mm (1 inch)

³⁾ Universal flange mates with EN 1092-1 (PN16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern.

Process temperature and pressure

Version	Stainless steel -1 ... 0.5 bar -1 ... 3.0 bar	Aimer flange: -1 ... 0.5 bar	Aimer flange: -1 ... 3.0 bar
40 m	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)
100 m	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +120 °C (-40 ... +248 °F)

Selection and ordering data	Article No.	Order code
SITRANS LR560 Radar level transmitter with flush lens antenna Continuous, non-contact, 100 m (328 ft) range, for general solids applications. Order handheld programmer separately. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5440- 000-	
Measurement and process temperature range 40 m (131 ft) max range, -40 ... +100 °C 100 m (328 ft) max range, -40 ... +200 °C	0 1	
Process connection Universal flat-faced flange fits ANSI/DIN/JIS flanges 80 mm/3 inch, 304 stainless steel 100 mm/4 inch, 304 stainless steel 150 mm/6 inch, 304 stainless steel 80 mm/3 inch, 316L stainless steel 100 mm/4 inch, 316L stainless steel 150 mm/6 inch, 316L stainless steel 80 mm/3 inch, painted aluminum, with integral aimer ¹⁾ 100 mm/4 inch, painted aluminum, with integral aimer ¹⁾ 150 mm/6 inch, painted aluminum, with integral aimer ¹⁾	A B C D E F G H J	
Enclosure (with cable inlet) Stainless steel, 1 x ½" NPT Stainless steel, 1 x M20 x 1.5 (plastic gland included)	A B	
Pressure rating 0.5 bar g (7.5 psi g) maximum 3 bar g (40 psi g) maximum	0 1	
Output/communication 4 ... 20 mA, HART PROFIBUS PA	A B	
Approvals General Purpose, FM, CSA _{US/C} , Industry Canada, FCC, CE, RED, RCM CSA/FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III, Industry Canada, FCC ATEX II 3G Ex nA/nL, 1D, ½D, 2D Ex ta, INMETRO, CE, RED, RCM	A B C	
Local display interface Without With	1 2	
		Further designs Please add "-Z" to Article No. and specify Order code(s). Plug M12 with mating connector ¹⁾²⁾³⁾ Plug 7/8" with mating connector ¹⁾³⁾⁴⁾ Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 Material inspection Certificate Type 3.1 per EN 10204 ⁵⁾ NAMUR NE43 compliant, device preset to failsafe < 3.6 mA ⁶⁾
		Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation
		Accessories Hand Programmer, Intrinsically safe Local display interface Sun Shield Cover, 304 stainless steel Housing lid with window One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ⁷⁾ One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ⁷⁾ SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 For applicable back up point level switch - see point level measurement section
		Article No. 7ML1930-1BK 7ML1930-1FJ 7ML1930-1FK 7ML1930-1FL 7ML1930-1AP 7ML1930-1AQ 7ML5741-.....- 7ML5742-.....-... 7ML5740-.....- 7ML5744-.....-

¹⁾ Rated to 120 °C max. when used with Pressure rating option 1.

¹⁾ Available with Approval option A only.

²⁾ Available with Enclosure option B only.

³⁾ Available with Output/communication options B and C only.

⁴⁾ Only available with enclosure option A (NPT thread).

⁵⁾ Available with Pressure rating option 1 only.

⁶⁾ Available with Output/communication option A only.

⁷⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR560

Selection and ordering data

Article No.

SITRANS LR560 Specials

SITRANS LR560 Electronics Modules

SITRANS LR560 Electronics Module, HART, 100 m range, compatible with 7ML54401XX00XAXX, no enclosure or process connection included.

7ML18303-AC

SITRANS LR560 Electronics Module, PROFIBUS PA, 100 m range, compatible with 7ML54401XX00XBXX, no enclosure or process connection included.

7ML18303-AH

SITRANS LR560 Electronics Module, HART, 40 m range, compatible with 7ML54400XX00XAXX, no enclosure or process connection included.

7ML18303-AK

SITRANS LR560 Electronics Module, PROFIBUS PA, 40 m range, compatible with 7ML54400XX00XBXX, no enclosure or process connection included.

7ML18303-AL

SITRANS LR560 Miscellaneous Spare Kits

Kit, lid gasket, EPDM

7ML18303-AA

Kit, wrench for 4 inch and 6 inch Aimers

7ML18303-AB

Kit, O-rings for 3 inch Aimer

7ML18303-AD

Kit, O-rings for 4 inch Aimer

7ML18303-AE

Kit, O-rings for 6 inch Aimer

7ML18303-AF

Kit, lid screw and purge plug set with hex keys

7ML18303-AG

Kit, lid, no Window

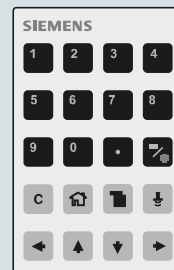
7ML18303-AP

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Options

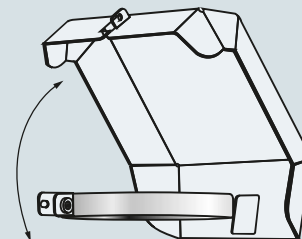
Handheld programmer

Article number:
7ML1930-1BK



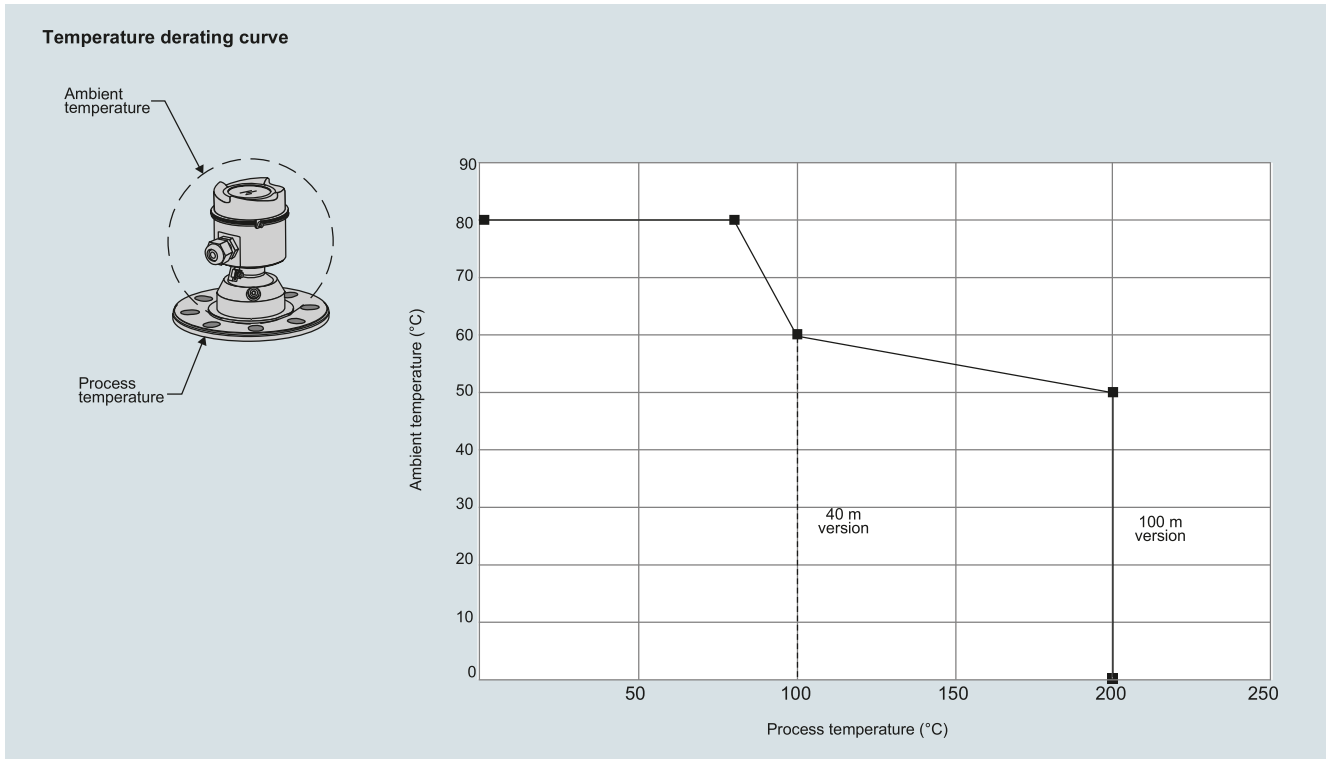
Sun shield cover (304 stainless steel)

Article number:
7ML1930-1FK



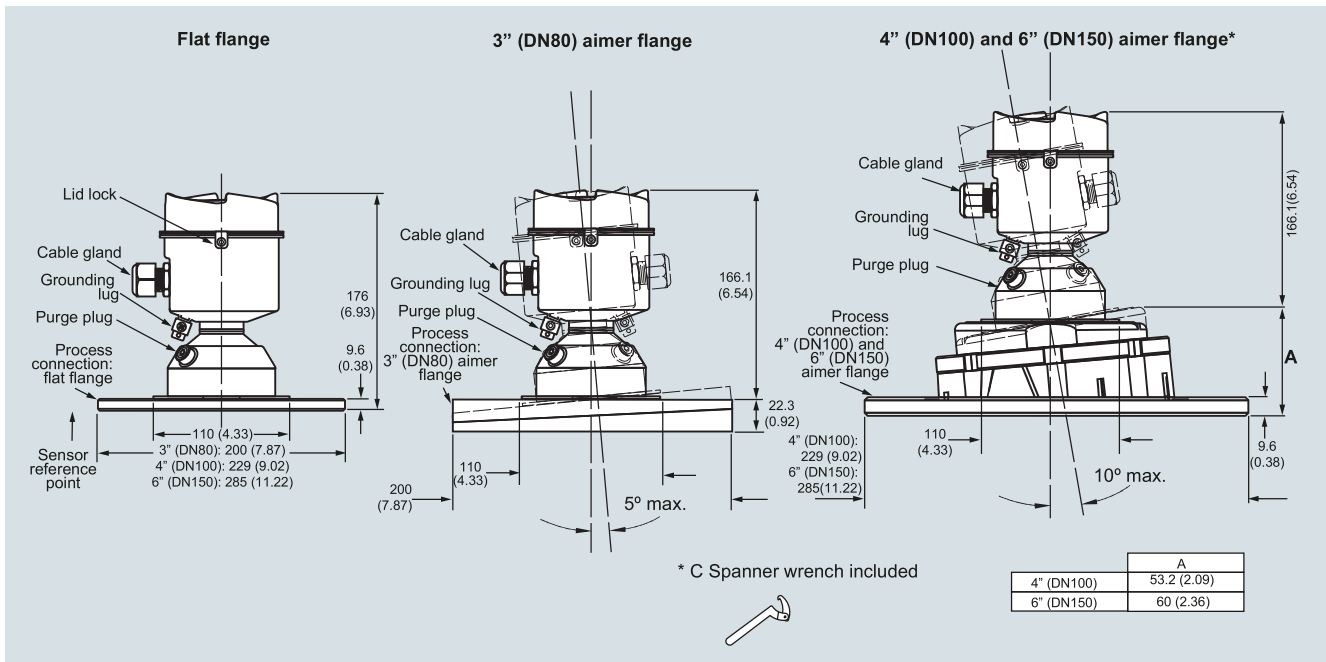
SITRANS LR560 handheld programmer and sun shield cover

Characteristic curves



SITRANS LR560 temperature derating curve

Dimensional drawings



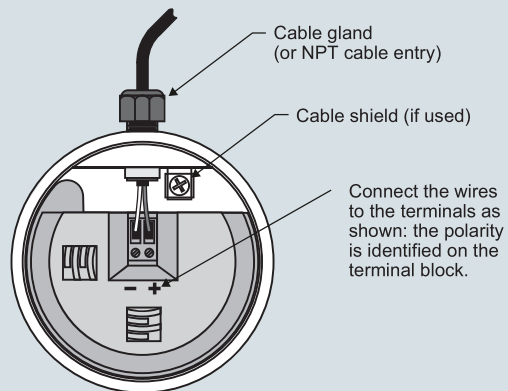
SITRANS LR560, dimensions in mm (inch)

Level measurement

Continuous level measurement
Radar level transmitters

SITRANS LR560

Circuit diagrams



Notes:

1. Depending on the approval rating, glands and plugs may be supplied with your instrument.
2. 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.
3. All field wiring must have insulation suitable for rated input voltages.
4. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
5. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR560 connections