

## 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
- 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

## SITRANS LR250 Flanged Encapsulated Antenna

### Configuration

**Installation**

**Note:**

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

**Mounting on bypass**      **Mounting on stilling well**

Orient front or back of device toward vent.

Orient front or back of device toward stillpipe slots.

**Mounting on vessel**      **Mounting on a nozzle**

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

\*Reference conditions

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



## SITRANS LR250 Flanged Encapsulated Antenna

## Selection and ordering data (continued)

	Article No.
<b>SITRANS LR250 Radar level transmitter with encapsulated horn and PTFE lens</b> <b>Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries in the chemical industry.</b>	7ML5432- ● ● ● ● 0 - ● ● ● ●
Increased Safety: ATEX II 1/2 GD, 1D, 2D, Ex eb mb ia IIC T4 Ga/Gb; UKEX II 1/2 GD, 1D, 2D, Ex eb mb ia IIC T4 Ga/Gb; IECEX Ex eb ia mb IIC T4 Ga/Gb; INMETRO Ex e ia mb IIC T4 Ga/Gb, INMETRO Ex ia ta IIIC T100°C Da, IP67/IP68; EAC Ex Ga/Gb Ex ia/ea+mb IIC T4 X; CE, UKCA, RED, RCM <sup>2)</sup>	F
Flameproof: ATEX II 1/2 GD, 1D, 2D, Ex db mb ia IIC T4 Ga/Gb; ATEX II 1/2 GD, 1D, 2D, Ex ia ta IIIC T100°C Da; UKEX II 1/2 GD, 1D, 2D, Ex db mb ia IIC T4 Ga/Gb; UKEX II 1/2 GD, 1D, 2D, Ex ia ta IIIC T100°C Da; IECEX Ex db mb ia IIC T4 Ga/Gb, IECEX Ex ia ta IIIC T100°C Da; INMETRO Ex d ia mb IIC T4 Ga/Gb, INMETRO Ex ia ta IIIC T100°C Da, IP67/IP68; EAC Ex Ga/Gb Ex ia/db+mb IIC T4 X, EAC Ex Ex ia ta IIIC T100°C Da; CE, UKCA, RED, RCM <sup>2)</sup>	G
Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada <sup>2)</sup>	H
Non Sparking: NEPSI Ex nA IIC T4 Gc	K
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C <sup>2)</sup>	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C <sup>2)</sup>	N
<b>Pressure rating</b> Rating per Pressure/Temperature curves in instruction manual	0

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

2) Applicable with communication option 2 only.

Selection and Ordering data	Order code
<b>Further designs</b>	
Please add "-Z" to Article No. and specify Order code(s).	
Plug M12 with mating Connector <sup>1)2)3)</sup>	<b>A50</b>
Plug 7/8" with mating Connector <sup>2)3)4)</sup>	<b>A55</b>
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	<b>Y15</b>
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	<b>C11</b>
Material inspection Certificate Type 3.1 per EN 10204	<b>C12</b>
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 <sup>5)6)</sup>	<b>C20</b>
Namur NE43 compliant, device preset to failsafe < 3.6 mA <sup>5)</sup>	<b>N07</b>

Accessories	Article No.
<b>Operating Instructions</b>	
All literature is available to download for free, in a range of languages, at <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	
<b>Accessories</b>	
Handheld programmer, Intrinsically safe, EEx ia	<b>7ML1930-1BK</b>
HART modem with USB interface	<b>7MF4997-1DC</b>

Accessories	Article No.
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (2 are required) <sup>6)</sup>	<b>7ML1930-1AP</b>
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA (2 are required) <sup>2)</sup>	<b>7ML1930-1AQ</b>
SITRANS RD100, loop powered display - see Chapter 7	<b>7ML5741-.....</b>
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	<b>7ML5742-.....</b>
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	<b>7ML5740-.....</b>
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	<b>7ML5744-.....</b>
For applicable back up point level switch - see point level measurement section	

1) Available with enclosure option 1 only.

2) Available with communication options 1 and 3 only.



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

4) Available with enclosure option 0 only.

5) Applicable with communication option 2 only.

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

## Selection and ordering data (continued)

SITRANS LR250 flanged encapsulated Specials		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, 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 A, with PROFIBUS PA communication, no process connection	A5E32462853	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, 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, 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, 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 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 C, with PROFIBUS PA communication, no process connection	A5E32462856	SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E32462833
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	<b>SITRANS LR250 flanged encapsulated antenna lens kits</b>	
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection	A5E32462858	Replacement TFM 1600 Lens and Spring Washer Kit for 2 inch Class 150 ASME B16.5 raised faced	A5E32462817
<b>SITRANS LR250 flanged encapsulated antenna version enclosures (&lt; 3.6 mA start-up HART models)</b>		Replacement TFM 1600 Lens and Spring Washer Kit for 3 inch Class 150 ASME B16.5 raised faced	A5E32462819
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	Replacement TFM 1600 Lens and Spring Washer Kit for 4 inch Class 150 ASME B16.5 raised faced	A5E32462820
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	Replacement TFM 1600 Lens and Spring Washer Kit for 6 inch Class 150 ASME B16.5 raised faced	A5E32462821
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	Replacement TFM 1600 Lens and Spring Washer Kit for 50A 10K JIS B 2220 raised Face	A5E32462822
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	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
		<b>Ex-proof plugs</b>	
		Ex-proof plugs kit, 1/2" NPT, qty 5	A5E39979991
		Ex-proof plugs kit, M20, qty 5	A5E39979992

## SITRANS LR250 Flanged Encapsulated Antenna

## Technical specifications

SITRANS LR250 Flanged Encapsulated Antenna	
<b>Mode of operation</b>	
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)
<b>Output</b>	
HART	Version 5.1
• Analog output	4 ... 20 mA
• Accuracy	± 0.02 mA
• Fail-safe	<ul style="list-style-type: none"> <li>• Programmable as high low or hold (loss of echo)</li> <li>• NE 43 programmable</li> </ul>
PROFIBUS PA	Profile 3.01
• Function blocks	2 Analog Input (AI)
<b>Performance (according to reference conditions IEC60770-1)</b>	
Maximum measured error	<ul style="list-style-type: none"> <li>• &gt; 500 mm from sensor reference point: 3 mm (0.118 inch)</li> <li>• &lt; 500 mm from sensor reference point: 25 mm (1 inch)</li> </ul>
Influence of ambient temperature	< 0.003 %/K
<b>Rated operating conditions</b>	
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
<b>Medium conditions</b>	
Dielectric constant $\epsilon_r$	≥ 1.6 (antenna dependent)
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection
Process pressure	See LR250 Flanged Encapsulated Antenna Pressure/Temperature curves for more information.
<b>Design</b>	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20 x 1.5 or 2 x ½" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68
Weight (dependent on process connection)	<ul style="list-style-type: none"> <li>• Approx. 7 kg (15.43 lb) for 2" Class 150 ASME B16.5 raised face flange (smallest size)</li> <li>• Approx. 17.7 kg (39.02 lb) for 6" Class 150 ASME B16.5 raised face flange (largest size)</li> </ul>
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)
<b>Process connections</b>	
Flanged connection	Raised Face <ul style="list-style-type: none"> <li>• 2, 3, 4, 6" Class 150 ASME B16.5</li> <li>• 50A, 80A, 100A, 150A 10K JIS B 2220</li> <li>• DN 50, DN 80, DN 100 &amp; DN 150 PN 10/16 EN 1092-1 type B1</li> </ul>

## Technical specifications (continued)

SITRANS LR250 Flanged Encapsulated Antenna	
<b>Power supply</b>	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	<ul style="list-style-type: none"> <li>• 15 mA</li> <li>• Per IEC 61158-2</li> </ul>
<b>Certificates and approvals</b>	
General	cCSA <sub>US</sub> , CE, UKCA, 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 (EU)	ATEX II 1G Ex ia IIC T4 Ga, ATEX II 1D Ex ia ta IIIC T100°C Da;
• Intrinsically Safe (UK)	UKEX II 1G Ex ia IIC T4 Ga, UKEX II 1D Ex ia ta IIIC T100°C Da;
• Intrinsically Safe (International)	IECEX Ex ia IIC T4 Ga, IECEX Ex ia ta IIIC T100°C Da
• Increased Safety - Zone 2 (EU)	ATEX II 3G Ex ec IIC T4 Gc;
• Increased Safety - Zone 2 (UK)	UKEX II 3G Ex ec IIC T4 Gc;
• Non-sparking (EAC)	EAC Ex 2Ex nA IIC T4 Gc;
• Flameproof (EU)	ATEX II 1/2 GD, 1D, 2D, Ex db mb ia IIC Ga/Gb, Ex ia ta IIIC T100°C Da;
• Flameproof (UK)	UKEX II 1/2 GD, 1D, 2D, Ex db mb ia IIC Ga/Gb, Ex ia ta IIIC T100°C Da;
• Flameproof (International)	IECEX Ex db mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100°C Da;
• Increased Safety - Zone 1 (EU)	ATEX II 1/2 GD, 1D, 2D, Ex eb mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100°C Da;
• Increased Safety - Zone 1 (UK)	UKEX II 1/2 GD, 1D, 2D, Ex eb mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100°C Da;
• Increased Safety - Zone 1 (International)	IECEX Ex eb mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100°C Da
• Explosion Proof (Russia/Kazakhstan)	EAC Ex d
• Increased Safety (Russia/Kazakhstan)	EAC Ex e
• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia
• Marine	<ul style="list-style-type: none"> <li>• Lloyd's Register of Shipping</li> <li>• ABS Type Approval</li> </ul>
• Functional Safety	SIL-2 suitable in accordance with IEC 61508/61511

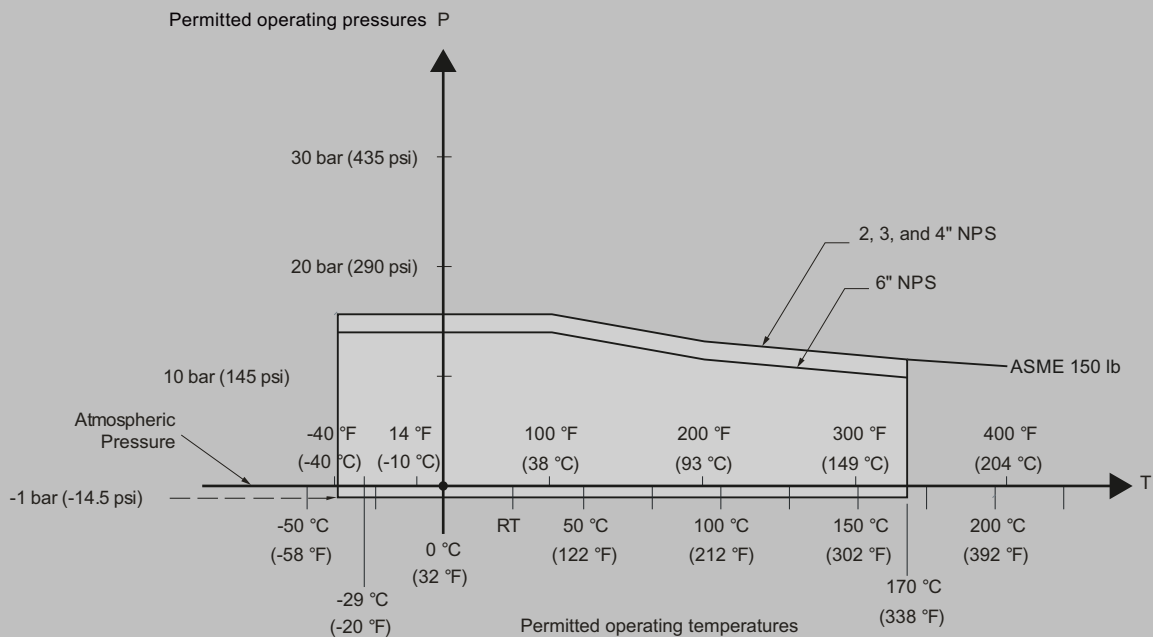
## Technical specifications (continued)

SITRANS LR250 Flanged Encapsulated Antenna	
<b>Programming</b>	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
<ul style="list-style-type: none"> <li>• Approvals for handheld-programmer</li> </ul>	IS model: ATEX II 1 GD Ex ia op is IIC T4 Ga ATEX II 1 GD Ex ia op is IIIC T135°C Da UKEX II 1 GD Ex ia op is IIC T4 Ga UKEX II 1 GD Ex ia op is IIIC T135°C Da Ta = -20 ... +50°C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, G, T6 Ta = 50°C IECEx SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> <li>• SIMATIC PDM</li> <li>• Emerson AMS</li> <li>• SITRANS DTM (for connection into FDT such as PACTware or Fieldcare)</li> </ul>
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

## SITRANS LR250 Flanged Encapsulated Antenna

## Characteristic curves

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

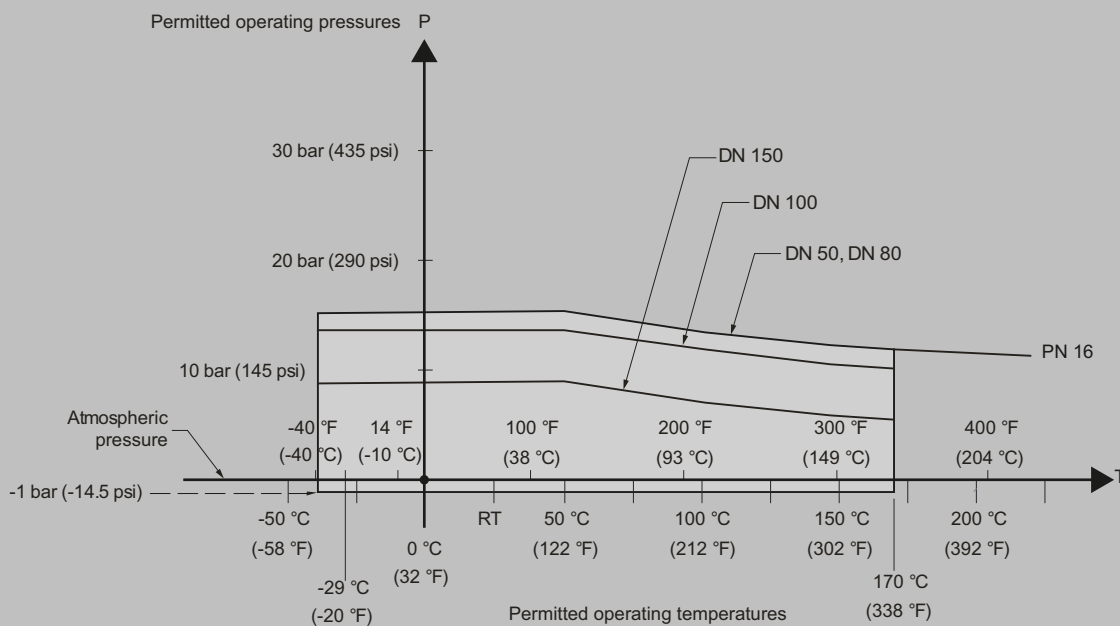


SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve



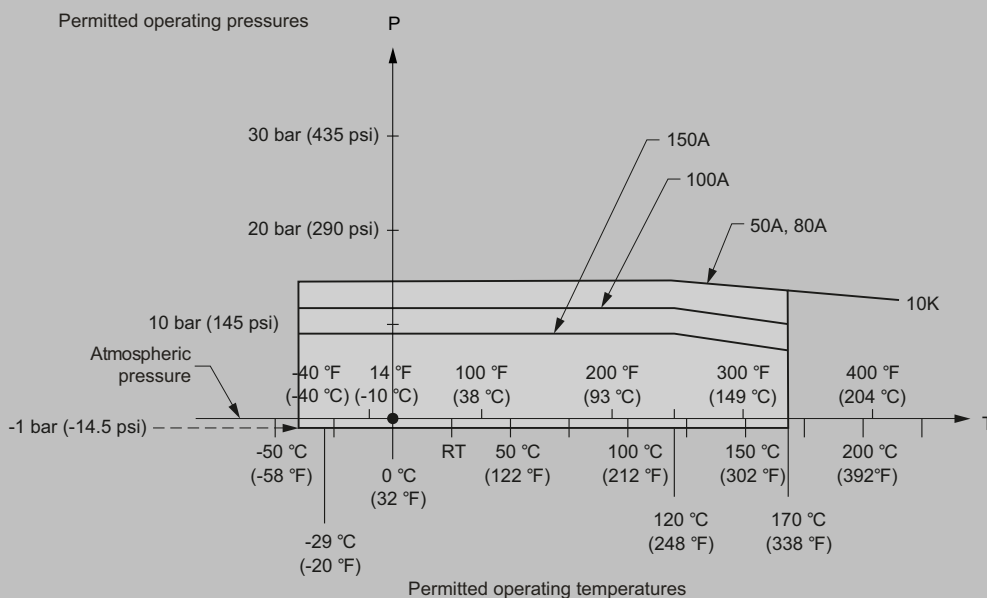
Characteristic curves (continued)

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



SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

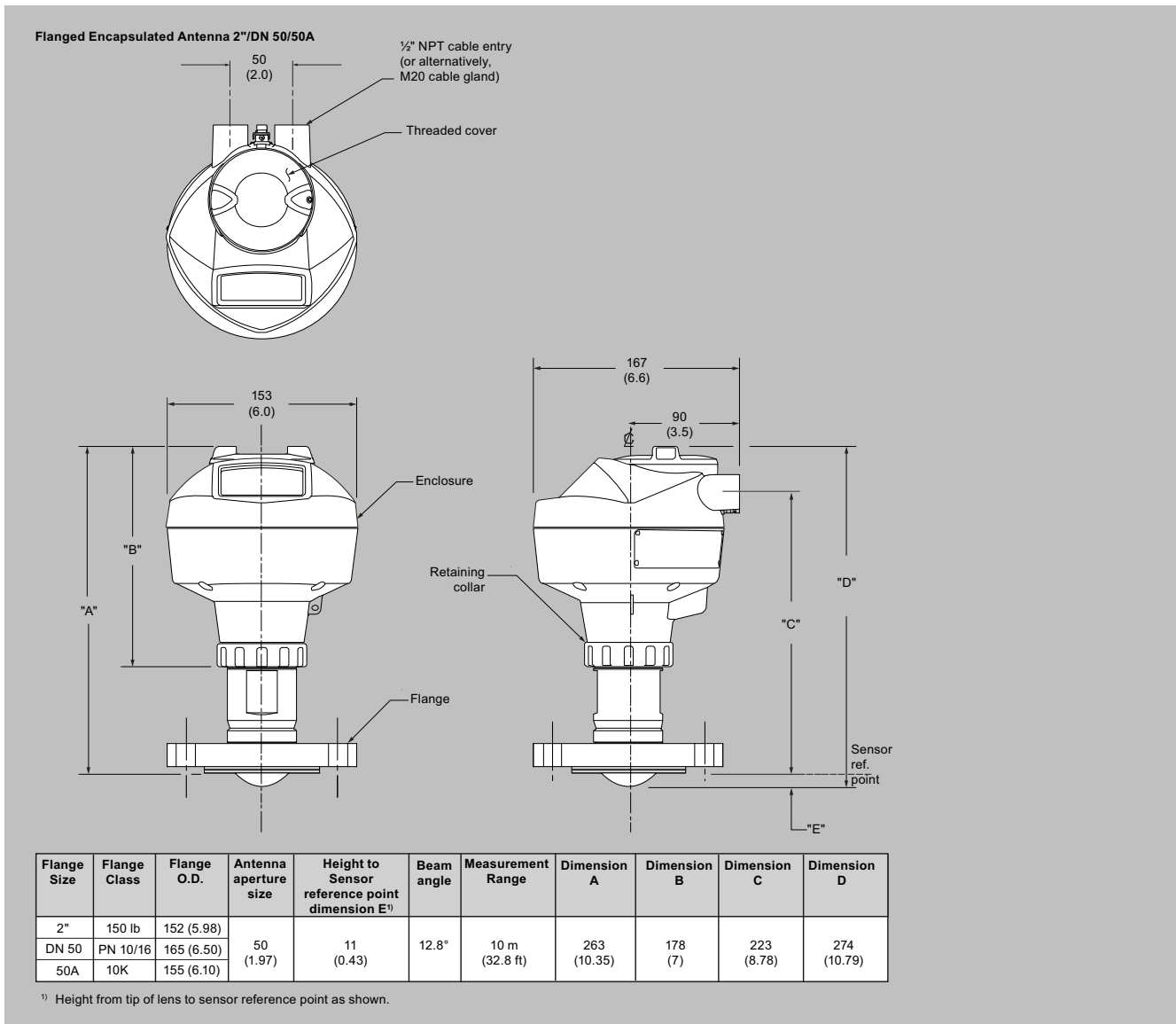
**Pressure/ temperature curve**  
**LR250 Flanged Encapsulated Antenna**  
**JIS B 2220 flanged process connections**  
**(7ML5432)**



SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

SITRANS LR250 Flanged Encapsulated Antenna

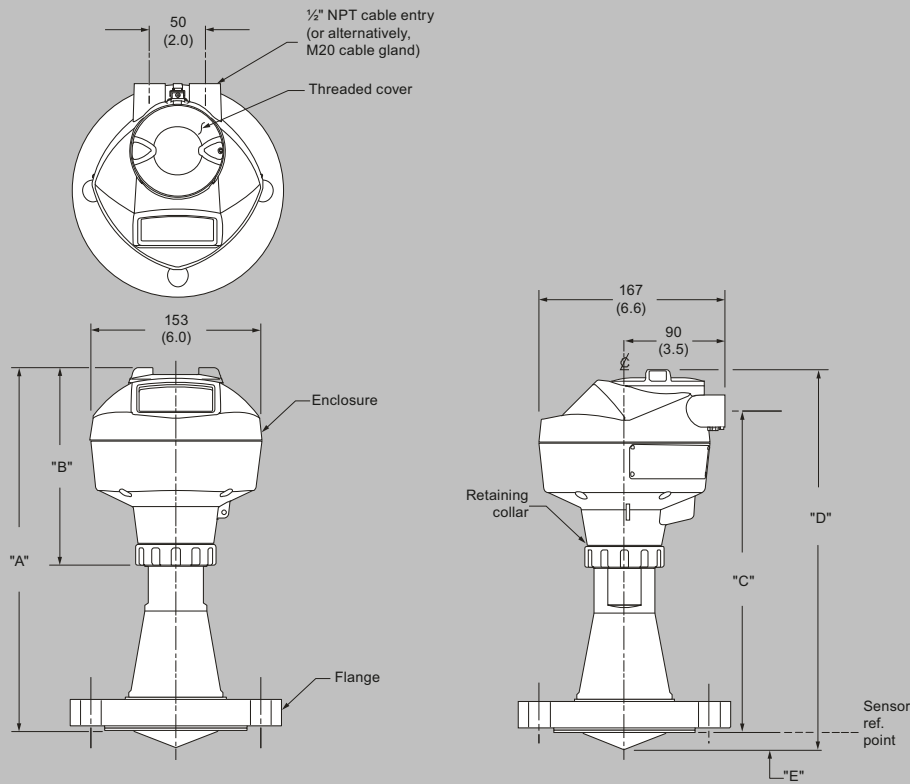
Dimensional drawings



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

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 <sup>1)</sup>	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)								

<sup>1)</sup> 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

## 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 and PROFIBUS PA 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