

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

Overview



SITRANS LR200 is a 2-wire, 6 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
- 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.

Start-up 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 patented Process Intelligence signal-processing technology for superior reliability.

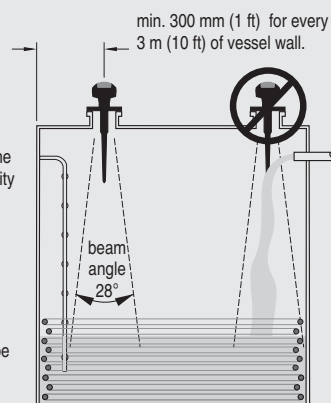
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, high temperatures, asphalt, digesters

Configuration

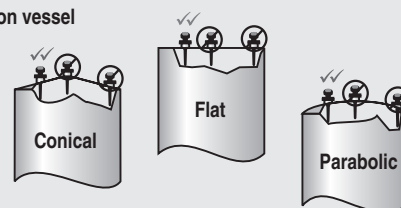
Installation

Note:

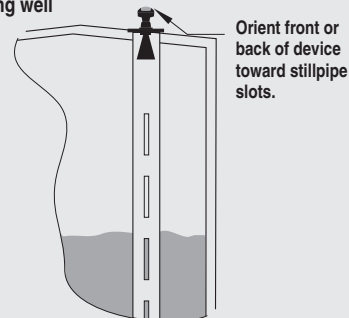
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected



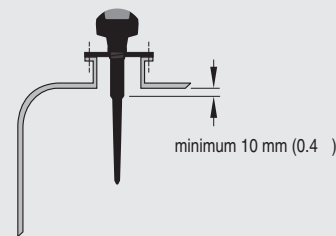
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



SITRANS LR200 installation

Technical specifications

Mode of operation

Measuring principle	Radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 to 20 m (1.0 to 65 ft)

Output

• Analog output	4 to 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")
• Remainder of range:	10 mm (0.4") or 0.1% of span (whichever is greater)

Rated operating conditions

Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 to +80 °C (-40 to +176 °F)
• Installation category	I
• Pollution degree	4

Medium conditions

• Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use waveguide antenna or stillpipe)
• Vessel temperature and pressure	Varies with connection type; see Pressure/Temperature curves for more information

Design

• Enclosure	
- Material	Aluminium, polyester powder coated
- Cable inlet	2 x M20x1.5 or 2 x 1/2" NPT with adapter
• Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68
• Weight	< 2 kg (4.4 lbs) (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") shield for maximum 100 mm (4") nozzle, or optional 250 mm (10") long shield
- Optional rods, horn and waveguides	Refer to SITRANS LR200 Antennas for optional rods, horns and waveguides

Process connections

• Process connection	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226], or G 1 1/2" [(BSP), EN ISO 228-1] (polypropylene rod antenna)
• Flange connection	Refer to SITRANS LR200 Antennas for more connections

Power supply

4 to 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	<ul style="list-style-type: none"> • 10.5 mA • per IEC 61158-2

Certificates and approvals

• General	CSA _{US/C} , CE, FM, C-TICK
• Marine	<ul style="list-style-type: none"> • Lloyd's Register of Shipping • ABS Type Approval
• Radio	FCC, Industry Canada and European (R&TTE), C-TICK
• Hazardous	
- Flame proof (Europe)	ATEX II 1/2 G EEx dmia IIC T4
- Increased safety (Europe)	ATEX II 1/2 G EEx emia IIC T4
- Explosion proof (USA/Canada)	CSA/FM (barrier not required) T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
- Non-incendive (USA)	FM (barrier not required) T5, Class I, Div. 2, Groups A, B, C, D
- Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
- Intrinsically Safe (USA/Canada)	CSA/FM (barrier required) T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
- Intrinsically Safe (Australia)	ANZEX Ex ia IIC T4 [Ta = -40 to +80 °C (-40 to +176 °F)] IP67
- Intrinsically Safe (International)	IECEx TSA 04.0020X T4
• Brazil - INMETRO	BR-Ex ia IIC T4

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 Ta = -20 to +50 °C CSA/FM Class I, II, and III, Div. 1., Groups A, B, C, D, E, F, G, T6 Ta = +50 °C
• Handheld communicator	HART communicator 375
• PC	<ul style="list-style-type: none"> • SIMATIC PDM • AMS
• Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

HART® is a registered trademark of the Hart Communications Foundation.

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Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Order No.
SITRANS LR200, Uni-Construction polypropylene rod antenna version 2-wire, 6 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). Max. 3 bar g (43.5 psi g) pressure and +80 °C (+176 °F)	C) 7 ML 5 4 2 2 - ■■■■ 0
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT, Siemens LUI interface 2 x M20x1.5, Siemens LUI interface	2 3
Polypropylene antenna type - (Max. 3 Bar pressure and +80 °C) 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield	A B C D E F
Approvals General Purpose, CE ¹⁾ General Purpose, CSA _{us.c.} , FM, for North America only ²⁾ CSA Class I and II, Div. I, Groups A, B, C, D, G, 6.3 GHz, for North America only, Intrinsically Safe with suitable barrier ²⁾ FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier ²⁾ ATEX II 1G EEx ja IIC T4, Intrinsically Safe with suitable barrier ¹⁾ FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required) ^{2) 3)} ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{1) 4) 5)} ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{1) 5)} CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) ^{2) 3) 5)}	A B C D E F G H J
Communication/Output PROFIBUS PA 4 to 20 mA, HART [®] , startup at <3.6 mA	2 3

¹⁾ Includes European Radio approval (R&TTE), 5.8 GHz, C-TICK

²⁾ Includes Radio approval FCC, 6.3 GHz

³⁾ Available with enclosure option 2 only

⁴⁾ Available with enclosure option 3 only

⁵⁾ Available with communication option 1 and 3 only

C) Subject to export regulations AL: N, ECCN: EAR99

Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 Namur NE43 compliant, device preset to failsafe <3.6 mA ⁵⁾	Y15 C11 N07
Operating Instructions for HART/mA device English German Note: The Operating Instructions should be ordered as a separate line item on the order. Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5JP02 C) 7ML1998-5JP32 C) 7ML1998-5XC82
Operating Instructions for PROFIBUS PA device English German Note: The Operating Instructions should be ordered as a separate line item on the order. Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5JR01 C) 7ML1998-5JR31 C) 7ML1998-5XD81
Accessories Handheld programmer, Intrinsically safe, EEx ia HART modem/RS-232 (for use with a PC and SIMATIC PDM) HART modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART ¹⁾ One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA ⁶⁾ SITRANS RD100 Remote display - see RD100 on page 5/324 SITRANS RD200 Remote display - see RD200 on page 5/327 SITRANS RD500 Remote display - see RD500 on page 5/331	C) 7ML1930-1BK D) 7MF4997-1DA D) 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ

¹⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

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Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Order No.
SITRANS LR200, Flange Adapter, Sanitary Version	C) 7 ML 5 4 2 4 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).	
Antenna material (uses antenna adapter)	0 1
PTFE, one piece rod antenna UHMW-PE, one piece rod antenna	
Process connection	A
Sanitary fitting clamp	
Configuration/Connection size	A B C
2" connection, rod antenna only 3" connection, rod antenna only 4" connection, rod antenna only	
Antenna extension	0
No extension	
Mounting Clamp	0 1
No mounting clamp Mounting clamp included, not available with Pressure rating option 0	
Enclosure/Cable inlet	2 3
Aluminum, Epoxy painted 2 x 1/2" NPT, Siemens LUI interface C) 2 x M20x1.5, Siemens LUI interface C)	
Communication/Output	B C
PROFIBUS PA 4 to 20 mA, HART®, startup at <3.6 mA	
Approvals	A B C D E F G H J
General Purpose, CE ¹⁾ General Purpose, CSA _{USC} , FM, C) for North America only ²⁾ CSA Class I and II, Div. I, Groups A, B, C, D, G, for C) North America only, Intrinsically Safe with suitable barrier ²⁾ FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, C) for North America only, Intrinsically Safe with suitable barrier ²⁾ ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier ¹⁾ FM, Class I, Div. 2, Groups A, B, C, D, FCC C) 6.3 GHz, for North America only (no barrier required) ³⁾ ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{1) 4) 5)} ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{1) 5)} CSA/FM Class I, II and III, Div. 1, Groups A, B, C, C) D, E, F, G (no barrier required) ^{2) 3) 5)}	
Pressure rating	0 1
Rating per Pressure/Temperature curves in Manual 0.5 bar g (7.25 psi g) maximum	

1) Includes European Radio approval (R&TTE), 5.8 GHz, C-TICK

2) Includes Radio approval FCC, 6.3 GHz

3) Available with enclosure option 2 only

4) Available with enclosure option 3 only

5) Available with communication option A and C only

C) Subject to export regulations AL: N, ECCN: EAR99

Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y15
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe <3.6 mA ⁵⁾	N07
Operating Instructions for HART/mA device	
English	C) 7ML1998-5JP02
German	C) 7ML1998-5JP32
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5XC81
Operating Instructions for PROFIBUS PA device	
English	C) 7ML1998-5JR02
German	C) 7ML1998-5JR32
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5XD81
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	C) 7ML1930-1BK
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DA
HART modem/USB (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DB
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART ¹⁾	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA ⁶⁾	7ML1930-1AQ
SITRANS RD100 Remote display - see RD100 on page 5/324	
SITRANS RD200 Remote display - see RD200 on page 5/327	
SITRANS RD500 Remote display - see RD500 on page 5/331	
Sanitary fitting clamps	
2", 304 stainless steel	7ML1830-1HD
3", 304 stainless steel	7ML1830-1HE
4", 304 stainless steel	7ML1830-1HF

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

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Order No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version	C) 7 ML 5 4 2 3 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).	
Antenna material (uses antenna adapter)	1
PTFE, uses antenna adapter and additional process connection below	
Process connection (refer to Pressure/Temperature curves in Operating Instructions)	
Flanges (316L stainless steel)	
DN 50 PN 16, Type A, flat faced	AA
DN 80 PN 16, Type A, flat faced	BA
DN 100 PN 16, Type A, flat faced	CA
DN 150 PN 16, Type A, flat faced	DA
2" ASME 150 lb, flat faced	FB
3" ASME 150 lb, flat faced	GB
4" ASME 150 lb, flat faced	HB
6" ASME 150 lb, flat faced	JB
DN 50 PN 40, flat faced	AC
DN 80 PN 40, flat faced	BC
DN 100 PN 40, flat faced	CC
DN 150 PN 40, flat faced	DC
2" ASME 300 lb, flat faced, available with Pressure rating option 1 only	FD
3" ASME 300 lb, flat faced	GD
4" ASME 300 lb, flat faced	HD
6" ASME 300 lb, flat faced	JD
JIS DN 50 10K	AE
JIS DN 80 10K	BE
JIS DN 100 10K	CE
JIS DN 150 10K	DE
(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]	LA
2" NPT [(Taper), ANSI/ASME B1.20.1]	MA
R 1½" [(BSPT), EN 10226]	LC
R 2" [(BSPT), EN 10226]	MC
G 1½" [(BSPP), EN ISO 228-1]	LE
G 2" [(BSPP), EN ISO 228-1]	ME
Antenna extensions or Inactive shield length	
No antenna extension	0
50 mm (2") extension, PTFE	1
100 mm (4") extension, PTFE	2
100 mm (4") extension, 316L stainless steel shield ¹⁾	3
150 mm (6") extension, 316L stainless steel shield ¹⁾	4
200 mm (8") extension, 316L stainless steel shield ¹⁾	5
250 mm (10") extension, 316L stainless steel shield ¹⁾	6
Custom inactive shield length 101 mm to 1000 mm (in 1 mm increments)	7
Add order code Y01 and plain text: "Inactive shield length...mm" ¹⁾	
Process seal/gasket	
Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 to 6	0
FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	1
Enclosure/Cable inlet	
Aluminum, Epoxy painted	
2 x ½" NPT, Siemens LUI interface	C) 2
2 x M20x1.5, Siemens LUI interface	C) 3
Communication/Output	
PROFIBUS PA	B
4 to 20 mA, HART®, startup at <3.6 mA	C

Selection and Ordering data	Order No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version	C) 7 ML 5 4 2 3 -
2-wire, 6 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).	
Approvals	
General Purpose, CE ²⁾	A
General Purpose, CSA _{USC} . FM, for North America only ³⁾	B
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier ³⁾	C
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier ³⁾	D
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier ²⁾	E
FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) ^{3) 4)}	F
ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{2) 5) 6)}	G
ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{2) 6)}	H
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) ^{2) 4) 6)}	J
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) Includes European Radio approval (R&TTE), 5.8 GHz, C-TICK	
3) Includes Radio approval FCC, 6.3 GHz	
4) Available with enclosure option 2 only	
5) Available with enclosure option 3 only	
6) Available with communication option A and C only	
C) Subject to export regulations AL: N, ECCN: EAR99	
Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Inactive custom shield lengths: Enter the total length of the inactive shield in plain text description (in 1 mm increments).	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y15
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe <3.6 mA ⁵⁾	N07
Operating Instructions for HART/mA device	
English	C) 7ML1998-5JP02
German	C) 7ML1998-5JP32
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual	C) 7ML1998-5XC81
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	
Operating Instructions for PROFIBUS PA device	
English	C) 7ML1998-5JR02

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Further designs

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

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.

Accessories

Handheld programmer, Intrinsically safe, EEx ia

HART modem/RS-232 (for use with a PC and SIMATIC PDM)

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

One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART¹⁾

One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA⁶⁾

Antenna, rod, PTFE

Antenna extension, 50 mm (2") PTFE

Antenna extension, 100 mm (4") PTFE

SITRANS RD100 Remote display - see RD100 on page 5/324

SITRANS RD200 Remote display - see RD200 on page 5/327

SITRANS RD500 Remote display - see RD500 on page 5/331

¹⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Order code

C) **7ML1998-5JR32**

C) **7ML1998-5XD81**

C) **7ML1930-1BK**

D) **7MF4997-1DA**

D) **7MF4997-1DB**

7ML1930-1AP

7ML1930-1AQ

7ML1830-1HC

7ML1830-1CG

7ML1830-1CH

Selection and Ordering data

Order No.

SITRANS LR200, Flange Adapter/Horn Antenna C)

7ML 5 4 2 5 -

Version
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Antenna 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 inlet¹⁾
Sliding waveguide system with 1000 mm (40") waveguide^{1) 2)}

0

1

2

Process connection (refer to Pressure/Temperature curves on specification sheets)

Flanges (316L stainless steel)
DN 50 PN 16, Type A, flat faced¹⁾
DN 80 PN 16, Type A, flat faced
DN 100 PN 16, Type A, flat faced
DN 150 PN 16, Type A, flat faced
DN 200 PN 16, Type A, flat faced

DN 80 PN 10/16 DIN EN1092-1 form B1
DN 100 PN 10/16 DIN EN1092-1 form B1
DN 150 PN 10/16 DIN EN1092-1 form B1
DN 200 PN 16 DIN EN1092-1 form B1

2" ASME 150 lb, flat faced¹⁾
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 faced¹⁾
DN 80 PN 40, flat faced
DN 100 PN 40, flat faced

DN 80 PN 25/40 DIN EN1092-1 form B1
DN 100 PN 25/40 DIN EN1092-1 form B1
DN 150 PN 25/40 DIN EN1092-1 form B1

2" ASME 300 lb, flat faced¹⁾
3" ASME 300 lb, flat faced
4" ASME 300 lb, flat faced

JIS DN 50 10K¹⁾
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.)

Communication/Output

PROFIBUS PA
4 to 20 mA, HART[®], startup at <3.6 mA

1

2

Process seal/gasket

FKM (-40 to +200 °C)
Nitrile (-40 to +60 °C), sliding waveguide systems only
FFKM (-35 to +200 °C)

0

1

2

Enclosure/Cable inlet

Aluminum, Epoxy painted
2 x 1/2" NPT, Siemens LUI interface
2 x M20x1.5, Siemens LUI interface

2

3

Horn size/Waveguide options

80 mm (3") horn³⁾ D) B
100 mm (4") horn³⁾ D) C
150 (6") mm horn D) D
200 (8") mm horn E
100 mm (4") horn with 100 mm (4") waveguide extension³⁾ D) F
100 mm (4") horn with 150 mm (6") waveguide extension³⁾ G
100 mm (4") horn with 200 mm (8") waveguide extension³⁾ H
100 mm (4") horn with 250 mm (10") waveguide extension³⁾ D) J

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SITRANS LR200

Selection and Ordering data	Order No.
SITRANS LR200, Flange Adapter/Horn Antenna Version	7ML5425-
2-wire, 6 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).	
150 mm (6") horn with 100 mm (4") waveguide extension	K
150 mm (6") horn with 150 mm (6") waveguide extension	L
150 mm (6") horn with 200 mm (8") waveguide extension	M
150 mm (6") horn with 250 mm (10") waveguide extension	N
200 mm (8") horn with 100 mm (4") waveguide extension	P
200 mm (8") horn with 150 mm (6") waveguide extension	Q
200 mm (8") horn with 200 mm (8") waveguide extension	R
200 mm (8") horn with 250 mm (10") waveguide extension	S
Waveguide only - Waveguide length 500 mm to 3000 mm (in 1 mm increments) <u>(Add order code Y01 and plain text: "waveguide length...mm")</u>	T
Approvals	
General Purpose, CE ⁴⁾	A
General Purpose, CSA _{USC} , FM, for North America only ⁵⁾	B
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier ⁵⁾	C
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier ⁵⁾	D
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier ⁴⁾	E
FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required) ^{5) 6)}	F
ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{4) 7) 8)}	G
ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{4) 8)}	H
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) ^{5) 6) 8)}	J
Pressure rating	
Rating per Pressure/Temperature curves in Manual 0.5 bar g (7.25 psi g) maximum	0 1
1) Available with pressure rating option 1 only	
2) Maximum Process Temperature +60 °C (+140 °F)	
3) For stillpipe applications only	
4) Includes European Radio approval (R&TTE), 5.8 GHz, C-TICK	
5) Includes Radio approval FCC, 6.3 GHz	
6) Available with enclosure option 2 only	
7) Available with enclosure option 3 only	
8) Available with communication option 0 and 2 only	
C) Subject to export regulations AL: N, ECCN: EAR99	
D) Subject to export regulations AL: N, ECCN: EAR99H	

Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Inactive custom shield lengths: Enter the total length of the inactive shield in plain text description (in 1 mm increments).	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y15
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe <3.6 mA ⁵⁾	N07
Operating Instructions for HART/mA device	
English	C) 7ML1998-5JP02
German	C) 7ML1998-5JP32
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5XC81
Operating Instructions for PROFIBUS PA device	
English	C) 7ML1998-5JR02
German	C) 7ML1998-5JR32
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5XC81
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	C) 7ML1930-1BK
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DA
HART modem/USB (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DB
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART ¹⁾	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA ⁶⁾	7ML1930-1AQ
SITRANS RD100 Remote display - see RD100 on page 5/324	
SITRANS RD200 Remote display - see RD200 on page 5/327	
SITRANS RD500 Remote display - see RD500 on page 5/331	
1) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.	
C) Subject to export regulations AL: N, ECCN: EAR99	
D) Subject to export regulations AL: N, ECCN: EAR99H	

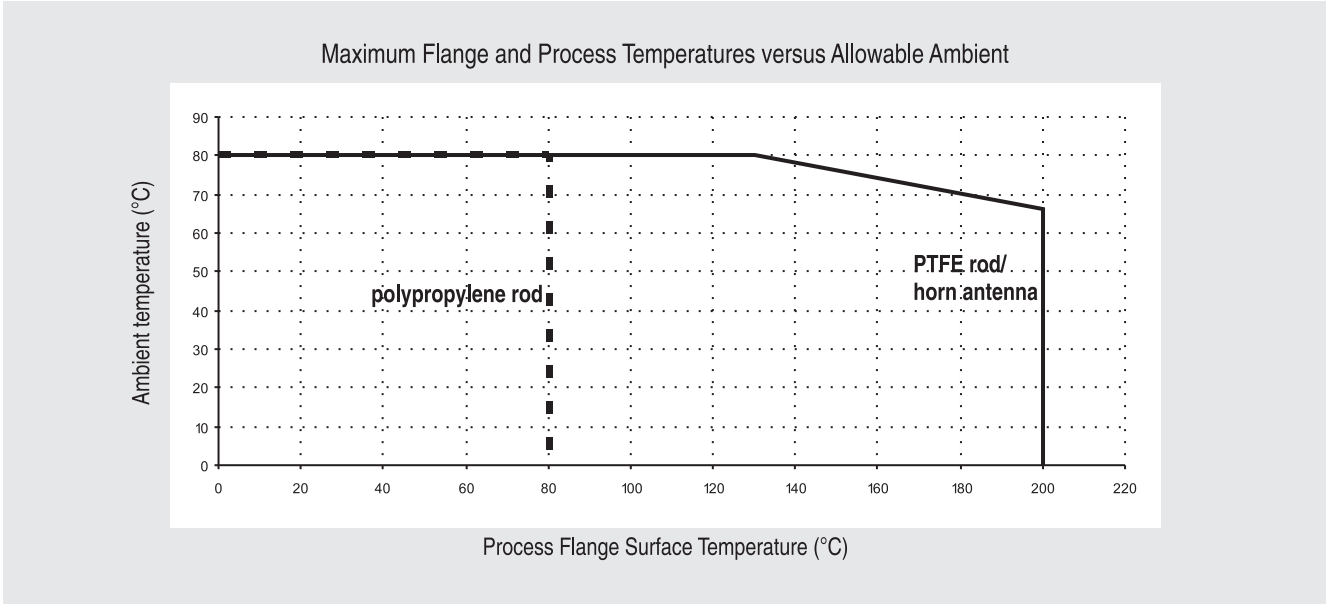
5

Level instruments

Continuous level measurement - Radar transmitters

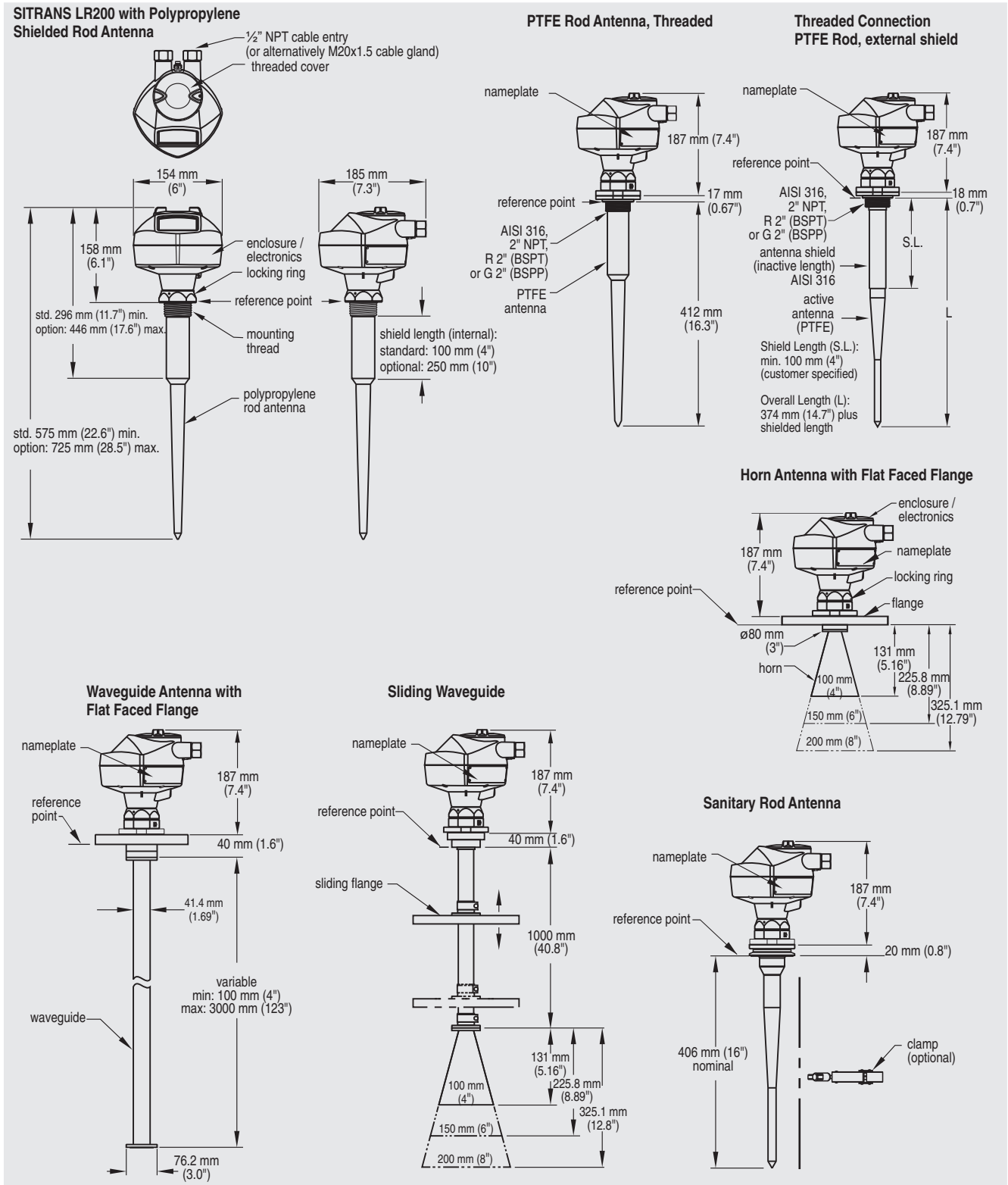
SITRANS LR200

Characteristic curves



SITRANS LR200 Ambient/Process Flange Surface Temperature Curve

Dimensional drawings



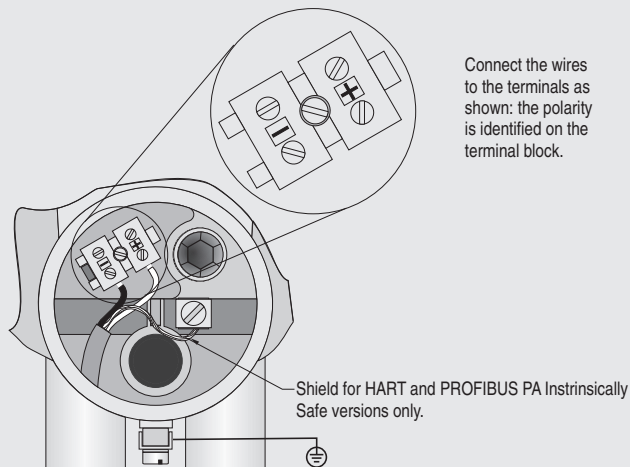
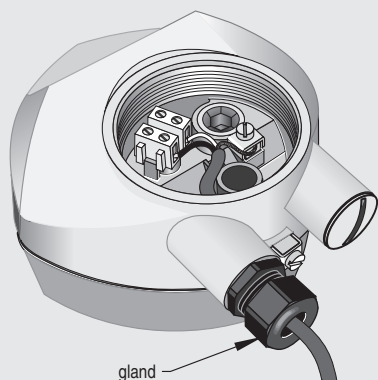
SITRANS LR200 dimensions

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

Schematics



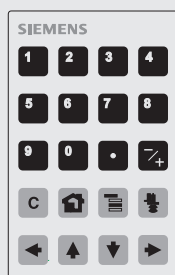
Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

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 to 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

Hand Programmer

Part number:
7ML1930-1BK



SITRANS LR200 connections

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200



Antenna configurations for SITRANS LR200

Technical specifications

Antenna Types	Flat Faced Flange with Rod	Shielded Rod	Sanitary Rod (1 piece construction)	Horn (4", 6", 8" sizes available)	Waveguide
Connection type	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")	Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4")	Sanitary fitting clamp 50, 80, 100 mm (2, 3, 4") sizes	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")
Wetted parts	PTFE	PTFE, 316L stainless steel, FKM o-ring	UHME-PE or PTFE	316L stainless steel PTFE, FKM o-ring	316L stainless steel PTFE, FKM o-ring
Extensions	50 or 100 mm (2 or 4") PTFE or UHMW-PE	100, 150, 200 or 250 mm (4, 6, 8 or 10") standard shield length	N/A	use waveguide for extensions to 6 m (20 ft) long	two sections (max.) can be connected together Max. overall length: 3 m (9.8 ft)
Dielectric constant	> 3	> 3	> 3	> 3	> 1.6
Insertion length (max.)	41 cm (16.3")	variable	41 cm (16.3")	variable with extension	variable
Purging option (liquid or gas)	No	No	No	Yes	Yes
Sliding waveguide option for digesters¹⁾	Yes	No	No	Yes	N/A
Weight²⁾	6.5 kg (14.3 lbs)	5.0 kg (11 lbs)	5.0 kg (11 lbs)	7.5 kg (16.5 lbs)	8.0 kg (17.6 lbs) 1 m (39") length

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




Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and ordering Data


SITRANS LR200 Specials


	Order No.		Order No.
SITRANS LR200 Aluminum Enclosure Kit with Electronics and Covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART [®] communication, no process connection. See note 7.	C) A5E01483323
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART [®] communication, no process connection. See note 7.		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option C, with HART [®] communication, no process connection. See note 7.	C) A5E01483368
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, M20 cable inlet, approval option C, with HART [®] communication, no process connection. See note 7.		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. See note 7.	C) A5E01483389
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. See note 7.		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. See note 7.	C) A5E01483420
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. See note 7.		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. See note 7.	C) A5E01483440
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. See note 7.		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART [®] communication, no process connection. See note 7.	C) A5E01483456
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART [®] communication, no process connection. See note 7.		SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option C, with HART [®] communication, no process connection. See note 7.	C) A5E01483468
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option C, with HART [®] communication, no process connection. See note 7.		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with HART [®] communication, no process connection. See note 7.	C) A5E01483480
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with HART [®] communication, no process connection. See note 7.		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with HART [®] communication, no process connection. See note 7.	C) A5E01483493
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with HART [®] communication, no process connection. See note 7.		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. See note 7.	C) A5E01483536
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. See note 7.		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. See note 7.	C) A5E01483547
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. See note 7.			C) A5E01483559
		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART [®] communication start-up at <3.6mA, no process connection. See note 7.	C) A5E02956419
		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART [®] communication start-up at <3.6mA, no process connection. See note 7.	C) A5E02956420
		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option G, with HART [®] communication start-up at <3.6mA, no process connection. See note 7.	C) A5E02956421
		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option H, with HART [®] communication start-up at <3.6mA, no process connection. See note 7.	C) A5E02956422
		SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)	
		80 mm (3") horn antenna kit	PBD-25500K02A
		100 mm (4") horn antenna kit	PBD-25500K03A
		150 mm (6") horn antenna kit	PBD-25500K05A
		200 mm (8") horn antenna kit	PBD-25500K07A
		SITRANS LR200 Extension Kits for Horn Antenna with mounting screws	
		100 mm (4") extension kit for horn antenna	PBD-25501K0100A
		150 mm (6") extension kit for horn antenna	PBD-25501K0150A
		200 mm (8") extension kit for horn antenna	PBD-25501K0200A
		250 mm (10") extension kit for horn antenna	PBD-25501K0250A
		500 mm (20") extension kit for horn antenna	PBD-25501K0500A
		1000 mm (40") extension kit for horn antenna	PBD-25501K1000A
		SITRANS LR200 Flanged Rod Antenna Kit with 316L SS flat faced flanges	
		Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar . See notes 1 and 6.	PBD-51003K020AAAA
		Flanged PTFE rod antenna kit, DN 50 PN16. See drawing 51003 on http://www.siemens.com/radar . See notes 1 and 6.	PBD-51003K050AJAA
		Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar . See notes 1 and 6.	PBD-51003K050AOAA


Level instruments


Continuous level measurement - Radar transmitters


SITRANS LR200


Order No.	
	<p>SITRANS LR200 PTFE Rod Antenna Kit with 316L SS 1½" pipe thread process connection</p>  <p>PTFE rod antenna kit, 1½" NPT 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.</p> <p>PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.</p> <p>PTFE rod antenna kit, 1½" G 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.</p>
PBD-51004K1AAA	
PBD-51004K2AAA	
PBD-51004K3AAA	

	<p>SITRANS LR200 PTFE Rod Antenna Kit with 316L SS 2" pipe thread process connection</p>  <p>PTFE rod antenna kit, 2" NPT 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.</p> <p>PTFE rod antenna kit, R 2" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.</p> <p>PTFE rod antenna kit, 2" G 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.</p>
PBD-51005K1AAA	
PBD-51005K2AAA	
PBD-51005K3AAA	

	<p>SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L SS 2" pipe thread process connection</p>  <p>PTFE rod antenna shielded kit, 2" NPT 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.</p> <p>PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.</p> <p>PTFE rod antenna shielded kit, 2" G 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.</p>
PBD-51002K0100AAA	
PBD-51002K0100BAA	
PBD-51002K0100CAA	

Order No.	
	<p>SITRANS LR200 Horn Antenna Kit with 316L SS flat faced flange, with PTFE emitter (without waveguide)</p>  <p>Horn antenna kit, 2" ASME 316L SS flange 3" horn, PTFE emitter; See notes 1 and 6.</p> <p>Horn antenna kit, 2" ASME 316L SS flange 4" horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, 2" ASME 316L SS flange 6" horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, 2" ASME 316L SS flange 8" horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, DN 50 PN 16 316L SS flange 80 mm horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, DN 50 PN 16 316L SS flange 100 mm horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, DN 50 PN 16 316L SS flange 150 mm horn, PTFE emitter; See notes 1 and 2.</p> <p>Horn antenna kit, DN 50 PN 16 316L SS flange 200 mm horn, PTFE emitter; See notes 1 and 2.</p>
PBD-51006K020AAAA	
PBD-51006K020AABA	
PBD-51006K020AACA	
PBD-51006K020AADA	
PBD-51006K050AJAA	
PBD-51006K050AJBA	
PBD-51006K050AJCA	
PBD-51006K050AJDA	

	<p>SITRANS LR200 Sanitary Rod Antenna with Sanitary Fitting Clamp Flange mounting and bushing. See drawing 51010 on http://www.siemens.com/radar (Sanitary Fitting Clamps not included)</p>  <p>PTFE sanitary rod antenna kit, 2" mounting connection. See note 6.</p> <p>PTFE sanitary rod antenna kit, 3" mounting connection. See note 6.</p> <p>PTFE sanitary rod antenna kit, 4" mounting connection. See note 6.</p> <p>UHMW-PE sanitary rod antenna kit, 2" mounting connection. See note 6.</p> <p>UHMW-PE sanitary rod antenna kit, 3" mounting connection. See note 6.</p> <p>UHMW-PE sanitary rod antenna kit, 4" mounting connection). See note 6.</p>
PBD-51010K1AA	
PBD-51010K2AA	
PBD-51010K3AA	
PBD-51010K1AB	
PBD-51010K2AB	
PBD-51010K3AB	

	<p>SITRANS LR200 PTFE Flanged Rod Antenna Kit with 316L SS shield and 316L SS flat faced flange</p>  <p>PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 100 mm 316L SS shield. See notes 1 and 6.</p> <p>PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 100 mm 316L SS shield. See notes 1 and 6.</p> <p>PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 150 mm 316L SS shield. See notes 1 and 6.</p> <p>PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 150 mm 316L SS shield. See notes 1 and 6.</p>
PBD-51014K0100AAA	
PBD-51014K0100EJA	
PBD-51014K0150AAA	
PBD-51014K0150EJA	

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Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR200

	Order No.
	Order No.
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 200 mm 316L SS shield. See notes 1 and 6.	PBD-51014K0200AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 200 mm 316L SS shield. See notes 1 and 6.	PBD-51014K0200EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 250 mm 316L SS shield. See notes 1 and 6.	PBD-51014K0250AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 250 mm 316L SS shield. See notes 1 and 6.	PBD-51014K0250EJA
PTFE paste	
Kit, PTFE paste, Tube, 250 mL. See note 7.	C) PBD-51036065
Cable gland	
One polymeric cable gland M20x1.5, rated -20 to +80 °C (-4 to +176 °F) for General Purpose and ATEX EEx e	7ML1930-1AN
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART®	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA	7ML1930-1AQ

C) Subject to export regulations AL: N, ECCN: EAR99

Please contact nacc.smpi@siemens.com for special requests.

Note 1: Available in flange sizes including ASME, DIN and JIS: please contact nacc.smpi@siemens.com.

Note 2: Available with no pressure rating

Note 3: Available in other shield lengths: please contact nacc.smpi@siemens.com.

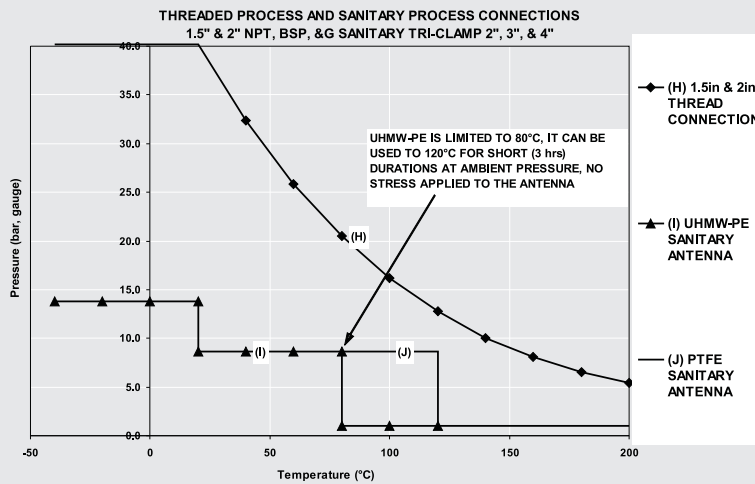
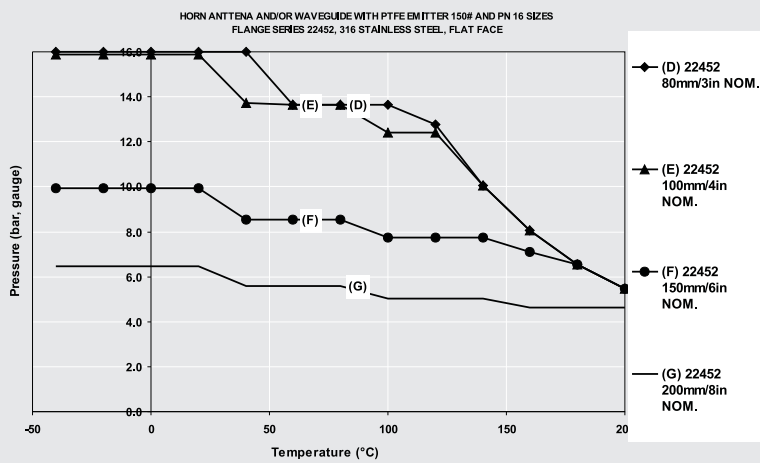
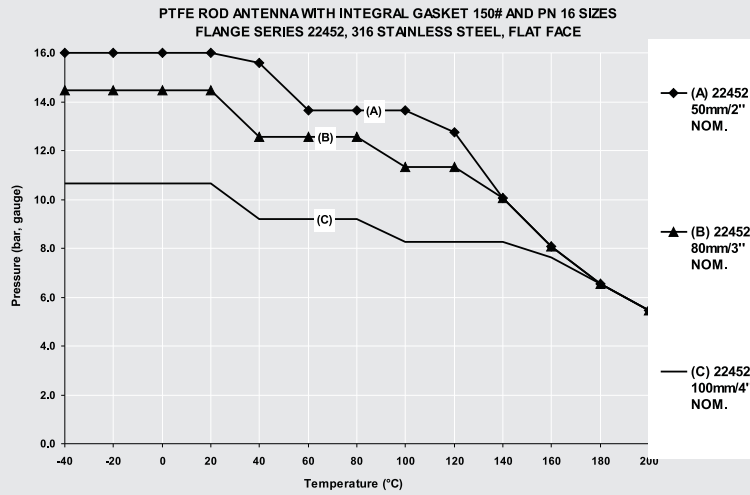
Note 4: Available with no pressure rating and with General Purpose Approvals only

Note 5: Please contact nacc.smpi@siemens.com for pricing and part number. Submit completed Application Questionnaire found on page 5/204.

Note 6: Available with Pressure rating; serial number of original unit required with completed Application Questionnaire found on page 5/204.

Note 7: Subject to export regulations AL: N, ECCN: EAR99

Characteristic curves



SITRANS LR200 Process Pressure/Temperature derating curves

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR250

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 horn 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") from the end of the horn
- Communication using HART® or PROFIBUS PA, or FOUNDATION Fieldbus™
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM.

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 options and decreasing sensitivity to obstructions.

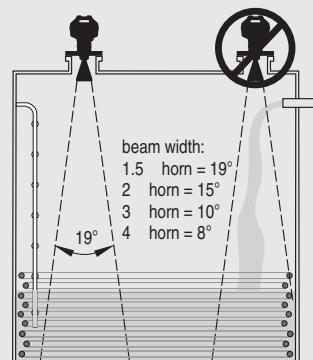
SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

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 with agitators, vaporous liquids, high temperatures, low dielectric media

Configuration

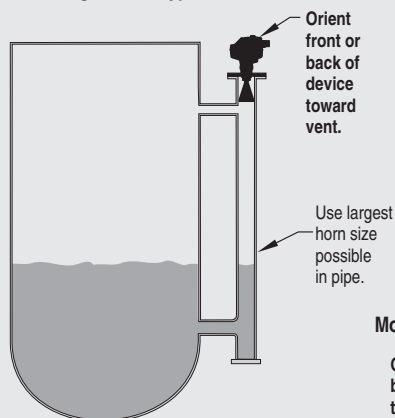
Installation



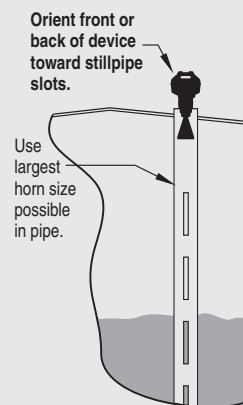
Note:

- 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

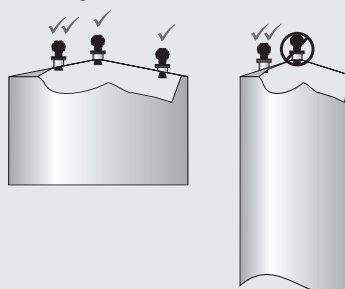
Mounting unit on bypass



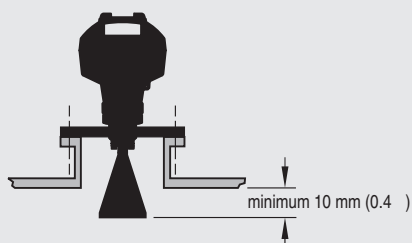
Mounting unit on stilling well



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 installation

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR250

Technical specifications

Mode of operation

Measuring principle	Radar level measurement
Frequency	K-band (25.0 GHz)
Minimum measuring range	50 mm (2") from end of horn
Maximum measuring range	20 m (65 ft), horn dependent

Output

• HART®:	Version 5.1
- Analog output	4 to 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 3.1
- Function blocks	2 Analog Input (AI)
• FOUNDATION Fieldbus™	H1
- Functionality	Basic or LAS
- Version	ITK 5.2.0
- Function blocks	2 Analog Input (AI)

Performance (according to reference conditions IEC60770-1)

• Maximum measured error	5 mm (0.2")
• Influence of ambient temperature	<0.003 %/K

Rated operating conditions

<u>Installation conditions</u>	
• Location	Indoor/outdoor
<u>Ambient conditions (enclosure)</u>	
• Ambient temperature	-40 to +80 °C (-40 to +176 °F)
• Installation category	I
• Pollution degree	4

Medium conditions

• Dielectric constant ϵ_r	$\epsilon_r > 1.6$, horn and application dependent
• Process temperature	-40 to +200 °C (-40 to +392 °F) (at process connection with FKM o-ring) -20 to +200 °C (-4 to +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	Aluminium, polyester powder-coated
- Cable inlet	2 x M20x1.5 or 2 x 1/2" NPT
• Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68
• Weight	< 3 kg (6.6 lbs) 3.75 mm (1/2") 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 [optional alloy N06022/2.4602 (Hastelloy® C-22® or equivalent)]
- Dimensions (nominal horn sizes)	Standard 1.5" (40 mm), 2" (48 mm), 3" (75 mm), 4" (95 mm) horn and optional 100 mm (4") horn extension

Process connections

• Process connection	1 1/2" or 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" or 2" [(BSPT), EN 10226] G 1 1/2" or 2" [(BSPP), EN ISO 228-1]
• Flange connection	2", 3", 4" (ANSI 150, 300 lbs), 50, 80, 100 mm (PN 16, 40, JIS 10K)

Power supply

4 to 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, NE 21, C-TICK
• Radio	FCC, Industry Canada and Europe ETSI EN 302-372, C-TICK
• Hazardous	
- Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 ATEX II 1D Ex tD A20 IP67 T90°C
- Non-sparking/Energy Limited (Europe)	ATEX II 3G Ex nA/nL IIC T4 Gc
- 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
- Intrinsically Safe (International)	IECEx Ex ia IIC T4, Ex tD A20 IP67 T90°C
- Flame Proof (International/Europe)	IECEx/ATEX II 1/2 GD, 1D, 2D, Ex dmbia IIC T4 Ga/Gb, Ex tD A20 IP67 T90°C
- Increased Safety (International/Europe)	IECEx/ATEX II 1/2 GD, 1D, 2D, Ex embia IIC T4 Ga/Gb, Ex tD A20 IP67 T90°C
- 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
• Marine	<ul style="list-style-type: none"> • Lloyd's Register of Shipping • ABS Type Approval • Bureau Veritas

Programming

• Intrinsically Safe Siemens handheld programmer	Infrared receiver
- Approvals for handheld programmer	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135°C Ta = -20 to +50 °C CSA/FM Class I, II, III, Div. 1., Groups A, B, C, D, E, F, G, T6 Ta = +50 °C IECEx SIR 09.0073

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<ul style="list-style-type: none">• Handheld communicator• PC	HART communicator 375/475 <ul style="list-style-type: none">• SIMATIC PDM• Emerson AMS• SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
<ul style="list-style-type: none">• Display (local)	Graphic local user interface including quick start wizard and echo profile displays

®HART is a registered trademark of the Hart Communications Foundation.

™FOUNDATION Fieldbus is a trademark of Fieldbus Foundation.

®Hastelloy and ®C-22 are registered trademarks of Haynes International Inc.

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR250

Selection and Ordering data	Order No.
SITRANS LR250	C) 7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.	0 -
Process Connection and Antenna Material	
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FKM seal	0
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal	1
Hastelloy C-22/2.4602, PTFE emitter, FKM seal ¹⁾	2
Hastelloy C-22/2.4602, PTFE emitter, FFKM seal ¹⁾	3
Process Connection Type	
1½" NPT [(Taper), ANSI/ASME B1.20.1] ²⁾	AA
R 1½" [(BSPT), EN 10226] ²⁾	AB
G 1½" [(BSPP), EN ISO 228-1] (parallel thread) ²⁾	AC
2" NPT [(Taper), ANSI/ASME B1.20.1]	AD
R 2" [(BSPT), EN 10226]	AE
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	AF
2" ASME, 150 lb, FF, ASME B16.5 ³⁾	BA
3" ASME, 150 lb, FF, ASME B16.5 ³⁾	BB
4" ASME, 150 lb, FF, ASME B16.5 ³⁾	BC
2" ASME, 300 lb, FF, ASME B16.5 ³⁾	CA
3" ASME, 300 lb, FF, ASME B16.5 ³⁾	CB
4" ASME, 300 lb, FF, ASME B16.5 ³⁾	CC
DN 50 PN 16, Type A, EN 1092-1 ³⁾	DA
DN 80 PN 16, Type A, EN 1092-1 ³⁾	DB
DN 100 PN 16, Type A, EN 1092-1 ³⁾	DC
DN 50 PN 40, Type A, EN 1092-1 ³⁾	EA
DN 80 PN 40, Type A, EN 1092-1 ³⁾	EB
DN 100 PN 40, Type A, EN 1092-1 ³⁾	EC
JIS 50A 10K, FF, JIS B2220 ³⁾	FA
JIS 80A 10K, FF, JIS B2220 ³⁾	FB
JIS 100A 10K, FF, JIS B2220 ³⁾	FC
DN 50 PN 10/16 DIN EN1092-1 form B1	GA
DN 80 PN 10/16 DIN EN1092-1 form B1	GB
DN 100 PN 10/16 DIN EN1092-1 form B1	GC
DN 150 PN 10/16 DIN EN1092-1 form B1	GD
DN 50 PN 25/40 DIN EN1092-1 form B1	HA
DN 80 PN 25/40 DIN EN1092-1 form B1	HB
DN 100 PN 25/40 DIN EN1092-1 form B1	HC
DN 150 PN 25/40 DIN EN1092-1 form B1	HD
Communication/Output	
PROFIBUS PA	1
4 to 20 mA, HART®, startup at <3.6 mA	2
FOUNDATION Fieldbus™	3
Enclosure/Cable inlet	
Aluminum, Epoxy painted	0
2 x ½" NPT	1
2 x M20x1.5	
Antenna	
1½" horn ⁴⁾	A
2" horn (fits 2" ASME or DN 50 nozzles)	B
3" horn (fits 3" ASME or DN 80 nozzles)	C
4" horn (fits 4" ASME or DN 100 nozzles)	D
1½" horn with 100 mm extension ⁴⁾	E
2" horn with 100 mm extension	F
3" horn with 100 mm extension	G
4" horn with 100 mm extension	H
(Note: Please use largest horn size possible.)	

Selection and Ordering data	Order No.
SITRANS LR250	C) 7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.	0 -
Approvals	
General Purpose, CE, CSA, FM, FCC, R&TTE, C-TICK	A
Intrinsically Safe, CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, FCC	B
Intrinsically Safe, IECEx/ATEX II 1 GD Ex ia IIC T4, Ex tD A20 IP67 T90°C, R&TTE, C-TICK, INMETRO	C
Non-incendive, CSA/FM Class I, Div. 2, Groups A, B, C, D, FCC	D
Non-sparking, Energy Limited, ATEX II 3G Ex nA/nL IIC T4, CE, R&TTE, C-TICK	E
Increased Safety, IECEx/ATEX II 1/2 GD Ex embia IIC T4, Ex tD A20 IP67 T90°C, CE, R&TTE, C-TICK ⁵⁾	F
Flame Proof, IECEx/ATEX II 1/2 GD Ex dmbia IIC T4, Ex tD A20 IP67 T90°C, CE, R&TTE, C-TICK ⁵⁾	G
Explosion Proof CSA/FM Class I, II, III, Div. 1, Gr. A, B, C, D, E, F, G, FCC ⁵⁾	H
Pressure rating	
Rating per Pressure/Temperature curves in manual	0
0.5 bar g (7.25 psi g) maximum	1
1) Not available with process connection options AA to AF	
2) For 1½" horn antennas only, max. range 10 m (32.8 ft), dk > 3	
3) Siemens Milltronics type flange, see instruction manual for details	
4) For 1½" threaded connection only, max. range 10 m (32.8 ft), dk > 3	
5) Applicable to Communication option 0 or 2 only	
C) Subject to export regulations AL: N, ECCN: EAR99	

Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Plug M12 with mating Connector ^{1) 2) 3)}	A50
Plug 7/8" with mating Connector ^{7) 8) 4)}	A55
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y15
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe <3.6 mA ⁵⁾	N07
Operating Instructions for HART/mA device	
English	C) 7ML1998-5JE03
German	C) 7ML1998-5JE33
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual	C) 7ML1998-5QX82
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	
Operating Instructions for PROFIBUS PA device	
English	C) 7ML1998-5JF03
German	C) 7ML1998-5JF33
Note: The Operating Instructions should be ordered as a separate line item on the order.	

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SITRANS LR250

Further designs	Order code
<p>Please add "-Z" to Order No. and specify Order code(s).</p> <p>Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.</p>	C) 7ML1998-5XE82
<p>Operating Instructions for FOUNDATION Fieldbus device</p>	
English	C) 7ML1998-5KL01
German	C) 7ML1998-5KL31
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	C) 7ML1998-5XN81
<p>Accessories</p>	
Handheld programmer, Intrinsically safe, EEx ia	C) 7ML1930-1BK
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DA
HART modem/USB (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DB
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), HART ⁵⁾	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA ⁶⁾	7ML1930-1AQ
SITRANS RD100 Remote display - see RD100 on page 5/324	
SITRANS RD200 Remote display - see RD200 on page 5/327	
SITRANS RD500 Remote display - see RD500 on page 5/331	
<p>1) Available with Enclosure option 1 only</p> <p>2) To be used with Communication options 1 and 3 only. Connector has IP67 rating.</p> <p>3) Available with Approvals option A, B, or C only</p> <p>4) Available with Enclosure option 0 only</p> <p>5) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.</p> <p>C) Subject to export regulations AL: N, ECCN: EAR99</p> <p>D) Subject to export regulations AL: N, ECCN: EAR99H</p>	

Selection and ordering Data

SITRANS LR250 Spare parts

	Order No.		Order No.
SITRANS LR250 Enclosures			
			
LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART® communication, no process connection	C) A5E01156819	LR250 enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection	C) A5E01156848
LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART® communication, no process connection	C) A5E01156820	LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART® communication, no process connection	C) A5E02448270
LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART® communication, no process connection	C) A5E01156823	LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART® communication, no process connection	C) A5E02448274
LR250 enclosure with board stack, M20 cable inlet, approval option B, with HART® communication, no process connection	C) A5E01156824	LR250 enclosure with board stack, NPT cable inlet, approval option H, with HART® communication, no process connection	C) A5E02448278
LR250 enclosure with board stack, NPT cable inlet, approval option C, with HART® communication, no process connection	C) A5E01156827	LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	C) A5E02653792
LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART® communication, no process connection	C) A5E01156832	LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	C) A5E02653793
LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART® communication, no process connection	C) A5E01156834	LR250 enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	C) A5E02654606
LR250 enclosure with board stack, M20 cable inlet, approval option D, with HART® communication, no process connection	C) A5E01156835	LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART® communication start-up at <3.6mA, no process connection	C) A5E02654608
LR250 enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	C) A5E01156836	LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART® communication start-up at <3.6mA, no process connection	C) A5E02956317
LR250 enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	C) A5E01156838	LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART® communication start-up at <3.6mA, no process connection	C) A5E02956319
LR250 enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	C) A5E01156839	LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART® communication start-up at <3.6mA, no process connection	C) A5E02956320
LR250 enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection	C) A5E01156841	LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART® communication start-up at <3.6mA, no process connection	C) A5E02956322
LR250 enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection	C) A5E01156843	LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART® communication start-up at <3.6mA, no process connection	C) A5E02956323
LR250 enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	C) A5E01156844	LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus™ communication, no process connection	C) A5E02653792
LR250 enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	C) A5E01156846	LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus™ communication, no process connection	C) A5E02653793
		LR250 enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus™ communication, no process connection	C) A5E02654606
		LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus™ communication, no process connection	C) A5E02654608

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR250

SITRANS LR250 horn antenna and extension kits



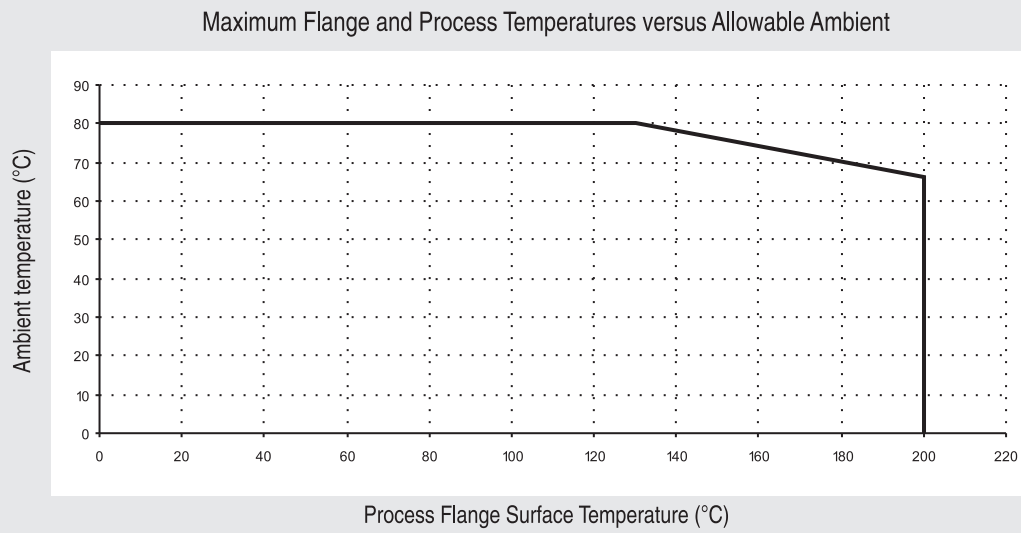
38 mm (1.5") horn antenna kit, 1.5" Process Connections only	C)	A5E01151539
100 mm (4") horn antenna extension kit, 1.5" Process Connections only		A5E01151553
50 mm (2") stainless steel 316L horn antenna kit	C)	A5E01151569
75 mm (3") stainless steel 316L horn antenna kit	C)	A5E01151571
100 mm (4") stainless steel 316L horn antenna kit	C)	A5E01151573
100 mm (4") horn antenna extension kit, 50 mm (2"), 75 mm (3") and 100 mm (4") process connection	C)	A5E01151577
50 mm (2") horn antenna kit, Hastelloy C-22	J)	A5E01151584
75 mm (3") horn antenna kit, Hastelloy C-22	J)	A5E01151585
100 mm (4") horn antenna kit, Hastelloy C-22	J)	A5E01151587
5 Dupont 1Gr Polyback, PTFE grease kit	C)	A5E01151626
LR250 lid with O-ring		A5E02465410

C) Subject to export regulations AL: N, ECCN: EAR99

J) Subject to export regulations AL: 91999, ECCN: EAR99

Please contact nacc.smpi@siemens.com for special requests.

Characteristic curves



SITRANS LR250 Ambient/Process Flange Surface Temperature Curve

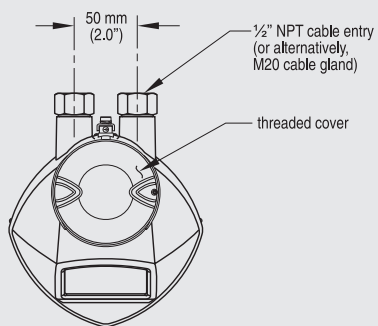
Level instruments

Continuous level measurement - Radar transmitters

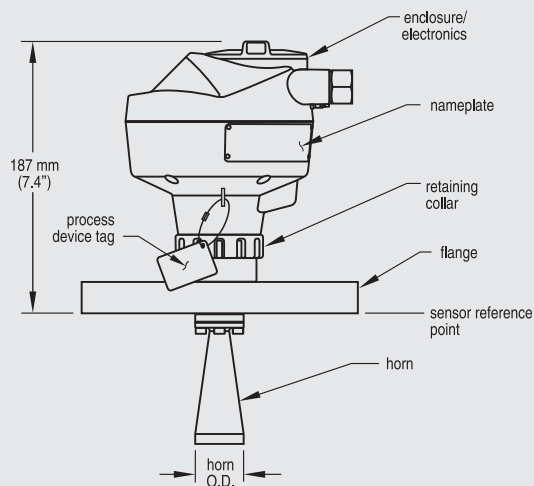
SITRANS LR250

Dimensional drawings

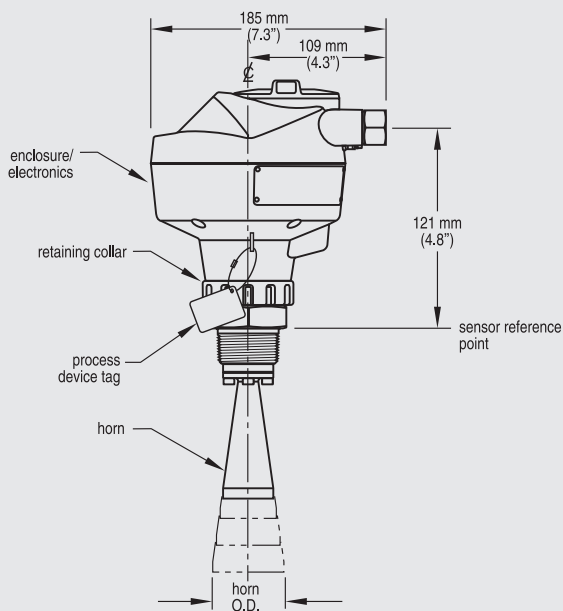
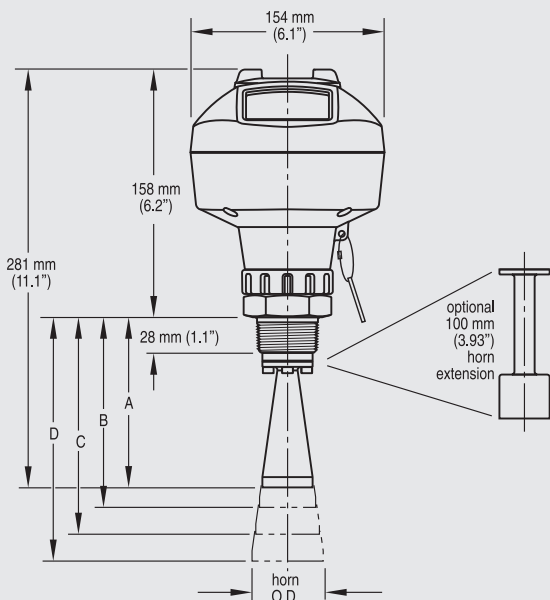
SITRANS LR250



Flanged



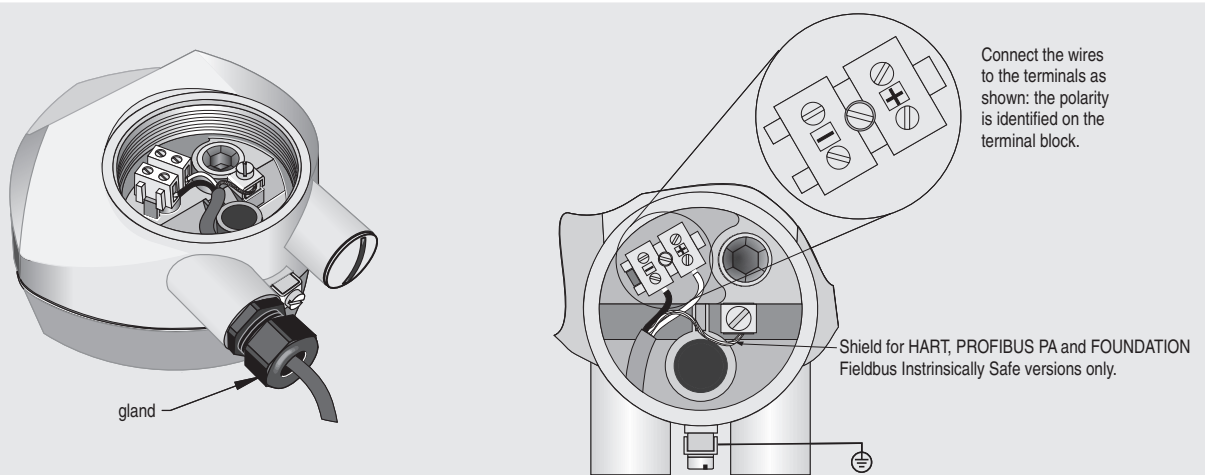
Threaded



Nominal Horn Size	Horn O.D.	Horn Height		Beam Angle	Measurement Range
40 mm (1.5")	39.8 mm (1.57")	A	135 mm (5.3")	19 degrees	10 m (32.8 ft)
50 mm (2")	47.8 mm (1.88")	B	166 mm (6.55")	15 degrees	20 m (65.6 ft)
80 mm (3")	74.8 mm (2.94")	C	199 mm (7.85")	10 degrees	20 m (65.6 ft)
100 mm (4")	94.8 mm (3.73")	D	254 mm (10")	8 degrees	20 m (65.6 ft)

SITRANS LR250 dimensions

Schematics



Notes:

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

Hand Programmer **SITRANS LR250**

Part number:
7ML1930-1BK



SITRANS LR250 connections