

Level Measurement

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

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.
- 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

Conical Flat Parabolic

Mounting unit on stilling well **Mounting on a nozzle**

Orient front or back of device toward stillpipe slots.

min. 10 (0.4)

SITRANS LR200 installation, dimensions in mm (inch)



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Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	5.8 GHz (North America 6.3 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")
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 ... +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" [(BSPP), EN ISO 228-1] (polypropylene rod antenna)
• Flange connection	Refer to SITRANS LR200 Antennas for more connections
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, C-TICK
Marine	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 [T _a = -40 ... +80 °C (-40 ... +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 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
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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Selection and Ordering data	Order No.	Selection and Ordering data	Order code
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) 7ML5422-0	Further designs 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⁾	
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT, Siemens LUI interface 2 x M20x1.5, Siemens LUI interface	2 3	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.	Y15 C11 N07
Polypropylene antenna type - (Max. 3 Bar pressure and +80 °C) 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield R 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield G 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield R 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield G 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield	A B C D E F	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.	Order No. C) 7ML1998-5JP02 C) 7ML1998-5JP32 C) 7ML1998-5XC82
Approvals General Purpose, CE ¹⁾ General Purpose, CSA _{USC} , 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	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 ... +80 °C (-40 ... +176 °F), HART ¹⁾ One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ⁶⁾ SITRANS RD100 Remote display - see Chapter 8 SITRANS RD200 Remote display - see Chapter 8 SITRANS RD500 Remote display - see Chapter 8	C) 7ML1998-5JR01 C) 7ML1998-5JR31 C) 7ML1998-5XD81 C) 7ML1930-1BK D) 7MF4997-1DA D) 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ
Communication/Output PROFIBUS PA 4 ... 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		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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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) PTFE, uses antenna adapter and additional process connection below	1
Process connection (refer to Pressure/Temperature curves in Operating Instructions) 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 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]	AA BA CA DA FB GB HB JB AC BC CC DC FD GD HD JD AE BE CE DE
Antenna extensions or Inactive shield length No antenna extension 50 mm (2") extension, PTFE 100 mm (4") extension, PTFE 100 mm (4") extension, 316L stainless steel shield ¹⁾ 150 mm (6") extension, 316L stainless steel shield ¹⁾ 200 mm (8") extension, 316L stainless steel shield ¹⁾ 250 mm (10") extension, 316L stainless steel shield ¹⁾ Custom inactive shield length 101 mm ... 1000 mm (in 1 mm increments) <u>Add order code Y01 and plain text: "Inactive shield length mm"¹⁾</u>	0 1 2 3 4 5 6 7
Process seal/gasket Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 to 6 FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	0 1
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x ½" NPT, Siemens LUI interface 2 x M20x1.5, Siemens LUI interface	C) 2 C) 3
Communication/Output PROFIBUS PA 4 ... 20 mA, HART®, startup at <3.6 mA	B 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⁾ General Purpose, CSA _{USC} FM, for North America only ³⁾ CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier ³⁾ 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⁾ ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier ²⁾ FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) ^{3) 4)} ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{2) 5) 6)} ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{2) 6)} CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) ^{2) 4) 6)}	A B C D E F G H 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	
Selection and Ordering data	Order code
Further designs 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	Order No.
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



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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 C) **7ML1998-5XD81**
 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 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 ... +80 °C (-40 ... +176 °F), HART¹⁾ **7ML1930-1AP**
 One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA⁶⁾ **7ML1930-1AQ**
 Antenna, rod, PTFE **7ML1830-1HC**
 Antenna extension, 50 mm (2") PTFE **7ML1830-1CG**
 Antenna extension, 100 mm (4") PTFE **7ML1830-1CH**
 SITRANS RD100 Remote display - see Chapter 8
 SITRANS RD200 Remote display - see Chapter 8
 SITRANS RD500 Remote display - see Chapter 8

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

Selection and Ordering data

Order No.

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).	
Antenna Material (uses antenna adapter)	
316L stainless steel with PTFE cone emitter	0
316L stainless steel with PTFE cone emitter and purge connection with 1/8" NPT inlet ¹⁾	1
Sliding waveguide system with 1000 mm (40") waveguide ^{1) 2)}	2
Process connection (refer to Pressure/Temperature curves on specification sheets)	
Flanges (316L stainless steel)	
DN 50 PN 16, Type A, flat faced ¹⁾	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
DN 200 PN 16, Type A, flat faced	EA
DN 80 PN 10/16 DIN EN1092-1 form B1	BF
DN 100 PN 10/16 DIN EN1092-1 form B1	CF
DN 150 PN 10/16 DIN EN1092-1 form B1	DF
DN 200 PN 16 DIN EN1092-1 form B1	EF
2" ASME 150 lb, flat faced ¹⁾	FB
3" ASME 150 lb, flat faced	GB
4" ASME 150 lb, flat faced	HB
6" ASME 150 lb, flat faced	JB
8" ASME 150 lb, flat faced	KB
DN 50 PN 40, flat faced ¹⁾	AC
DN 80 PN 40, flat faced	BC
DN 100 PN 40, flat faced	CC
DN 80 PN 25/40 DIN EN1092-1 form B1	CG
DN 100 PN 25/40 DIN EN1092-1 form B1	DG
DN 150 PN 25/40 DIN EN1092-1 form B1	EG
2" ASME 300 lb, flat faced ¹⁾	FD
3" ASME 300 lb, flat faced	GD
4" ASME 300 lb, flat faced	HD
JIS DN 50 10K ¹⁾	AE
JIS DN 80 10K	BE
JIS DN 100 10K	CE
JIS DN 150 10K	DE
JIS DN 200 10K	EE
(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	1
4 ... 20 mA, HART [®] , startup at <3.6 mA	2
Process seal/gasket	
FKM (-40 ... +200 °C)	0
Nitrile (-40 ... +60 °C), sliding waveguide systems only	1
FFKM (-35 ... +200 °C)	2
Enclosure/Cable inlet	
Aluminum, Epoxy painted	
2 x 1/2" NPT, Siemens LUI interface	2
2 x M20x1.5, Siemens LUI interface	3
Horn size/Waveguide options	
80 mm (3") horn ³⁾	B
100 mm (4") horn ³⁾	C
150 (6") mm horn	D
200 (8") mm horn	E
100 mm (4") horn with 100 mm (4") waveguide extension ³⁾	F
100 mm (4") horn with 150 mm (6") waveguide extension ³⁾	G
100 mm (4") horn with 200 mm (8") waveguide extension ³⁾	H
100 mm (4") horn with 250 mm (10") waveguide extension ³⁾	J



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Level Measurement

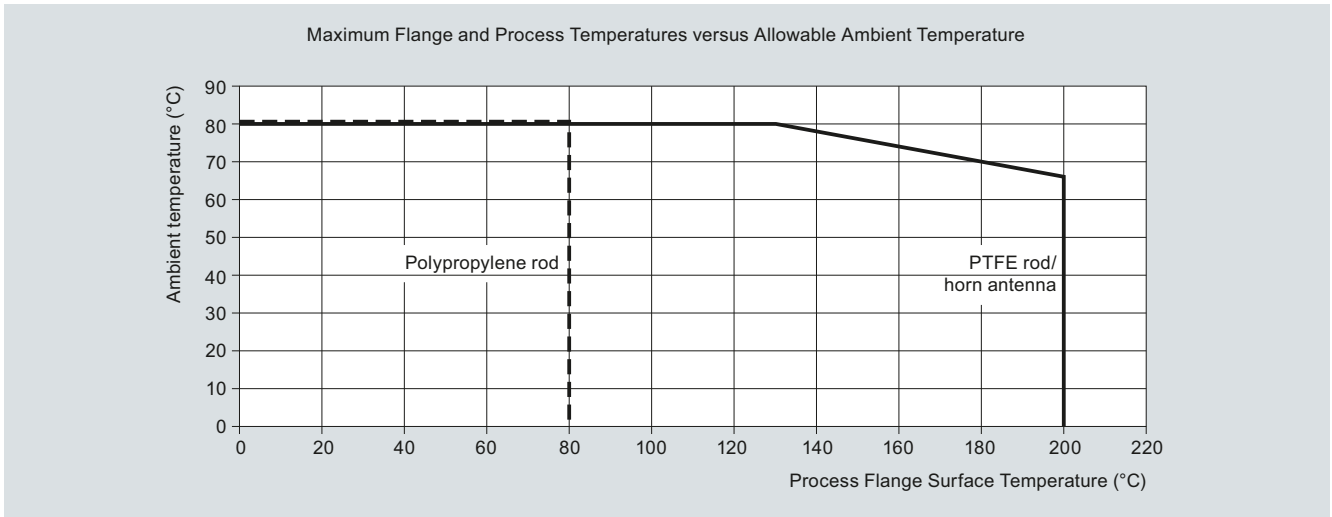
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Selection and Ordering data	Order No.	Selection and Ordering data	Order code
SITRANS LR200, Flange Adapter/Horn Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5425- 	Further designs 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). Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y01 Y15
150 mm (6") horn with 100 mm (4") waveguide extension 150 mm (6") horn with 150 mm (6") waveguide extension 150 mm (6") horn with 200 mm (8") waveguide extension 150 mm (6") horn with 250 mm (10") waveguide extension 200 mm (8") horn with 100 mm (4") waveguide extension 200 mm (8") horn with 150 mm (6") waveguide extension 200 mm (8") horn with 200 mm (8") waveguide extension 200 mm (8") horn with 250 mm (10") waveguide extension Waveguide only - Waveguide length 500 mm ... 3000 mm (in 1 mm increments) (Add order code Y01 and plain text: "waveguide length ... mm")	K L M N P Q R S T	Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Namur NE43 compliant, device preset to failsafe <3.6 mA ¹⁾	C11 C12 N07
Approvals General Purpose, CE ⁴⁾ General Purpose, CSA _{USC} , FM, for North America only ⁵⁾ CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier ⁵⁾ 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⁾ ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier ⁴⁾ FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required) ^{5) 6)} ATEX II 1/2 G EEx emia IIC T4 (no barrier required) ^{4) 7) 8)} ATEX II 1/2 G EEx dmia IIC T4 (no barrier required) ^{4) 8)} CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) ^{5) 6) b)}	A B C D E F G H J	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.	Order No. C) 7ML1998-5JP02 C) 7ML1998-5JP32 C) 7ML1998-5XC81
Pressure rating Rating per Pressure/Temperature curves in Manual 0.5 bar g (7.25 psi g) maximum	0 1	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) 7ML1998-5JR02 C) 7ML1998-5JR32 C) 7ML1998-5XD81
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		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 ... +80 °C (-40 ... +176 °F), HART ²⁾ One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ³⁾ SITRANS RD100 Remote display - see Chapter 8 SITRANS RD200 Remote display - see Chapter 8 SITRANS RD500 Remote display - see Chapter 8	C) 7ML1930-1BK D) 7MF4997-1DA D) 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ
C) Subject to export regulations AL: N, ECCN: EAR99 D) Subject to export regulations AL: N, ECCN: EAR99H		1) Includes Radio approval FCC, 6.3 GHz 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 C) Subject to export regulations AL: N, ECCN: EAR99 D) Subject to export regulations AL: N, ECCN: EAR99H	



Characteristic curves



SITRANS LR200 Ambient/Process Flange Surface Temperature Curve

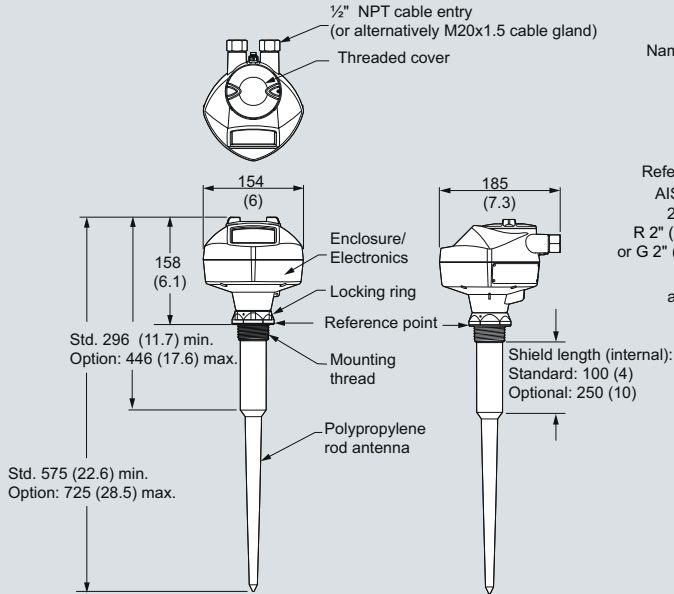
Level Measurement

Continuous level measurement - Radar transmitters

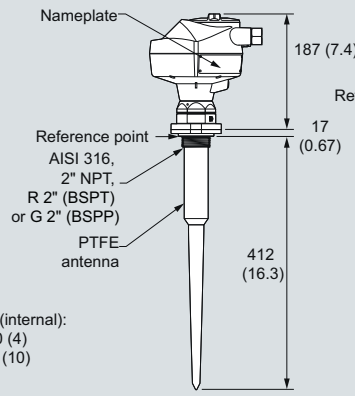
SITRANS LR200

Dimensional drawings

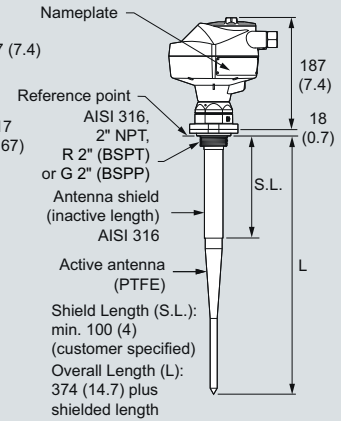
SITRANS LR200 with Polypropylene Shielded Rod Antenna



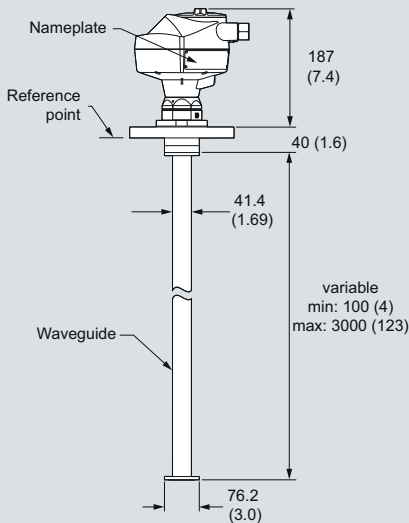
PTFE Rod Antenna, Threaded



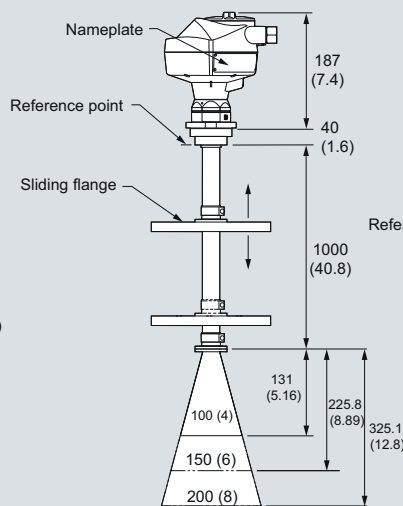
Threaded Connection PTFE Rod, external shield



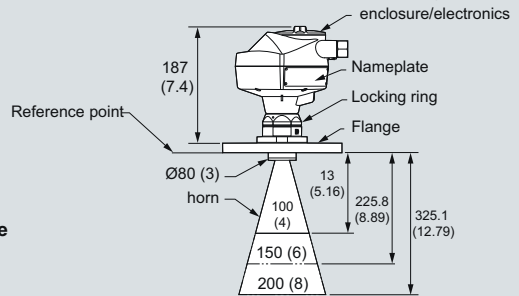
Waveguide Antenna with Flat Faced Flange



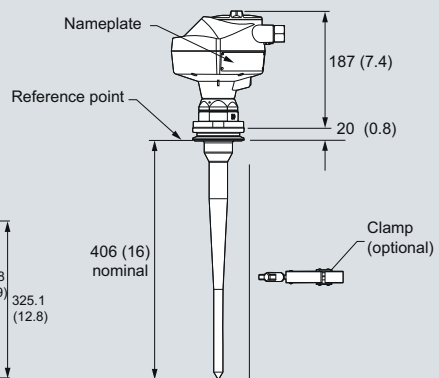
Sliding Waveguide



Horn Antenna with Flat Faced Flange



Sanitary Rod Antenna



SITRANS LR200, dimensions in mm (inch)



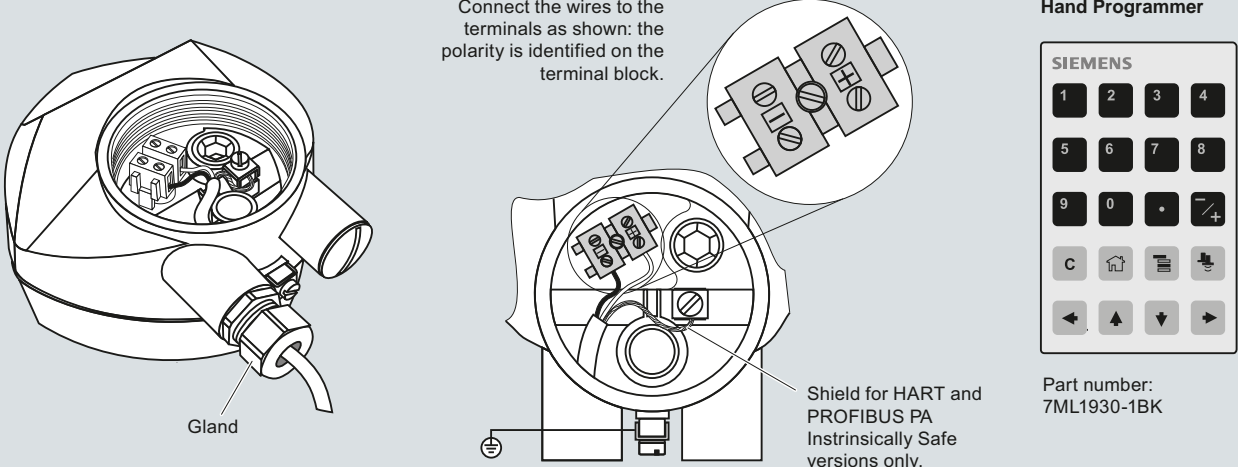
icenta CONTROLS Ltd, North Station Yard, Warminster Road, Wilton, Salisbury, SP2 0AT
Tel: 0845 895 1020 Fax: 0845 895 1021 Email: sales@icenta.co.uk www.icenta.co.uk

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Schematics



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

Gland

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

Note:

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.

SITRANS LR200 connections



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Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200 Antennas

Integration



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

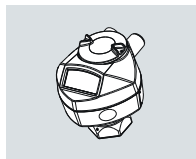
¹⁾ Maximum pressure 0.5 bar g at +60 °C (7.25 psi g at +140 °F)


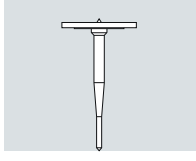
²⁾ Not including extensions, includes SITRANS LR200 and smallest process connection

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200 Specials

SITRANS LR200 Specials		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. 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. 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. 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. 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. 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. 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. 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. 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. 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. 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. 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. ⁷⁾	C)	A5E01483559


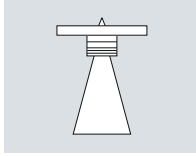
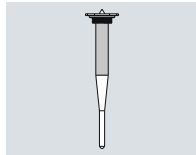
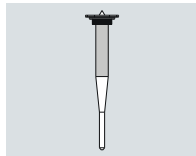


SITRANS LR200 Specials		Order No.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART [®] communication start-up at <3.6mA, no process connection. ⁷⁾	C)	A5E02956419
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART [®] communication start-up at <3.6mA, no process connection. 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. 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. 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 ^{1) 6)}		PBD-51003K020AAAA
Flanged PTFE rod antenna kit, DN 50 PN16. See drawing 51003 on http://www.siemens.com/radar ^{1) 6)}		PBD-51003K050AJAA
Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar ^{1) 6)}		PBD-51003K050AOAA



Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200 Specials

	Order No.		Order No.
SITRANS LR200 PTFE Rod Antenna Kit with 316L SS 1½" pipe thread process connection		SITRANS LR200 Horn Antenna Kit with 316L SS flat faced flange, with PTFE emitter (without waveguide)	
PTFE rod antenna kit, 1½" NPT 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar ⁽⁶⁾	PBD-51004K1AAA	Horn antenna kit, 2" ASME 316L SS flange 3" horn, PTFE emitter ^{(2) (6)}	PBD-51006K020AAAA
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 ⁽⁶⁾	PBD-51004K2AAA	Horn antenna kit, 2" ASME 316L SS flange 4" horn, PTFE emitter ^{(2) (6)}	PBD-51006K020AABA
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 ⁽⁶⁾	PBD-51004K3AAA	Horn antenna kit, 2" ASME 316L SS flange 6" horn, PTFE emitter ^{(2) (6)}	PBD-51006K020AACA
PTFE rod antenna kit, 1½" G 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar ⁽⁶⁾	PBD-51004K3AAA	Horn antenna kit, 2" ASME 316L SS flange 8" horn, PTFE emitter ^{(2) (6)}	PBD-51006K020AADA
SITRANS LR200 PTFE Rod Antenna Kit with 316L SS 2" pipe thread process connection		Horn antenna kit, DN 50 PN 16 316L SS flange 80 mm horn, PTFE emitter ^{(2) (6)}	PBD-51006K050AJAA
PTFE rod antenna kit, 2" NPT 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar ⁽⁶⁾	PBD-51005K1AAA	Horn antenna kit, DN 50 PN 16 316L SS flange 100 mm horn, PTFE emitter ^{(2) (6)}	PBD-51006K050AJBA
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 ⁽⁶⁾	PBD-51005K2AAA	Horn antenna kit, DN 50 PN 16 316L SS flange 150 mm horn, PTFE emitter ^{(2) (6)}	PBD-51006K050AJCA
PTFE rod antenna kit, 2" G 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar ⁽⁶⁾	PBD-51005K3AAA	Horn antenna kit, DN 50 PN 16 316L SS flange 200 mm horn, PTFE emitter ^{(2) (6)}	PBD-51006K050AJDA
SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L SS 2" pipe thread process connection		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)	
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 ^{(3) (6)}	PBD-51002K0100AAA	PTFE sanitary rod antenna kit, 2" mounting connection. ⁽⁶⁾	PBD-51010K1AA
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 ^{(3) (6)}	PBD-51002K0100BAA	PTFE sanitary rod antenna kit, 3" mounting connection. ⁽⁶⁾	PBD-51010K2AA
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 ^{(3) (6)}	PBD-51002K0100CAA	PTFE sanitary rod antenna kit, 4" mounting connection. ⁽⁶⁾	PBD-51010K3AA
		UHMW-PE sanitary rod antenna kit, 2" mounting connection. ⁽⁶⁾	PBD-51010K1AB
		UHMW-PE sanitary rod antenna kit, 3" mounting connection. ⁽⁶⁾	PBD-51010K2AB
		UHMW-PE sanitary rod antenna kit, 4" mounting connection. ⁽⁶⁾	PBD-51010K3AB
		SITRANS LR200 PTFE Flanged Rod Antenna Kit with 316L SS shield and 316L SS flat faced flange	
		PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 100 mm 316L SS shield. ^{(1) (6)}	PBD-51014K0100AAA
		PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 100 mm 316L SS shield. ^{(1) (6)}	PBD-51014K0100EJA
		PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 150 mm 316L SS shield. ^{(1) (6)}	PBD-51014K0150AAA



Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200 Specials

	Order No.
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 150 mm 316L SS shield. ^{1) 6)}	PBD-51014K0150EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 200 mm 316L SS shield. ^{1) 6)}	PBD-51014K0200AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 200 mm 316L SS shield. ^{1) 6)}	PBD-51014K0200EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 250 mm 316L SS shield. ^{1) 6)}	PBD-51014K0250AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 250 mm 316L SS shield. ^{1) 6)}	PBD-51014K0250EJA
PTFE paste	
Kit, PTFE paste, Tube, 250 mL. ⁷⁾	C) PBD-51036065
Cable gland	
One polymeric cable gland M20x1.5, rated -20 ... +80 °C (-4 ... +176 °F) for General Purpose and ATEX EEx e	7ML1930-1AN
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART®	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA	7ML1930-1AQ

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

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

- 1) Available in flange sizes including ASME, DIN and JIS: please contact nacc.smpi@siemens.com.
- 2) Available with no pressure rating
- 3) Available in other shield lengths: please contact nacc.smpi@siemens.com.
- 4) Available with no pressure rating and with General Purpose Approvals only
- 5) Please contact nacc.smpi@siemens.com for pricing and part number. Submit completed Application Questionnaire found on page 5/195
- 6) Available with Pressure rating; serial number of original unit required with completed Application Questionnaire found on page 5/195
- 7) Subject to export regulations AL: N, ECCN: EAR99



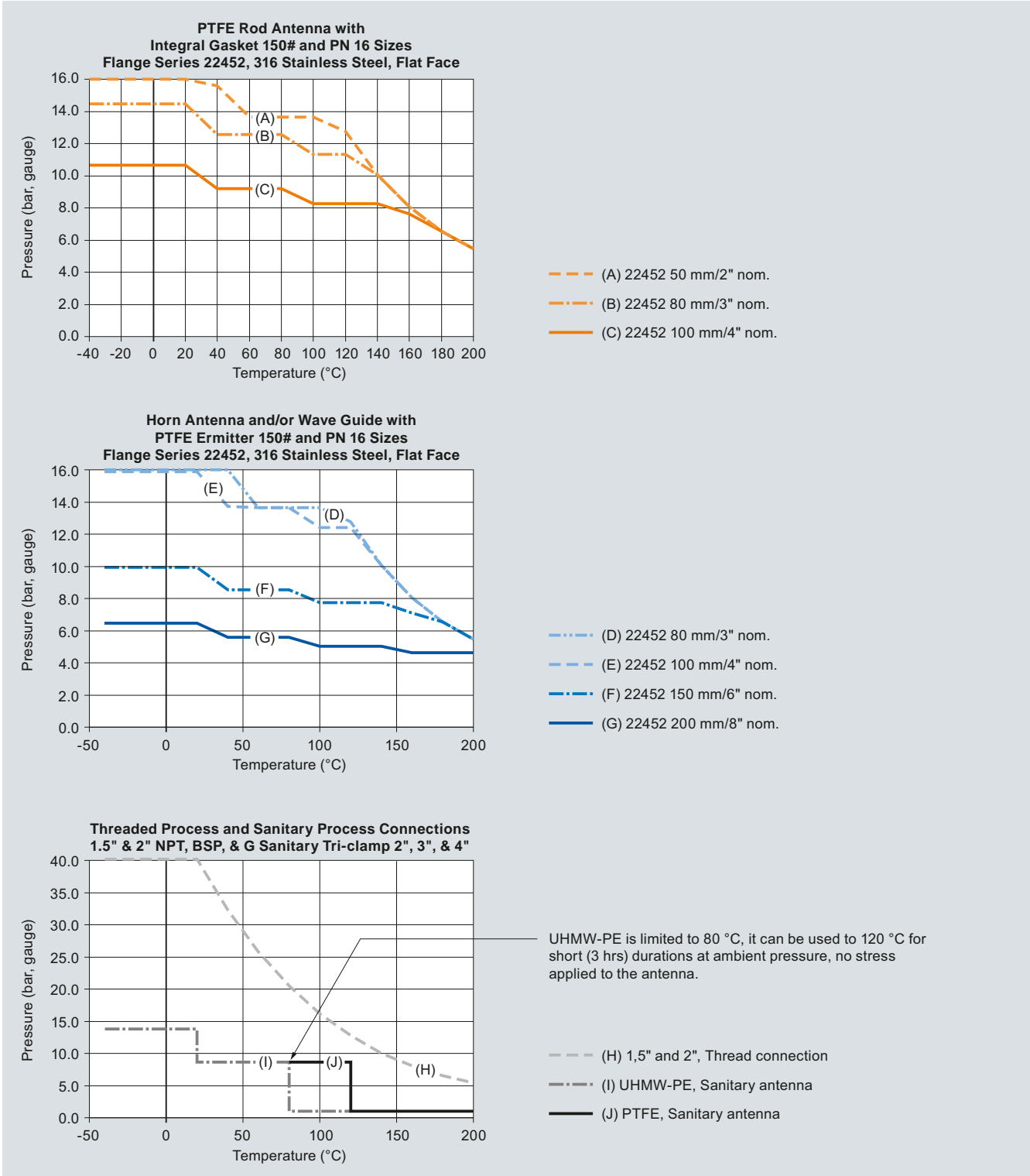
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 Tel: 0845 895 1020 Fax: 0845 895 1021 Email: sales@icenta.co.uk www.icenta.co.uk

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Characteristic curves



SITRANS LR200 Process Pressure/Temperature derating curves

