

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 process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

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

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

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 process vessels with agitators, vaporous liquids, high temperatures, asphalt, digesters

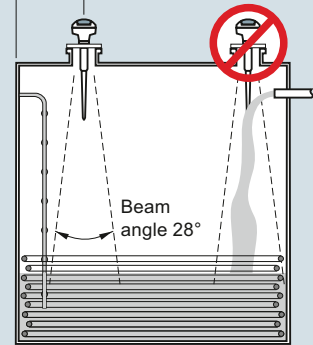
Configuration

Installation

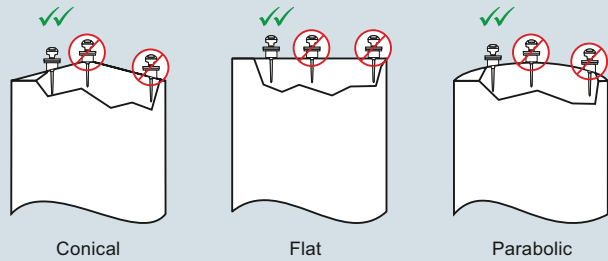
Min. 300 mm (1 ft) for every 3 m (10 ft) of vessel wall.

Note:

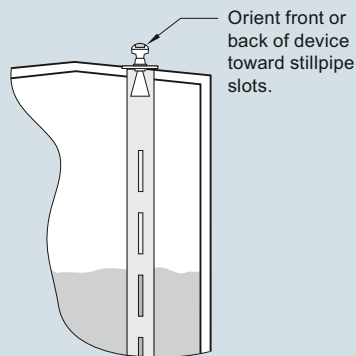
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- Beam angle for horn antenna dependent on horn size
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore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



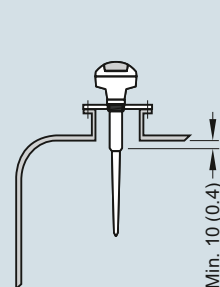
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



SITRANS LR200 installation, dimensions in mm (inch)

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Technical specifications

Mode of operation		Design	
Measuring principle	Radar level measurement	Enclosure	Aluminum, polyester powder coated 2 x M20x1.5 or 2 x 1/2" NPT with adapter
Frequency	5.8 GHz (North America 6.3 GHz)	• Material	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	• Cable inlet	
Output		Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
• Analog output	4 ... 20 mA	Weight	< 2 kg (4.4 lb) (polypropylene rod antenna)
• Accuracy	± 0.02 mA	Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
• Span	Proportional or inversely proportional	Antenna	Polypropylene rod, hermetically sealed construction, optional PTFE
• Communications	HART	• Material	
• Fail-safe	Optional: PROFIBUS PA (Profile 3.0, Class B) Programmable as high, low or hold (Loss of Echo)	• Dimensions	
Performance (according to reference conditions IEC60770-1)		• Optional rods, horn and waveguides	Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield Refer to SITRANS LR200 Antennas for optional rods, horns and waveguides
• From end of antenna to 600 mm:	40 mm (1.57 inch)	Process connections	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) Refer to SITRANS LR200 Antennas for more connections
• Remainder of range:	10 mm (0.4 inch) or 0.1 % of span (whichever is greater)	• Process connection	
Rated operating conditions		• Flange connection	
Installation conditions	Indoor/outdoor	Power supply	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω Nominal 24 V DC (max. 30 V DC) with max. 250 Ω
• Location			
Ambient conditions (enclosure)		4 to 20 mA/HART	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• General Purpose, Non-incendive, Intrinsically Safe	• per IEC 61158-2
• Installation category	I	• Flame proof, Increased safety, Explosion proof	
• Pollution degree	4	PROFIBUS PA	
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		

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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	
<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Explosion Proof (Canada/USA) 	INMETRO Ex ia IIC T4 Ga CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4
<ul style="list-style-type: none"> Intrinsically Safe (Canada/USA) 	CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4
<ul style="list-style-type: none"> Non-incendive (USA) 	FM, Class I, Div. 2, Groups A, B, C, D, T5
<ul style="list-style-type: none"> Flame Proof/Increased Safety (China) Flame Proof (Europe) 	NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4 ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb
<ul style="list-style-type: none"> Increased Safety (Europe) 	ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb
<ul style="list-style-type: none"> Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia) 	ATEX II 1G Ex ia IIC T4 IECEX Ex ia IIC T4 GOST-R Ex ia
Programming	
<ul style="list-style-type: none"> Intrinsically Safe Siemens handheld programmer - Approvals for handheld programmer 	Infrared receiver 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
<ul style="list-style-type: none"> Handheld communicator PC 	HART communicator 375 <ul style="list-style-type: none"> SIMATIC PDM AMS
<ul style="list-style-type: none"> Display (local) 	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

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Selection and Ordering data

SITRANS LR200, Uni-Construction polypropylene rod antenna version

2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in 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)

Enclosure/Cable inlet

Aluminum, epoxy painted
2 x 1/2" NPT
2 x M20x1.5

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

Approvals

General Purpose, CE, R&TTE, C-TICK
General Purpose, CSA, FM, Industry Canada, FCC
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada

Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC
Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R

Non incandive, FM Class I, Div. 2, Groups A, B, C, D, FCC¹⁾

Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R²⁾³⁾

Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R³⁾

Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC¹⁾³⁾

Communication/Output

PROFIBUS PA
4 ... 20 mA, HART, startup at < 3.6 mA

¹⁾ Available with enclosure option 2 only

²⁾ Available with enclosure option 3 only

³⁾ Available with communication option 3 only

Article No.

7ML5422-
0



Selection and Ordering data

Further designs

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

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

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

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

Operating Instructions 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 DVD containing the ATEX Quick Start and Operating Instructions library.

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 DVD containing the 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 ... +80 °C (-40 ... +176 °F), HART²⁾

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA²⁾

One general purpose polymeric cable gland M20x1.5, rated -20 ... +80 °C (-40 ... +176 °F)

SITRANS RD100 Remote display - see Chapter 7

SITRANS RD200 Remote display - see Chapter 7

SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7

For applicable back up point level switch - see point level section on page 4/9

¹⁾ Available with communication option 3 only

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

Order code

Y15

C11

N07

Article No.

7ML1998-5JP02

7ML1998-5JP32

A5E31993614

7ML1998-5JR02

7ML1998-5JR32

A5E32153438

7ML1930-1BK

7MF4997-1DA

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML1930-1AM

7ML5750-1AA00-0

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Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5423-	SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5423-
Antenna material (uses antenna adapter) PTFE, uses antenna adapter and additional process connection below	1	Communication/Output PROFIBUS PA 4 ... 20 mA, HART, startup at < 3.6 mA	B C
Process connection (refer to Pressure/Temperature curves, page 4/212) Flanges (316L stainless steel) DN 50 PN 16, Type A, flat faced DN 80 PN 16, Type A, flat faced DN 100 PN 16, Type A, flat faced DN 150 PN 16, Type A, flat faced 2" ASME 150 lb, flat faced 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced DN 50 PN 40, flat faced DN 80 PN 40, flat faced DN 100 PN 40, flat faced DN 150 PN 40, flat faced 2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing 3" ASME 300 lb, flat faced 4" ASME 300 lb, flat faced 6" ASME 300 lb, flat faced JIS DN 50 10K JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.) Threaded connection (316L stainless steel) 1½" NPT [(Taper), ANSI/ASME B1.20.1] 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] R 2" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1] G 2" [(BSPP), EN ISO 228-1]	AA BA CA DA FB GB HB JB AC BC CC DC FD GD HD JD AE BE CE DE	Approvals General Purpose, CE, R&TTE, C-TICK General Purpose, CSA, FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC ²⁾ Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R ³⁾⁴⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R ⁴⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ²⁾⁴⁾	A B C D E F G H J
Antenna extensions or Inactive shield length No antenna extension 50 mm (2 inch) extension, PTFE 100 mm (4 inch) extension, PTFE 100 mm (4 inch) extension, 316L stainless steel shield ¹⁾ 150 mm (6 inch) extension, 316L stainless steel shield ¹⁾ 200 mm (8 inch) extension, 316L stainless steel shield ¹⁾ 250 mm (10 inch) extension, 316L stainless steel shield ¹⁾	0 1 2 3 4 5 6	Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum	0 1
Process seal/gasket Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6 FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	0 1		
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x ½" NPT 2 x M20x1.5	2 3		

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Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe < 3.6 mA ¹⁾	N07
Operating Instructions for HART/mA device	
English	7ML1998-5JP02
German	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 DVD containing the ATEX Quick Start and Operating Instructions library.	A5E31993614
Operating Instructions for PROFIBUS PA device	
English	7ML1998-5JR02
German	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 DVD containing the ATEX Quick Start and Operating Instructions library.	A5E32153438
Accessories	
Handheld programmer, Intrinsically safe, EEx ia HART modem/RS 232 (for use with a PC and SIMATIC PDM)	7ML1930-1BK 7MF4997-1DA
HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ²⁾	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ²⁾	7ML1930-1AQ
Antenna, rod, PTFE	7ML1830-1HC
Antenna extension, 50 mm (2 inch) PTFE	7ML1830-1CH
Antenna extension, 100 mm (4 inch) PTFE	7ML1830-1CG
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	7ML5750- 1AA00-0

¹⁾ Available with communication option 3 only

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

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Selection and Ordering data	Article 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 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 1 000 mm (40 inch) waveguide ¹⁾²⁾	2
Process connection (refer to Pressure/ Temperature curves, page 4/212)	
Flanges (316L stainless steel)	
DN 50 PN 16 EN 1092-1 Type A flat faced ¹⁾	AA
DN 80 PN 16 EN 1092-1 Type A flat faced	BA
DN 100 PN 16 EN 1092-1 Type A flat faced	CA
DN 150 PN 16 EN 1092-1 Type A flat faced	DA
DN 200 PN 16 EN 1092-1 Type A flat faced	EA
DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	BF
DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	CF
DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	DF
DN 200 PN 16 DIN EN 1092-1 Type B1 raised face ³⁾	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 ³⁾	AC
DN 80 PN 40, flat faced ³⁾	BC
DN 100 PN 40, flat faced ³⁾	CC
DN 200 PN 40, flat faced ³⁾	EC
DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	CG
DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	DG
DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	EG
2" ASME 300 lb, flat faced ¹⁾³⁾	FD
3" ASME 300 lb, flat faced ³⁾	GD
4" ASME 300 lb, flat faced ³⁾	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

Selection and Ordering data	Article 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 process vessels including high temperature and pressure, to a range of 20 m (66 ft).	
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	2
2 x M20x1.5	3
Horn size/Waveguide options	
80 mm (3 inch) horn ⁴⁾	B
100 mm (4 inch) horn ⁴⁾	C
150 (6 inch) mm horn	D
200 (8 inch) mm horn	E
100 mm (4 inch) horn with 100 mm (4 inch) waveguide extension ⁴⁾	F
100 mm (4 inch) horn with 150 mm (6 inch) waveguide extension ⁴⁾	G
100 mm (4 inch) horn with 200 mm (8 inch) waveguide extension ⁴⁾	H
100 mm (4 inch) horn with 250 mm (10 inch) waveguide extension ⁴⁾	J
150 mm (6 inch) horn with 100 mm (4 inch) waveguide extension	K
150 mm (6 inch) horn with 150 mm (6 inch) waveguide extension	L
150 mm (6 inch) horn with 200 mm (8 inch) waveguide extension	M
150 mm (6 inch) horn with 250 mm (10 inch) waveguide extension	N
200 mm (8 inch) horn with 100 mm (4 inch) waveguide extension	P
200 mm (8 inch) horn with 150 mm (6 inch) waveguide extension	Q
200 mm (8 inch) horn with 200 mm (8 inch) waveguide extension	R
200 mm (8 inch) horn with 250 mm (10 inch) waveguide extension	S
(Add Order code Y01 and plain text: "waveguide length ... mm")	

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Selection and Ordering data	Article 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 process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5425- 	Further designs Please add "-Z" to Article No. and specify Order code(s).	
Approvals General Purpose, CE, R&TTE, C-TICK General Purpose, CSA, FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC ⁵⁾ Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R ⁶⁾⁷⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R ⁷⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ⁵⁾⁷⁾	A B C D E F G H J	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 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Y15 Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 C11 Inspection Certificate Type 3.1 per EN 10204 C12 Namur NE43 compliant, device preset to failsafe < 3.6 mA ¹⁾ N07	
Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum	0 1	Operating Instructions for HART/mA device English 7ML1998-5JP02 German 7ML1998-5JP32 Note: The Operating Instructions should be ordered as a separate line item on the order. A5E31993614 Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library. A5E32153438	Article No. 7ML1998-5JP02 7ML1998-5JP32 A5E31993614 A5E32153438
¹⁾ Available with pressure rating option 1 only ²⁾ Maximum Process Temperature 60 °C (140 °F) ³⁾ Available with Antenna Material option 0 and 1 only ⁴⁾ For stillpipe applications only ⁵⁾ Available with enclosure option 2 only ⁶⁾ Available with enclosure option 3 only ⁷⁾ Available with communication option 2 only		Operating Instructions for PROFIBUS PA device English 7ML1998-5JR02 German 7ML1998-5JR32 Note: The Operating Instructions should be ordered as a separate line item on the order. A5E32153438 Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the 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) 7ML1930-1BK 7MF4997-1DA HART modem/USB (for use with a PC and SIMATIC PDM) 7MF4997-1DB One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ²⁾ 7ML1930-1AP One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ³⁾ 7ML1930-1AQ One general purpose polymeric cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F) 7ML1930-1AM SITRANS RD100 Remote display - see Chapter 7 SITRANS RD200 Remote display - see Chapter 7 SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7 7ML5750-1AA00-0 For applicable back up point level switch - see point level section on page 4/9	

Level Measurement

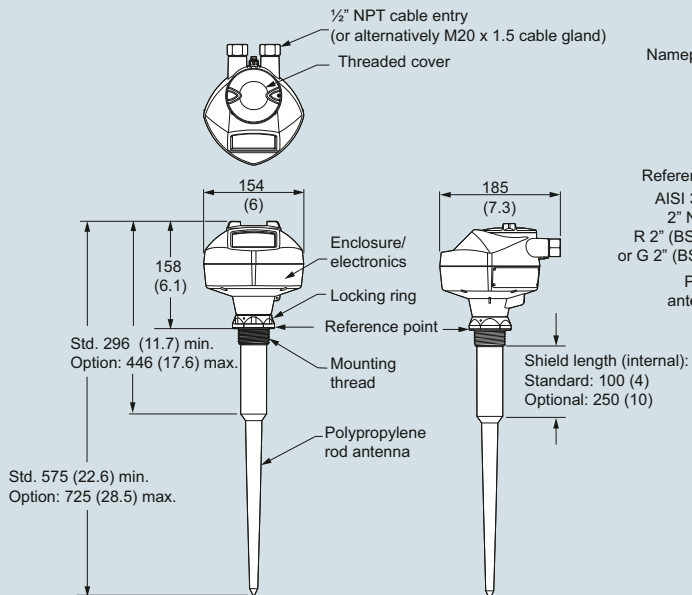
Continuous level measurement – Radar transmitters

SITRANS LR200

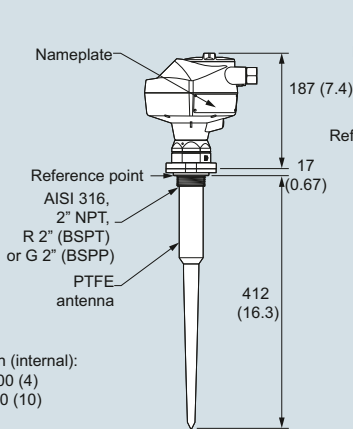
Dimensional drawings

4

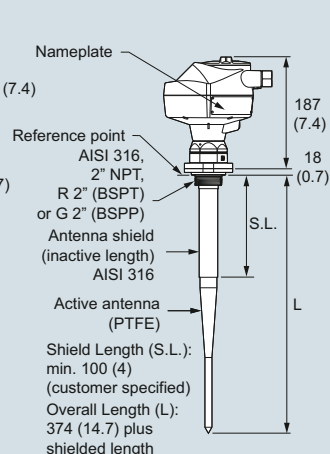
SITRANS LR200 with polypropylene shielded rod antenna



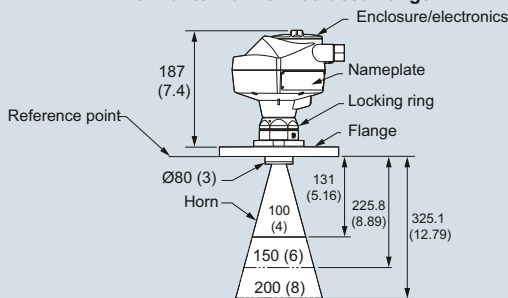
PTFE rod antenna, threaded



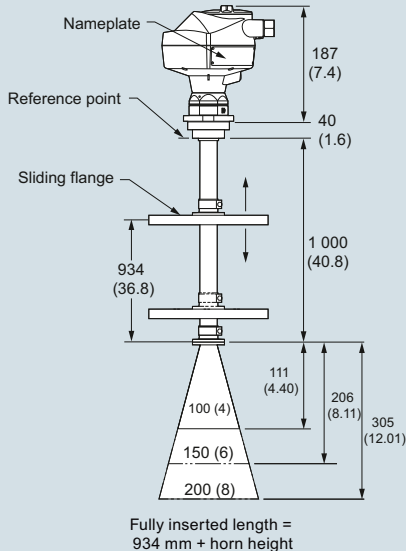
Threaded connection PTFE rod, external shield



Horn antenna with flat faced flange

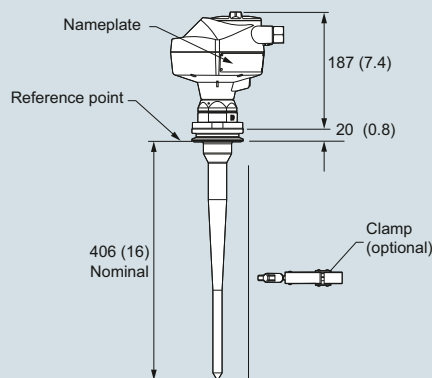


Sliding waveguide



Fully inserted length = 934 mm + horn height

Sanitary rod antenna



SITRANS LR200, dimensions in mm (inch)

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.

Shield for HART and PROFIBUS PA intrinsically safe versions only.

Hand programmer

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

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from an SELV source in accordance with IEC 1010-1 Annex H.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR200 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Antennas

Integration

4



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

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

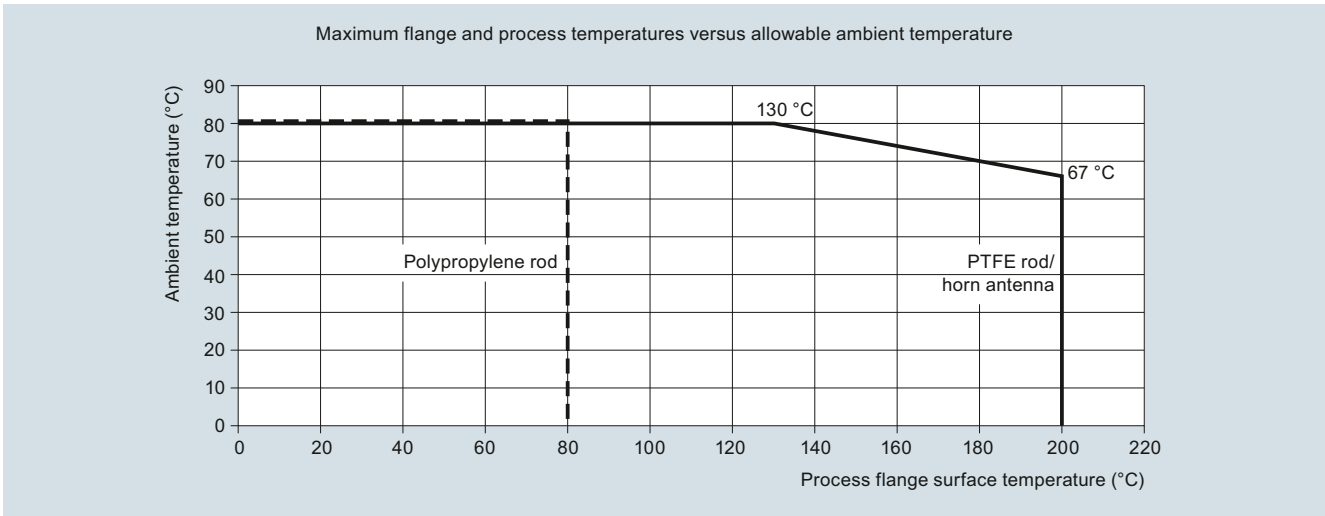
²⁾ Not including extensions, includes SITRANS LR200 and smallest process connection

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Antennas

Characteristic curves



SITRANS LR200 Ambient/Process Flange Surface Temperature Curve

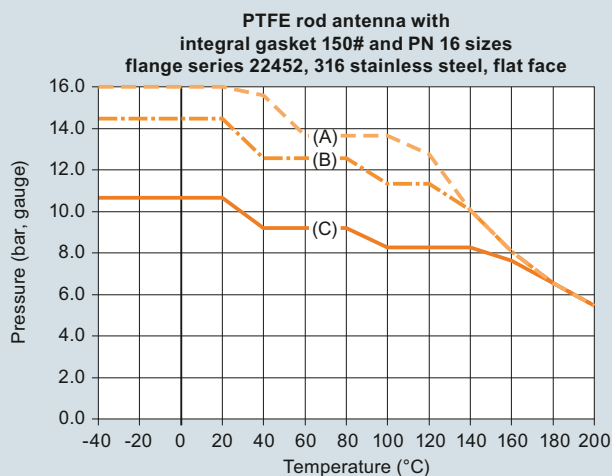
4

Level Measurement

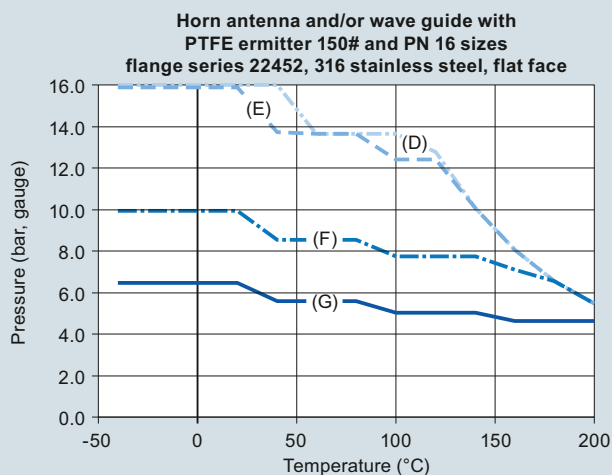
Continuous level measurement – Radar transmitters

SITRANS LR200 Antennas

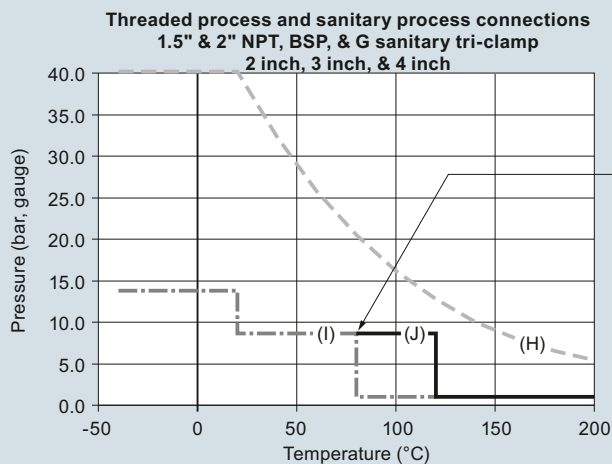
4



- (A) 22452 50 mm/2 inch nom.
- (B) 22452 80 mm/3 inch nom.
- (C) 22452 100 mm/4 inch nom.



- (D) 22452 80 mm/3 inch nom.
- (E) 22452 100 mm/4 inch nom.
- (F) 22452 150 mm/6 inch nom.
- (G) 22452 200 mm/8 inch nom.



UHMW-PE is limited to 80 °C, it can be used to 120 °C for short (3 hrs) durations at ambient pressure, no stress applied to the antenna.




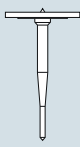
- (H) 1.5" and 2", thread connection
- (I) UHMW-PE, sanitary antenna
- (J) PTFE, sanitary antenna

SITRANS LR200 Process Pressure/Temperature derating curves

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Specials

SITRANS LR200 Specials		SITRANS LR200 Specials	
	Article No.		Article No.
SITRANS LR200 PROFIBUS PA 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, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E03617085
	A5E01483420	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. ⁵⁾	A5E03617086
	A5E01483440	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. ⁵⁾	A5E03617087
	A5E01483456	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. ⁵⁾	A5E03617088
	A5E01483547	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection. ⁵⁾	
SITRANS LR200 HART 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, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	
	A5E01483559	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. ⁵⁾	
	A5E02956419	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	
	A5E02956420	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	
	A5E02956421	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	
A5E02956422	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾		
		SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)	
		80 mm (3 inch) horn antenna kit	PBD:25500K02A
		100 mm (4 inch) horn antenna kit	PBD:25500K03A
		150 mm (6 inch) horn antenna kit	PBD:25500K05A
		200 mm (8 inch) horn antenna kit	PBD:25500K07A
		SITRANS LR200 Extension Kits for Horn Antenna with mounting screws	
		100 mm (4 inch) extension kit for horn antenna	PBD:25501K0100A
		150 mm (6 inch) extension kit for horn antenna	PBD:25501K0150A
		200 mm (8 inch) extension kit for horn antenna	PBD:25501K0200A
		250 mm (10 inch) extension kit for horn antenna	PBD:25501K0250A
		500 mm (20 inch) extension kit for horn antenna	PBD:25501K0500A
		1 000 mm (40 inch) extension kit for horn antenna	PBD:25501K1000A
		SITRANS LR200 Flanged Rod Antenna Kit with 316L stainless steel flat faced flanges	
		Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾	PBD: 51003K020AAAA
		Flanged PTFE rod antenna kit, DN 50 PN 16. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾	PBD: 51003K050AJAA
		Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar . ¹⁾⁴⁾	PBD: 51003K050AOAA

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Specials

SITRANS LR200 Specials

Article No.

SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 1½" pipe thread process connection



PTFE rod antenna kit, 1½" NPT 316L stainless steel process connection, FKM O-ring; See drawing 51004 on <http://www.siemens.com/radar.4>

PBD:
51004K1AAA

PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring; see drawing 51004 on <http://www.siemens.com/radar.4>

PBD:
51004K2AAA

PTFE rod antenna kit, 1½" G 316L stainless steel process connection, FKM O-ring; see drawing 51004 on <http://www.siemens.com/radar.4>

PBD:
51004K3AAA

SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 2" pipe thread process connection



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

PBD:
51005K1AAA

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

PBD:
51005K2AAA

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

PBD:
51005K3AAA

SITRANS LR200 Specials

Article No.

SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L stainless steel 2" pipe thread process connection



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

PBD:
51002K0100AAA

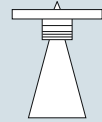
PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on <http://www.siemens.com/radar.34>

PBD:
51002K0100BAA

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

PBD:
51002K0100CAA

SITRANS LR200 Horn Antenna Kit with 316L stainless steel flat faced flange, with PTFE emitter (without waveguide)



Horn antenna kit, 2" ASME 316L stainless steel flange 3" horn, PTFE emitter¹⁾⁴⁾

PBD:
51006K020AAAA

Horn antenna kit, 2" ASME 316L stainless steel flange 4" horn, PTFE emitter¹⁾²⁾

PBD:
51006K020AABA

Horn antenna kit, 2" ASME 316L stainless steel flange 6" horn, PTFE emitter¹⁾²⁾

PBD:
51006K020AACA

Horn antenna kit, 2" ASME 316L stainless steel flange 8" horn, PTFE emitter¹⁾²⁾

PBD:
51006K020AADA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter¹⁾²⁾

PBD:
51006K050AJAA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter¹⁾²⁾

PBD:
51006K050AJBA

Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter¹⁾²⁾

PBD:
51006K050AJCA



Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter¹⁾²⁾

PBD:
51006K050AJDA

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Specials

SITRANS LR200 Specials	Article No.
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 sanitary rod antenna kit, 2" mounting connection. ⁴⁾	PBD:51010K1AA
PTFE sanitary rod antenna kit, 3" mounting connection. ⁴⁾	PBD:51010K2AA
PTFE sanitary rod antenna kit, 4" mounting connection. ⁴⁾	PBD:51010K3AA
UHMW-PE sanitary rod antenna kit, 2" mounting connection. ⁴⁾	PBD:51010K1AB
UHMW-PE sanitary rod antenna kit, 3" mounting connection. ⁴⁾	PBD:51010K2AB
UHMW-PE sanitary rod antenna kit, 4" mounting connection. ⁴⁾	PBD:51010K3AB
SITRANS LR200 PTFE flanged rod antenna kit with 316L stainless steel shield and 316L stainless steel flat faced flange	
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0100AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0100EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0150AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0150EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0200AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0200EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0250AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0250EJA

SITRANS LR200 Specials	Article No.
PTFE paste Kit, PTFE paste, Tube, 250 mL	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
Please contact ceg.smpi@siemens.com for special requests.	
¹⁾ Available in flange sizes including ASME, DIN and JIS: please contact ceg.smpi@siemens.com .	
²⁾ Available with no pressure rating	
³⁾ Available in other shield lengths: please contact ceg.smpi@siemens.com .	
⁴⁾ Available with Pressure rating; serial number of original unit required with completed Application Questionnaire found on page 4/11	