## Overview

SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 ft).

## Benefits

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

## Application

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

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

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

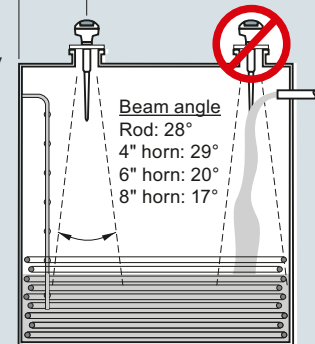- Key Applications: liquid process vessels with agitators, vaporous liquids, high temperatures, asphalt
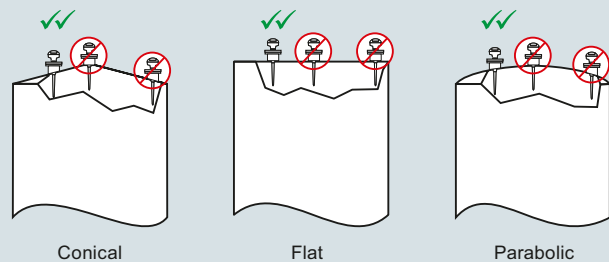
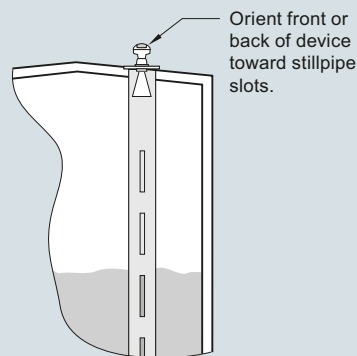## Configuration

**Installation**

**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.

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

Beam angle
Rod: 28°
4" horn: 29°
6" horn: 20°
8" horn: 17°

**Mounting unit on vessel**

Conical

Flat

Parabolic

**Mounting unit on stilling well**

Orient front or back of device toward stillpipe slots.

**Mounting on a nozzle**

Min. 10 (0.4)
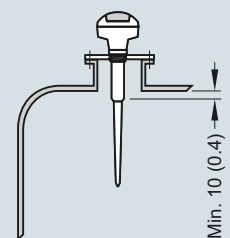
SITRANS LR200 installation, dimensions in mm (inch)

4

# Level Measurement
Continuous level measurement
Radar transmitters

## SITRANS LR200

### ■ Integration



SITRANS LR200 with flange adapter for connection to optional antennas.

Horn with waveguide extension. Used for high temperature isolation, long standpipes, and clearing tank obstructions.

Flat faced flange connection with PTFE rod antenna.

Shielded rod antenna with a stainless steel shield eliminates standpipe interference. Various lengths available.

Antenna configurations for SITRANS LR200

| Antenna types | Flat Faced Flange with Rod | Shielded Rod | Horn (4", 6", 8" sizes available) |
|---|---|---|---|
| Connection type | Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch) | Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4 inch) | Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch) |
| Wetted parts | PTFE | PTFE, 316L stainless steel, FKM O-ring | 316L stainless steel PTFE, FKM O-ring |
| Extensions | 50 or 100 mm (2 or 4 inch) PTFE or UHMW-PE | 100, 150, 200 or 250 mm (4, 6, 8 or 10 inch) standard shield length | Use waveguide for extensions to 6 m (20 ft) long |
| Dielectric constant | > 3 | > 3 | > 3 |
| Insertion length (max.) | 41 cm (16.3 inch) | Variable | Variable with extension |
| Purging option (liquid or gas) | No | No | Yes |
| Sliding waveguide option for digesters[1] | Yes | No | Yes |
| Weight[2] | 6.5 kg (14.3 lb) | 5.0 kg (11 lb) | 7.5 kg (16.5 lb) |

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

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

■ **Technical specifications**

| Mode of operation | |
|---|---|
| Measuring principle | Radar level measurement |
| Frequency | C-band, approx. 6 GHz |
| Measuring range | 0.3 ... 20 m (1.0 ... 65 ft) |

| Output | |
|---|---|
| Analog output | 4 ... 20 mA |
| Accuracy | ± 0.02 mA |
| Span | Proportional or inversely proportional |
| Communications | HART |
| | Optional: PROFIBUS PA (Profile 3.0, Class B) |
| Fail-safe | Programmable as high, low or hold (Loss of Echo) |

| Performance (according to reference conditions IEC60770-1) | |
|---|---|
| From end of antenna to 600 mm | 40 mm (1.57 inch) |
| Remainder of range | 10 mm (0.4 inch) or 0.1 % of span (whichever is greater) |

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

| Medium conditions | |
|---|---|
| Dielectric constant $\varepsilon_r$ | $\varepsilon_r > 1.6$ (for $\varepsilon_r < 3$, use stillpipe) |
| Vessel temperature and pressure | Varies with connection type; see Pressure/Temperature curves for more information |

| Design | |
|---|---|
| Enclosure | |
| • Material | Aluminum, polyester powder coated |
| • Cable inlet | 2 x M20 x 1.5 or 2 x ½" NPT |
| Degree of protection | Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68 |
| Weight | < 2.82 kg (6.21 lb) (polypropylene rod antenna) |
| Display (local) | Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages |
| Antenna | |
| • Material | Polypropylene rod, hermetically sealed construction, optional PTFE |
| • Dimensions | Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield |
| • Optional rods and horn | Refer to SITRANS LR200 Antennas for optional rods and horns |
| Process connections | |
| • Process connection | 1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226], |
| | or |
| | G 1½" [(BSPP), EN ISO 228-1] (polypropylene rod antenna) |
| • 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<br>• Per IEC 61158-2 |

| Certificates and approvals | |
|---|---|
| General | CSA$_{US/C}$, CE, FM, RCM |
| Marine | • Lloyd's Register of Shipping<br>• ABS Type Approval |
| Radio | FCC, Industry Canada, and European (RED), RCM |
| Hazardous | |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga |
| • Explosion Proof (Canada/USA) | CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 |
| • Intrinsically Safe (Canada/USA) | CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 |
| • Non-incendive (USA) | FM, Class I, Div. 2, Groups A, B, C, D, T5 |
| • Flame Proof/Increased Safety (China) | NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4 |
| • Flame Proof (Europe) | ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb |
| • Increased Safety (Europe) | ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 |
| • Intrinsically Safe (International) | IECEx Ex ia IIC T4 |
| • Intrinsically Safe (Russia/Kazakhstan) | EAC Ex ia |

| Programming | |
|---|---|
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld programmer | IS model:<br>ATEX II 1GD Ex ia IIC T4 Ga<br>Ex iaD 20 T135 °C $T_a$ = -20 ... +50 °C<br>CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G,<br>T6 $T_a$ = +50 °C |
| Handheld communicator | HART communicator 375 |
| PC | • SIMATIC PDM<br>• AMS<br>• SITRANS DTM (for connecting to FDT such as PACTware or Fieldcare) |
| Display (local) | Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages |

**4**

# Level Measurement
Continuous level measurement
Radar transmitters

## SITRANS LR200

| Selection and Ordering data | Article No. |
|---|---|
| **SITRANS LR200, Uni-Construction polypropylene rod antenna version** ↗ | **7ML5422-**<br>**■■■■0** |
| 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) | |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Enclosure/Cable inlet**<br>Aluminum, epoxy painted | |
| 2 x ½" NPT | 2 |
| 2 x M20 x 1.5 | 3 |
| **Polypropylene antenna type -**<br>**(Max. 3 Bar pressure and 80 °C)** | |
| 1½" NPT [(Taper), ANSI/ASME B1.20.1],<br>c/w integral 100 mm shield | A |
| R 1½" [(BSPT), EN 10226],<br>c/w integral 100 mm shield | B |
| G 1½" [(BSPP), EN ISO 228-1],<br>c/w integral 100 mm shield | C |
| 1½" NPT [(Taper), ANSI/ASME B1.20.1],<br>c/w integral 250 mm shield | D |
| R 1½" [(BSPT), EN 10226],<br>c/w integral 250 mm shield | E |
| G 1½" [(BSPP), EN ISO 228-1],<br>c/w integral 250 mm shield | F |
| **Approvals** | |
| General Purpose, CE, RED, RCM | A |
| General Purpose, CSA, FM, Industry Canada, FCC | B |
| Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada | C |
| Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC | D |
| Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, RED, RCM; EAC | E |
| Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[1] | F |
| Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC[2)3)] | G |
| Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC[3] | H |
| Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[1)3)] | J |
| **Communication/Output** | |
| PROFIBUS PA | 2 |
| 4 ... 20 mA, HART, start-up at < 3.6 mA | 3 |

[1] Available with enclosure option 2 only

[2] Available with enclosure option 3 only

[3] Available with communication option 3 only

| 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)]:<br>Measuring-point number/identification<br>(max. 27 characters); specify in plain text | **Y15** |
| Manufacturer's test certificate:<br>M to DIN 55350, Part 18 and to ISO 9000 | **C11** |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[1] | **N07** |
| *Operating Instructions* | |
| All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation | |
| *Accessories* | Article No. |
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| HART modem/USB<br>(for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART[2] | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[2] | **7ML1930-1AQ** |
| One general purpose polymeric cable gland M20 x 1.5, rated -20 ... + 80 °C (-40 ... +176 °F) | **7ML1930-1AM** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-...** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-...** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-...** |
| SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 | **7ML5750-...** |
| For applicable back up point level switch - see point level measurement section | |

[1] Available with communication option 3 only

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

**4**

| Selection and Ordering data | Article No. |
|---|---|
| **SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version** ↗ | **7ML5423-** ▪▪▪▪▪ - ▪▪▪▪ |
| 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). | |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |

| **Antenna material (uses antenna adapter)** | |
|---|---|
| PTFE, uses antenna adapter and additional process connection below | 1 |

| **Process connection** (refer to Pressure/Temperature curves, page 4/211) | |
|---|---|
| Flanges (316L stainless steel) | |
| DN 50 PN 16, Type A, flat faced | A A |
| DN 80 PN 16, Type A, flat faced | B A |
| DN 100 PN 16, Type A, flat faced | C A |
| DN 150 PN 16, Type A, flat faced | D A |
| 2" ASME 150 lb, flat faced | F B |
| 3" ASME 150 lb, flat faced | G B |
| 4" ASME 150 lb, flat faced | H B |
| 6" ASME 150 lb, flat faced | J B |
| DN 50 PN 40, flat faced | A C |
| DN 80 PN 40, flat faced | B C |
| DN 100 PN 40, flat faced | C C |
| DN 150 PN 40, flat faced | D C |
| 2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing | F D |
| 3" ASME 300 lb, flat faced | G D |
| 4" ASME 300 lb, flat faced | H D |
| 6" ASME 300 lb, flat faced | J D |
| JIS DN 50 10K | A E |
| JIS DN 80 10K | B E |
| JIS DN 100 10K | C E |
| JIS DN 150 10K | D E |
| (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] | L A |
| 2" NPT [(Taper), ANSI/ASME B1.20.1] | M A |
| R 1½" [(BSPT), EN 10226] | L C |
| R 2" [(BSPT), EN 10226] | M C |
| G 1½" [(BSPP), EN ISO 228-1] | L E |
| G 2" [(BSPP), EN ISO 228-1] | M E |

| **Antenna extensions or Inactive shield length** | |
|---|---|
| No antenna extension | 0 |
| 50 mm (2 inch) extension, PTFE | 1 |
| 100 mm (4 inch) extension, PTFE | 2 |
| 100 mm (4 inch) extension, 316L stainless steel shield[1] | 3 |
| 150 mm (6 inch) extension, 316L stainless steel shield[1] | 4 |
| 200 mm (8 inch) extension, 316L stainless steel shield[1] | 5 |
| 250 mm (10 inch) extension, 316L stainless steel shield[1] | 6 |

| **Process seal/gasket** | |
|---|---|
| Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6 | 0 |
| FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2 | 1 |

| Selection and Ordering data | Article No. |
|---|---|
| **SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version** | **7ML5423-** ▪▪▪▪▪ - ▪▪▪▪ |
| 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). | |

| **Enclosure/Cable inlet** | |
|---|---|
| Aluminum, Epoxy painted | |
| 2 x ½" NPT | 2 |
| 2 x M20 x 1.5 | 3 |

| **Communication/Output** | |
|---|---|
| PROFIBUS PA | B |
| 4 ... 20 mA, HART, start-up at < 3.6 mA | C |

| **Approvals** | |
|---|---|
| General Purpose, CE, RED, RCM | A |
| General Purpose, CSA, FM, Industry Canada, FCC | B |
| Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada | C |
| Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC | D |
| Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, RED, RCM; EAC | E |
| Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[2] | F |
| Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC [3][4] | G |
| Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC[4] | H |
| Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[2][4] | J |

| **Pressure rating** | |
|---|---|
| Rating per Pressure/Temperature curves in manual | 0 |
| 0.5 bar g (7.25 psi g) maximum | 1 |

[1] Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only

[2] Available with enclosure option 2 only

[3] Available with enclosure option 3 only

[4] Available with communication option C only

**4**

## Level Measurement
Continuous level measurement
Radar transmitters

### SITRANS LR200

| 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** |
| Material inspection Certificate Type 3.1 per EN 10204 | **C12** |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[3)] | **N07** |
| **_Operating Instructions_** | |
| All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation | |
| **_Accessories_** | Article No. |
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| Antenna, rod, PTFE | **7ML1830-1HC** |
| Antenna extension, 50 mm (2 inch), PTFE | **7ML1830-1CH** |
| Antenna extension, 100 mm (4 inch), PTFE | **7ML1830-1CG** |
| HART modem / USB (for use with PC and SIMATIC PDM) | **7MF4997-1DB** |
| Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C (176 °F), HART (two are required) | **7ML1930-1AP** |
| Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C (176 °F), PROFIBUS PA (two required) | **7ML1930-1AQ** |
| One General Purpose polymeric cable gland M20 x 1.5, rating for -20 °C (-4°F) ... + 80 °C (176 °F) | **7ML1930-1AM** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-...** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-...** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-...** |
| SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 | **7ML5750-...** |
| For applicable back up point level switch - see point level measurement section | |

4

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

| **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** | |

| **Process connection (refer to Pressure/ Temperature curves, page 4/211)** Flanges (316L stainless steel) | | |
|---|---|---|
| DN 50 PN 16 EN 1092-1 Type A flat faced[1] | **A A** | |
| DN 80 PN 16 EN 1092-1 Type A flat faced | **B A** | |
| DN 100 PN 16 EN 1092-1 Type A flat faced | **C A** | |
| DN 150 PN 16 EN 1092-1 Type A flat faced | **D A** | |
| DN 200 PN 16 EN 1092-1 Type A flat faced | **E A** | |
| DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face[2] | **B F** | |
| DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face[3] | **C F** | |
| DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face[3] | **D F** | |
| DN 200 PN 16 DIN EN 1092-1 Type B1 raised face[3] | **E F** | |
| 2" ASME 150 lb, flat faced[1] | **F B** | |
| 3" ASME 150 lb, flat faced | **G B** | |
| 4" ASME 150 lb, flat faced | **H B** | |
| 6" ASME 150 lb, flat faced | **J B** | |
| 8" ASME 150 lb, flat faced | **K B** | |
| DN 50 PN 40, flat faced[3] | **A C** | |
| DN 80 PN 40, flat faced[3] | **B C** | |
| DN 100 PN 40, flat faced[3] | **C C** | |
| DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face[3] | **C G** | |
| DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face[3] | **D G** | |
| DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face[3] | **E G** | |
| 2" ASME 300 lb, flat faced[1][3] | **F D** | |
| 3" ASME 300 lb, flat faced[3] | **G D** | |
| 4" ASME 300 lb, flat faced[3] | **H D** | |
| JIS DN 50 10K[1] | **A E** | |
| JIS DN 80 10K | **B E** | |
| JIS DN 100 10K | **C E** | |
| JIS DN 150 10K | **D E** | |
| JIS DN 200 10K | **E E** | |
| (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, start-up 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) | **1** |

| **Enclosure/Cable inlet** Aluminum, Epoxy painted | |
|---|---|
| 2 x ½" NPT | **2** |
| 2 x M20 x 1.5 | **3** |

| **Horn size/Waveguide options** | |
|---|---|
| 80 mm (3 inch) horn[3] | **B** |
| 100 mm (4 inch) horn[4] | **C** |
| 150 mm (6 inch) horn | **D** |
| 200 mm (8 inch) 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) wave-guide 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** |

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# Level Measurement
## Continuous level measurement
## Radar transmitters

**SITRANS LR200**

| Selection and Ordering data | Article No. |
|---|---|
| **SITRANS LR200,**<br>**Flange adapter/Horn Antenna version** | **7ML5425-**<br>■■■■■ - ■■■■ |
| 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). | |

| Approvals | |
|---|---|
| General Purpose, CE, RED, RCM | A |
| General Purpose, CSA, FM, Industry Canada, FCC | B |
| Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada | C |
| Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC | D |
| Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, RED, RCM; EAC | E |
| Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[4] | F |
| Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC[5][6] | G |
| Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, RED, RCM; EAC[6] | H |
| Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[5][6] | J |

| Pressure rating | |
|---|---|
| Rating per Pressure/Temperature curves in manual | 0 |
| 0.5 bar g (7.25 psi g) maximum | 1 |

[1] Available with pressure rating option 1 only

[2] Available with Antenna Material options 0 and 1 only

[3] For stillpipe applications only

[4] Available with enclosure option 2 only

[5] Available with enclosure option 3 only

[6] Available with communication option 2 only

| 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** |
| Material inspection Certificate Type 3.1 per EN 10204 | **C12** |
| Namur NE43 compliant, device preset to failsafe < 3.6 mA[1] | **N07** |
| *Operating Instructions* | |
| All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation | |

| Accessories | Article No. |
|---|---|
| Handheld programmer, Intrinsically safe, EEx ia | **7ML1930-1BK** |
| HART modem/USB (for use with a PC and SIMATIC PDM) | **7MF4997-1DB** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART[2] | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[3] | **7ML1930-1AQ** |
| One general purpose polymeric cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) | **7ML1930-1AM** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-...** |
| SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 | **7ML5740-...** |
| SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 | **7ML5744-...** |
| SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 | **7ML5750-...** |
| For applicable back up point level switch - see point level measurement section | |

[1] Available with communication option 2 only

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

[3] Available with enclosure option 2 only
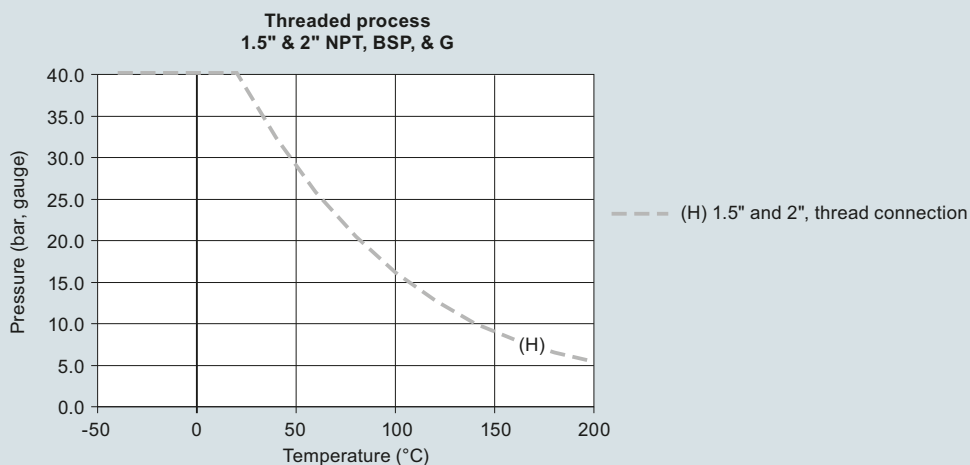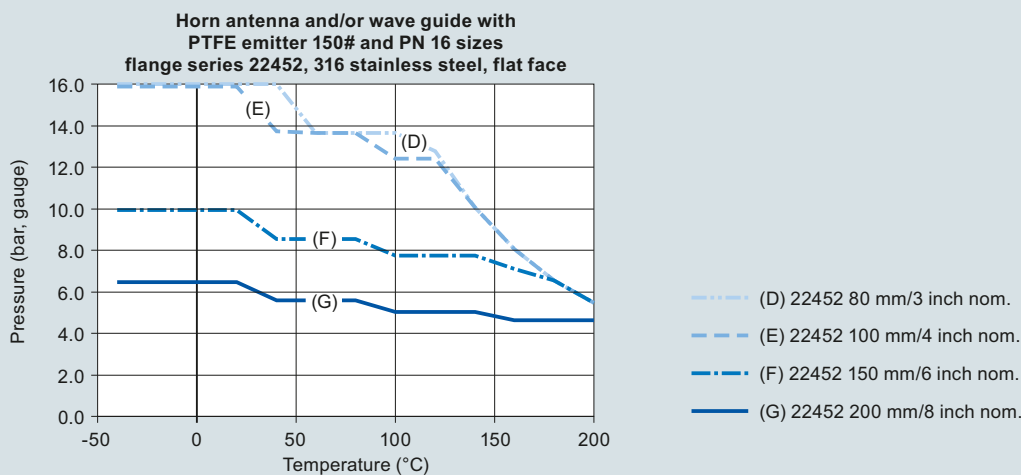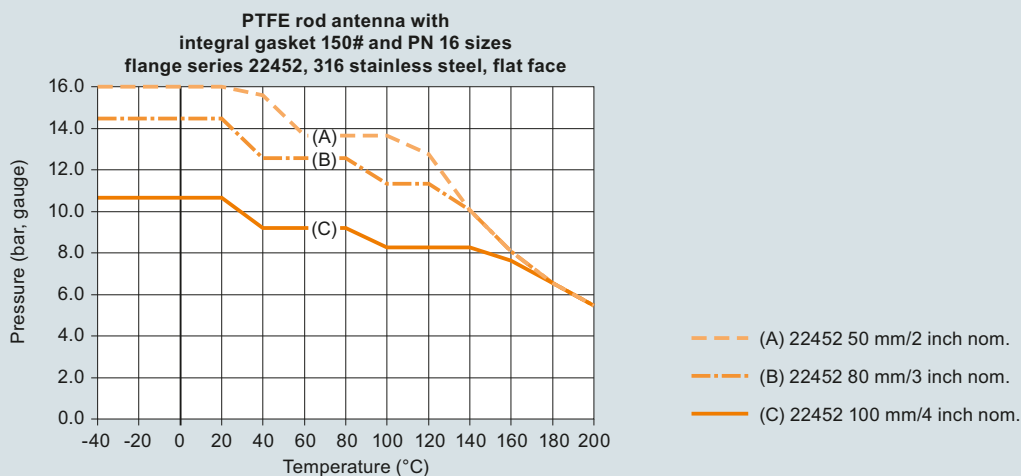
**4**

## Characteristic curves
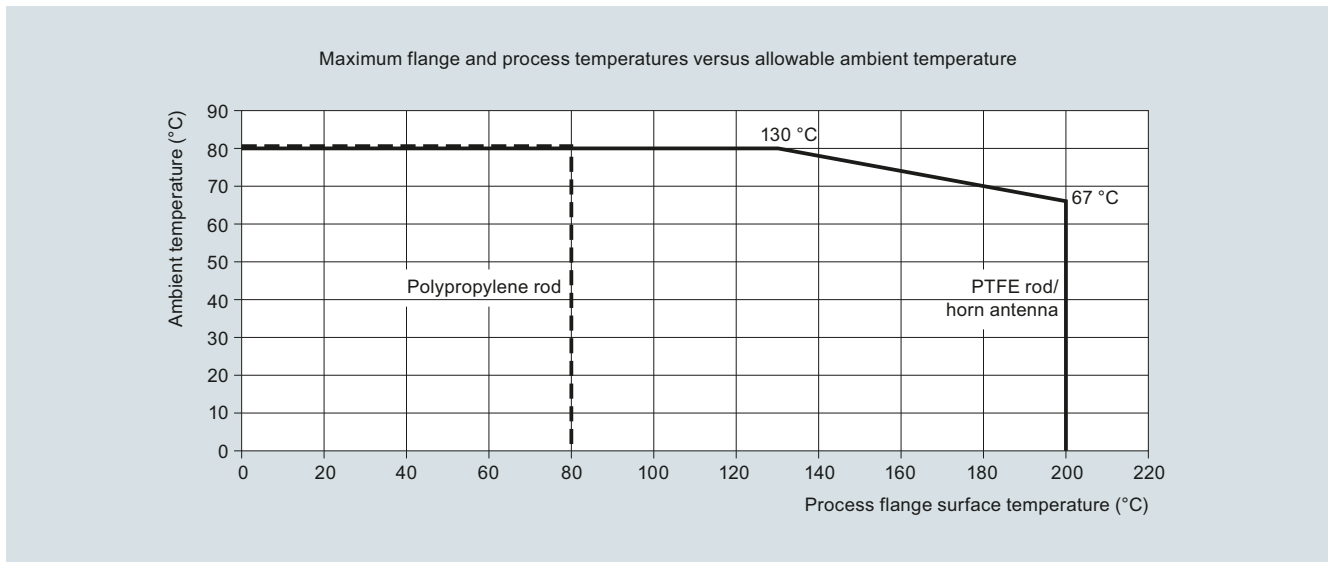


SITRANS LR200 ambient/process flange surface temperature curve

# Level Measurement
## Continuous level measurement
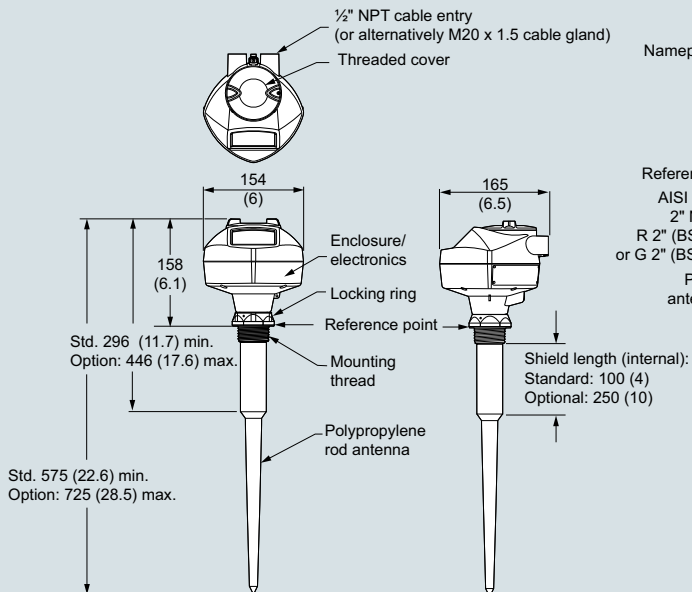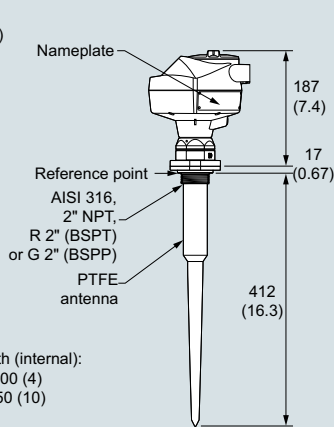## Radar transmitters

**SITRANS LR200**

**PTFE rod antenna with
integral gasket 150# and PN 16 sizes
flange series 22452, 316 stainless steel, flat face**

(A)
(B)
(C)

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

**Horn antenna and/or wave guide with
PTFE emitter 150# and PN 16 sizes
flange series 22452, 316 stainless steel, flat face**

(E)
(D)
(F)
(G)

- · · - (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.

**Threaded process
1.5" & 2" NPT, BSP, & G**

(H)

- - - - (H) 1.5" and 2", thread connection

SITRANS LR200 process pressure/temperature derating curves

## ■ Dimensional drawings

**SITRANS LR200 with polypropylene shielded rod antenna**

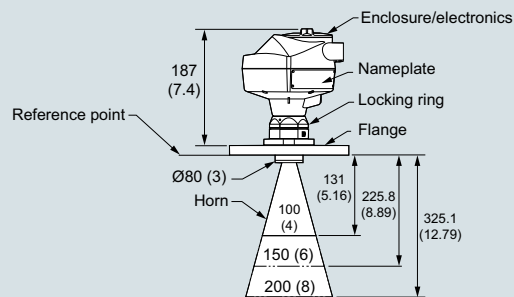½" NPT cable entry
(or alternatively M20 x 1.5 cable gland)

Threaded cover

154 (6)

158 (6.1)

165 (6.5)

Enclosure/electronics

Locking ring

Reference point

Mounting thread

Std. 296 (11.7) min.
Option: 446 (17.6) max.

Polypropylene rod antenna

Std. 575 (22.6) min.
Option: 725 (28.5) max.

Shield length (internal):
Standard: 100 (4)
Optional: 250 (10)

**PTFE rod antenna, threaded**

Nameplate

187 (7.4)

17 (0.67)

Reference point

AISI 316,
2" NPT,
R 2" (BSPT)
or G 2" (BSPP)

PTFE antenna

412 (16.3)

**Threaded connection PTFE rod, external shield**

Nameplate

187 (7.4)

18 (0.7)

Reference point

AISI 316,
2" NPT,
R 2" (BSPT)
or G 2" (BSPP)

Antenna shield
(inactive length)
AISI 316

Active antenna
(PTFE)

Shield Length (S.L.):
min. 100 (4)
(customer specified)
Overall Length (L):
374 (14.7) plus
shielded length

S.L.

L
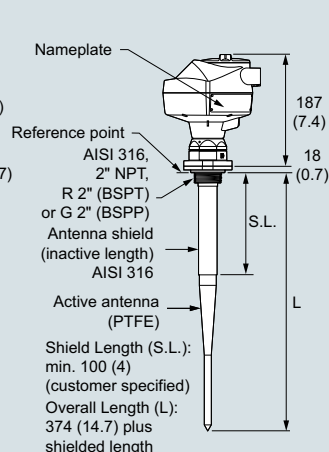
**Horn antenna with flat faced flange**

Enclosure/electronics

Nameplate

Locking ring

Flange

187 (7.4)

Reference point

Ø80 (3)

Horn

100 (4)

131 (5.16)

150 (6)

200 (8)

225.8 (8.89)

325.1 (12.79)

SITRANS LR200, dimensions in mm (inch)

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# Level Measurement
## Continuous level measurement
## Radar transmitters

**SITRANS LR200**

■ **Circuit diagrams**

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

**Hand programmer**

Part number: 7ML1930-1BK

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

Shield for HART and PROFIBUS PA intrinsically safe versions only.
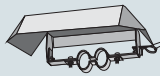
**Notes:**

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.
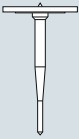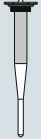
SITRANS LR200 connections
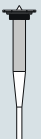
## Selection and ordering data
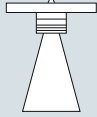
| SITRANS LR200 Specials | Article No. |
|---|---|
| **SITRANS LR200 PROFIBUS PA Aluminum Enclosure Kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna** | |
| SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection. | 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. | 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. | 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. | 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. | A5E01483559 |
| **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, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. | 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 < 3.6 mA, no process connection. | 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 < 3.6 mA, no process connection. | 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 < 3.6 mA, no process connection. | A5E02956422 |

| SITRANS LR200 Specials | Article No. |
|---|---|
| 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. | A5E03617085 |
| SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection. | A5E03617086 |
| SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection. | A5E03617087 |
| SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection. | A5E03617088 |
| **Sun shield for SITRANS LR200 enclosure, stainless steel** | |
| | A5E39142556 |
| **SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)** | |
| 80 mm (3 inch) horn antenna kit | PBD:25500K02A |
| 100 mm (4 inch) horn antenna kit | PBD:25500K03A |
| 150 mm (6 inch) horn antenna kit | PBD:25500K05A |
| **SITRANS LR200 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 |

# Level Measurement
## Continuous level measurement
## Radar transmitters

### SITRANS LR200 Specials

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| SITRANS LR200 Specials | Article No. |
|---|---|

**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** |

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

| | |
|---|---|
| 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 [3)4)] | **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 [3)4)] | **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 [3)4)] | **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 inch horn, PTFE emitter [1)4)] | **PBD: 51006K020AAAA** |
| Horn antenna kit, 2" ASME 316L stainless steel flange 4 inch horn, PTFE emitter [1)2)] | **PBD: 51006K020AABA** |
| Horn antenna kit, 2" ASME 316L stainless steel flange 6 inch horn, PTFE emitter [1)2)] | **PBD: 51006K020AACA** |
| Horn antenna kit, 2" ASME 316L stainless steel flange 8 inch horn, PTFE emitter [1)2)] | **PBD: 51006K020AADA** |
| Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter [1)2)] | **PBD: 51006K050AJAA** |
| Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter [1)2)] | **PBD: 51006K050AJBA** |
| Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter [1)2)] | **PBD: 51006K050AJCA** |
| Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter [1)2)] | **PBD: 51006K050AJDA** |

**SITRANS LR200 Specials**

| | Article No. |
|---|---|
| **SITRANS LR200 PTFE flanged rod antenna kit with 316L stainless steel shield and 316L stainless steel flat faced flange** | |
| PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 100 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0100AAA** |
| PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 100 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0100EJA** |
| PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 150 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0150AAA** |
| PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 150 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0150EJA** |
| PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 200 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0200AAA** |
| PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 200 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0200EJA** |
| PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 250 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0250AAA** |
| PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 250 mm 316L stainless steel shield.[1)4)] | **PBD: 51014K0250EJA** |
| **PTFE grease** | |
| Kit, PTFE grease, 5 Dupont 1 GR Polypack | **A5E01151626** |
| **Cable gland** | |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART | **7ML1930-1AP** |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA | **7ML1930-1AQ** |
| **Ex-proof plugs** | |
| Ex-proof plugs kit, 1/2" NPT, qty 5 | **A5E39979991** |
| Ex-proof plugs kit, M20, qty 5 | **A5E39979992** |

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

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

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

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

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