

# SITRANS L Level instruments

## Continuous 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

- Uni-Construction polypropylene rod antenna standard, other antenna options available
- Easy installation and simple start-up
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM
- Communication using HART® or PROFIBUS PA
- Patented Sonic Intelligence® signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of fixed obstructions
- Various flanges, horn and waveguide antenna options available

#### Application

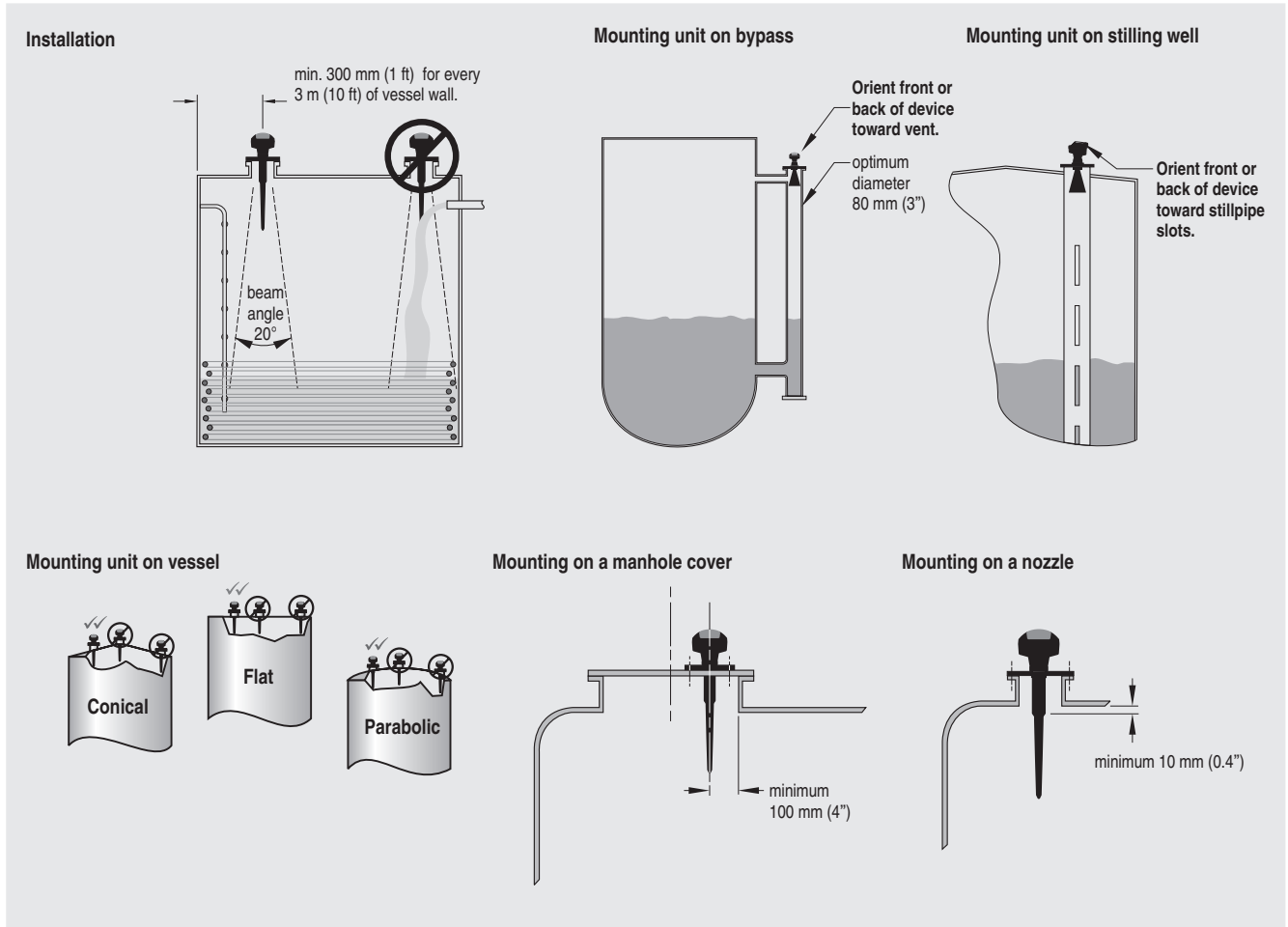
SITRANS LR200's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It also features a built-in alphanumeric display in four languages.

The SITRANS LR200 has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. With other instruments, you may need to consider compatibility of multiple materials including the seal between the materials. 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 Sonic Intelligence signal-processing technology for superior reliability.

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

#### Configuration



SITRANS LR200 installation

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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 to 20 m (1.0 to 65 ft)

##### Output

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

##### Performance (reference conditions)

• Blanking distance	0.3 m (from reference point plus any shield length)
• Accuracy	± the greater of 0.1% of range or 10 mm
• Influence of ambient temperature	0.003% / K
• Non-repeatability	± 5 mm

##### Rated operating conditions

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

##### Medium conditions

• Dielectric constant $\epsilon_r$	$\epsilon_r > 1.6$ (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/LR300 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/LR300 Antennas for more connections

##### Power supply

4 to 20 mA/HART	
- General Purpose, Non-incendive, Intrinsically Safe	Nominal 24 V DC (max. 30 V DC) with max. 550 $\Omega$
- Flame proof, Increased safety, Explosion proof	Nominal 24 V DC (max. 30 V DC) with max. 250 $\Omega$
PROFIBUS PA	• 10.5 mA • per IEC 61158-2

##### Certificates and approvals

• General	CSA <sub>US/C</sub> , CE, FM
• Marine	• Lloyd's Register of Shipping • ABS Type Approval
• Radio	FCC, Industry Canada and European (R&TTE)
• Hazardous	
- Flame proof (Europe)	ATEX II 1/2 G EEx dm ia IIC T4
- Increased safety (Europe)	ATEX II 1/2 G EEx em ia IIC T4
- Explosion proof (USA/Canada)	FM/CSA (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)	FM/CSA (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 (Tamb = -40 to +80 °C) IP67
- Intrinsically Safe (International)	IECEX TSA 04.0020X T4

##### Programming

• Intrinsically Safe Siemens Milltronics handheld programmer	Infrared receiver
- Approvals for handheld programmer	IS model with ATEX EEx ia IIC T4, FM/CSA Class I, Div. 1, Groups A, B, C, D
• Hand communicator	HART communicator 375
• PC	SIMATIC PDM
• 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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SITRANS LR200

Selection and Ordering data	Order No.
<b>SITRANS LR200, Uni-Construction polypropylene rod antenna version</b> 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. +80 °C (+176 °F), 3 bar]	C) <b>7 ML 5 4 2 2 - 0</b>
<b>Enclosure/Cable inlet</b> Aluminum, Epoxy painted 2 x 1/2" NPT, Milltronics local interface 2 x M20x1.5, Milltronics local interface 2 x 1/2" NPT, Siemens LUI interface 2 x M20 x 1.5, Siemens LUI interface	0 1 2 3
<b>Polypropylene antenna type - (Max. 3 Bar pressure and +80 °C)</b> 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield	A B C D E F
<b>Approvals</b> General Purpose, CE <sup>1)</sup> General Purpose, CSA <sub>US/C</sub> , FM, for North America only <sup>2)</sup> 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 <sup>2)</sup> FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier <sup>2)</sup> ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier <sup>1)</sup> FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required) <sup>2) and 4)</sup> ATEX II 1/2 G EEx em ia IIC T4 (no barrier required) <sup>1), 3) and 5)</sup> ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required) <sup>1) and 5)</sup> CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) <sup>2), 4) and 5)</sup>	A B C D E F G H J
<b>Communication/Output</b> 4 to 20 mA, HART <sup>®</sup> PROFIBUS PA	1 2
<b>Further designs</b>	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Stainless steel tag [69 mm 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	Y15  C11
<b>Instruction manual for HART/mA device</b> English C) <b>7ML1998-5FN04</b> French C) <b>7ML1998-5FN11</b> German C) <b>7ML1998-5FN34</b> Note: The instruction manual should be ordered as a separate line item on the order. Multi-language Quick Start manual C) <b>7ML1998-5QL83</b> This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Instruction manual for PROFIBUS device</b> English C) <b>7ML1998-5HP01</b> French C) <b>7ML1998-5HP11</b> German C) <b>7ML1998-5HP31</b> Note: The instruction manual should be ordered as a separate line item on the order.	

Selection and Ordering data	Order No.
<b>SITRANS LR200, Uni-Construction polypropylene rod antenna version</b> 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. +80 °C (+176 °F), 3 bar]	C) <b>7 ML 5 4 2 2 - 0</b>
Multi-language Quick Start manual C) <b>7ML1998-5QG81</b> This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Instruction manual for HART/mA device (Siemens LUI interface version)</b> English C) <b>7ML1998-5JP01</b> German C) <b>7ML1998-5JP31</b> Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick Start manual C) <b>7ML1998-5XC81</b> This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Instruction manual for PROFIBUS device (Siemens LUI interface version)</b> English C) <b>7ML1998-5JR01</b> German C) <b>7ML1998-5JR31</b> Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick Start manual C) <b>7ML1998-5XD81</b> This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Accessories</b> Handheld programmer, Intrinsically Safe, EEx ia (for HART device) <b>7ML5830-2AH</b> Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device) C) <b>7ML5830-2AJ</b> Handheld programmer, Intrinsically safe, EEx ia (LUI enabled) C) <b>7ML1930-1BK</b> HART modem/RS-232 (for use with a PC and SIMATIC PDM) D) <b>7MF4997-1DA</b> HART modem/USB (for use with a PC and SIMATIC PDM) D) <b>7MF4997-1DB</b> One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) <b>7ML1930-1AP</b> One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 °F to +176 °F) with integrated shield connection (available for PROFIBUS PA) <b>7ML1930-1AQ</b> One General Purpose polymeric cable gland M20 x 1.5, rating for -20 to + 80 °C (-4 to 176 °F) SITRANS RD100 Remote display - see RD100 on page 5/259 <b>7ML1930-1AM</b> SITRANS RD200 Remote display see RD200 on page 5/261	
1) Includes European Radio approval (R&TTE), 5.8 GHz 2) Includes Radio approval FCC, 6.3 GHz 3) Available with enclosure option 1 only 4) Available with enclosure option 0 only 5) Available with communication option 1 only C) Subject to export regulations AL: N, ECCN: EAR99 D) Subject to export regulations AL: N, ECCN: EAR99H	

# SITRANS L Level instruments

## Continuous measurement - Radar transmitters

### SITRANS LR200

Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter, Sanitary Version</b>	C) 7 ML 5 4 2 4 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	
<b>Antenna material (uses antenna adapter)</b> PTFE, one piece rod antenna UHMW-PE, one piece rod antenna	0 1
<b>Process connection</b> Sanitary fitting clamp	A
<b>Configuration/Connection size</b> 2" connection, rod antenna only 3" connection, rod antenna only 4" connection, rod antenna only	A B C
<b>Antenna extension</b> No extension	0
<b>Mounting Clamp</b> No mounting clamp Mounting clamp included, not available with Pressure rating option 0	0 1
<b>Enclosure/Cable inlet</b> <u>Aluminum, Epoxy painted</u> 2 x 1/2" NPT, Milltronics local interface 2 x M20x1.5, Milltronics local interface 2 x 1/2" NPT, Siemens LUI interface 2 x M20 x 1.5, Siemens LUI interface	0 1 2 3
<b>Communication/Output</b> 4 to 20 mA, HART® PROFIBUS PA	A B
<b>Approvals</b> General Purpose, CE <sup>1)</sup> General Purpose, CSA <sub>AUS/IC</sub> , FM, for North America only CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier <sup>1)</sup> FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) <sup>2) and 4)</sup> ATEX II 1/2 G EEx em ia IIC T4 (no barrier required) <sup>1), 3) and 5)</sup> ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required) <sup>1) and 5)</sup> CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) <sup>2), 4) and 5)</sup>	A B C D E F G H J
<b>Pressure rating</b> Rating per Pressure/Temperature curves in Manual 0.5 bar (7.25 psi) maximum	0 1
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s).	Order code
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	C11 C12 Y15
<b>Instruction manual for HART/mA device</b> English French German Note: The instruction manual 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 instruction manual library.	C) 7ML1998-5FN04 C) 7ML1998-5FN11 C) 7ML1998-5FN34  C) 7ML1998-5QL83

Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter, Sanitary Version</b>	C) 7 ML 5 4 2 4 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	
<b>Instruction manual for PROFIBUS device</b> English French German Note: The instruction manual 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 instruction manual library.	C) 7ML1998-5HP01 C) 7ML1998-5HP11 C) 7ML1998-5HP31  C) 7ML1998-5QG81
<b>Instruction manual for HART/mA device (Siemens LUI interface version)</b> English German Note: The instruction manual 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 instruction manual library.	C) 7ML1998-5JP01 C) 7ML1998-5JP31  C) 7ML1998-5XC81
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<b>Accessories</b> Handheld programmer, Intrinsically Safe, EEx ia (for HART device) Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device) Hand Programmer, Intrinsically safe, EEx ia (LUI enabled) 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 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 °F to +176 °F) with integrated shield connection (available for PROFIBUS PA) One General Purpose polymeric cable gland M20 x 1.5, rating for -20 to + 80 °C (-4 to 176 °F) SITRANS RD100 Remote display - see RD100 on page 5/259 SITRANS RD200 Remote display see RD200 on page 5/261	7ML5830-2AH C) 7ML5830-2AJ C) 7ML1930-1BK D) 7MF4997-1DA D) 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ 7ML1930-1AM
<b>Sanitary fitting clamps</b> 2", 304 stainless steel 3", 304 stainless steel 4", 304 stainless steel	7ML1830-1HD 7ML1830-1HE 7ML1830-1HF
1) Includes European Radio approval (R&TTE), 5.8 GHz 2) Includes Radio approval FCC, 6.3 GHz 3) Available with enclosure option 1 only 4) Available with enclosure option 0 only 5) Available with communication option A only C) Subject to export regulations AL: N, ECCN: EAR99 D) Subject to export regulations AL: N, ECCN: EAR99H	

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## Continuous measurement - Radar transmitters

SITRANS LR200

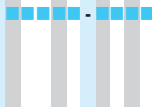
Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version</b>	C) 7 ML 5 4 2 3 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	
<b>Antenna material (uses antenna adapter)</b> PTFE, uses antenna adapter and additional process connection below	1
<b>Process connection (refer to Pressure/Temperature curves in Instruction manual)</b> <u>Flat Faced Flanges (316L stainless steel)</u> 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 DN50 10K JIS DN80 10K JIS DN100 10K JIS DN150 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.) <u>Threaded connection (316L stainless steel)</u> 1-½" NPT [(Taper), ANSI/ASME B1.20.1] 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1-½" [(BSPT), EN 10226] R 2" [(BSPT), EN 10226] G 1-½" [(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 LA MA LC MC LE ME
<b>Antenna extensions or Inactive shield length</b> No antenna extension 50 mm (2") extension, PTFE 100 mm (4") extension, PTFE 100 mm (4") extension, 316L stainless steel shield <sup>(6)</sup> 150 mm (6") extension, 316L stainless steel shield <sup>(6)</sup> 200 mm (8") extension, 316L stainless steel shield <sup>(6)</sup> 250 mm (10") extension, 316L stainless steel shield <sup>(6)</sup> Custom inactive shield length 101 mm to 1000 mm (in 1 mm increments) Add order code Y01 and plain text: "Inactive shield length...mm" <sup>(6)</sup>	0 1 2 3 4 5 6 7
<b>Process Seal/Gasket</b> 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
<b>Enclosure/Cable inlet</b> Aluminum, Epoxy painted 2 x ½" NPT, Milltronics local interface 2 x M20x1.5, Milltronics local interface 2 x ½" NPT, Siemens LUI interface 2 x M20 x 1.5, Siemens LUI interface	0 1 2 3
<b>Communication/Output</b> 4 to 20 mA, HART <sup>®</sup> PROFIBUS PA	A B

Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version</b>	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)	
<b>Approvals</b> General Purpose, CE <sup>1)</sup> General Purpose, CSAus/c, FM, for North America only <sup>2)</sup> CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier <sup>2)</sup> FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier <sup>2)</sup> ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier <sup>1)</sup> FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) <sup>2)</sup> and 4) ATEX II 1/2 G EEx em ia IIC T4 (no barrier required) <sup>1), 3)</sup> and 5) ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required) <sup>1)</sup> and 5) CSA/FM Class I, II and III, Div. 1, Groups A,B, C, D, E, F, G (no barrier required) <sup>2), 4)</sup> and 5)	A B C D E F G H J
<b>Pressure rating</b> rating per Pressure/Temperature curves in Manual 0.5 bar (7.25 psi) maximum	0 1
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s). Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text Inactive custom shield lengths: Enter the total length of the inactive shield in plain text description (in 1 mm increments).	Order code C11 C12 Y15 Y01
<b>Instruction manual for HART/ma device</b> English French German Note: The instruction manual 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 instruction manual library.	Order No. C) 7ML1998-5FN04 C) 7ML1998-5FN11 C) 7ML1998-5FN34 C) 7ML1998-5QL83
<b>Instruction manual for PROFIBUS device</b> English French German Note: The instruction manual 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 instruction manual library.	C) 7ML1998-5HP01 C) 7ML1998-5HP11 C) 7ML1998-5HP31 C) 7ML1998-5QG81
<b>Instruction manual for HART/ma device (Siemens LUI interface version)</b> English German Note: The instruction manual 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 instruction manual library.	C) 7ML1998-5JP01 C) 7ML1998-5JP31 C) 7ML1998-5XC81

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## Continuous measurement - Radar transmitters

### SITRANS LR200

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<b>Instruction manual for PROFIBUS device (Siemens LUI interface version)</b> English German Note: The instruction manual 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 instruction manual library.	C) <b>7ML1998-5JR01</b> C) <b>7ML1998-5JR31</b>  C) <b>7ML1998-5XD81</b>
<b>Accessories</b> Handheld programmer, Intrinsically Safe, EEx ia (for HART device) Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device) Handheld programmer, Intrinsically safe, EEx ia (LUI enabled) 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 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) Antenna, rod, PTFE Antenna extension, 50 mm (2") PTFE Antenna extension, 100 mm (4") PTFE One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 °F to +176 °F) with integrated shield connection (available for PROFIBUS PA) One General Purpose polymeric cable gland M20 x 1.5, rating for -20 to + 80 °C (-4 to 176 °F) SITRANS RD100 Remote display - see RD100 on page 5/259 SITRANS RD200 Remote display see RD200 on page 5/261	 C) <b>7ML5830-2AH</b> C) <b>7ML5830-2AJ</b> C) <b>7ML1930-1BK</b> D) <b>7MF4997-1DA</b> D) <b>7MF4997-1DB</b>  <b>7ML1930-1AP</b>  <b>7ML1830-1HC</b> <b>7ML1830-1CG</b> <b>7ML1830-1CH</b> <b>7ML1930-1AP</b>  <b>7ML1930-1AQ</b>  <b>7ML1930-1AM</b>

- 1) Includes European Radio approval (R&TTE), 5.8 GHz
  - 2) Includes Radio approval FCC, 6.3 GHz
  - 3) Available with enclosure option 1 only
  - 4) Available with enclosure option 0 only
  - 5) Available with communication option A only
  - 6) Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only
- C) Subject to export regulations AL: N, ECCN: EAR99  
 D) Subject to export regulations AL: N, ECCN: EAR99H

# SITRANS L Level instruments

## Continuous measurement - Radar transmitters

SITRANS LR200


Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter/Horn Antenna Version</b>	7 ML 5 4 2 5 -
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)	
<b>Antenna Material (uses antenna adapter)</b>	
316L stainless steel with PTFE cone emitter	0
316L stainless steel with PTFE cone emitter and purge connection with 1/8" NPT inlet <sup>7)</sup>	1
Sliding waveguide system with 1000 mm (40") waveguide <sup>7)</sup>	2
<b>Process connection (refer to Pressure/Temperature curves on specification sheets)</b>	
<u>Flat Faced Flanges (316L stainless steel)</u>	
DN 50 PN 16, Type A, flat faced <sup>7)</sup>	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
2" ASME 150 lb, flat faced <sup>7)</sup>	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 <sup>7)</sup>	AC
DN 80 PN 40, flat faced	BC
DN 100 PN 40, flat faced	CC
DN 150 PN 40, flat faced	DC
DN 200 PN 40, flat faced	EC
2" ASME 300 lb, flat faced <sup>7)</sup>	FD
3" ASME 300 lb, flat faced	GD
4" ASME 300 lb, flat faced	HD
6" ASME 300 lb, flat faced	JD
8" ASME 300 lb, flat faced	KD
JIS DN 50 10K <sup>7)</sup>	AE
JIS DN 80 10K	BE
JIS DN 100 10K	CE
JIS DN 150 10K	DE
JIS DN 200 10K	EE
(Note: Bolt patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)	
<b>Communication/Output</b>	
4 to 20 mA, HART <sup>®</sup>	0
PROFIBUS PA	1
<b>Process Seal/Gasket</b>	
FKM (-40 to +200 °C)	0
Nitrile (-40 to +100 °C), sliding waveguide systems only	1
FFKM (-35 to +200 °C)	2
<b>Enclosure/Cable inlet</b>	
<u>Aluminum, Epoxy painted</u>	
2 x 1/2" NPT	0
2 x M20x1.5	1
2 x 1/2" NPT, Siemens LUI interface	2
2 x M20 x 1.5, Siemens LUI interface	3
<b>Horn size/Waveguide options</b>	
80 mm (3") horn <sup>3)</sup>	B
100 mm (4") horn <sup>3)</sup>	C
150 (6") mm horn	D
200 (8") mm horn	E
100 mm (4") horn with 100 mm (4") waveguide extension <sup>3)</sup>	F
100 mm (4") horn with 150 mm (6") waveguide extension <sup>3)</sup>	G
100 mm (4") horn with 200 mm (8") waveguide extension <sup>3)</sup>	H
100 mm (4") horn with 250 mm (10") waveguide extension <sup>3)</sup>	J
150 mm (6") horn with 100 mm (4") waveguide extension	K
150 mm (6") horn with 150 mm (6") waveguide extension	L

Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter/Horn Antenna Version</b>	7 ML 5 4 2 5 -
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	
150 mm (6") horn with 200 mm (8") waveguide extension	M
150 mm (6") horn with 250 mm (10") waveguide extension	N
200 mm (8") horn with 100 mm (4") waveguide extension	P
200 mm (8") horn with 150 mm (6") waveguide extension	Q
200 mm (8") horn with 200 mm (8") waveguide extension	R
200 mm (8") horn with 250 mm (10") waveguide extension	S
Waveguide only - Waveguide length 500 mm to 3000 mm (in 1 mm increments) (Add order code Y01 and plain text: "waveguide length ...mm")	T
Horn with custom waveguide lengths 101 to 2000 mm (Add order codes Y01 and Y03 and plain text: "waveguide length...mm", and "horn size ...mm") <sup>8)</sup>	U
<b>Approvals</b>	
General Purpose, CE <sup>1)</sup>	A
General Purpose, CSAus/c, FM, for North America only <sup>2)</sup>	B
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier <sup>2)</sup>	C
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier <sup>2)</sup>	D
ATEX II 1G EEx ja IIC T4, Intrinsically Safe with suitable barrier <sup>1)</sup>	E
FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required) <sup>2)</sup>	F
ATEX II 1/2 G EEx em ia IIC T4 (no barrier required) <sup>1), 4) and 6)</sup>	G
ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required) <sup>1) and 6)</sup>	H
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required) <sup>2), 5) and 6)</sup>	J
<b>Pressure rating</b>	
Rating per Pressure/Temperature curves in Manual	0
0.5 bar (7.25 psi) maximum	1
<b>Further designs</b>	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	<b>C11</b>
Inspection Certificate Type 3.1 per EN 10204	<b>C12</b>
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	<b>Y15</b>
Waveguide custom lengths: Enter the total length of the waveguide in plain text description (1 mm increments)	<b>Y01</b>
Enter the waveguide length (100 mm to 1000 mm) and enter the horn size (100 mm, 150 mm, and 200 mm only) in plain text description	<b>Y03</b>
<b>Instruction manual for HART/ma device</b>	Order No.
English	C) <b>7ML1998-5FN04</b>
French	C) <b>7ML1998-5FN11</b>
German	C) <b>7ML1998-5FN34</b>
Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick Start manual	C) <b>7ML1998-5QL83</b>
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	

# SITRANS L Level instruments

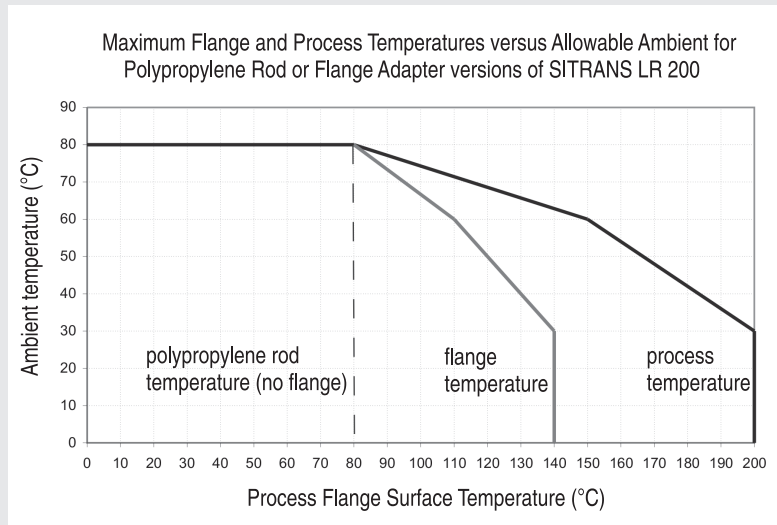
## Continuous measurement - Radar transmitters

### SITRANS LR200

Selection and Ordering data	Order No.
<b>SITRANS LR200, Flange Adapter/Horn Antenna Version</b> 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)	<b>7ML5425-</b> 
<b>Instruction manual for PROFIBUS device</b>	
English	C) <b>7ML1998-5HP01</b>
French	C) <b>7ML1998-5HP11</b>
German	C) <b>7ML1998-5HP31</b>
Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick start manual	C) <b>7ML1998-5QG81</b>
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Instruction manual for HART/mA device (Siemens LUI interface version)</b>	
English	C) <b>7ML1998-5JP01</b>
German	C) <b>7ML1998-5JP31</b>
Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick Start manual	C) <b>7ML1998-5XC81</b>
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Instruction manual for PROFIBUS device (Siemens LUI interface version)</b>	
English	C) <b>7ML1998-5JR01</b>
German	C) <b>7ML1998-5JR31</b>
Note: The instruction manual should be ordered as a separate line item on the order.	
Multi-language Quick Start manual	C) <b>7ML1998-5XD81</b>
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
<b>Accessories</b>	
Handheld programmer, Intrinsically Safe, EEx ia (for HART® device)	<b>7ML5830-2AH</b>
Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA® device)	C) <b>7ML5830-2AJ</b>
Handheld programmer, Intrinsically safe, EEx ia (LUI enabled)	C) <b>7ML1930-1BK</b>
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D) <b>7MF4997-1DA</b>
HART modem/USB (for use with a PC and SIMATIC PDM®)	D) <b>7MF4997-1DB</b>
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) (available for HART only)	<b>7ML1930-1AP</b>
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)	<b>7ML1930-1AQ</b>
One General Purpose polymeric cable gland M20 x 1.5, rating for -20 to + 80 °C (-4 to 176 °F)	<b>7ML1930-1AM</b>
SITRANS RD100 Remote display - see RD100 on page 5/259	
SITRANS RD200 Remote display see RD200 on page 5/261	

- 1) Includes European Radio approval (R&TTE), 5.8 GHz
  - 2) Includes Radio approval FCC, 6.3 GHz
  - 3) For stillpipe applications only
  - 4) Available with enclosure option 1 only
  - 5) Available with enclosure option 0 only
  - 6) Available with communication option 0 only
  - 7) Available with pressure rating option 1 only
  - 8) Order standard waveguide lengths 100, 150, 200, 250 mm (3.93, 5.91, 7.87, 9.84") by choosing options from *Horn size/Waveguide options*
- C) Subject to export regulations AL: N, ECCN: EAR99  
 D) Subject to export regulations AL: N, ECCN: EAR99H

#### Characteristic curves



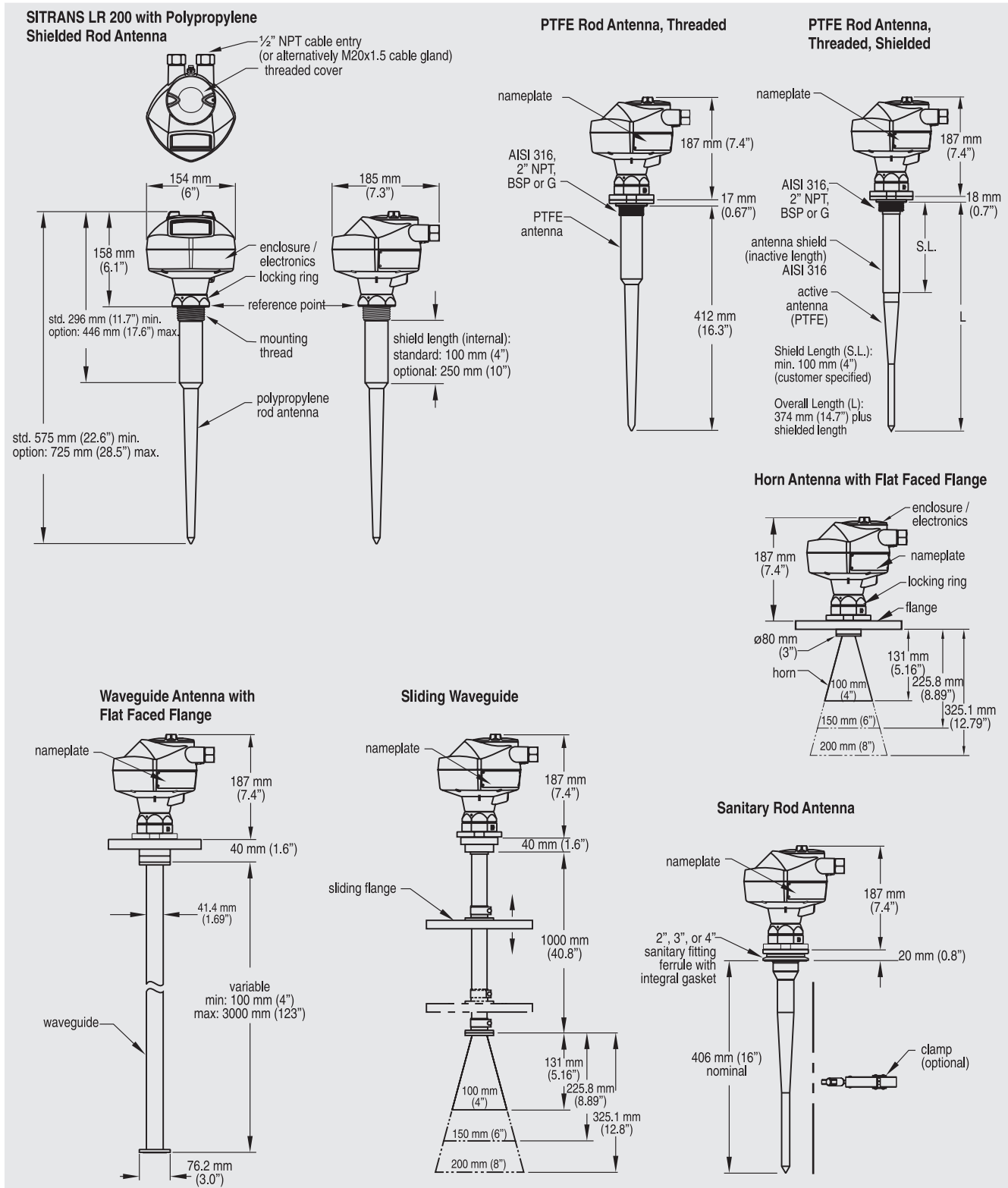
SITRANS LR200 Temperature/Pressure Curve

# SITRANS L Level instruments

## Continuous measurement - Radar transmitters

### SITRANS LR200

#### Dimensional drawings



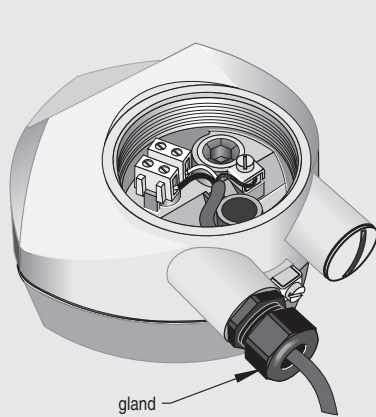
SITRANS LR200 dimensions

# SITRANS L Level instruments

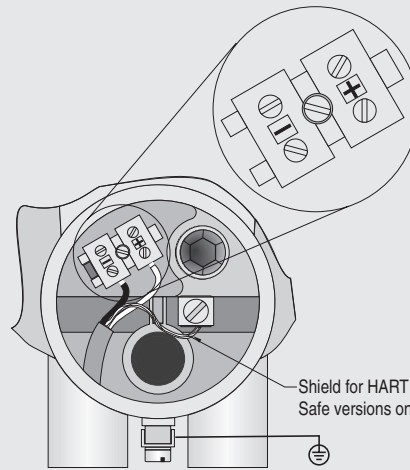
## Continuous measurement - Radar transmitters

SITRANS LR200

### Schematics



gland



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.

#### Notes:

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

#### Hand Programmers

**SITRANS LR200 HART**

Part number:  
7ML5830-2AH



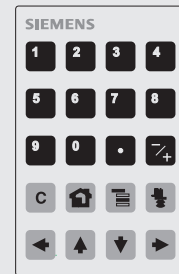
**SITRANS LR200 PROFIBUS PA**

Part number:  
7ML5830-2AJ



**SITRANS LR200 LUI**

Part number:  
7ML5830-1BK



SITRANS LR200 connections

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