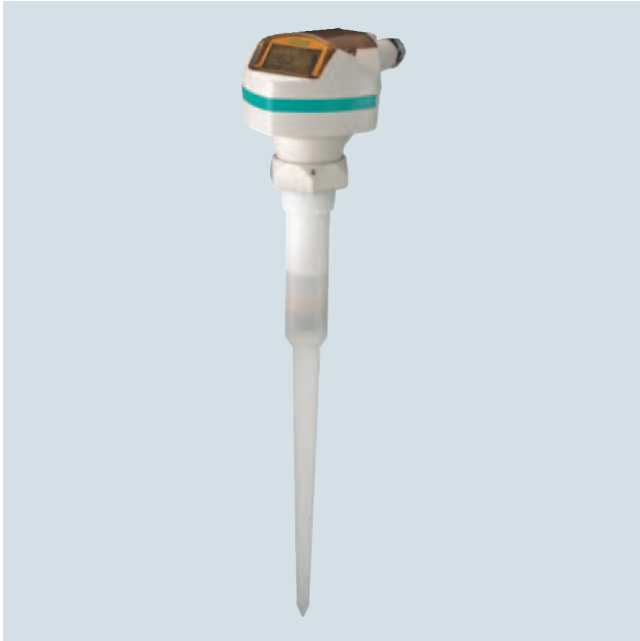


Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR

Overview



SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

Benefits

- Uni-Construction polypropylene rod antenna standard
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART handheld communicator
- Communication using HART
- Patented Process Intelligence signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of false echoes

Application

The Probe LR is ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as simple chemical storage or water treatment vessels. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

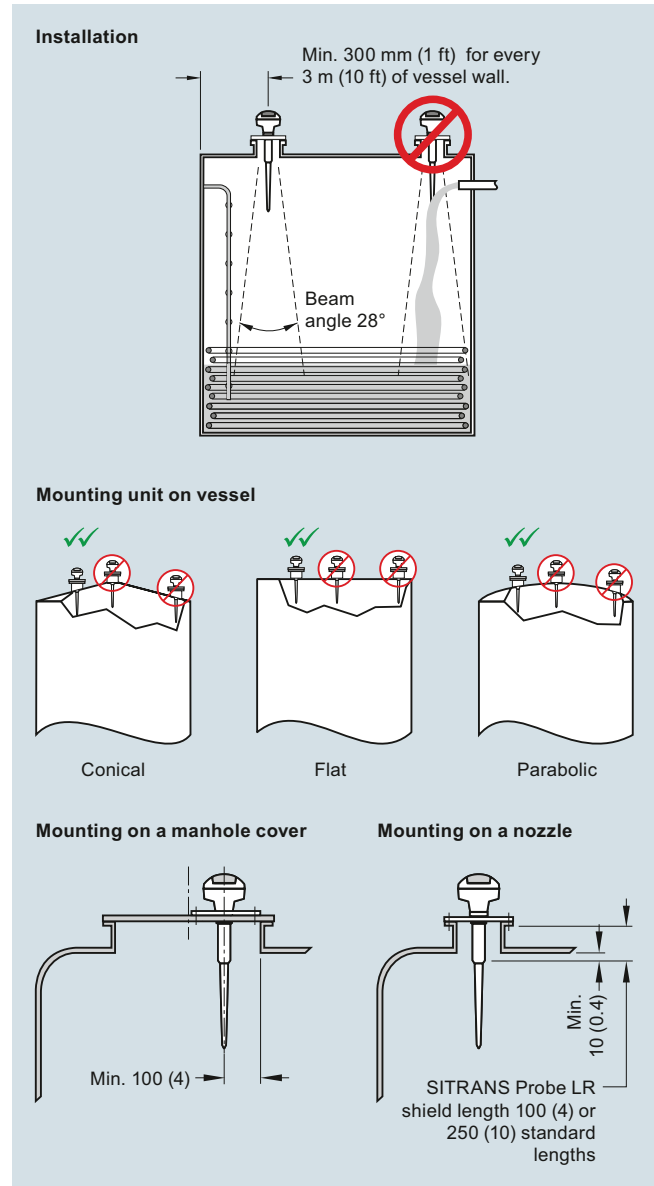
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna includes an internal, integrated shield that eliminates vessel nozzle interference.

SITRANS Probe LR incorporates Process Intelligence signal processing. The Probe LR also has a high signal-to-noise ratio leading to improved reliability.

Start-up is easy with as few as two parameters for basic operation. Programming is simple using SIMATIC PDM, HART handheld communicator or the Intrinsically Safe handheld programmer.

- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration



SITRANS Probe LR installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR



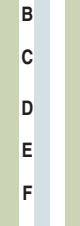
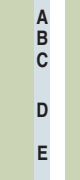

Technical specifications

| | | | |
|---|---|---|---|
| Mode of operation | | Power supply | |
| Measuring principle | Pulse radar level measurement | | • Nominal 24 V DC with max. 550 Ω, maximum 30 V DC |
| Frequency | 5.8 GHz (North America 6.3 GHz) | | • 4 ... 20 mA |
| Measuring range | 0.3 ... 20 m (1.0 ... 65 ft) | Certificates and approvals | |
| Output | | General | CSA _{US/C} , CE, FM, C-TICK |
| Analog output | 4 ... 20 mA | Marine | • Lloyd's Register of Shipping • ABS Type Approval |
| Accuracy | ± 0.02 mA | Radio | FCC, Industry Canada and European (R&TTE), C-TICK |
| Span | Proportional or inversely proportional | Hazardous | |
| Communications | HART | • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga |
| Performance (reference conditions) | | • Intrinsically Safe (Canada) | CSA Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III |
| Accuracy | ± the greater of 0.1 % of range or 10 mm (0.4 inch) | • Intrinsically Safe (Europe) | ATEX II 1G EEx ia IIC T4 |
| Influence of ambient temperature | 0.003 %/K | • Intrinsically Safe (International) | IECEx Ex ia IIC T4 |
| Repeatability | ± 5 mm (2 inch) | • Intrinsically Safe (Russia) | GOST-R Ex ia |
| Fail-safe | mA signal programmable as high, low or hold (LOE) | • Intrinsically Safe (USA) | FM Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III |
| Rated operating conditions | | Programming | |
| Installation conditions | | Handheld programmer | HART communicator 375 |
| • Location | Indoor/outdoor | PC | SIMATIC PDM |
| Ambient conditions (enclosure) | | Intrinsically safe Siemens handheld programmer (optional) | Infrared receiver |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) | • Approvals (handheld programmer) | ATEX II 1G EEx ia IIC T4 CSA and FM Class I, Div.1, Groups A, B, C, D, T6 at max. ambient |
| • Installation category | I | | |
| • Pollution degree | 4 | Display (local) | Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages |
| Medium conditions | | | |
| Dielectric constant ϵ_r | $\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe) | | |
| Vessel temperature | -40 ... +80 °C (-40 ... +176 °F) | | |
| Vessel pressure | 3 bar g (43.5 psi g) | | |
| Design | | | |
| Enclosure | | | |
| • Body construction | PBT (Polybutylene Terephthalate) | | |
| • Lid construction | PEI (Polyether Imide) | | |
| • 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 | 1.97 kg (4.35 lb) | | |
| Antenna | | | |
| • Material | Polypropylene rod, hermetically sealed construction | | |
| • Dimensions | Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield | | |
| Process connections | 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSP), EN 10226] G 1 1/2" [(BSPP), EN ISO 228-1] | | |

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR

| Selection and Ordering data | Article No. | Selection and Ordering data | Order code |
|--|--|--|--|
| SITRANS Probe LR 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F) | 7ML5430-  | 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)]: Y15 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 C11 | |
| Enclosure/Cable inlet Plastic, (PBT), 2 x 1/2" NPT Plastic, (PBT), 2 x M20x1.5 |  | Operating Instructions English French Spanish German Note: The Operating Instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library. | Article No. 7ML1998-5HR02 7ML1998-5HR11 7ML1998-5HR21 7ML1998-5HR32 |
| Antenna type/Material - (max. 3 bar and 80 °C) Polypropylene Antenna 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield |  | Additional Operating Instructions Multi-language Quick Start manual | A5E32106153 |
| Approvals General Purpose, CE, R&TTE, C-TICK General Purpose, CSA _{us/c} , FM, FCC CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, FCC, Intrinsically Safe FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, C-TICK, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; GOST-R |  | Accessories Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex 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) 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 | 7ML5830-2AH 7MF4997-1DA 7MF4997-1DB 7ML1930-1AP 7ML5750-1AA00-0 |
| Communication/Output 4 ... 20 mA, HART |  | Spare parts Plastic lid For applicable back up point level switch - see point level section on page 4/9 | 7ML1830-1KB |

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

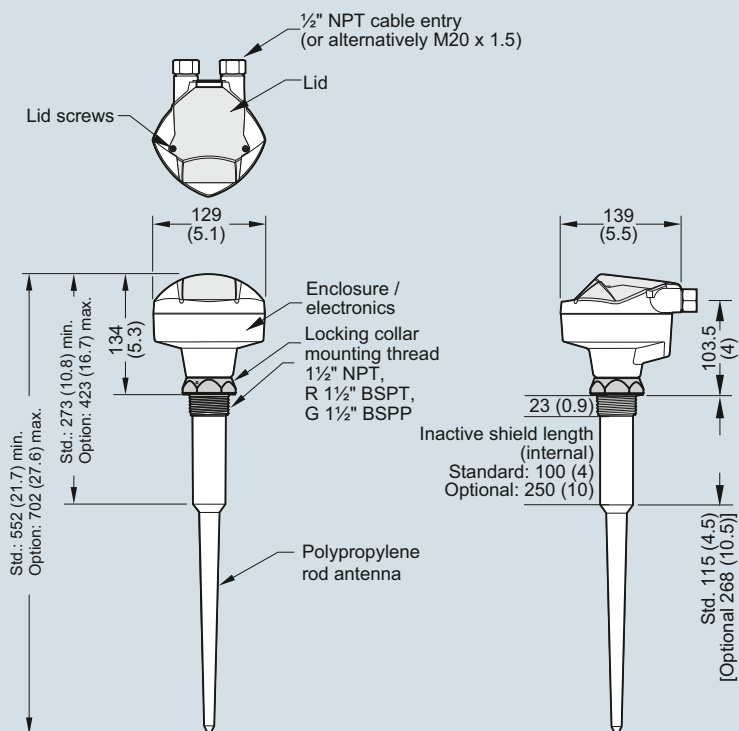
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Level Measurement

Continuous level measurement – Radar transmitters

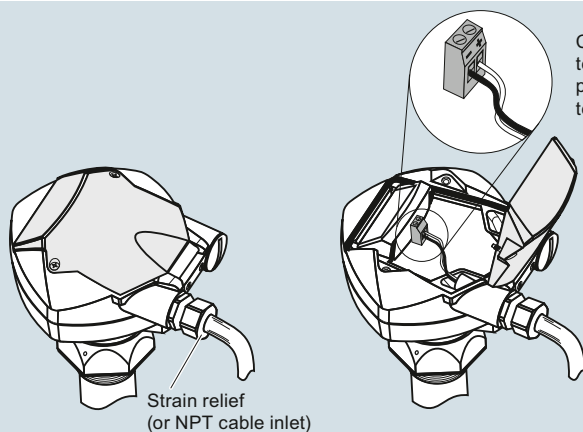
SITRANS Probe LR

Dimensional drawings



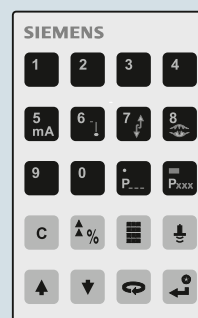
SITRANS Probe LR, dimensions in mm (inch)

Schematics



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

Hand Programmer



SITRANS Probe LR
Part number: 7ML5830-2AH

Notes:

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

SITRANS Probe LR connections

4