

Overview



SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.

Benefits

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART Communicator
- Communication using HART or PROFIBUS PA
- ETFE or PVDF transducers for chemical compatibility
- Sonic Intelligence signal processing
- Auto False-Echo Suppression for fixed obstruction avoidance
- Level to volume or level to flow conversion

Application

The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry, chemical storage vessels, and small bulk hoppers.

The range of SITRANS Probe LU is 6 or 12 m (20 or 40 ft). Using Sonic Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch), the Probe LU provides unmatched reliability.

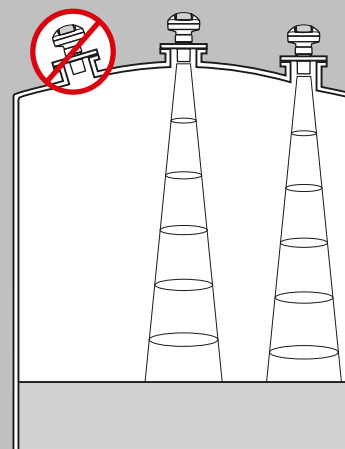
The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.

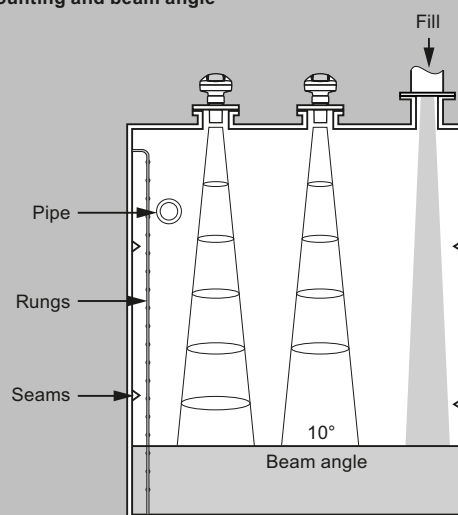
- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

Configuration

Parabolic mounting



Flat mounting and beam angle



SITRANS Probe LU mounting

Level Measurement

Continuous level measurement

Ultrasonic / Ultrasonic transmitters / SITRANS Probe LU

Selection and ordering data

| SITRANS Probe LU Ultrasonic level transmitter Continuous, non-contact, up to 12 m (40 ft) range. Monitors level and volume in liquids and slurries. With optional PROFIBUS PA. | | Article No. 7ML5221- | ● | ● | ● | ● | ● |
|--|--|-------------------------|---|---|---|---|---|
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | | | | | | |
| Enclosure/Cable Inlet | | | | | | | |
| Plastic (PBT), 1 x M20 x 1.5 and 1 x ½" NPT (no cable glands supplied) | | 0 | | | | | |
| Plastic (PBT), 2 x M20 x 1.5 (includes 1 general purpose cable gland: 7ML1930-1AM) | | 1 | | | | | |
| Plastic (PBT), 2 x ½" NPT (no cable glands supplied) | | 2 | | | | | |
| Range/Transducer material | | | | | | | |
| 6 m (20 ft), ETFE | | | | A | | | |
| 6 m (20 ft), PVDF Copolymer | | | | B | | | |
| 12 m (40 ft), ETFE | | | | C | | | |
| 12 m (40 ft), PVDF Copolymer | | | | D | | | |
| Process connection | | | | | | | |
| 2" NPT [(Taper), ASME B1.20.1] | | | | | A | | |
| R 2" [(BSPT), EN 10226] | | | | | B | | |
| G 2" [(BSPP), EN ISO 228-1] | | | | | C | | |
| Communication/Output | | | | | | | |
| 4 ... 20 mA, HART | | | | | | 1 | |
| PROFIBUS PA | | | | | | 2 | |
| Approvals | | | | | | | |
| Ordinary Locations/General Purpose (Non-Ex), FM, cCSA _{US} , CE, UKCA, RCM, KC | | | | | | | 1 |
| Non-incendive, FM Class I, Div. 2, Groups A, B, C, D T5 ¹⁾ | | | | | | | 4 |
| Intrinsically Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ²⁾ | | | | | | | 5 |
| ATEX 1G Ex ia IIC T4 Ga, Ta = -40°C to +80°C; UKEX 1G Ex ia IIC T4 Ga, Ta = -40°C to +80°C; INMETRO Ex ia IIC T4 Ga, IP67/IP68, -40°C ≤ Ta ≤ +80°C; KCs Ex ia IIC T4; RCM ²⁾ | | | | | | | 6 |
| ATEX 1G Ex ia IIC T4 Ga, Ta = -40°C to +80°C; UKEX 1G Ex ia IIC T4 Ga, Ta = -40°C to +80°C; IECEX Ex ia IIC T4 Ga, Ta = -40°C to +80°C; INMETRO Ex ia IIC T4 Ga, IP67/IP68, -40°C ≤ Ta ≤ +80°C; KCs Ex ia IIC T4; RCM ³⁾ | | | | | | | 7 |
| Intrinsically safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ³⁾ | | | | | | | 8 |

¹⁾ Available with Enclosure/Cable Inlet option 2 only.

²⁾ Available with Communication option 2 only.

³⁾ Available with Communication option 1 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 |

| Spare parts and accessories | Article No. |
|---|-------------|
| Operating Instructions for HART/mA device | |
| All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation | |
| Accessories | |
| Handheld programmer, Intrinsically Safe, EEx ia | 7ML5830-2AH |
| Handheld programmer, General Purpose approvals | A5E36563512 |
| Handheld programmer, Infrared, Intrinsically Safe, PROFIBUS PA | 7ML5830-2AJ |
| HART modem with USB interface | 7MF4997-1DB |
| 2" BSP nylon plastic locknut | 7ML1830-1DQ |
| 2" NPT nylon plastic locknut | 7ML1830-1DT |

Selection and ordering data (continued)

| Spare parts and accessories | Article No. |
|--|---------------|
| 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT | 7ML1830-1BT |
| 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT | 7ML1830-1BU |
| One General Purpose polymeric cable gland M20 x 1.5, rated for -20 ... +80 °C (-4 ... +176 °F) | 7ML1930-1AM |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) | 7ML1930-1AP |
| One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA) | 7ML1930-1AQ |
| Universal box bracket, FMS-200 | 7ML1830-1BK |
| Probe LU rock guard and sunshield | 7ML1930-1GH |
| SITRANS RD100, loop powered display -see Chapter 7 | 7ML5741-..... |
| SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 | 7ML5742-..... |
| 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-..... |
| For applicable back up point level switch see point level measurement section. | |
| Spare Parts | |
| Plastic lid | 7ML1830-1KB |

Technical specifications

| SITRANS Probe LU | |
|-----------------------------------|---|
| Mode of operation | |
| Measuring principle | Ultrasonic level measurement |
| Typical application | Level measurement in storage vessels and simple process vessels |
| Inputs | |
| Measuring range | |
| • 6 m (20 ft) model | 0.25 ... 6 m (10 inch ... 20 ft) |
| • 12 m (40 ft) model | 0.25 ... 12 m (10 inch ... 40 ft) |
| Frequency | 54 kHz |
| Outputs | |
| mA/HART | |
| • Range | 4 ... 20 mA |
| • Accuracy | ± 0.02 mA |
| PROFIBUS PA | Profile 3, Class B |
| Performance | |
| Resolution | ≤ 3 mm (0.12 inch) |
| Accuracy | ± the greater of 0.15 % of range or 6 mm (0.24 inch) |
| Repeatability | ≤ 3 mm (0.12 inch) |
| Blanking distance | 0.25 m (10 inch) |
| Update time | ≤ 5 s |
| • 4/20 mA/HART version | ≤ 5 s at 4 mA |
| • PROFIBUS version | ≤ 4 s at 15 mA current loop |
| Temperature compensation | Built-in to compensate over temperature range |
| Beam angle | 10° |
| Rated operating conditions | |
| Ambient conditions | |
| • Location | Indoor/outdoor |
| • Ambient temperature | -40 ... +80 °C (-40 ... +176 °F) |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |

Technical specifications (continued)

| SITRANS Probe LU | |
|--|---|
| • Relative humidity/ingress protection | Suitable for outdoor |
| • Installation category | I |
| • Pollution degree | 4 |
| Medium conditions | |
| • Temperature at flange or threads | -40 ... +85 °C (-40 ... +185 °F) |
| • Pressure (vessel) | 0.5 bar g (7.25 psi g) |
| Design | |
| Material (enclosure) | PBT (Polybutylene Terephthalate) |
| Degree of protection | Type 4X/NEMA 4X, Type 6/NEMA 6/IP67/IP68 enclosure |
| Weight | 2.1 kg (4.6 lb) |
| Cable inlet | 2 x M20 x 1.5 cable gland or 2 x ½" NPT thread or 1 x M20 x 1.5 and 1 x ½" NPT |
| Material (transducer) | Buna-N seal with ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride) |
| Process connection | |
| Threaded connection | 2" NPT [(Taper), ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1] |
| Flange connection | 3 inch (80 mm) universal flange |
| Other connection | FMS 200 mounting bracket (see FMS mounting bracket product page for more information) or customer supplied mount. |
| Display and Controls | |
| Interface | Local: LCD display with bar graph Remote: Available via HART or PROFIBUS PA |
| Configuration | Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens infrared handheld programmer |
| Memory | Non-volatile EEPROM |
| Power supply | |
| 4 ... 20 mA/HART | Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 ... 20 mA |

Level Measurement

Continuous level measurement

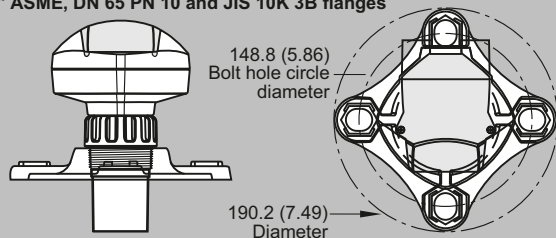
Ultrasonic / Ultrasonic transmitters / SITRANS Probe LU

Technical specifications (continued)

| SITRANS Probe LU | |
|--|--|
| PROFIBUS PA | 12, 13, 15, or 20 mA depending on programming (General Purpose or Intrinsically Safe version) per IEC 61158-2 |
| Certificates and Approvals | |
| General | cCSA _{US} , FM, CE, UKCA, RCM |
| Marine (only applies to HART communication option) | <ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval |
| Hazardous | |
| • Intrinsically Safe (Europe) | ATEX II 1G Ex ia IIC T4 Ga |
| • Intrinsically Safe (UK) | UKEX II 1G Ex ia IIC T4 Ga |
| • Intrinsically Safe (USA/Canada) | CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 |
| • Intrinsically Safe (International) | SIR 13.0008X Ex ia IIC T4 Ga |
| • Intrinsically Safe (Brazil) | INMETRO Ex ia IIC T4 Ga |
| • Non-incendive (USA) | FM Class I, Div. 2, Groups A, B, C, D T4 |
| Handheld Programmer | |
| Intrinsically Safe Siemens handheld programmer | Infrared receiver |
| • Approvals for handheld programmer | IS model: ATEX II 1 GD Ex ia op is IIC T4 Ga, ATEX II 1 GD Ex ia op is IIIC T135°C Da, Ta = -20 ... +50°C; UKEX II 1 GD Ex ia op is IIC T4 Ga, UKEX II 1 GD Ex ia op is IIIC T135°C Da, Ta = -20 ... +50°C; CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, G, T6, Ta = 50°C; IECEx SIR 09.0073 |
| Ambient temperature | -20 ... 50 °C (-5 ... 122 °F) |
| Interface | Proprietary infrared pulse signal |
| Power | 3 V lithium battery (non-replaceable) |

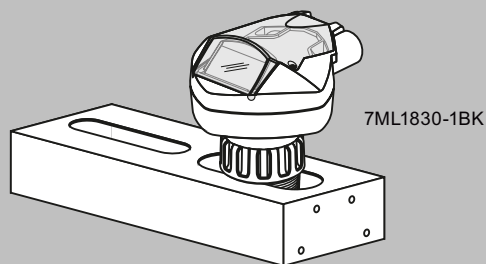
Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ASME, DN 65 PN 10 and JIS 10K 3B flanges



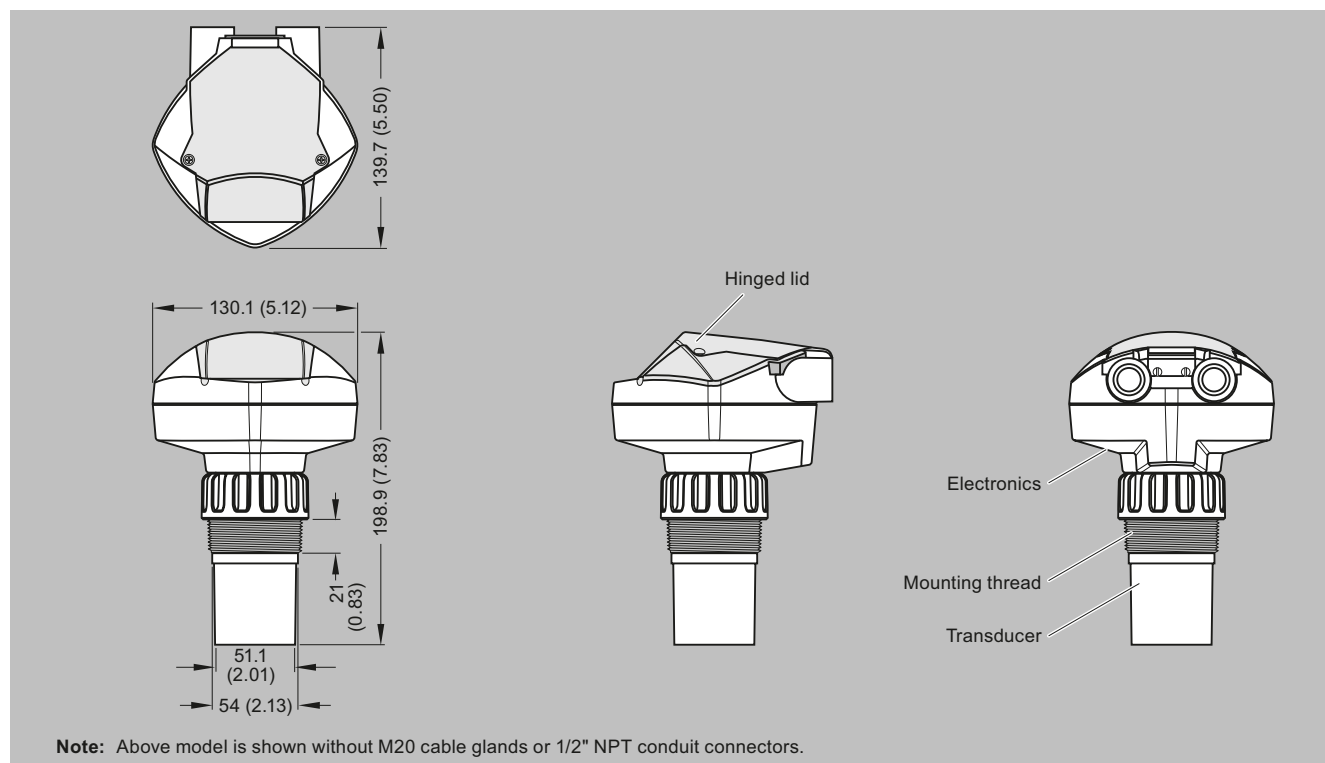
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

SITRANS Probe LU with FMS 200 universal box bracket



SITRANS Probe LU with optional mounting bracket

Dimensional drawings



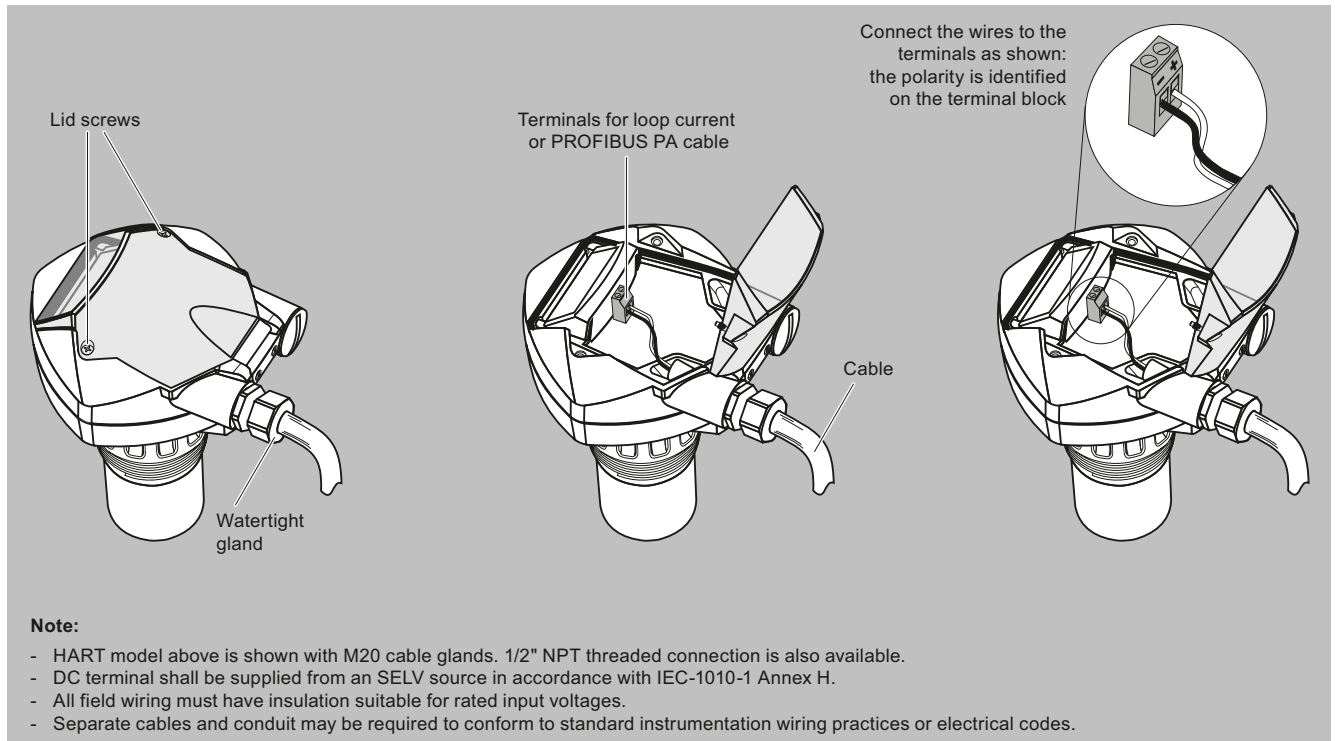
SITRANS Probe LU, dimensions in mm (inch)

Level Measurement

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Circuit diagrams



SITRANS Probe LU connections