

Level Measurement

Continuous level measurement
Ultrasonic transmitters

SITRANS Probe LU

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.

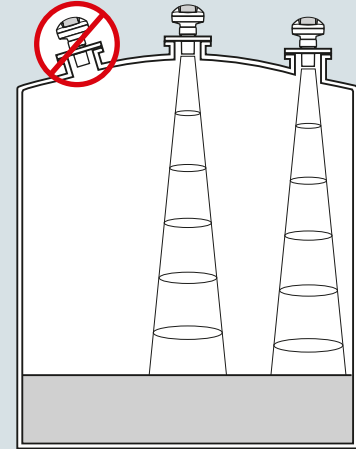
The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

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.

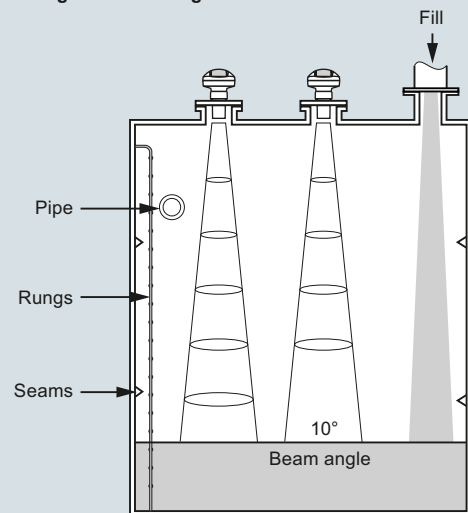
- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

Configuration

Parabolic mounting



Flat mounting and beam angle



SITRANS Probe LU mounting

Technical specifications

Mode of operation		Process connection	
Measuring principle	Ultrasonic level measurement	Threaded connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Typical application	Level measurement in storage vessels and simple process vessels	Flange connection	3 inch (80 mm) universal flange
Inputs		Other connection	FMS 200 mounting bracket (see page 4/186) or customer supplied mount
Measuring range		Display and Controls	
• 6 m (20 ft) model	0.25 ... 6 m (10 inch ... 20 ft)	Interface	Local: LCD display with bar graph Remote: Available via HART or PROFIBUS PA
• 12 m (40 ft) model	0.25 ... 12 m (10 inch ... 40 ft)	Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens infrared handheld programmer
Frequency	54 kHz	Memory	Non-volatile EEPROM
Outputs		Power supply	
mA/HART		4 ... 20 mA/HART	Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 ... 20 mA
• Range	4 ... 20 mA	PROFIBUS PA	12, 13, 15, or 20 mA depending on programming (General Purpose or Intrinsically Safe version) per IEC 61158-2
• Accuracy	± 0.02 mA	Certificates and Approvals	
PROFIBUS PA	Profile 3, Class B	General	
Performance		CSA _{US/C} , FM, CE, RCM	
Resolution	≤ 3 mm (0.12 inch)	Marine (only applies to HART communication option)	
Accuracy	± the greater of 0.15 % of range or 6 mm (0.24 inch)	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval 	
Repeatability	≤ 3 mm (0.12 inch)	Hazardous	
Blanking distance	0.25 m (10 inch)	<ul style="list-style-type: none"> Intrinsically Safe (Europe) Intrinsically Safe (USA/Canada) 	
Update time	≤ 5 s	<ul style="list-style-type: none"> Intrinsically Safe (International) Intrinsically Safe (Brazil) Non-incendive (USA) 	
• 4/20 mA/HART version	≤ 5 s at 4 mA	ATEX II 1G Ex ia IIC T4 Ga CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4	
• PROFIBUS version	≤ 4 s at 15 mA current loop	SIR 13.0008X Ex ia IIC T4 Ga INMETRO Ex ia IIC T4 Ga FM Class I, Div. 2, Groups A, B, C, D T4	
Temperature compensation	Built-in to compensate over temperature range	Handheld Programmer	
Beam angle	10°	Intrinsically Safe Siemens handheld programmer	
Rated operating conditions		<ul style="list-style-type: none"> Approvals for handheld programmer 	
Ambient conditions		ATEX II 1GD / IECEx SIR 09.0073 Ex ia IIC T4 Ga Ex iaD 20 T135 °C FM/CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T6	
• Location	Indoor/outdoor	Ambient temperature	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	-20 ... 50 °C (-5 ... 122 °F)	
• Relative humidity/ingress protection	Suitable for outdoor	Interface	
• Installation category	I	Proprietary infrared pulse signal	
• Pollution degree	4	Power	
Medium conditions		3 V lithium battery (non-replaceable)	
• 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)		

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Selection and Ordering data

SITRANS Probe LU

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

➤ 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 1/2" NPT (no cable glands supplied)

Plastic (PBT), 2 x M20 x 1.5 (includes 1 general purpose cable gland: 7ML1930-1AM)

Plastic (PBT), 2 x 1/2" NPT (no cable glands supplied)

Range/Transducer material

6 m (20 ft), ETFE

6 m (20 ft), PVDF Copolymer

12 m (40 ft), ETFE

12 m (40 ft), PVDF Copolymer

Process connection

2" NPT [(Taper), ANSI/ASME B1.20.1]

R 2" [(BSPT), EN 10226]

G 2" [(BSPP), EN ISO 228-1]

Communication/Output

4 ... 20 mA, HART

PROFIBUS PA

Approvals

General Purpose, FM, CSA_{US/C}, CE, RCM, KCC Non-incendive, FM Class I, Div. 2, Groups A, B, C, D T5¹⁾

Intrinsically Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4²⁾

Intrinsically Safe ATEX 1G / JECEX / INMETRO Ex ia IIC T4 Ga, RCM, KCC²⁾

Intrinsically Safe ATEX 1G / JECEX / INMETRO Ex ia IIC T4 Ga, RCM, KCC³⁾

Intrinsically safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4³⁾

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

²⁾ Available with Communication option 2 only.

³⁾ Available with Communication option 1 only.

Article No.

7ML5221-

0

1

2

A

B

C

D

A

B

C

1

2

1

4

5

6

7

8

Selection and Ordering data

Further designs

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

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

Operating Instructions for HART/mA device

English

Note: The Operating Instructions should be ordered as a separate item on the order.

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

Handheld programmer, General Purpose approvals

Handheld programmer, Infrared, Intrinsically Safe, PROFIBUS PA

HART modem/USB
(for use with a PC and SIMATIC PDM)

2" NPT locknut, plastic

2" BSPT locknut, plastic

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT

One General Purpose polymeric cable gland M20 x 1.5, rated for -20 ... +80 °C (-4 ... +176 °F)

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)

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA)

Universal box bracket, FMS-200

Probe LU rock guard and sunshield

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch see point level measurement section.

Spare Parts

Plastic lid

Order code

Y15

Article No.

A5E32337695

7ML5830-2AH

A5E36563512

7ML5830-2AJ

7MF4997-1DB

7ML1830-1DT

7ML1830-1DQ

7ML1830-1BT

7ML1830-1BU

7ML1930-1AM

7ML1930-1AP

7ML1930-1AQ

7ML1830-1BK

7ML1930-1GH

7ML5741-...

7ML5740-...

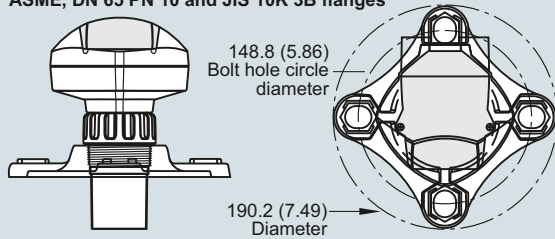
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7ML1830-1KB

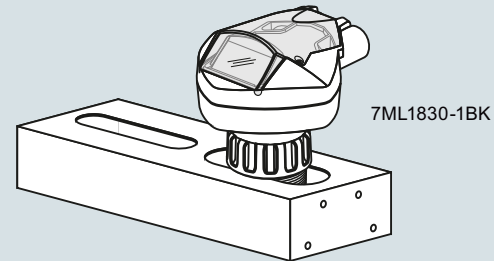
Options

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



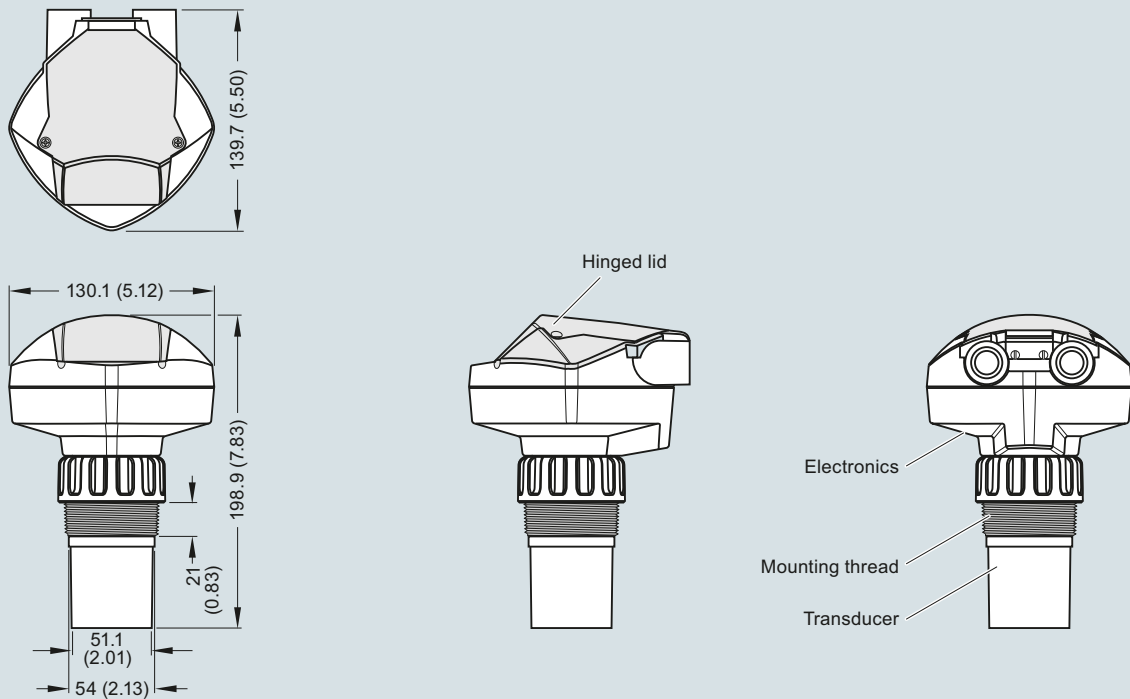
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

SITRANS Probe LU with FMS 200 universal box bracket



SITRANS Probe LU with optional mounting bracket

Dimensional drawings



Note: Above model is shown without M20 cable glands or 1/2" NPT conduit connectors.

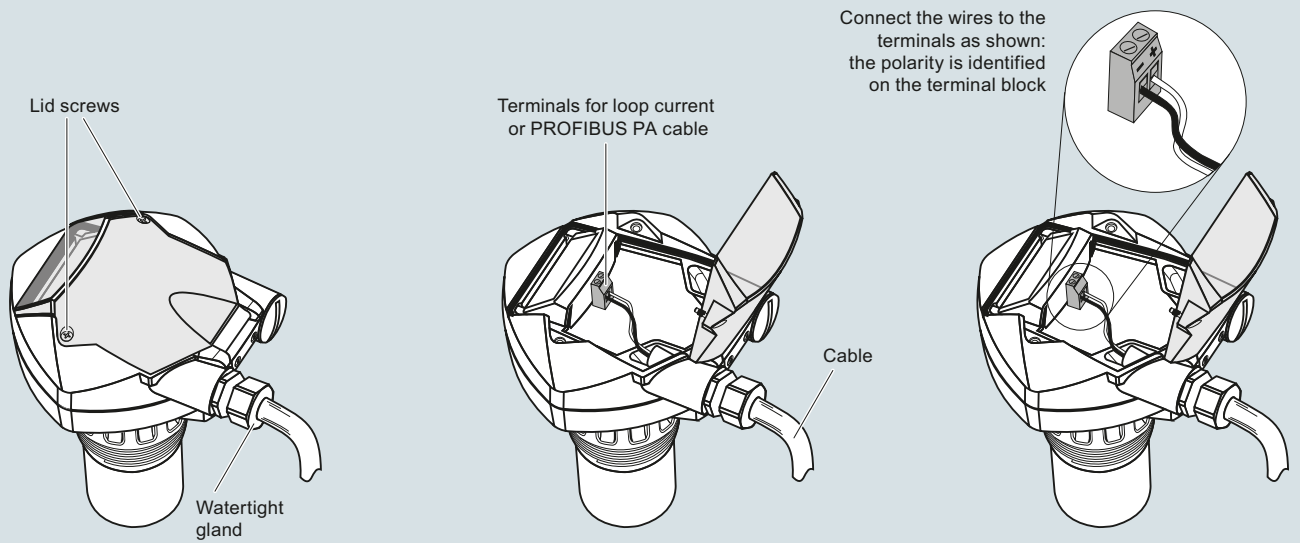
SITRANS Probe LU, dimensions in mm (inch)

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Circuit diagrams



Note:

- HART model above is shown with M20 cable glands. 1/2" NPT threaded connection is also available.
- 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.
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LU connections