

## 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.

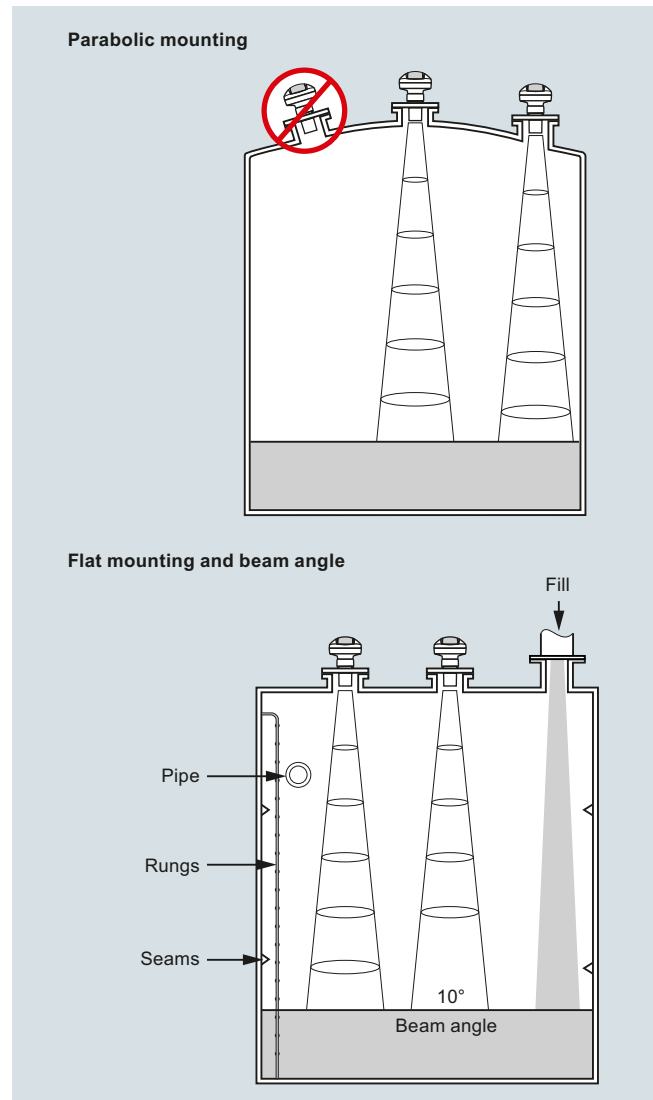
The range of SITRANS Probe LU is 6 or 12 m (20 or 40 ft). Using Sonic Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch), the Probe LU provides unmatched reliability.

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



SITRANS Probe LU mounting

#### Technical specifications

<b>Mode of operation</b>		<b>Process connection</b>	
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
<b>Inputs</b>		Other connection	FMS 200 mounting bracket (see page 5/189) or customer supplied mount
Measuring range		<b>Display and Controls</b>	
• 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
<b>Outputs</b>		<b>Power supply</b>	
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	<b>Certificates and Approvals</b>	
PROFIBUS PA	Profile 3, Class B	General	
<b>Performance</b>		Marine (only applies to HART communication option)	
Resolution	≤ 3 mm (0.12 inch)	Hazardous	
Accuracy	± the greater of 0.15 % of range or 6 mm (0.24 inch)	• Intrinsically Safe (Europe)	
Repeatability	≤ 3 mm (0.12 inch)	• Intrinsically Safe (USA/Canada)	
Blanking distance	0.25 m (10 inch)	• Intrinsically Safe (International)	
Update time	≤ 5 s	• Intrinsically Safe (Brazil)	
• 4/20 mA/HART version	≤ 5 s at 4 mA	• Non-incendive (USA)	
• PROFIBUS version	≤ 4 s at 15 mA current loop	Handheld Programmer	
Temperature compensation	Built-in to compensate over temperature range	Intrinsically Safe Siemens handheld programmer	
Beam angle	10°	• Approvals for handheld programmer	
<b>Rated operating conditions</b>		Ambient temperature	
Ambient conditions		Interface	
• Location	Indoor/outdoor	Power	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	3 V lithium battery (non-replaceable)	
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)		
• 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)		
<b>Design</b>			
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)		

## Level measurement


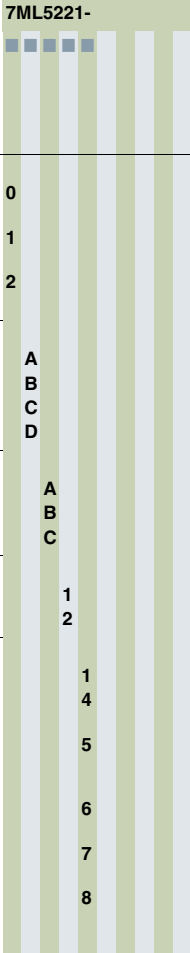

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### SITRANS Probe LU

#### Selection and ordering data

#### Article No.

#### Order code

Selection and ordering data	Article No.
<b>SITRANS Probe LU Ultrasonic level transmitter</b>  Continuous, non-contact, up to 12 m (40 ft) range. Monitors level and volume in liquids and slurries. With optional PROFIBUS PA.	<b>7ML5221-</b> 
 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Enclosure/Cable Inlet</b> Plastic (PBT), 1 x M20 x 1.5 and 1 x 1/2" 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 1/2" NPT (no cable glands supplied)	2
<b>Range/Transducer material</b> 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
<b>Process connection</b> 2" NPT [(Taper), ANSI/ASME B1.20.1]	A
R 2" [(BSPT), EN 10226]	B
G 2" [(BSPP), EN ISO 228-1]	C
<b>Communication/Output</b> 4 ... 20 mA, HART	1
PROFIBUS PA	2
<b>Approvals</b> General Purpose, FM, CSA <sub>US/C</sub> : CE, RCM, KCC Non-incendive, FM Class I, Div. 2, Groups A, B, C, D T5 <sup>1)</sup>	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 <sup>2)</sup>	5
Intrinsically Safe ATEX 1G/IECEx/INMETRO Ex ia IIC T4 Ga, RCM, KCC <sup>2)</sup>	6
Intrinsically Safe ATEX 1G/IECEx/INMETRO Ex ia IIC T4 Ga, RCM, KCC <sup>3)</sup>	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 <sup>3)</sup>	8

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

2) Available with Communication option 2 only.

3) Available with Communication option 1 only.

#### 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

#### 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

Accessories	Article No.
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/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
2" BSP nylon plastic locknut	7ML1830-1DQ
2" NPT nylon plastic locknut	7ML1830-1DT
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.	

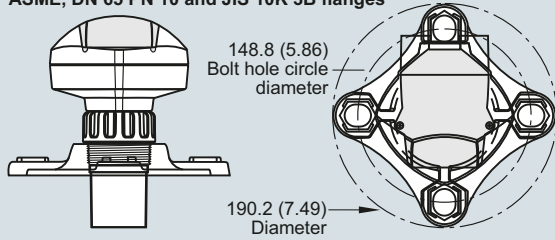
#### Spare Parts

Plastic lid

7ML1830-1KB

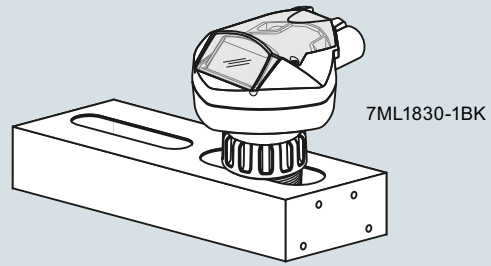
**Options**

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



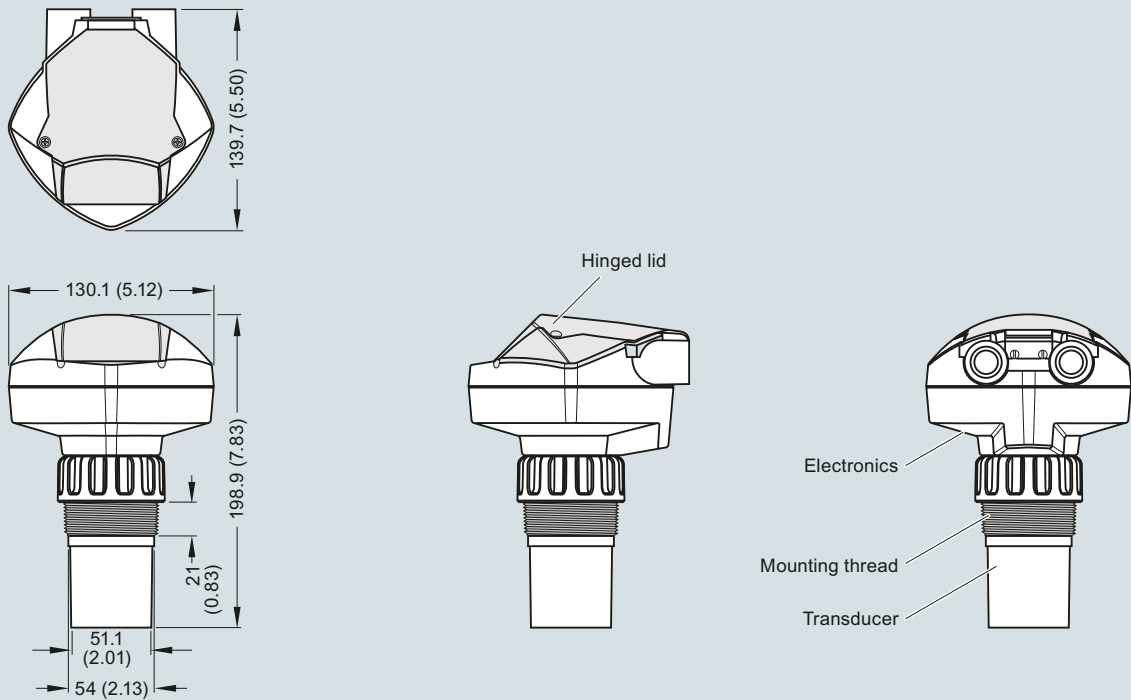
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

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.

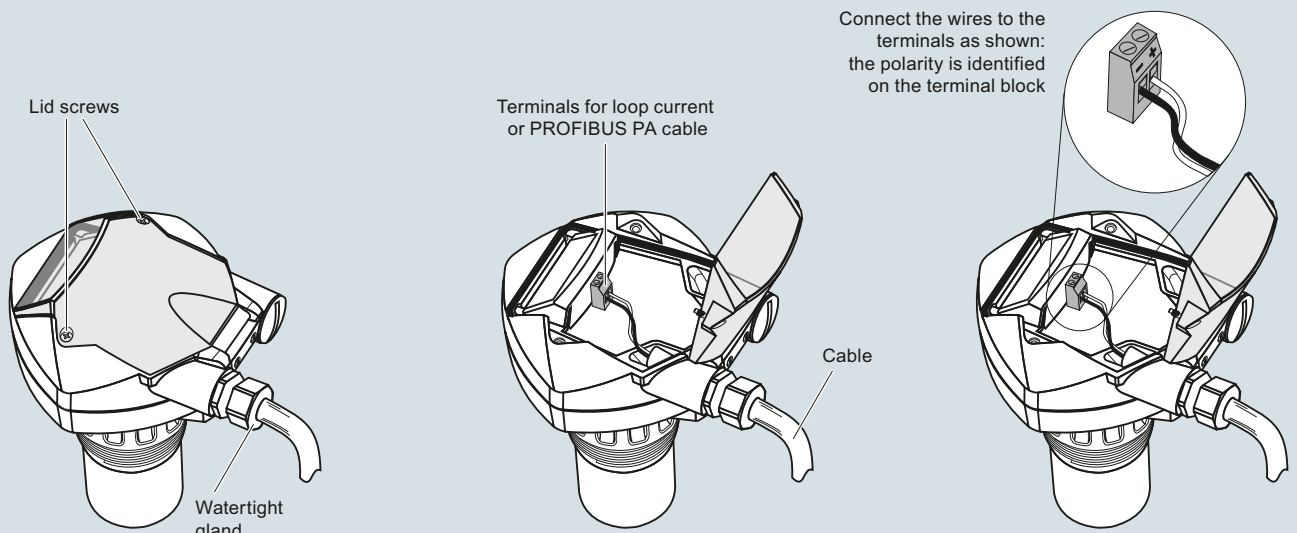
SITRANS Probe LU, dimensions in mm (inch)

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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