

Level measurement

Continuous level measurement
Radar level 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
- Process Intelligence signal processing
- 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.

Startup 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.

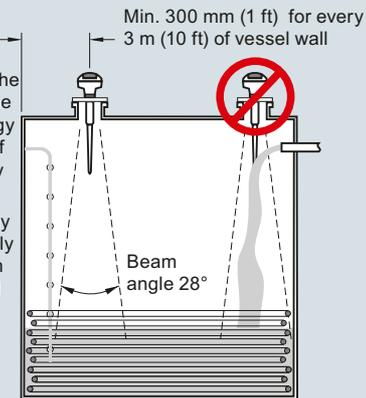
- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration

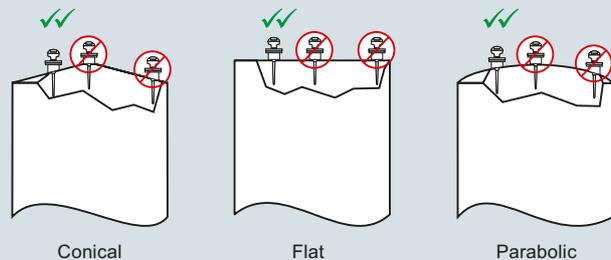
Installation

Note:

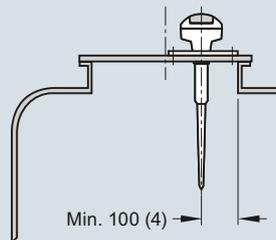
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the rod antenna.



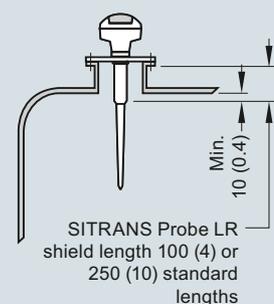
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



SITRANS Probe LR installation, dimensions in mm (inch)

Technical specifications

Mode of operation		Power supply	
Measuring principle	Pulse radar level measurement		<ul style="list-style-type: none"> Nominal 24 V DC with max. 550 Ω, maximum 30 V DC 4 ... 20 mA
Frequency	C-band, approx. 6 GHz	Certificates and approvals	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	General	CSA _{US/C} , CE, FM, RCM
Output		Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Analog output	4 ... 20 mA	Radio	FCC, Industry Canada, RED, RCM
Accuracy	± 0.02 mA	Hazardous	
Span	Proportional or inversely proportional	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Intrinsically Safe (Canada) 	INMETRO Ex ia IIC T4 Ga CSA Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III
Communications	HART	<ul style="list-style-type: none"> Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia/Kazakhstan) Intrinsically Safe (USA) 	ATEX II 1G EEx ia IIC T4 IECEX Ex ia IIC T4 EAC Ex ia
Performance (reference conditions)			FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)	Programming	
<ul style="list-style-type: none"> From end of antenna to 600 mm (23.62 inch) Remainder of range 10 mm (0.4 inch) or 0.1 % of span (whichever is greater) 	40 mm (1.57 inch)	Handheld programmer	HART communicator 375
Influence of ambient temperature	0.003 %/K	PC	SIMATIC PDM
Repeatability	± 5 mm (2 inch)	Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
Fail-safe	mA signal programmable as high, low or hold (LOE)	<ul style="list-style-type: none"> 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
Rated operating conditions		Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Installation conditions			
<ul style="list-style-type: none"> Location 	Indoor/outdoor		
Medium conditions			
Ambient conditions (enclosure)			
<ul style="list-style-type: none"> Ambient temperature Storage temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F)		
	-40 ... +80 °C (-40 ... +176 °F)		
	I		
	4		
Dielectric constant ϵ_r	> 3.0		
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)		
Vessel pressure	3 bar g (43.5 psi g)		
Design			
Enclosure			
<ul style="list-style-type: none"> Body construction Lid construction Cable inlet 	PBT (Polybutylene Terephthalate) PEI (Polyether Imide) 2 x M20 x 1.5 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			
<ul style="list-style-type: none"> Material 	Polypropylene rod, hermetically sealed construction		
<ul style="list-style-type: none"> 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" [(BSPT), EN 10226] G 1 1/2" [(BSPP), EN ISO 228-1]		

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Selection and ordering data

Article No.

Order code

SITRANS Probe LR Radar level transmitter

Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Enclosure/Cable inlet

Plastic, (PBT), 2 x 1/2" NPT
Plastic, (PBT), 2 x M20 x 1.5

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

Approvals

General Purpose, CE, RED, RCM
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, RED, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; EAC

Communication/Output

4 ... 20 mA, HART

7ML5430-

0

1

2

A

B

C

D

E

F

A

B

C

D

E

1

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

Manufacturer's test certificate:M to DIN 55350, Part 18 and to ISO 9000

Operating Instructions

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, ATEX II 1G, Ex ia

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

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F)

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - 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

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

Spare parts

Plastic lid

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

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Article No.

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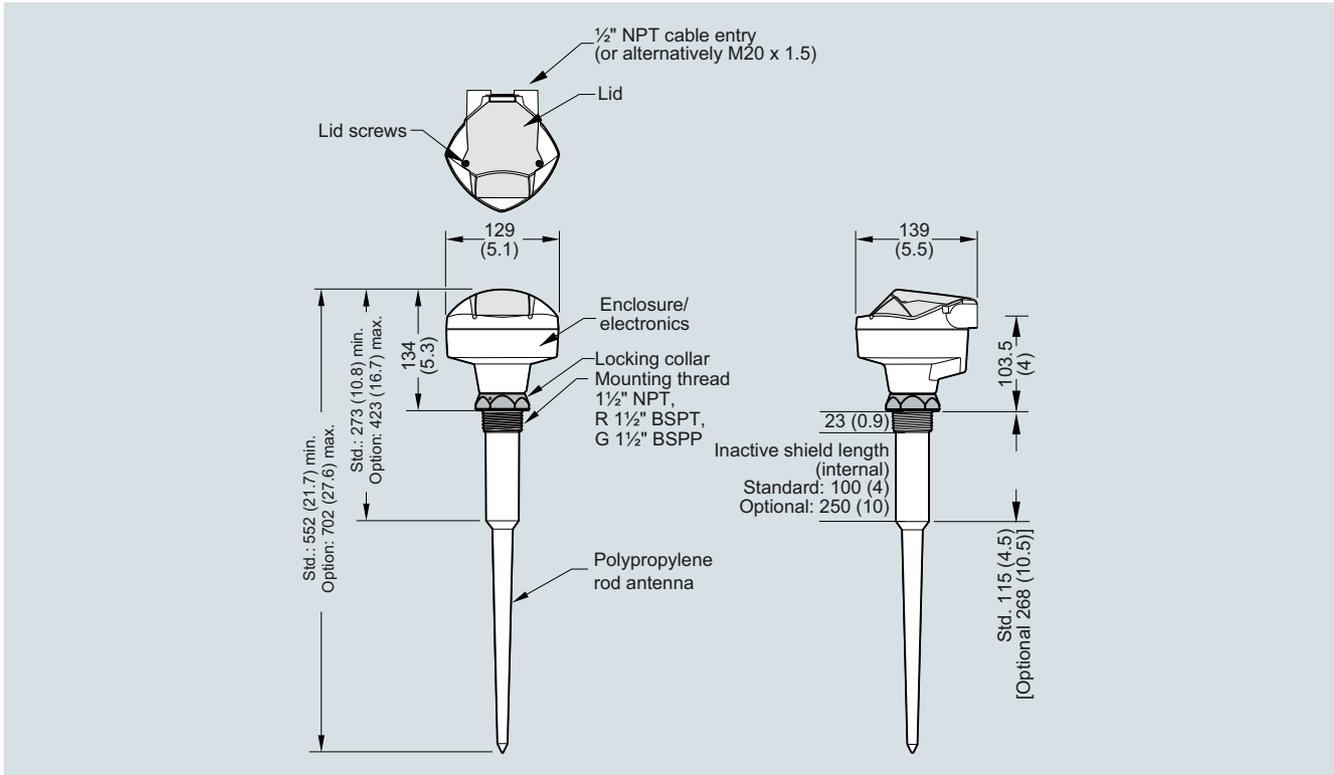
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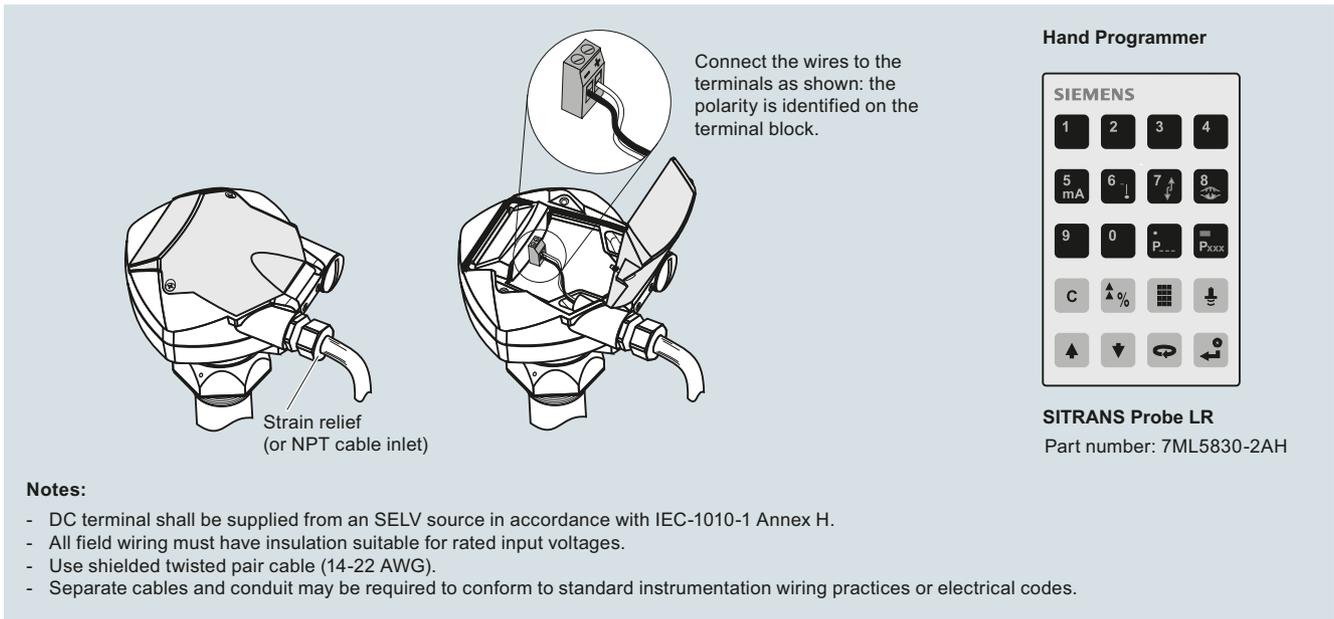
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Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

Circuit diagrams



SITRANS Probe LR connections