

Level instruments

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 vapours, temperature gradients, vacuum or pressure, such as tank farms, chemical storage, digesters and long-range applications. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

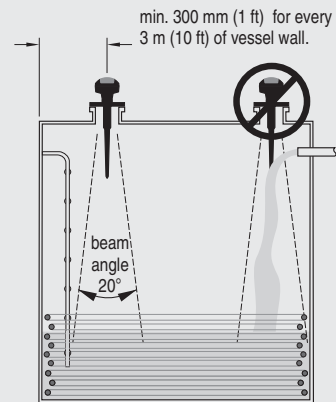
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna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

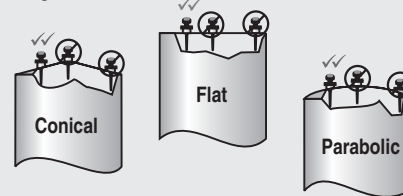
- Key Applications: tank farms, chemical storage, wastewater wet well

Configuration

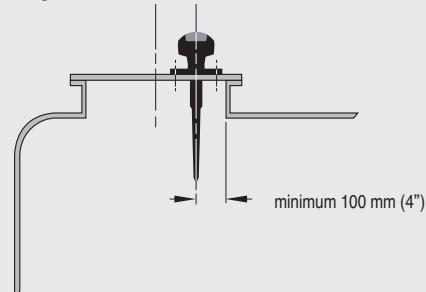
Installation



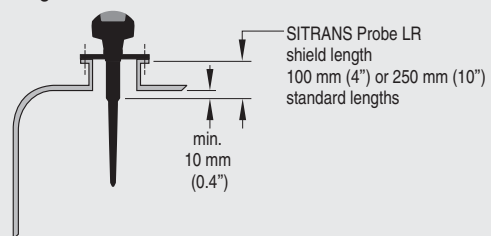
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



SITRANS Probe LR installation

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Technical specifications

Mode of operation

Measuring principle	Pulse radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 to 20 m (1.0 to 65 ft)

Output

Analog output	4 to 20 mA
Accuracy	± 0.02 mA
Span	Proportional or inversely proportional
Communications	HART®

Performance (reference conditions)

Accuracy	± the greater of 0.1% of range or 10 mm (0.4")
Influence of ambient temperature	0.003%/K
Repeatability	± 5 mm (2")
Fail-safe	mA signal programmable as high, low or hold (LOE)

Rated operating conditions

• Installation conditions	
- Location	Indoor/outdoor
• Ambient conditions (enclosure)	
- Ambient temperature	-40 to +80 °C (-40 to +176 °F)
- Installation category	I
- Pollution degree	4

Medium conditions

Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)
Vessel temperature	-40 to +80 °C (-40 to +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") shield for maximum 100 mm (4") nozzle or optional 250 mm (10") 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]

Power supply

- Nominal 24 V DC with max. 550 Ω , maximum 30 V DC
- 4 to 20 mA

Certificates and approvals

General	CSA _{US/C} , CE, FM, C-TICK
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada and European (R&TTE), C-TICK

Hazardous

- Europe
 - USA
 - Canada
 - Brazil - INMETRO
- ATEX II 1G EEx ia IIC T4
Intrinsically Safe barrier required
FM Class I, Div. 1, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III
Intrinsically Safe barrier required
CSA Class I, Div. 1, Groups A,B,C,D; Class II, Div. 1, Group G; Class III
BR-Ex ia IIC T4

Programming


Handheld programmer	HART communicator 375
PC	SIMATIC PDM
Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
• Approvals (handheld programmer)	ATEX II 1G EEx ia IIC T4 CSA and FM Class I, Div. 1, Groups A,B,C,D, T6 @ max. ambient
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages


HART® is a registered trademark of the Hart Communications Foundation.

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Selection and Ordering data	Order No.
SITRANS Probe LR	C) 7ML5430 -
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)	
Enclosure	
Plastic, (PBT), 2 x 1/2" NPT	1
Plastic, (PBT), 2 x M20x1.5	2
Antenna type/Material - (max. 3 bar and +80 °C)	
Polypropylene Antenna	
1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield	A
R 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield	B
G 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield	C
1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield	D
R 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield	E
G 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield	F
Approvals	
General Purpose, CE ¹⁾	A
General Purpose, FM, CSA _{US/IC} ²⁾	B
CSA Class I, Div 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, Intrinsically Safe with suitable barrier ²⁾	C
FM, Class I, II and III, Div 1, Groups A, B, C, D, E, F, G, Intrinsically Safe with suitable barrier ²⁾	D
ATEX II 1G EEx ja IIC T4, Intrinsically Safe with suitable barrier ¹⁾	E
Communication/Output	
4 to 20 mA, HART [®]	1
Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Instruction manual	Order No.
English	C) 7ML1998-5HR02
French	C) 7ML1998-5HR11
Spanish	C) 7ML1998-5HR21
German	C) 7ML1998-5HR32
Note: The instruction manual should be ordered as a separate item on the order.	
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Additional quick start manual	
Multi-language Quick Start manual	C) 7ML1998-5QP81

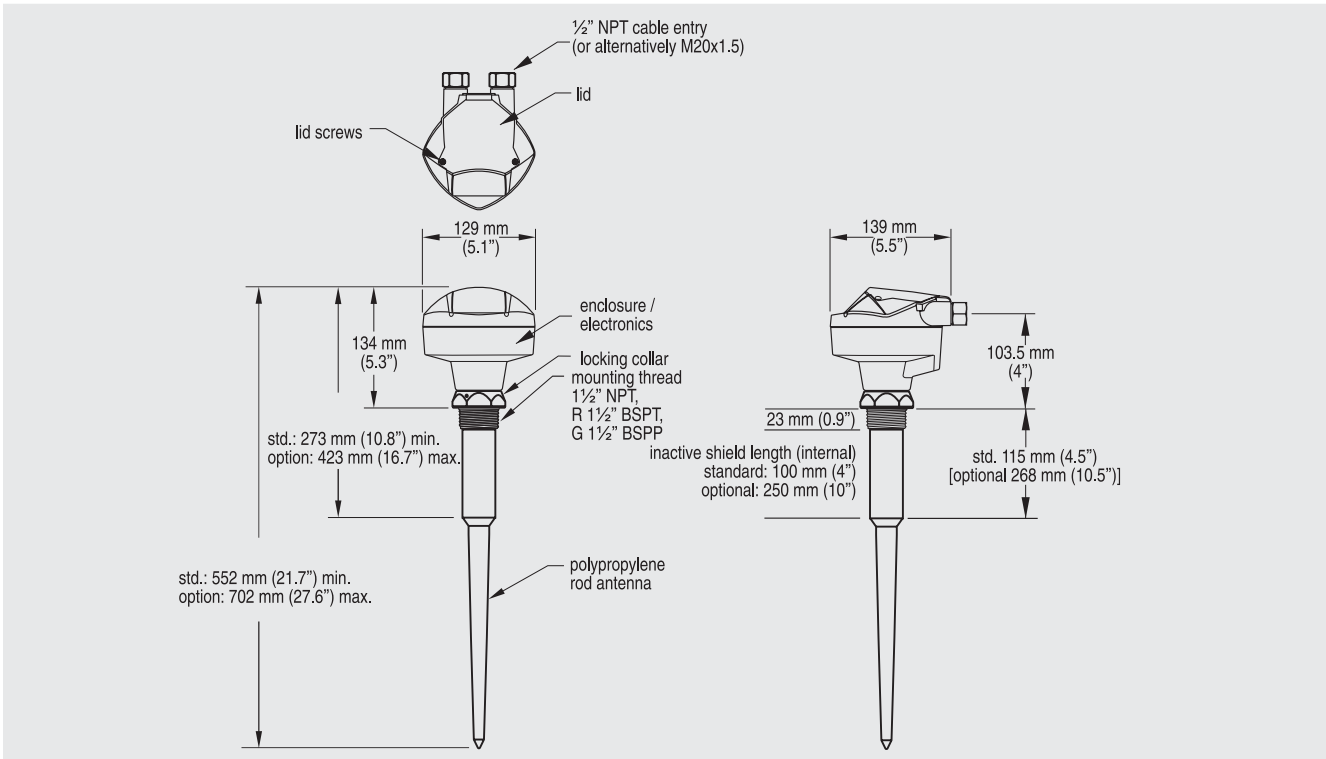
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Optional equipment	
Handheld programmer, Intrinsically Safe, ATEX II 1G, EEx ia	7ML5830-2AH
HART [®] modem/RS-232	D) 7MF4997-1DA
(for use with a PC and SIMATIC PDM)	
HART modem/USB	D) 7MF4997-1DB
(for use with a PC and SIMATIC PDM)	
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F)	7ML1930-1AP
SITRANS RD100 Remote display - see RD100 on page 5/304	
SITRANS RD200 Remote display - see RD200 on page 5/306	
Spare parts	
Plastic lid	C) 7ML1830-1KB
1) Includes European Radio approvals (R&TTE), 5.8 GHz, C-TICK	
2) Includes FCC Radio approvals, 6.3 GHz for North America only	
C) Subject to export regulations AL: N, ECCN: EAR99	
D) Subject to export regulations AL: N, ECCN: EAR99H	

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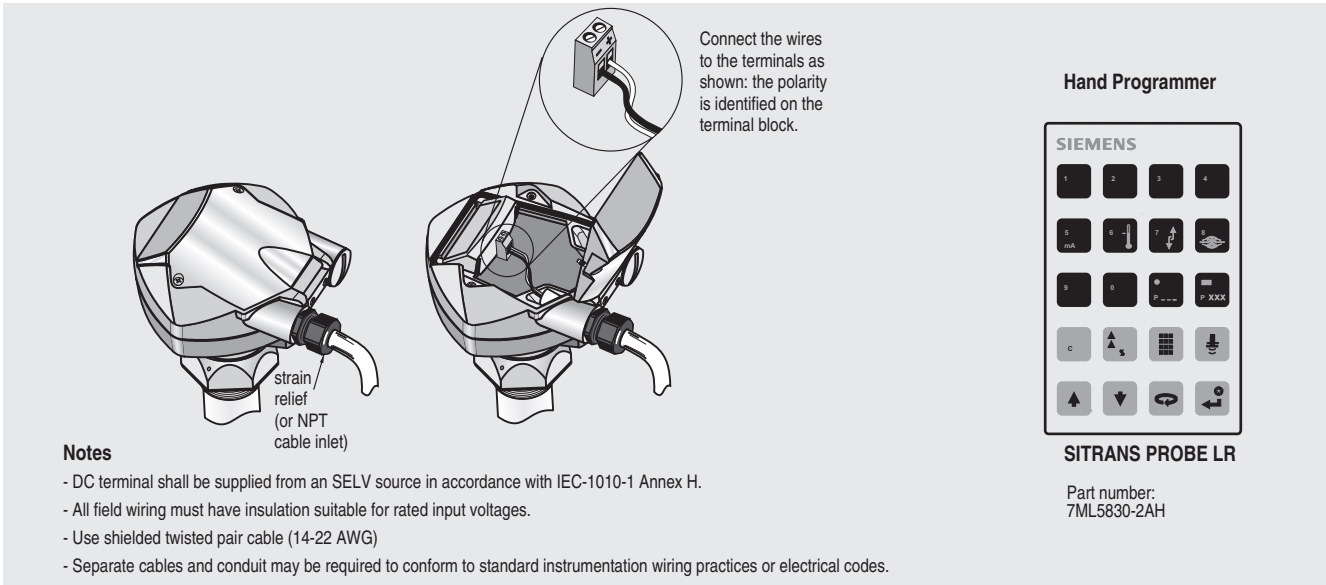
Dimensional drawings



SITRANS Probe LR dimensions

5

Schematics



SITRANS Probe LR connections