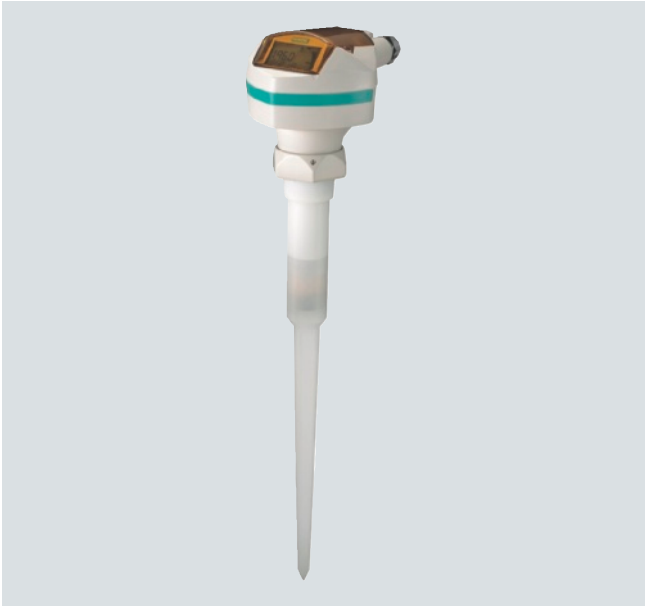
Overview



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).

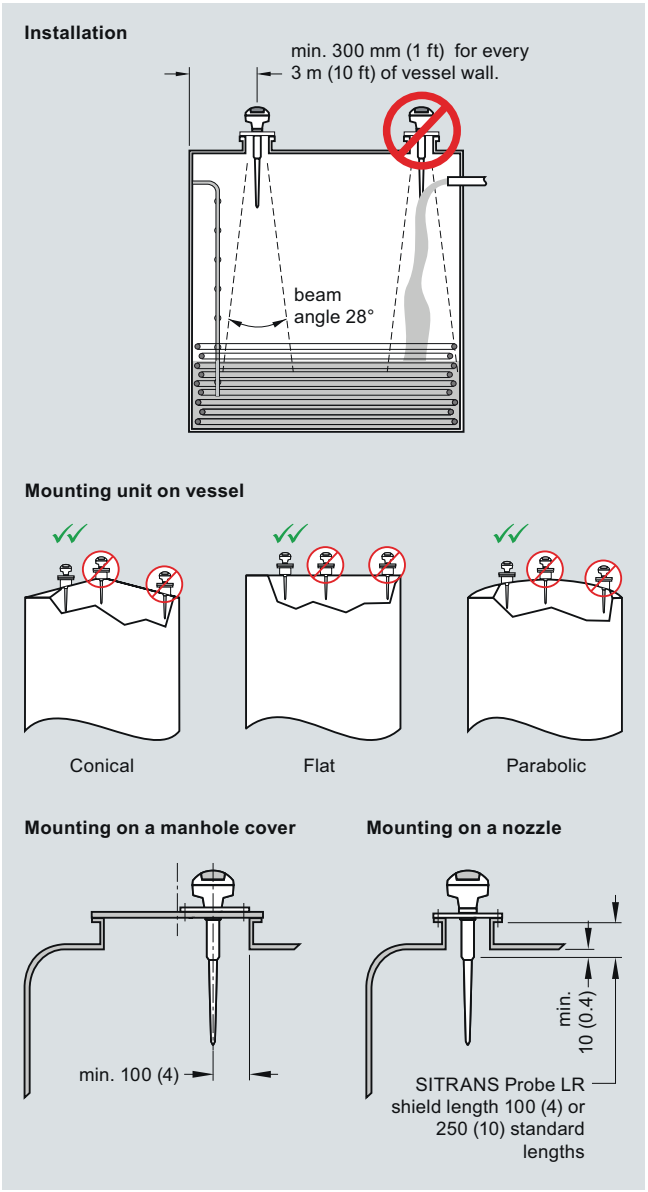
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna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



SITRANS Probe LR installation, dimensions in mm (inch)

5

SITRANS Probe LR

Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
Output	
Analog output	4 ... 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 inch)
Influence of ambient temperature	0.003%/K
Repeatability	± 5 mm (2 inch)
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 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ε_r	ε_r > 1.6 (for ε_r < 3, use stillpipe)
Vessel temperature	-40 ... +80 °C (-40 ... +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 ½" 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 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield
Process connections	1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1]

Power supply	• Nominal 24 V DC with max. 550 Ω, maximum 30 V DC • 4 ... 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	ATEX II 1G EEx ia IIC T4
• USA	Intrinsically Safe barrier required FM Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III
• Canada	Intrinsically Safe barrier required CSA Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Group G; Class III
• Brazil - INMETRO	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 at max. ambient
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

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)		■■■■ **0**
Enclosure/Cable inlet		
Plastic, (PBT), 2 x ½" NPT		**1**
Plastic, (PBT), 2 x M20x1.5		**2**
Antenna type/Material - (max. 3 bar and 80 °C)		
Polyproylene Antenna 1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield		**A**
R 1½" [(BSPT), EN 10226], c/w integral 100 mm shield		**B**
G 1½" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield		**C**
1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield		**D**
R 1½" [(BSPT), EN 10226], c/w integral 250 mm shield		**E**
G 1½" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield		**F**
Approvals		
General Purpose, CE, R&TTE, C-TICK		**A**
General Purpose, CSAus/c, FM, FCC		**B**
CSA Class I, Div 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, FCC, Intrinsically Safe[1)]		**C**
FM, Class I, II and III, Div 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe[1)]		**D**
ATEX II 1G EEx ia IIC T4, R&TTE, C-TICK, Intrinsically Safe[1)]		**E**
Communication/Output		
4 ... 20 mA, HART		**1**

1) Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data		Order code
Further designs		
Please add "**-Z**" to Order 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**
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**
Operating Instructions		Order No.
English	C)	**7ML1998-5HR02**
French	C)	**7ML1998-5HR11**
Spanish	C)	**7ML1998-5HR21**
German Note: The Operating Instructions should be ordered as a separate item on the order.	C)	**7ML1998-5HR32**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.		
Additional Operating Instructions		
Multi-language Quick Start manual	C)	**7ML1998-5QP81**
Optional equipment		
Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia		**7ML5830-2AH**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F)		**7ML1930-1AP**
SITRANS RD100 Remote display - see Chapter 8		
SITRANS RD200 Remote display - see Chapter 8		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 8	K)	**7ML5750-1AA00-0**
Spare parts		
Plastic lid		**7ML1830-1KB**

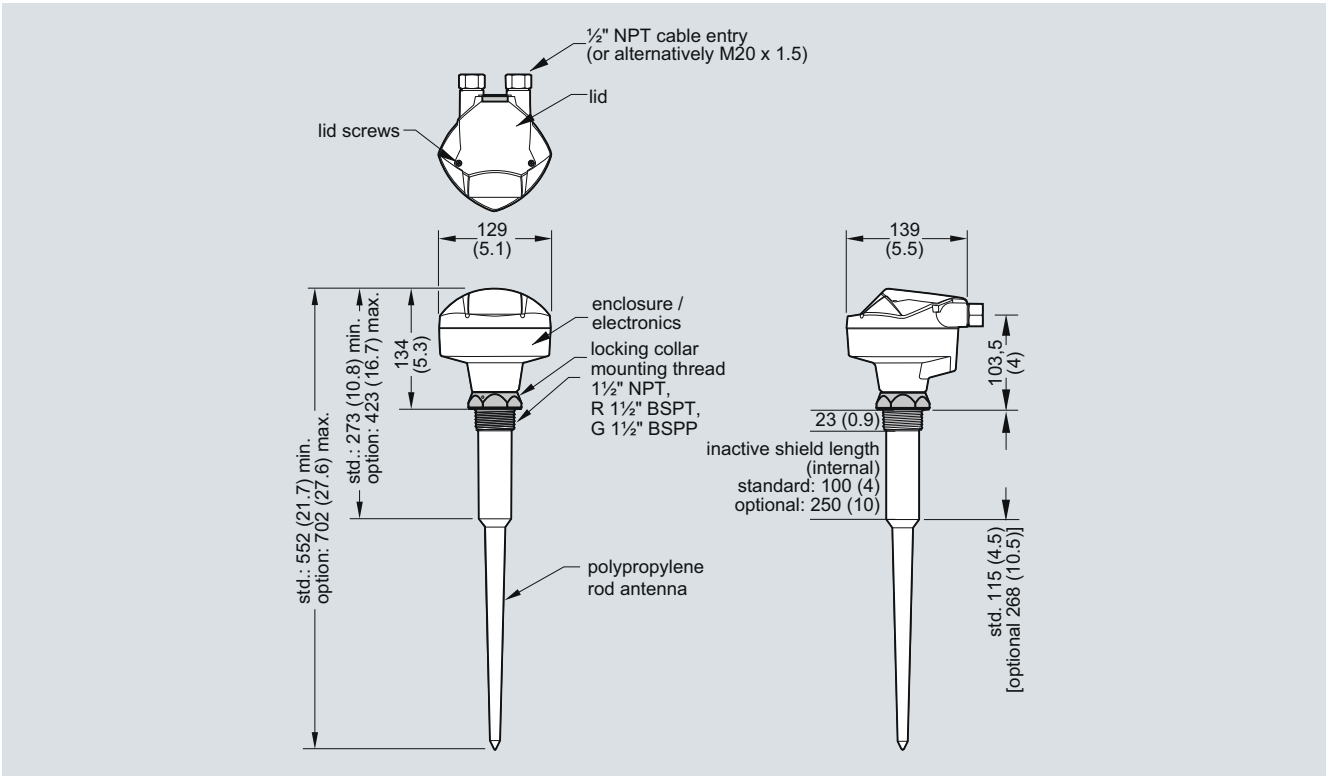
C) Subject to export regulations AL: N, ECCN: EAR99.

D) Subject to export regulations AL: N, ECCN: EAR99H.

K) Subject to export regulations AL: N, ECCN: 5A991X.

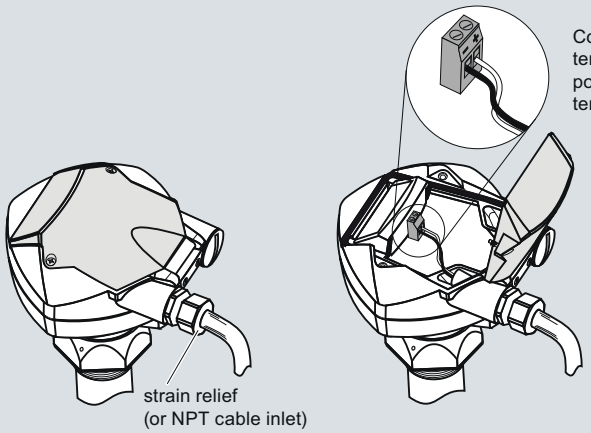
SITRANS Probe LR

Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

Schematics



Hand Programmer

SITRANS Probe LR
Part number: 7ML5830-2AH

Notes:

- 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.
- Use shielded twisted pair cable (14-22 AWG)
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LR connections