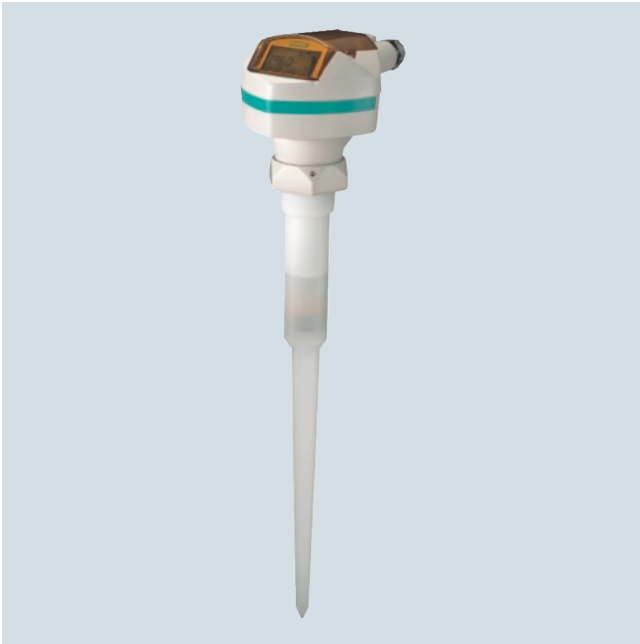


Level Measurement

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 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).

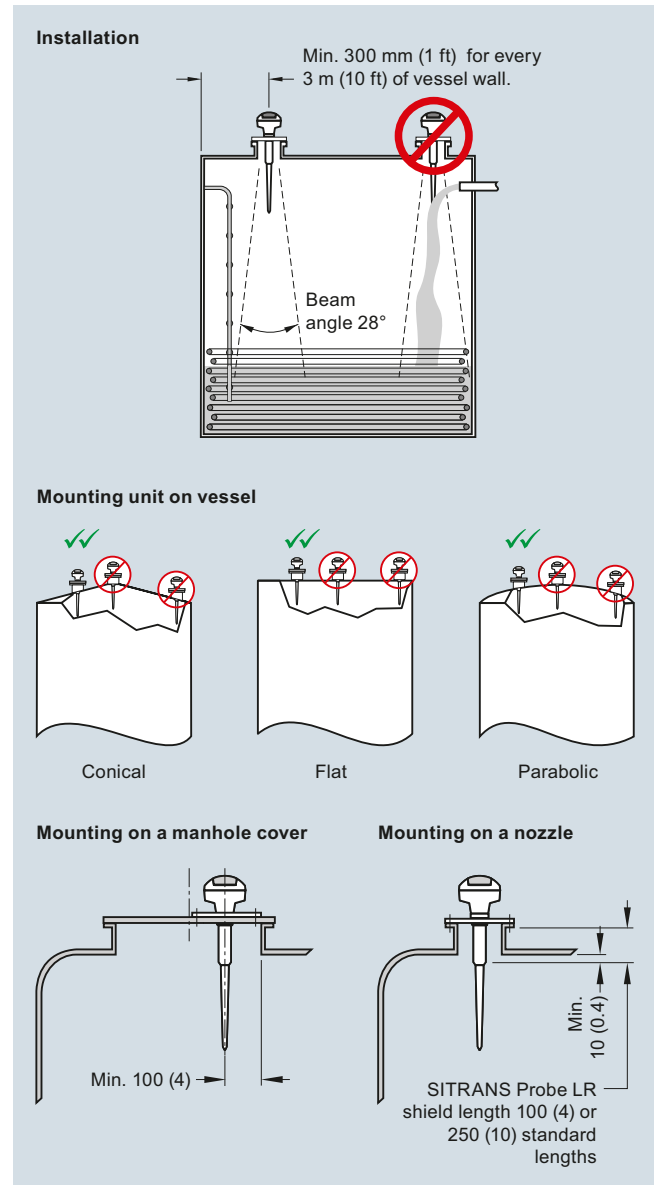
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna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

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: chemical storage, wastewater wet well, and drilling mud

Configuration



SITRANS Probe LR installation, dimensions in mm (inch)

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SITRANS Probe LR

Technical specifications

Mode of operation		Power supply	
Measuring principle	Pulse radar level measurement		• Nominal 24 V DC with max. 550 Ω, maximum 30 V DC
Frequency	5.8 GHz (North America 6.3 GHz)		• 4 ... 20 mA
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	Certificates and approvals	
Output		General	CSA _{US/C} , CE, FM, C-TICK
Analog output	4 ... 20 mA	Marine	• Lloyd's Register of Shipping • ABS Type Approval
Accuracy	± 0.02 mA	Radio	FCC, Industry Canada and European (R&TTE), C-TICK
Span	Proportional or inversely proportional	Hazardous	
Communications	HART	• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
Performance (reference conditions)		• Intrinsically Safe (Canada)	CSA Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)	• Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
Influence of ambient temperature	0.003 %/K	• Intrinsically Safe (International)	IECEx Ex ia IIC T4
Repeatability	± 5 mm (2 inch)	• Intrinsically Safe (Russia)	GOST-R Ex ia
Fail-safe	mA signal programmable as high, low or hold (LOE)	• Intrinsically Safe (USA)	FM Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
Rated operating conditions		Programming	
Installation conditions		Handheld programmer	HART communicator 375
• Location	Indoor/outdoor	PC	SIMATIC PDM
Ambient conditions (enclosure)		Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• Approvals (handheld programmer)	ATEX II 1G EEx ia IIC T4
• Installation category	I		CSA and FM Class I, Div.1, Groups A, B, C, D, T6 at max. ambient
• Pollution degree	4		
Medium conditions		Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, 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 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 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]		

Level Measurement

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SITRANS Probe LR

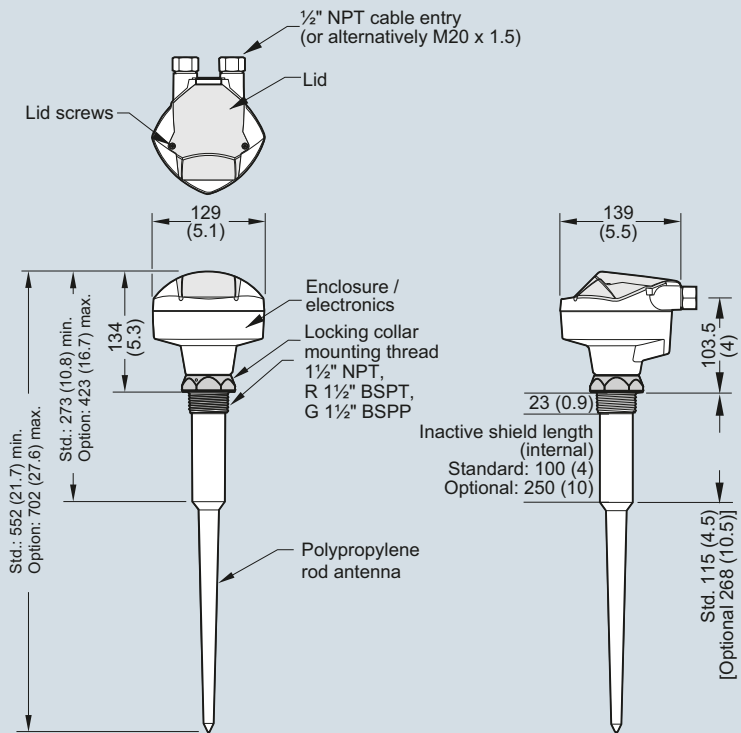
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS Probe LR	7ML5430-	Further designs	
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).	0	Please add "-Z" to Article No. and specify Order code(s).	
Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F)		Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:	● Y15
Enclosure/Cable inlet		Measuring-point number/identification (max. 27 characters) specify in plain text	
Plastic, (PBT), 2 x 1/2" NPT	● 1	Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	● C11
Plastic, (PBT), 2 x M20x1.5	● 2	Operating Instructions	Article No.
Antenna type/Material - (max. 3 bar and 80 °C)		English	7ML1998-5HR02
Polypropylene Antenna		French	7ML1998-5HR11
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield	● A	Spanish	7ML1998-5HR21
R 1 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield	● B	German	7ML1998-5HR32
G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield	● C	Note: The Operating Instructions should be ordered as a separate item on the order.	
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield	● D	This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
R 1 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield	● E	Additional Operating Instructions	
G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	● F	Multi-language Quick Start manual	A5E32106153
Approvals		Accessories	
General Purpose, CE, R&TTE, C-TICK	● A	Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia	7ML5830-2AH
General Purpose, CSA _{us/c} , FM, FCC	● B	HART modem/RS 232 (for use with a PC and SIMATIC PDM)	7MF4997-1DA
CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, FCC, Intrinsically Safe	● C	HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe	● D	One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F)	7ML1930-1AP
IECEX Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, C-TICK, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; GOST-R	● E	SITRANS RD100 Remote display - see Chapter 7	
Communication/Output		SITRANS RD200 Remote display - see Chapter 7	
4 ... 20 mA, HART	● 1	SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	7ML5750-1AA00-0
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.		Spare parts	
		Plastic lid	7ML1830-1KB
		For applicable back up point level switch - see point level section on page 4/9	
		● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	

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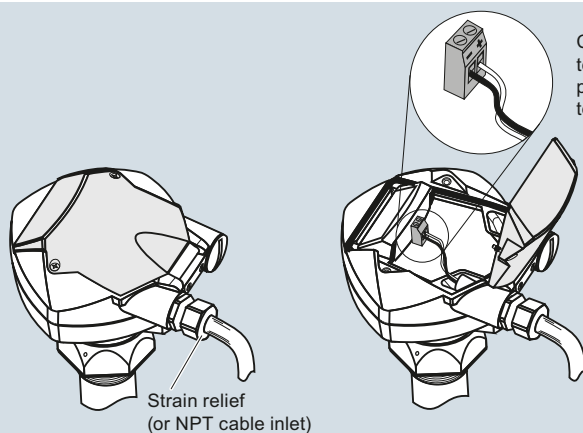
SITRANS Probe LR

Dimensional drawings

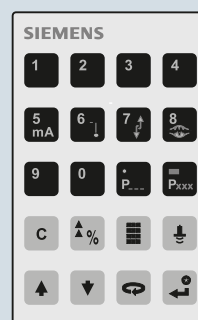


SITRANS Probe LR, dimensions in mm (inch)

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