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).

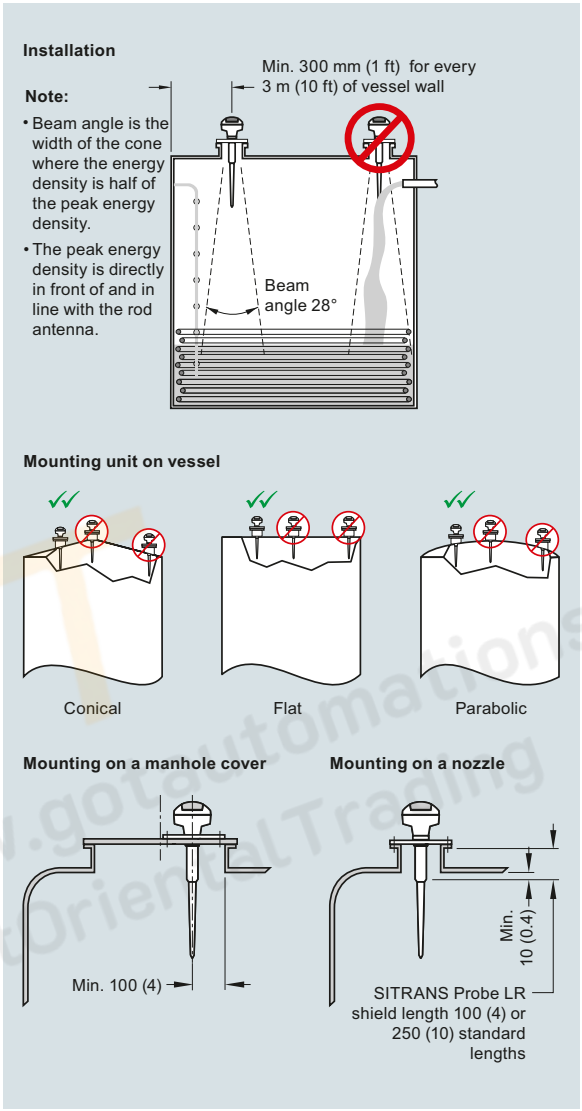
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna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



SITRANS Probe LR installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	C-band, approx. 6 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)
• From end of antenna to 600 mm (23.62 inch)	40 mm (1.57 inch)
• Remainder of range 10 mm (0.4 inch) or 0.1 % of span (whichever is greater)	10 mm (0.4 inch) or 0.1 % of span (whichever is greater)
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)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
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	
• Body construction	PBT (Polybutylene Terephthalate)
• Lid construction	PEI (Polyether Imide)
• Cable inlet	2 x M20 x 1.5 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, RCM
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada, RED, RCM
Hazardous	
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• Intrinsically Safe (Canada)	CSA Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III
• Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
• Intrinsically Safe (International)	IECEx Ex ia IIC T4
• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia
• Intrinsically Safe (USA)	FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
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

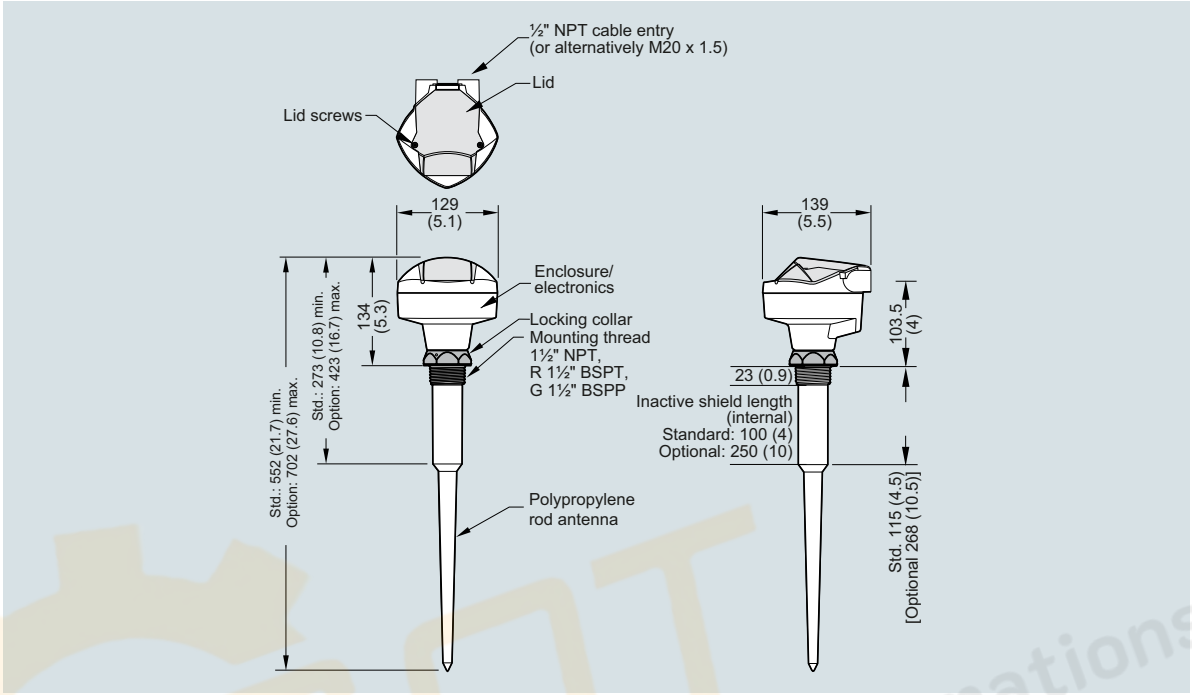
Selection and ordering data

	Article No.
SITRANS Probe LR Radar level transmitter	7ML5430-
Continuous, non-contact, 20 m (66 ft) range, for liquids and slurries.	■ ■ ■ ■ 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure/Cable inlet	
Plastic, (PBT), 2 x ½" NPT	1
Plastic, (PBT), 2 x M20 x 1.5	2
Antenna type/Material - (max. 3 bar and 80 °C)	
Polypropylene antenna	
1½" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield	A
R 1½" [(BSPT), EN 10226], comes with integral 100 mm shield	B
G 1½" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield	C
1½" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield	D
R 1½" [(BSPT), EN 10226], comes with integral 250 mm shield	E
G 1½" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	F
Approvals	
General Purpose, CE, RED, RCM	A
General Purpose, $CSA_{us/c}$, FM, FCC	B
CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Group G, Class III, FCC, Intrinsically Safe	C
FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe	D
IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, RED, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; EAC	E
Communication/Output	
4 ... 20 mA, HART	1

	Order code
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**
Manufacturer's test certificate:M to DIN 55350, Part 18 and to ISO 9000	**C11**
Operating Instructions	
All literature is available to download for free, in a range of languages, at	
http://www.siemens.com/processinstrumentation/documentation	

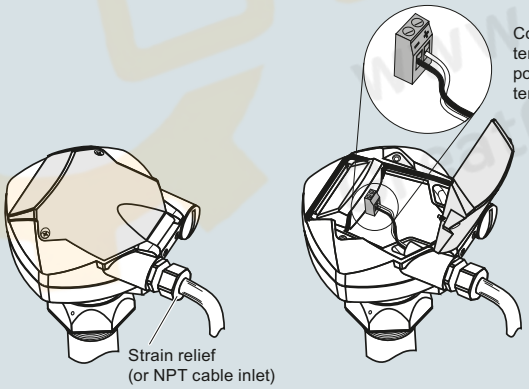
Accessories	Article No.
Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia	**7ML5830-2AH**
HART modem/USB (for use with a PC and SIMATIC PDM)	**7MF4997-1DB**
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F)	**7ML1930-1AP**
SITRANS RD100, loop powered display - see Chapter 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**
For applicable back up point level switch - see point level measurement section	

Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

Circuit diagrams



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