SITRANS Probe LU

Overview

SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels and simple process vessels.

Benefits

- Continuous level measurement up to 12 m (40 ft) range
- · Easy installation and simple start-up
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART[®] Communicator
- Communication using HART or PROFIBUS PA
- ETFE or PVDF transducers for chemical compatibility
- Patented Sonic Intelligence signal processing
- · Extremely high signal-to-noise ratio
- Auto False-Echo Suppression for fixed obstruction avoidance
- · Level to volume or level to flow conversion

Application

The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry and chemical storage vessels.

The range of SITRANS Probe LU is 6 or 12 meters (20 or 40 feet). Using Auto False-Echo Suppression for fixed obstruction avoidance, as well as an improved signal-to-noise ratio and improved accuracy of 0.15% of range or 6 mm (0.25"), the Probe LU provides unmatched reliability.

SITRANS Probe LU includes Sonic Intelligence[®] signal processing from the field-proven Milltronics Probe and incorporates new echo processing features and the latest micro-processor and communications technology. The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.

Key Applications: chemical storage vessels, filter beds, liquid storage vessels



Parabolic Mounting



fill

Flat Mounting and Beam Angle



SITRANS Probe LU mounting

SITRANS Probe LU

Technical specifications			
Mode of operation			
Measuring principle	Ultrasonic level measurement		
Typical application	Level measurement in storage vessels and simple process ves-		
Inputs			
Measuring range			
• 6 m (20 ft) model	0.25 to 6 m (10" to 20 ft)		
• 12 m (40 ft) model	0.25 to 12 m (10" to 40 ft)		
Frequency	54 kHz		
Outputs			
mA/HART			
• Range	4 to 20 mA		
Accuracy	± 0.02 mA		
PROFIBUS PA	Profile 3, Class B		
Performance			
Resolution	≤ 3 mm (0.12")		
Accuracy	± the greater of 0.15% of range or 6 mm (0.24")		
Repeatability	≤ 3 mm (0.12")		
Blanking distance	0.25 m (10")		
Update time	≤5 seconds		
• 4/20 mA/HART version	≤ 5 seconds at 4 mA		
PROFIBUS version	≤ 4 seconds at 15 mA current loop		
Temperature compensation	built-in to compensate over tem- perature range		
Beam angle	10°		
Rated operating conditions			
 Ambient conditions 			
- Location	Indoor/outdoor		
- Ambient temperature	-40 to +80 °C (-40 to +176 °F)		
- Relative humidity/ingress protec- tion	Suitable for outdoor		
 Installation category 	1		
- Pollution degree	4		
Medium conditions			
- Temperature at flange or threads	-40 to +85 °C (-40 to +185 °F)		
- Pressure (vessel)	0.5 bar (7.25 psi)		
Design			
Material (enclosure)	PBT (Polybutylene Terephthalate)		
Degree of protection	Iype 4X/NEMA 4X, Type 6/ NEMA 6/IP67/IP68 enclosure		
Weight	2.1 kg (4.6 lbs)		
Cable inlet	2 x M20x1.5 cable gland or 2 x ½" NPT thread		
Transducer (2 options)	ETFE (Ethylene Tetrafluoroethyl- ene) or PVDF (Polyvinylidene Fluoride)		
Process connection			
Threaded connection	2" NPT, BSPT or G		
Flange connection	3" (80 mm) universal flange		
Other connection	FMS 200 mounting bracket (see page 5/118) or customer supplied mount		

Display and Controls		
Interface	Local: LCD display with bar graph	
	Remote: Available via HART on PROFIBUS PA	
Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld commu- nicator or Siemens Milltronics infrared handheld programmer	
Memory	non-volatile EEPROM	
Power supply		
4 to 20 mA/HART	nominal 24 V DC with 550 W max- imum; maximum 30 V DC 4 to 20 mA	
PROFIBUS PA	12, 13, 15, or 20 mA depending on programming (General Pur- pose or Intrinsically Safe version)	
	per IEC 61158-2	
Certificates and Approvals		
General	CSA _{US/C} , FM, CE	
Marine (only applies to HART com- munication option)	Lloyd's Register of ShippingABS Type Approval	
Hazardous		
 Intrinsically Safe (Europe) 	ATEX II 1G EEx ia IIC T4	
Intrinsically Safe (USA/Canada)	CSA/FM (barrier required) T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III	
 Intrinsically Safe (Australia/New Zealand) 	ANZEx Ex ia IIC T4, Tamb = -40 to +80 °C (-40 to 176 °F) IP67, IP68	
 Intrinsically Safe (International) 	IECEx TSA 04.0020X Ex ia IIC T4	
Non-incendive (USA)	FM (no barrier required) T5: Class I, Div. 2, Groups A,B,C and D	
Handheld Programmer		
Intrinsically Safe Siemens Milltronics handheld programmer	Infrared receiver	
 Approvals for handheld pro- grammer 	IS model with ATEX EEx ia IIC T4	

• Ambient temperature

Interface

• Power

CSA/FM Class I, Div. 1, Groups A, B, C, D -20 to +40 °C (-5 to +104 °F) proprietary infrared pulse signal

3 V lithium battery (non-replaceable)

SITRANS Probe LU

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
SITRANS Probe LU C: 2-wire, loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels and simple process ves- sels.	7 M L 5 2 2 1 -	Instruction manual for HART/mA deviceEnglishC)FrenchC)GermanC)Note: The instruction manual should be ordered as	7ML1998-5HT02 7ML1998-5HT11 7ML1998-5HT32
Enclosure/Cable Inlet Plastic (PBT), 2 × M20x1.5 (check Approvals for cable gland details) Plastic (PBT), 2 × ½" NPT (no cable glands sup- plied) Bange/Transducer material	1 2	a separate item on the order. Additional Multi-language Quick start manual C) Note: Due to ATEX regulations, one Quick start manual is included with every product. This device is shipped with the Siemens Milltronics manual CD containing the complete instruction	7ML1998-5QR81
6 meter (20 ft), ETFE 6 meter (20 ft), PVDF Copolymer 12 meter (40 ft), ETFE 12 meter (40 ft), PVDF Copolymer Process connection 2" NPT (ANSI/ASME B1.20.1) 2" BSPT (EN 10226-1) 2" G (EN ISO 228-1)	A B C D A B C	manual library. Instruction manual for PROFIBUS PA English C) German C) Note: The instruction manual should be ordered as a separate item on the order. Additional Multi-language Quick start manual C) Note: Due to ATEX regulations, one Quick start manual is included with every product.	7ML1998-5JB02 7ML1998-5JB32 7ML1998-5QV81
Communication/Output 4 to 20 mA, HART® PROFIBUS PA	1	This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	
Approvals General Purpose, FM, CSA, CE ¹⁾ Intrinsically Safe, FM Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups E, F, G; Class III; ATEX II 1G EEx ia IIC T4, ANZEX, IECEX (HART model only) ¹⁾ Intrinsically Safe, CSA Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups G; Class III (HART model only) FM, Class I, Div. 2 (Enclosure option 2 only) Intrinsically Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups E, F, G; Class III (PROFIBUS PA model only) Intrinsically Safe, ATEX II 1G EEx ia IIC T4 (PROFI-	1 2 3 4 5 6	Optional equipment Handheld programmer, Intrinsically Safe, EEx ia C) Handheld programmer, General Purpose approvals Handheld programmer, Infrared, Intrinsically Safe, C) PROFIBUS PA HART modem/RS-232 (for use with PC and D) SIMATIC PDM) HART modem/USB (for use with a PC and SIMATIC D) PDM) Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia 2" NPT locknut, plastic 2" BSPT locknut, plastic	7ML5830-2AH 7ML1830-2AN 7ML5830-2AJ 7MF4997-1DA 7MF4997-1DB 7NG4122-1AA10 7ML1830-1DT 7ML1830-1DQ
BUS PA model only) ¹⁾ <i>Further designs</i> Please add "- 2 " to Order No. and specify Order code(s).	Order code	3" ASME, DIN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT 3" ASME, DIN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT	7ML1830-1BT 7ML1830-1BU
Stainess steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15	One General Purpose polymeric cable gland M20x1.5, rated for -20 °C (-4 °F) to +80 °C (+176 °F) One metallic cable gland M20x1.5, rated -40 °C (-40 °C) to +80 °C (+176 °E)	7ML1930-1AM 7ML1930-1AP

Spare Parts

 Plastic lid
 C)
 7ML1830-1KB

 ¹⁾ Supplied with one uninstalled plymeric cable gland M20x1.5, rated -20 °C (-4 °F) to +80 °C (+176 °F). To order metallic cable gland M20x1.5, rated -40 °C (-40 °F) to +80 °C (+176 °F), add -Z to order code and see cable glands under Optional equipment.

C) Subject to export regulations AL: N, ECCN: EAR99 D) Subject to export regulations AL: N, ECCN: EAR99H

Options



SITRANS Probe LU Optional Flange Adapter



SITRANS Probe LU with Optional Mounting Bracket

SITRANS Probe LU

Dimensional drawings



SITRANS Probe LU dimensions

Schematics



SITRANS Probe LU connections