The Probe

Overview

The Probe is a short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels.

Benefits

- Easy to install, program and maintain
- Accurate and reliable
- Sanitary models available
- Patented Sonic Intelligence echo processing
- Integral temperature compensation

Application

The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

The reliability of the level data is based on the Sonic Intelligence echo processing algorithms. A filter discriminates between the true echo and false echoes from acoustic or electrical noises and agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature-compensated and converted into distance for display, analog output and relay actuation.

- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration

Parabolic mounting
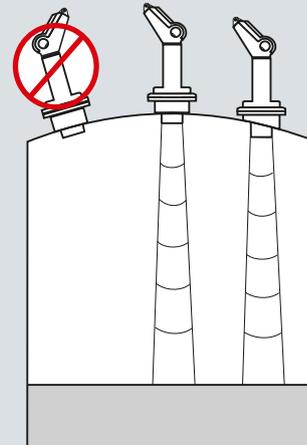
Flat mounting and beam angle
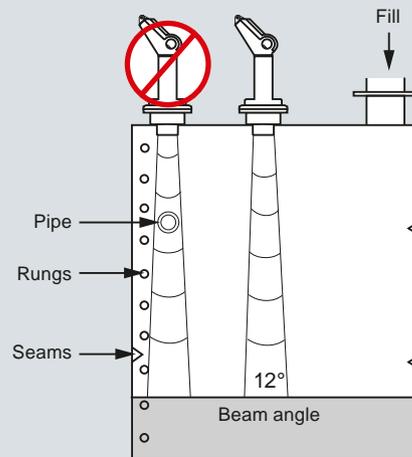
The Probe mounting

Level measurement
Continuous level measurement – Ultrasonic transmitters

The Probe

Technical specifications

	Three-wire version	Two-wire version (standard)
Mode of operation		
Measuring principle	Ultrasonic level measurement	Ultrasonic level measurement
Input		
Measuring range	0.25 ... 8 m (0.8 ... 26.25 ft)	0.25 ... 5 m (0.8 ... 16.4 ft)
Output		
• mA	4 ... 20 mA	4 ... 20 mA
- Span	Proportional/ inversely proportional	Proportional/ inversely proportional
- Max. load	750 Ω at 24 V DC	600 Ω in the loop at 24 V DC
• Relay	For level alarm or fault	No
Power supply		
Supply voltage	18 ... 30 V DC, max. 0.2 A	12 ... 28 V DC, 0.1 A surge
Max. power consumption	5 W (200 mA at 24 V DC)	0.75 W (25 mA at 24 V DC)
Certificates and approvals	CE, C-TICK, CSA$_{US/C}$, FM	CE, C-TICK, CSA$_{US/C}$
Accuracy		
• Error in measurement	0.25 % of measuring range (in air)	
• Resolution	3 mm (0.125 inch)	
• Temperature compensation	Built in	
• Echo processing	Sonic Intelligence	
Rated operation conditions		
• Beam angle	12°	
• Ambient temperature		
- Standard	-40 ... +60 °C (-40 ... +140 °F)	
- Metallic mounting	-20 ... +60 °C (-4 ... +140 °F)	
• Max. static operating pressure	Normal atmospheric pressure	
• Degree of protection	IP65	
Design		
• Weight		
- Without flange adapter	1.5 kg (3.3 lb)	
- With flange adapter	1.7 kg (3.7 lb)	
• Material		
- Electronics enclosure	PVC	
- Transducer	PVDF copolymer	
• Degree of protection	IP65	
• Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]	
• Flange adapter	3" Universal, (fits DN 65, PN 10 and 3" ASME) 4" sanitary	
• Cable inlet	2 inlets for PG 13.5 or ½" NPT cable glands	

Selection and Ordering data

	Order No.
The Probe	**7ML1201-**
Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels	■ ■ ■■ 0 0

Measuring range	
3 m (9.84 ft)	0
5 m (16.40 ft)	1
8 m (26.25 ft)	2

Transducer/Process connection	
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]	E
PVDF copolymer, R 2" [(BSPT), EN 10226]	F
PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]	G
PVDF copolymer, 4" Sanitary mounting[1]	J

Model/Approval	
3 Wire, 24 V DC, CE, C-TICK, CSA, FM	E
2 Wire, 24 V DC, CE, C-TICK, CSA[2]	F
2 Wire, IS, ATEX, CSA, FM[2]	K

[1] Not available with model option K or 8M Measurement Range
[2] Available with 3M or 5M Measuring Range Only

Selection and Ordering data

	Order code
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 20 characters) specify in plain text	**Y17**

Additional Operating Instructions	Order No.
3 Wire, 24 V model, Multi-language manual	**7ML1998-5GD62**
2 Wire model, Multi-language manual	**7ML1998-5GC63**

| *Accessories*	
Universal Box Bracket Mounting kit	**7ML1830-1BK**
Sanitary 4" mounting clamp	**7ML1830-1BR**
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT	**7ML1830-1BT**
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT	**7ML1830-1BU**
2" NPT locknut, plastic	**7ML1830-1DT**
2" BSPT locknut, plastic	**7ML1830-1DQ**
Plastic M20 cable gland with metal locknut	**7ML1930-1DB**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

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## ■ Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ANSI, DN 65 PN10, and JIS 10K 3B flanges

148.8 (5.86) bolt hole circle diameter

190.2 (7.49) diameter
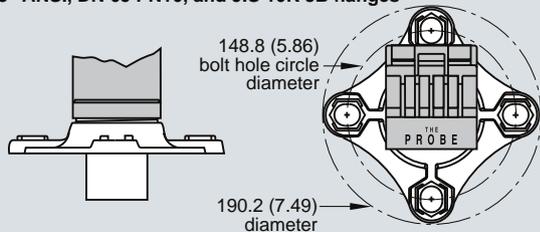
The Probe Optional Flange Adapter, dimensions in mm (inch)

The probe with FMS 200 mounting bracket
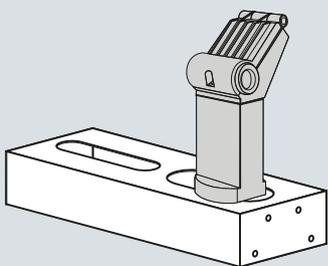
The Probe with Optional Mounting Bracket

■ Schematics

3 wire model (standard and sanitary models)

mA output: 4 ... 20 mA, non-isolated, 750 ohms max.

Power supply

Connect to protective earth

Relays: dry contact, closed unpowered or alarm state

2 wire model (standard and sanitary models)

Probe

Loop instrumentation R_{max}

$$R_{max} = \frac{V_{supply} - 12\,V}{20\,mA}$$

V_{supply} 12 ... 28 V DC

Display

Program mode

Segment display

'20' key

'4' key

Units

Operation status

LOE/fault
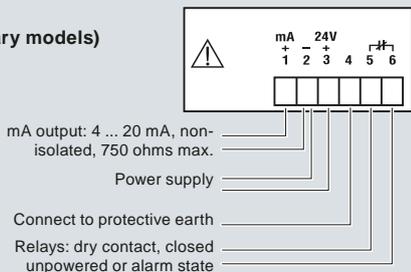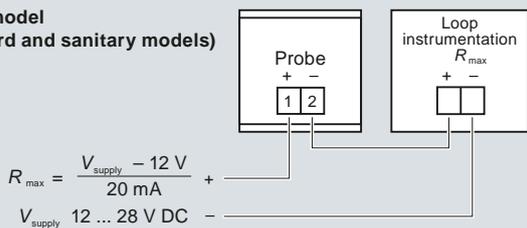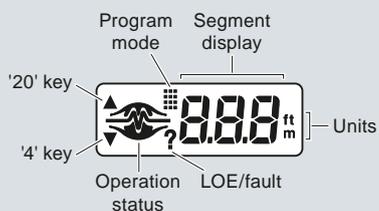
The Probe connections

■ Dimensional drawings

Standard model

Hinged lid

117 (4.6)

Cable entry 'knock out'

87 (3.4) Ø

Mounting thread

61 (2.4)

7 (0.3)

84 (3.3) max.

279 (11)

74 (2.9)

Electronics

Mounting thread transducer

53 (2.1) max.

Sanitary model

Hinged lid

117 (4.6)

Cable entry 'knock out'

87 (3.4) Ø

61 (2.4)

7 (0.3)

84 (3.3) max.

279 (11)

74 (2.9)

Electronics

Process connection

Transducer

53 (2.1) max.
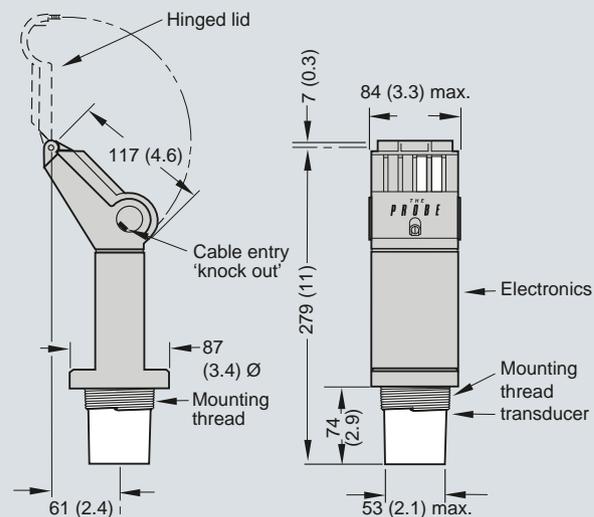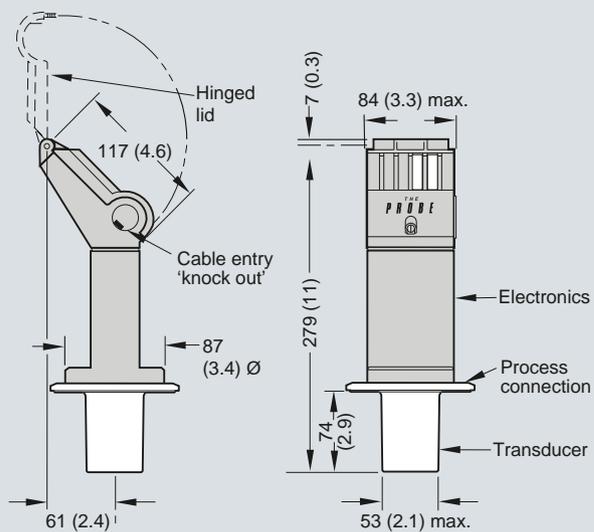
The Probe, dimensions in mm (inch)

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