

Level Measurement

Continuous level measurement – Ultrasonic transmitters

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

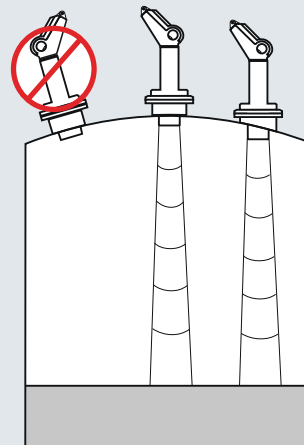
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

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.

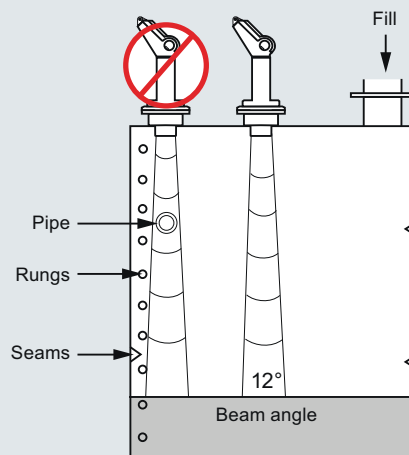
- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

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 ... 5 m (0.8 ... 16.4 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")	
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 lbs)	
• With flange adapter	1.7 kg (3.7 lbs)	
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]	
Cable inlet	2 inlets for PG 13.5 or ½" NPT cable glands	

Selection and Ordering data	Order No.
The Probe	C) 7ML1201-000
Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels	
Measuring range	1
5 m (16.40 ft)	
Transducer/Process connection	E F G J
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1] PVDF copolymer, R 2" [(BSPT), EN 10226] PVDF copolymer, G 2" [(BSPP), EN ISO 228-1] PVDF copolymer, 4" Sanitary mounting	
Model/Approval	E F
3 Wire, 24 V DC, CE, C-TICK, CSA, FM 2 Wire, 24 V DC, CE, C-TICK, CSA	

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")]: 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	C) 7ML1998-5GD62
2 Wire model, Multi-language manual	C) 7ML1998-5GC63
Accessories	
Universal Box Bracket Mounting kit	7ML1830-1BK
Sanitary 4" mounting clamp	7ML1830-1BR
Power Supply, 24 V DC, 200 mA for 2 probes (105 ... 125 V AC input)	C) 7ML1930-1AA
Power Supply, 24 V DC, 100 mA for 1 probe (105 ... 125 V AC input)	C) 7ML1930-1AB
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 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
C) Subject to export regulations AL: N, ECCN: EAR99.	
K) Subject to export regulations AL: N, ECCN: 5A991X.	

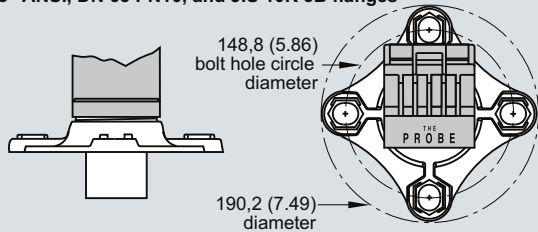
Level Measurement

Continuous level measurement – Ultrasonic transmitters

The Probe

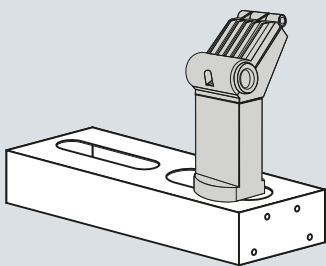
Options

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



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

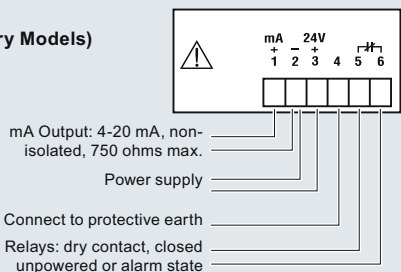
The probe with FMS 200 mounting bracket



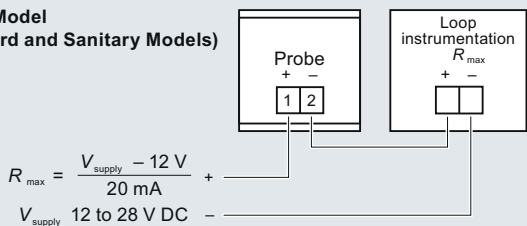
The Probe with Optional Mounting Bracket

Schematics

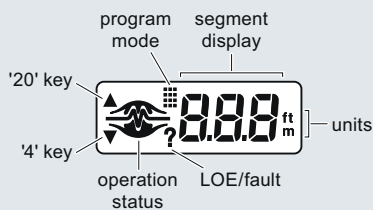
3 Wire Model (Standard and Sanitary Models)



2 Wire Model (Standard and Sanitary Models)



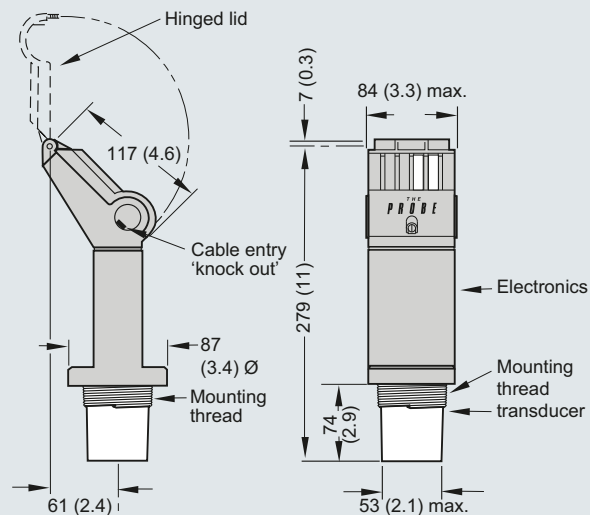
Display



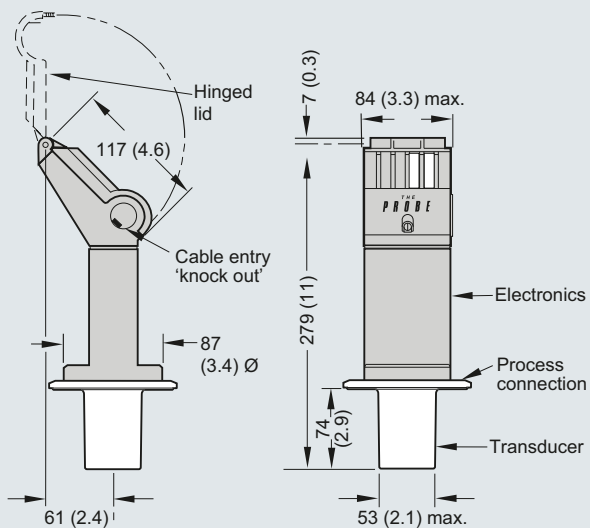
The Probe connections

Dimensional drawings

Standard model



Sanitary model



The Probe, dimensions in mm (inch)