

# Level measurement

## Continuous level measurement – Ultrasonic transducers

ST-H

4

### Overview



ST-H transducers use ultrasonic technology to measure level in chemical storage and liquid tanks.

### Benefits

- Can be mounted on a 2 inch (50.8 mm) standpipe
- Immune to corrosive and harsh environments
- Integral temperature sensor

### Application

The narrow design of the ST-H allows the transducer to be mounted on a 2 inch (50.8 mm) standpipe. When mounted correctly, it is completely protected from the process and can even be used in harsh, corrosive environments.

During operation, the ultrasonic transducer emits acoustic pulses in a narrow beam perpendicular to the transducer face. The level transceiver measures the propagation time between pulse emission and reception of the echo to calculate the distance from the transducer to the material. Variations in sound velocity due to changes in temperature within the permissible range are automatically compensated by the integral temperature sensor.

- Key Applications: chemical storage, liquid tanks

### Technical specifications

<b>Mode of operation</b>	
Measuring principle	Ultrasonic transducer
<b>Input</b>	
Measuring range	0.3 ... 10 m (1 ... 33 ft)
<b>Output</b>	
Frequency	44 kHz
Beam angle	12°
<b>Accuracy</b>	
Temperature compensation	Compensated by integral temperature sensor
<b>Rated operating conditions</b>	
Pressure	Normal atmospheric pressure
Ambient conditions	
• Ambient temperature	-20 ... +60 °C (-5 ... +140 °F) (ATEX approved model) -40 ... +73 °C (-40 ... +163 °F) (CSA/FM approved model)
<b>Design</b>	
Weight <sup>1)</sup>	1.4 kg (3 lb)
Material (enclosure)	Base and lid made of ETFE or PVDF (epoxy fitted joint) <sup>2)</sup>
Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1], R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Degree of protection	IP68
Cable connection	2-core shielded/twisted, 0.519 mm <sup>2</sup> (20 AWG), PVC sheath
Cable (max. length)	365 m (1 200 ft) with RG 62 A/U coaxial cable
<b>Options</b>	
• Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
<b>Certificates and approvals</b>	
CE <sup>3)</sup> , CSA Class I, II, III, Div. 1, Gr. A, B, C, D, E, F, G T3 (ETFE only), FM Class I, II, Div. 1, Gr. C, D, E, F, G T4A, ATEX II 2G EEx m IIC T5, C-TICK, INMETRO: Br-Ex m II T5	

<sup>1)</sup> Approximate shipping weight of transducer with standard cable length

<sup>2)</sup> When measuring chemicals, check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

<sup>3)</sup> EMC certificate available on request

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### ST-H

Selection and Ordering data	Order No.
<b>EchoMax ST-H ultrasonic transducer</b> Level measurement in chemical storage and liquid tanks. The narrow design of the ST-H allows the transducer to be mounted on a 2" standpipe. Measuring range: min. 0.3 m (1 ft), max. 10 m (33 ft).	<b>7ML1100-</b>
<b>Process connection</b> ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1] ETFE, R 2" [(BSPT), EN 10226] ETFE, G 2" [(BSPP), EN ISO 228-1] 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]	<b>A 0</b> 0 1 2 3 4 5
<b>Cable length</b> 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	A B C D E
<b>Approvals</b> FM Class I, II, Div. 1, C-TICK <sup>3)</sup> ATEX II 2G, CSA, C-TICK, INMETRO <sup>1)</sup> ATEX II 2G, C-TICK, INMETRO <sup>2)</sup>	2 3 4
<b>Operating Instructions</b> Quick Start Manual, multi-language Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	Order No. <b>7ML1998-5QK82</b> <b>7ML1998-5HV61</b>

- 1) Available with Process connection options 0 ... 2 only  
 2) Available with Process connection options 3 ... 5 only  
 3) Not suitable for Ketone, Hexane, Ester or Ethyl Acetate atmospheres

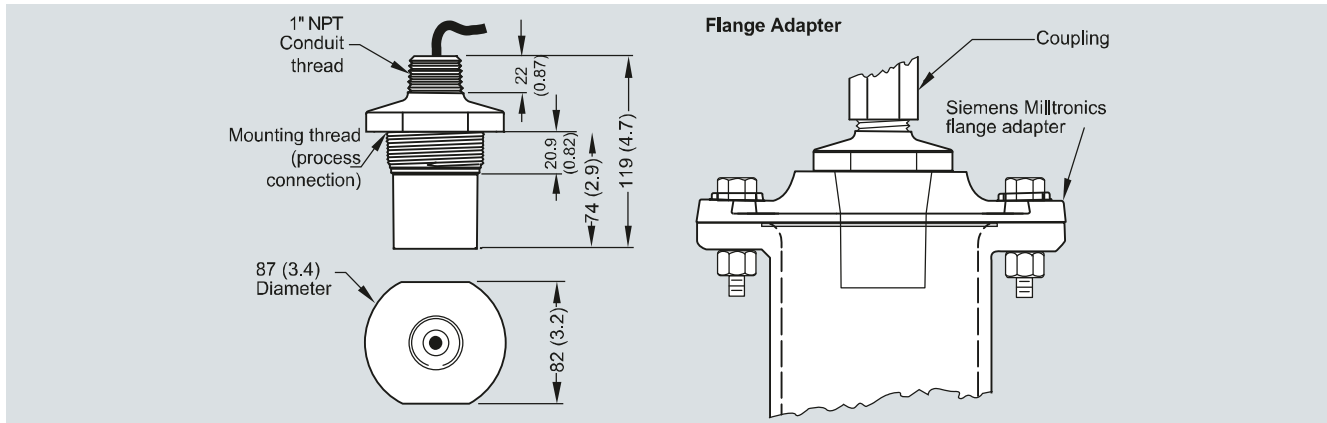
Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s). Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text	<b>Y17</b>
<b>Accessories</b> Universal box bracket, mounting kit 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" BSPT Easy Aimer 2, NPT with ¾" x 1" PVC coupling Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings Easy Aimer 304, with stainless steel coupling Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 SS couplings	Order No. <b>7ML1830-1BK</b> <b>7ML1830-1BT</b> <b>7ML1830-1BU</b> <b>7ML1830-1AQ</b> <b>7ML1830-1AX</b> <b>7ML1830-1AU</b> <b>7ML1830-1GN</b>

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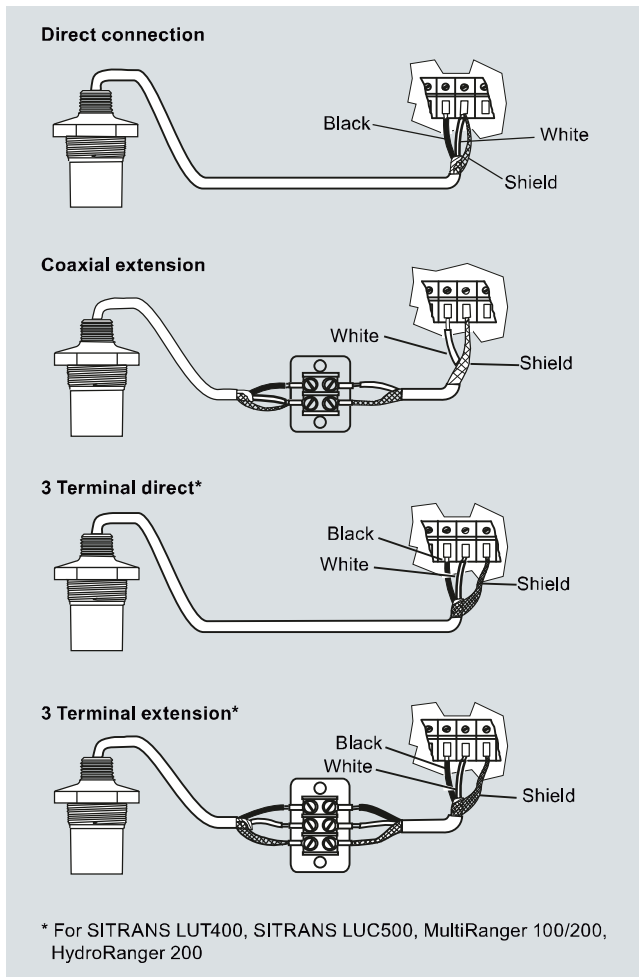
ST-H

### Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

### Schematics



ST-H ultrasonic transducer connections