

Solid-state Level Sensors Installation Instructions

Catalog Numbers 840E-TB1B1A1-D4, 840E-TB1B2A1-D4, 840E-TB1B3A1-D4, 840E-TB2B1A1-E4, 840E-TB2B2A1-E4



ATTENTION: Read this document for information on installation, handling, mounting, general product specifications, and operation of this product.

Introduction



ATTENTION: The Bulletin 840E is a level sensor for all kinds of liquid and is used in tanks, containers, and pipelines. The device has been safely built with state-of-the-art technology and meets the applicable requirements and EC directives. It can, however, be a source of danger if used incorrectly or for anything other than the designated use.

Installation Considerations

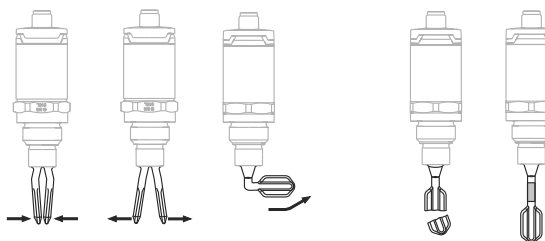
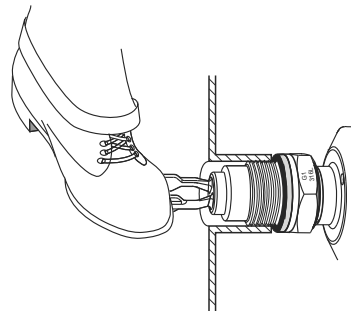
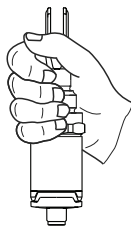
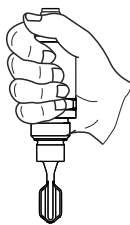


ATTENTION: Qualified individuals are required for installation and commissioning. Failure to comply will result in personal injury or equipment damage.

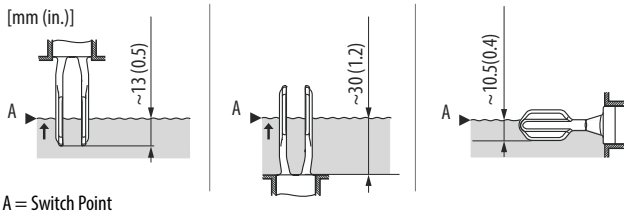
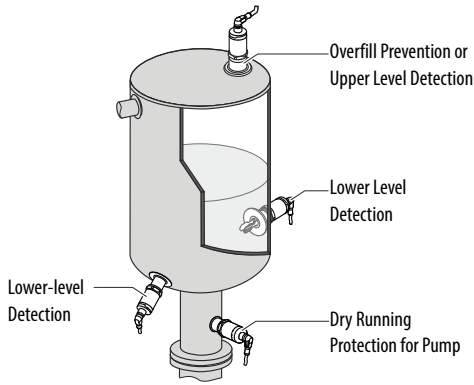
Handling

Hold by the housing, not by the sensor fork.

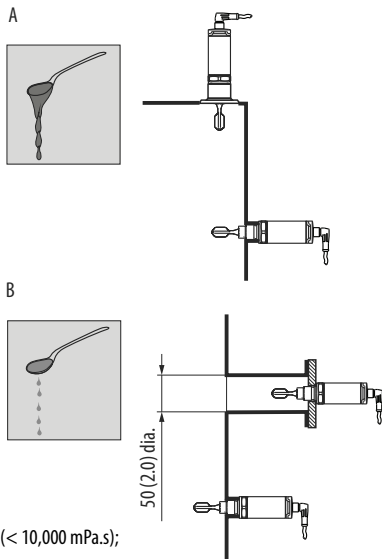
Do not bend, shorten, or lengthen.



Mounting

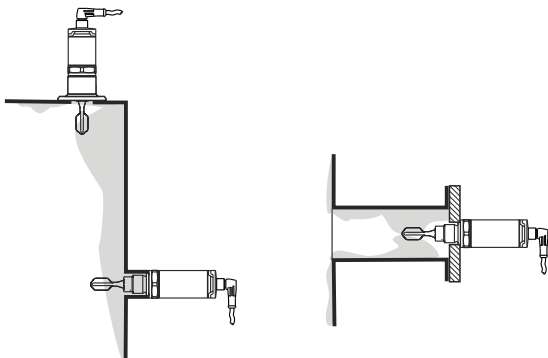


Viscosity



A = High Viscosity (<math>< 10,000 \text{ mPa}\cdot\text{s}</math>);
 B = Low Viscosity (<math>< 2,000 \text{ mPa}\cdot\text{s}</math>)

Build-up



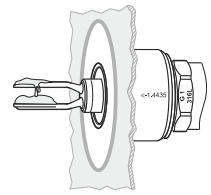
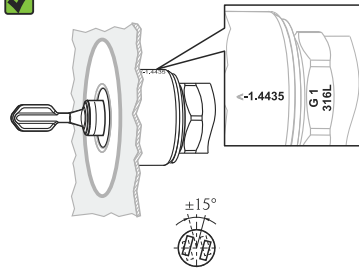
ATTENTION: Make sure that the installation socket does not exceed a certain length so that the tuning fork can project freely into the vessel.

Installation

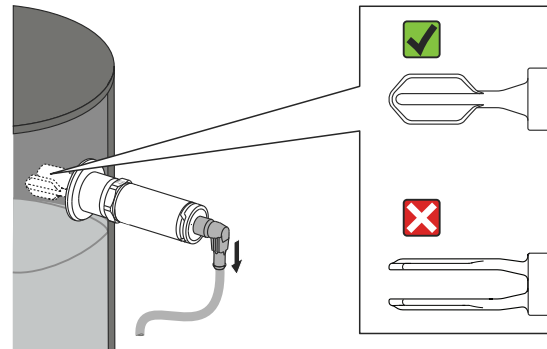
Vessel

The marking indicates the position of the tuning fork. If installed horizontally in the vessels, the marking is face up.

Orientation in a Vessel

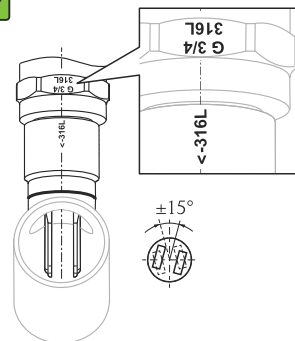


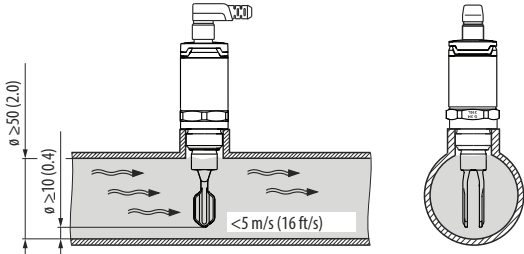
Position of the Fork in a Horizontal Vessel



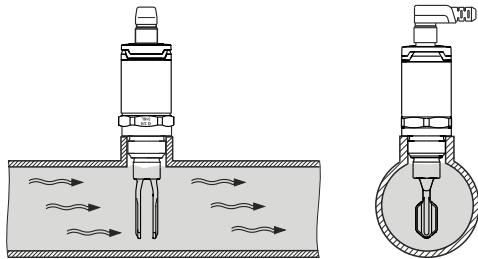
Pipes

Orientation in a Pipe

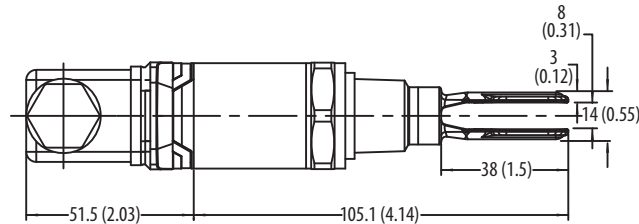
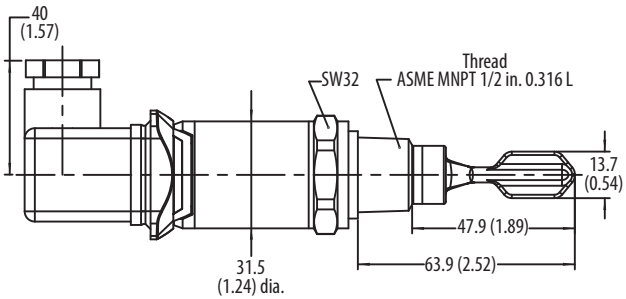




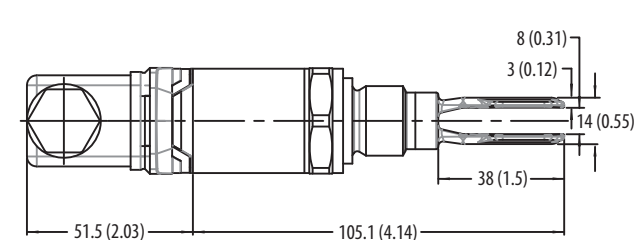
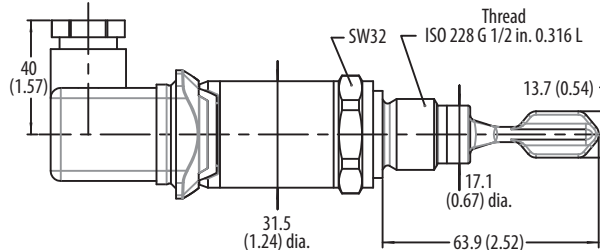
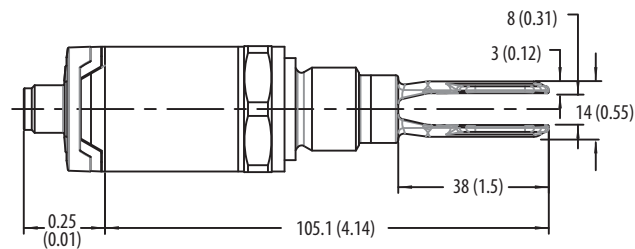
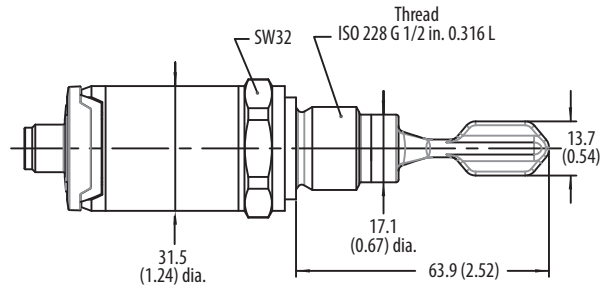
Pay attention to the position of the fork to minimize the turbulence in the pipe.



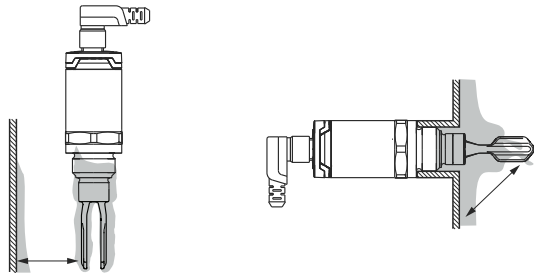
1/2 in. NPT Valve Connector



G 1/2 in. Process Connection



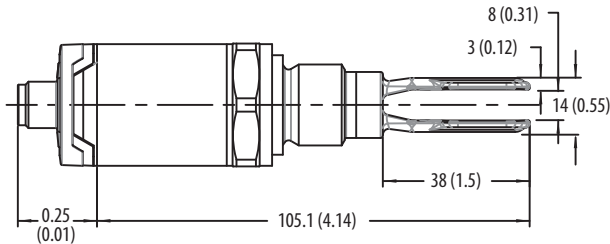
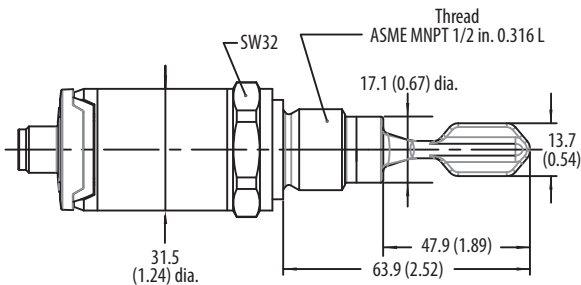
Distance from Wall



Recommended distance from wall ≥ 10 mm (0.39 in.)

Dimensions [mm (in.)]

1/2 in. NPT and 3/4 in. NPT Process Connection

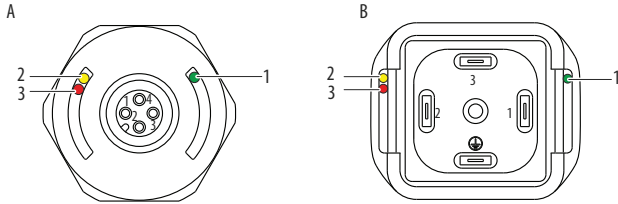


Mating Cables

DC-PNP → 889D-F4AC-2 (M12x1 connector); 889D-R4AC-2 (M12x1) right angle connector. AC version → 889V-RZ3ABE-2 – 2 m (6.56 ft) DIN valve cable.

Sensor Operation

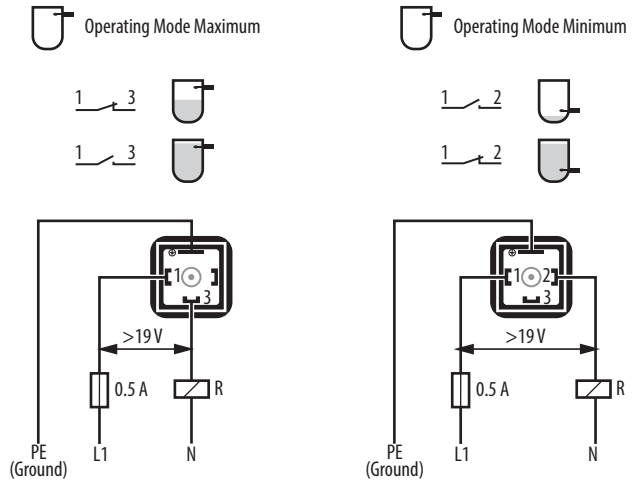
A ≥ 12 connector



B ≥ Valve plug

Item	Function	Description
1	Green LED (gn) lit	Device is operational
2	Yellow LED (ye) lit	M12 connector: indicates the sensor state: Tuning fork is covered by liquid Valve plug: indicates the switching state <ul style="list-style-type: none"> Maximum operating mode (overflow prevention) sensor is not covered by liquid Minimum operating mode (dry running protection) the sensor is covered by liquid
3	Red LED (rd) flashing lit	Warning/maintenance required: error can be rectified, for example, incorrect wiring Fault/device failure: error cannot be rectified, for example, electronic error

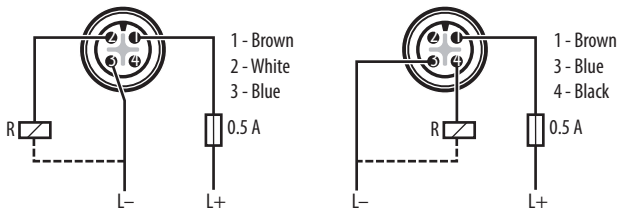
AC Version with Valve Connector 1/2 in. NPT



R = External Load
Current = 250 mA Maximum
Voltage = 19...253V AC

Wiring Diagrams

DC — PNP version with M12 Connector



R = External Load
Current = 250 mA Maximum
Voltage = 10...35V DC

Specifications

Attribute	840E-TB1x	840E-TB2x
Power Supply		
Supply Voltage	10...30 V DC, 3-wire	2...253V AC, 2-wire
Power Consumption	< 975 mW	< 850 mW
Current Consumption	< 15 mA	< 3.8 mA
Performance Characteristics		
Switching Delay	0.5 s when covering; 1.0 s when free	
Resolution	< 0.5 mm (0.02 in.)	
Maximum Error	13.0 ± 1 mm (0.51 in. ± 0.04 in.)	
Repeatability	± 1 mm (0.04 in.)	
Hysteresis	3.0 ± 0.5 m (0.12 in. ± 0.02 in.)	
Setting Time	< 2 s	
Reference Operation Conditions		
Ambient Temperature [C (F)]	25° (77°)	
Process Pressure	1 Bar (14.5 psi)	
Fluid	Water (density: approx. 1 g/cm ³ , viscosity 1 mm ² /s)	
Medium Temperature [C (F)]	25° (77°)	
Density Setting	> 0.7 g/cm ³	
Switching Time Delay	Standard (0.5 s, 1 s)	
Operating Conditions		
Ambient Temperature Range [C (F)]	-40...+70° (-40...+158°)	
Storage Temperature [C (F)]	-40...+85° (-40...+185°)	
Process Temperature Range [C (F)]	-40...+100° (-40...+212°); -40...+150° (-40...+302°)	
Process Pressure Range	Maximum -1...+40 bar (-14.5...+580 psi)	
Degree of Protection	NEMA 4X (IP66/67) DC -M12 connector IP65 AC-Valve connector	
Shock Resistance	EN 60068-2-27:2007	
Vibration Resistance	EN 60068-2-64:2008	
Density	> 0.7 g/cm ³ (optionally available: > 0.5 g/cm ³)	
Viscosity	1...10,000 mPa s, dynamic viscosity	
Media	Liquid	
Gas Content	Stagnant mineral water	
Solids Content	< 5 mm (0.20 in.) diameter	
Materials		
<i>Wetted Parts</i>		
Tuning Fork	Stainless steel 316L	
Process Adapter	Stainless steel 316L	
Seal for Weld-in Adapter	VMQ (vinyl-methyl-silicone)	
Flat Seal	FA (composite material based on aramid fibers combined with NBR)	
<i>Non-wetted Parts</i>		
Housing Cover with M12 Connector (IP65/IP67)	PPSU (polyphenylsulfone)	
Design Ring	PBT/PC (polybutylene terephthalate/polycarbonate)	
Housing	316L	
Cable Gland	PVDF (polyvinylidene fluoride)	
Name Plate	Plastic foil (attached to housing)	

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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