

Level Selection Guide



Type	<i>levelprox</i> ®	<i>levelprox</i> Mounting Accessories
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Type	<i>EZ-track</i> ® Level Probe	Level Probe Accessories	Probe Holder	Level Control Monitor
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levelprox®

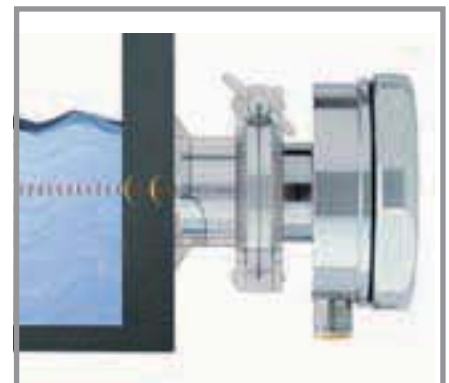
levelprox is a unique, non-invasive ultrasonic sensing solution that provides accurate media detection through metal container walls. **levelprox** mounts to the outside of a container with no compromise to structural integrity, and is ideal for high pressure, hazardous or sterile applications.

All it takes to reliably detect the presence of liquid through a metal container is to program the empty and full conditions into the **levelprox** using a simple teach button. The sensor generates a high frequency ultrasonic pulse that is transferred into the container wall through a coupling gel. As the pulse enters the container wall it is influenced by the containers contents. **levelprox** analyzes this pulse and compares it to the conditions that were programmed into the memory of the sensor.

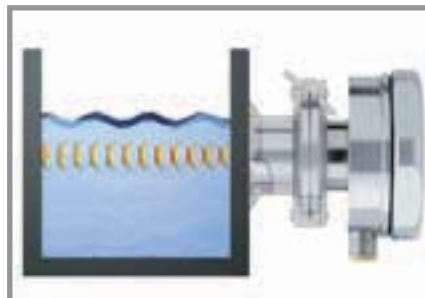


With Dual Operating Modes, levelprox Provides Reliable Detection in Even the Toughest Applications:

Reverb Mode: evaluates the ultrasonic pulse as it reverberates within the container wall. This pulse travels through the container wall until it reaches the inner wall. The reverb mode works great when the liquid to be detected has a low viscosity, leaving little or no coating on the container wall. The reverb mode should also be utilized when stirring devices are used inside the container.



Echo mode: evaluates the ultrasonic pulse as it travels through the liquid and echoes off of the opposite container wall. Highly viscous liquids can be reliably detected with the echo mode. The mode looks past the layers of product that can coat the inside of a container to give the true level of the product.





Dual Mode T50

levelprox®

The T50 dual-mode **levelprox** features a robust 316L stainless steel housing with an integrated sanitary connection. The sensors construction and non-invasive operation make it the perfect choice for applications in food, beverage and pharmaceutical industries. The integrated Tri-Clamp mounting flange maintains proper orientation to the tank wall and also protects the coupling during washdown operations.



Dual Mode M30

The M30 dual-mode **levelprox** is ideal for level detection applications where stainless steel sanitary fittings are not required. The M30 delivers non-invasive detection without the additional expense of a sanitary housing. Its 30 mm barrel can be easily mounted using a welding adapter or a metal strap kit.

Mounting accessories are available for the T50 and M30 sensors for welding, bonding and strapping **levelprox** sensors to most common containers.



Mounting Accessories

Recommended Operating Mode

Application	Reverb	Echo
Liquids contaminated with solids	Yes	No
Liquids that leave a film on container wall	No	Yes
Liquid with internal mixing devices	Yes	No
Containers with internal coating	No	Yes
Containers greater than 6 ft. across	Yes	No
Aerated liquid	Yes	No

levelprox Specifications

- Switching Delay 1-10 second (adjustable via DIP-switches)
- Rated Operational Current (DC) I_e ≤ 200 mA
- No-load Current I_o ≤ 60 mA
- Overload Trip Point > 270 mA
- Max. Voltage Drop at 200 mA ≤ 2.5 V
- Switching Frequency 1 Hz
- Time Delay Before Availability ≤ 2 s
- Protection Class IP 68
- Housing Material T50: 316L stainless (A41.4404)
M30: Chrome plated brass
- Operation Temperature -25° to $+70^\circ\text{C}$ (-13° to $+158^\circ\text{F}$)
- Supply Voltage Indication Green LED
- Switching status indication Yellow LED
- Error Indication Red LED flashing and alarm output on
- Alarm Indication Red LED
Flashing Green LED indicates alarm off
- Approvals Class I, Division 2

Mounting the T50 *levelprox*[®]

Mounting

One of the most critical procedures in any *levelprox* application is the mounting of the sensor. Reliable operation of the sensor requires a mount that is rigidly fixed and properly oriented to the container wall. Below you will find some important tips for mounting a *levelprox*.

Surface Preparation

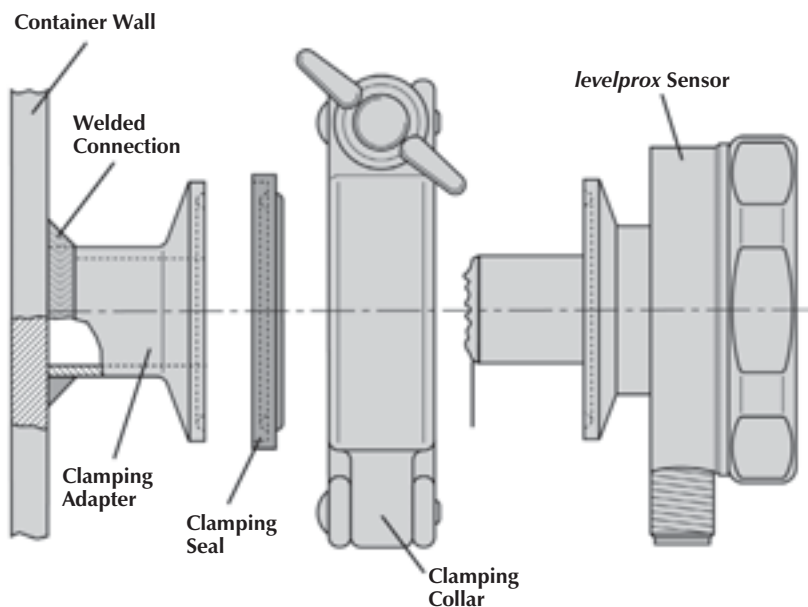
The surface of the tank plays an important role ensuring proper operation of the sensor. The surface finish and structural integrity of the container wall need to be evaluated when selecting a mounting location for the sensor. The surface finish should be smooth and free of rust, paint, and coatings that could affect the sound transmission of the sensor. The area of the tank where the sensor will mount should be in good condition, i.e. no pitting, dents, welded joints, internal structures etc. If you are using a weld-on mount, be aware that excessive heat from the welder can distort thin walled containers.

Mounting the Sensor

The *levelprox* needs to make solid contact with the container wall for proper operation. Ideally the clamping adapter should be mounted perpendicular to the container wall. In the case of a round container, the sensor should be mounted so that the transducer is pointing at the center axis. **TURCK** offers several mounting options designed to keep the sensor optimally coupled with the wall of the container.

Installation

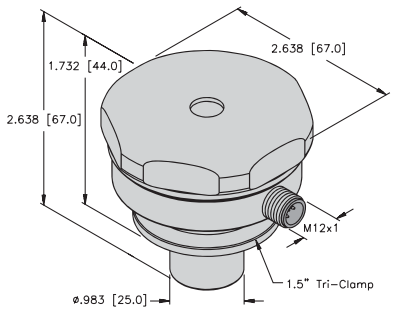
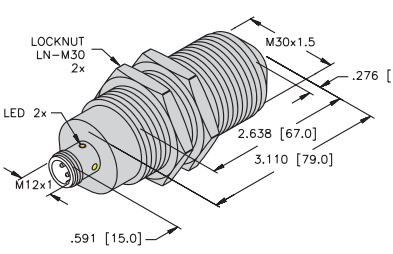
Included with every **TURCK *levelprox*** is a small container of coupling gel. This gel is required for the sensor to efficiently pass the ultrasonic pulses into the container wall. Before installing the sensor on the container, remember to apply a generous amount of the gel to the sensors transducer surface.



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Housing Style	Part Number	ID Number	Container Wall Thickness	Min/Max Container Diameter	Programming	Output
Smooth Cylindrical T50 Style 	LPRE-T50-UP6X3-H1151	M1606201	1-15 mm	100-2000 mm** Stainless Steel	Push button or external teach wire	5-Wire DC PNP
Standard M30 Style 	LPRE-M30-AP6X2-H1141	M1606203	1-15 mm	100-2000 mm** Nickel Brass	VB2-SP1	4-Wire DC PNP

Additional specifications on page M105.

Accessories on page M109.

** 2000 mm (echo mode), no limit (reverberation mode).



TURCK *levelprox* sensors are FM approved for installation in Class I, Division 2 hazardous locations when installed per TURCK control drawing Ni-1.005 (www.turck.com/fmcd).




Voltage	Switching Current (mA)	Min. Repeat Accuracy (mm)	Operating Temp. (°C)	Protection Class	Housing	Short-Circuit Protection	Rev. Polarity Protection	Wire Break Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
15-30 VDC	≤200	≤±5 mm	-25 to +70	IP 67	SS	Yes	Yes	Yes	RK 4.5T-*	1	<p>Diagram 1</p> <p>Diagram 2</p>
15-30 VDC	≤200	≤±5 mm	-25 to +70	IP 67	CPB	Yes	Yes	Yes	RK 4.4T-*	2	


* Length in meters.


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Process Automation – Instrumentation

Mounting Accessories for T50


Part Number	ID Number	T50 Weld Kit
LP-MS-T50-S	M6900253	
<p>Designed to mount the T50 sensor to flat sided containers. Can also be used for mounting to large diameter round containers.</p> <p>Includes: Clamping Adapter, Clamp, and Gasket</p>		


Part Number	ID Number	T50 Epoxy Mounting Kit
LP-MS-T50-K	M6900255	
<p>Designed for mounting the T50 sensor to flat sided containers. Kit is ideal for applications where welding is not possible.</p> <p>Includes: Clamping Adapter, General Purpose Epoxy, Clamp, Gasket, and Locator Buttons</p>		


Part Number	Clamping Adapter
LP-Clamping Adapter-*	
<p>Custom machined weld-on clamping adapter to fit round containers.</p> <p>Note: Clamp and gasket need to be purchased separately, see table on right.</p> <p>* Indicates the container diameter in meters.</p>	


Individual Pieces		
Part Number	ID Number	Description
LP-OKS1110**	M6900296	Coupling Gel
LP-MZ-T50-SR**	A5316	Sanitary Clamp
LPMZ-T50-CS	M6900365	Clamping Adapter
LP-MZ-T50-D**	A5315	Gasket

Mounting Accessories for M30

Part Number	ID Number	Push Button
VB2-SP1	A3501-29	
<p>The VB2-SP1 is used for programming and mode selection of the M30 <i>levelprox</i>.</p>		

Part Number	ID Number	M30 Weld Mount
LP-MZ-M30-SB	A5321	
<p>Mounting Bracket can be strapped or welded to container. Perfect for applications that don't require washdown.</p>		

Part Number	ID Number	M30 Sanitary Adapter
LP-MZ-M30-T50	A5317	
<p>Allows the M30 to be mounted using T50 Accessories. Use with LP-Clamping Adapter-* in applications that are subjected to washdown.</p> <p>* Indicates the container diameter in meters.</p>		

Part Number	ID Number	M30 Straps
LP-MZ-M30-B250	A5320	
LP-MZ-M30-B500	A5319	
LP-MZ-M30-B1000	A5322	
<p>Use with LP-MZ-M30-SB to mount the M30 using straps. Constructed of stainless steel with lengths available: 250 cm, 500 cm, and 1000 cm</p> <p>Includes: Two stainless steel straps</p>		

** Accessories that can also be used on M30 style *levelprox*.

EZ-track® Liquid Level Probe

The *EZ-track* line from TURCK is a line of magnetostrictive linear displacement transducers. These devices detect the position of an external magnet along the active stroke of the sensor without causing any wear on the sensor parts. Because there are no parts to wear or break, the sensors can offer better performance over a longer life than competing technologies. They also offer an alternative when a continuous, absolute reading is necessary in the application.

The *EZ-track* R16 Liquid Level Sensor is a programmable, two-wire loop powered intrinsically safe probe that is ideal for continuous level monitoring in a variety of liquids and tank designs. The R16 sensor uses magnetostrictive technology to monitor the position of a magnetic float along the active stroke of the sensing tube, which is then converted into a configurable 4-20 mA output. The IP 68 rated R16 liquid level sensors are available in a rigid 316 stainless steel housing or a flexible PVDF design. The probe lengths vary between 18 and 288 inches. The stainless steel version is also available in an optional Food Grade or 3A Rated Sanitary finish probe for use in an array of food service, dairy and beverage applications. A variety of floats, fittings, and accessories are available to fit virtually any application requirement.

All of the electronics for the R16 sensor are incorporated within the 5/8 inch sensing rod, which eliminates the need for an electronics enclosure at the top of the sensor. This feature when ordered with the standard 4-pin *minifast*® quick disconnect, offers greater mounting options, and a faster, more reliable installation. The R16 liquid level sensor has a resolution of 0.02 inches of full scale, and an accuracy of 0.1% over the programmable monitoring span, making it the ideal sensor for applications where continuous level position is required.

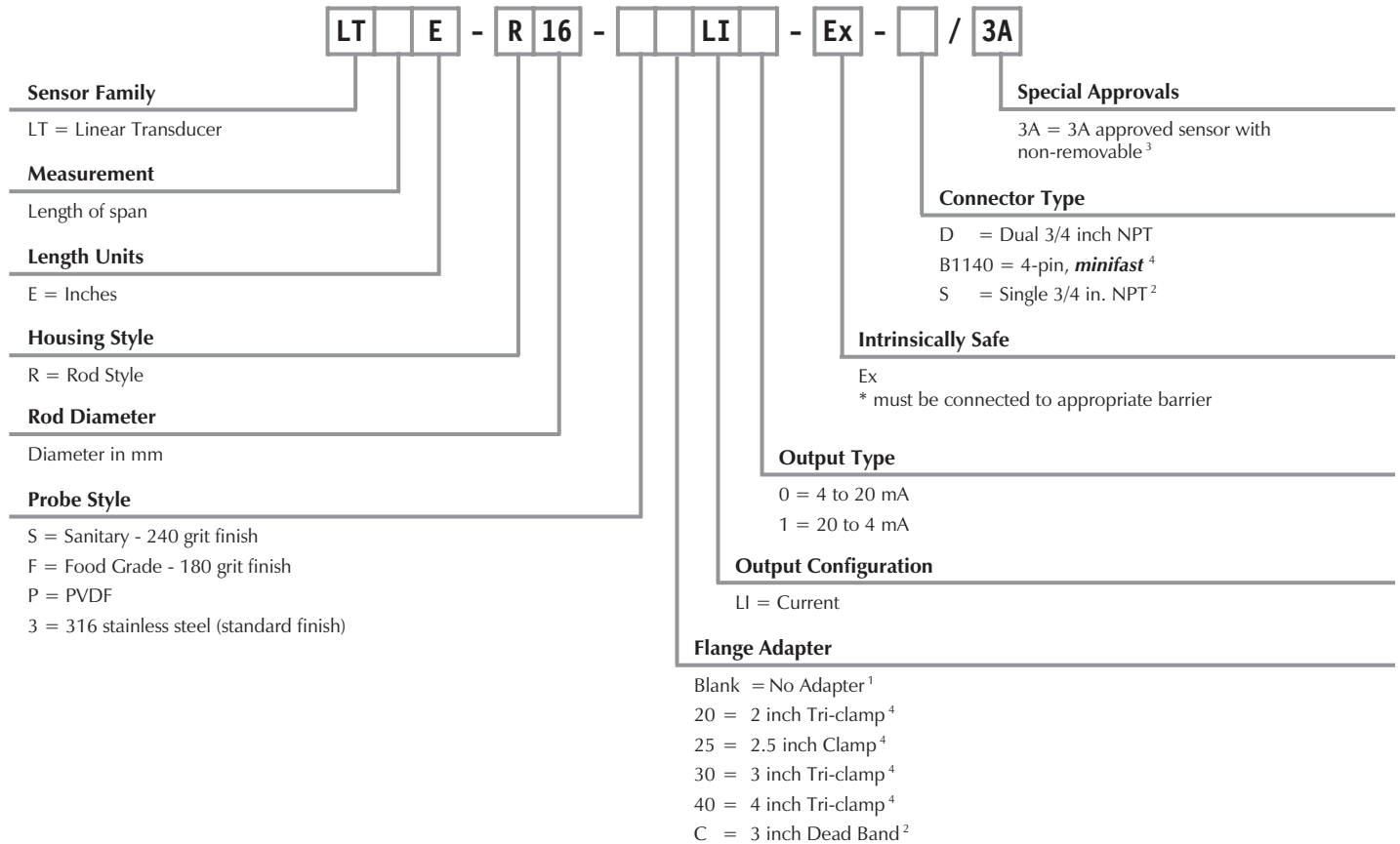


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Process Automation – Instrumentation

R16 Level Probe Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult factory for catalog items not identified.



¹ Available on probe styles 3 or P only.
² Available on probe styles P only.
³ Available on probe styles S only.
⁴ Not available on probe style P.



PVDF Probe Specifications

Output	4 to 20 mA, 20 to 4 mA
Span	7 to 288 in.
Repeatability	0.014 in. + 0.5% of programmable span typical; max 0.014 in. + 0.4% of programmable span
Resolution	0.25% of programmable span or 0.02 in., whichever is greater
Operating Temperature	-20° to +70°C (-4° to +158°F)
Null Zone	12 in.
Dead Zone	6 to 8 in. (span 7 in. to 126 in.: 6 in.; span 127 in. to 288 in.: 8 in.)
Operational Voltage	13.5-30 VDC
Current Consumption	Loop Powered
Enclosure Rating	IP 69
Non-linearity	0.1% of programmable span
Reading Rate	40 ms
Rod Diameter	0.625 in. (15.9 mm)
Pressure	145 psi
Electronics	PVDF
Rod	PVDF
Agency Approvals	FM
FM-Approval	Class I, Div 1, Group C and D Class II, Div 1, Group E, F, and G Class I, Zone 0 or 1, Groups IIA or IIB

Stainless Steel Probe Specifications

Output	4 to 20 mA, 20 to 4 mA
Span	10 to 288 inches
Repeatability	0.014 in. + 0.5% of programmable span typical; max 0.014 in. + 0.4% of span
Resolution	0.25% of programmable span / 0.02 in., whichever is greater
Operating Temperature	-20° to +70°C (-4° to +158°F)
Null Zone	8 in.
Dead Zone	2 in.
Operational Voltage	13.5 to 30 VDC
Current Consumption	Loop Powered
Enclosure Rating	IP 69
Non-linearity	0.1% of programmable span
Reading Rate	40 ms
Rod Diameter	0.625 in. (15.9 mm)
Pressure	1015 psi
Electronics	Stainless Steel 316L
Rod	Stainless Steel 316L
Agency Approvals	FM
FM-Approval	Class I, Div 1, Group C and D Class II, Div 1, Group E, F, and G Class I, Zone 0 or 1, Groups IIA or IIB



Housing Style	Part Number	Output Current
Stainless Steel Level Probe, <i>minifast</i>® Connection 	LT***E-R16-3LI0-EX-B1140	4-20 mA Loop Powered
	LT***E-R16-3LI1-EX-B1140	20-4 mA Loop Powered
Stainless Steel Level Probe, Dual 3/4 NPT Connection 	LT***E-R16-3LI0-EX-D	4-20 mA Loop Powered
	LT***E-R16-3LI1-EX-D	20-4 mA Loop Powered
Stainless Steel Level Probe, <i>minifast</i> Connection, Tri-clamp Adapter 	LT***E-R16-3**LI0-EX-B1140	4-20 mA Loop Powered
	LT***E-R16-S**LI0-EX-B1140	
	LT***E-R16-F**LI0-EX-B1140	
Stainless Steel Level Probe, Dual 3/4 NPT Connection, Tri-clamp Adapter 	LT***E-R16-3**LI1-EX-B1140	20-4 mA Loop Powered
	LT***E-R16-S**LI1-EX-B1140	
	LT***E-R16-F**LI1-EX-B1140	
Stainless Steel Level Probe, Dual 3/4 NPT Connection, Tri-clamp Adapter 	LT***E-R16-3**LI0-EX-D	4-20 mA Loop Powered
	LT***E-R16-3**LI1-EX-D	20-4 mA Loop Powered

* Float ordered separately, see page M118.

** For flange dimensions, see page M117.



TURCK 'R16' level probes are FM approved as intrinsically safe for installation in Class I, Division 1 hazardous locations when installed per TURCK control drawing IS-1.111 (www.turck.com/fmcd).



Voltage	Probe Style (Finish)	Pressure Rating (psi)	Connection Type	Agency Approval	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
13.5-30 VDC	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	<p>Diagram 1</p> <p>Diagram 2</p>
	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
13.5-30 VDC	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	<p>Diagram 2</p>
	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	
13.5-30 VDC	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	<p>Diagram 1</p> <p>Diagram 2</p>
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
	Food Grade (316 SS w/180 grit)	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
	Food Grade (316 SS w/180 grit)	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
13.5-30 VDC	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	<p>Diagram 2</p>
	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	

* Length in meters.



Housing Style	Part Number	Output
Stainless Steel Level Probe, minifast® Connection, Tri-clamp Adapter, Non-removable Float 	LT***E-R16-S**LI0-EX-B1140/3A	4-20 mA Loop Powered
	LT***E-R16-S**LI1-EX-B1140/3A	20-4 mA Loop Powered
PVDF Level Probe, Dual 3/4 NPT Connection 	LT***E-R16-PLI0-EX-D	4-20 mA Loop Powered
	LT***E-R16-PLI1-EX-D	20-4 mA Loop Powered
PVDF Level Probe, Single 3/4 NPT Connection 	LT***E-R16-PLI0-EX-S LT***E-R16-PCLI0-EX-S	4-20 mA Loop Powered
	LT***E-R16-PLI1-EX-S LT***E-R16-PCLI1-EX-S	20-4 mA Loop Powered

* Float ordered separately, see page M118.
 ** For flange dimensions, see page M117.



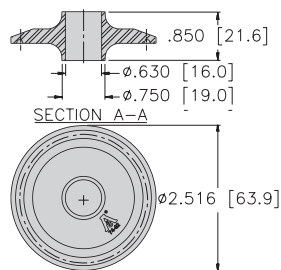
TURCK 'R16' level probes are FM approved as intrinsically safe for installation in Class I, Division 1 hazardous locations when installed per TURCK control drawing IS-1.111 (www.turck.com/fmcd).



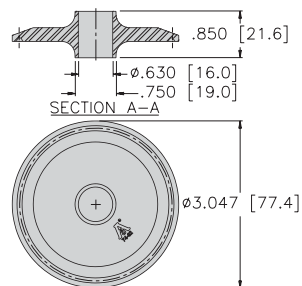
Voltage	Probe Style (Finish)	Pressure Rating (psi)	Connection Type	Agency Approval	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
13.5-30 VDC	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	3A, FM	RKV 46-*M	1	<p>Diagram 1</p> <p>Diagram 2</p>
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	3A, FM	RKV 46-*M	1	
13.5-30 VDC	PVDF	145	Dual 3/4 NPT	FM	2M/PVC	2	<p>Diagram 2</p>
	PVDF	145	Dual 3/4 NPT	FM	2M/PVC	2	
13.5-30 VDC	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	<p>Diagram 2</p>
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	

* Length in meters.

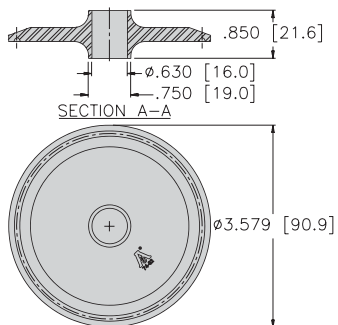
Flange Options



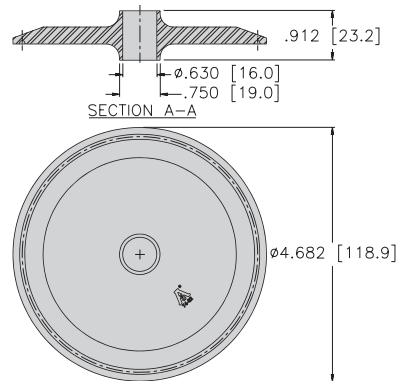
Flange, 2 inch Tri-clamp



Flange, 2.5 inch Tri-clamp



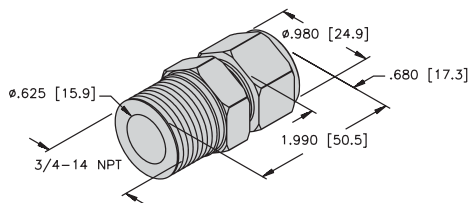
Flange, 3 inch Tri-clamp



Flange, 4 inch Tri-clamp

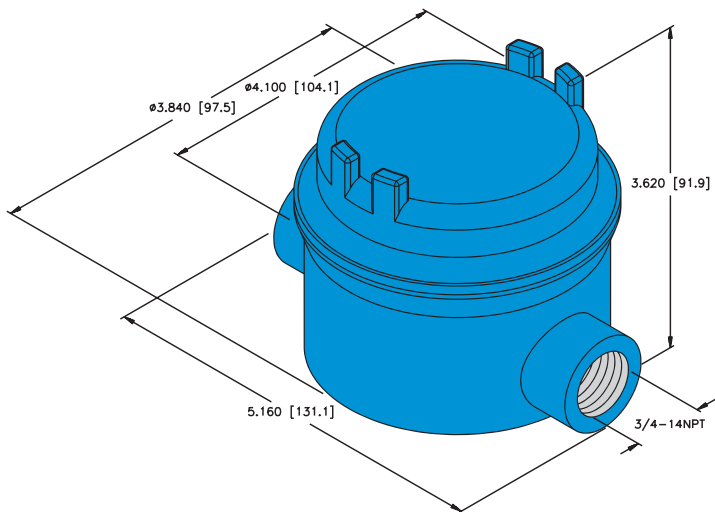
Level Probe Accessories

Tube Coupling



TC-R16-SS
(LT0305)

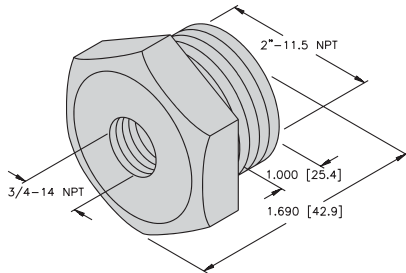
Junction Box



TB-R16S
(LT0294)

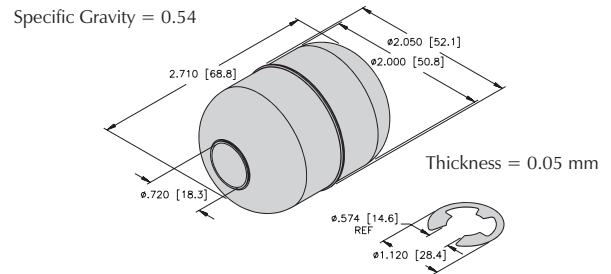
Level Probe Accessories

Bushing (316 Stainless Steel)



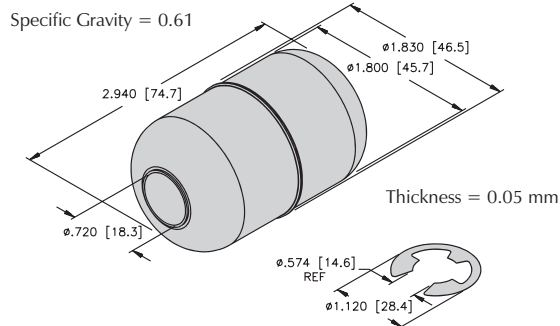
BU-R16-2x3/4 NPT-SS (LT0306)

Float Kit (316 Stainless Steel)



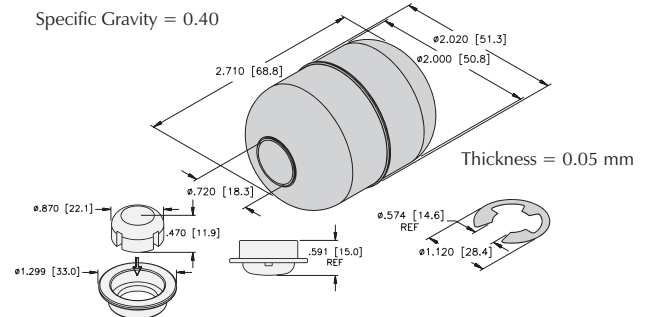
FK-R16-205-SSES (LT0299)

Float Kit (316 Stainless Steel)



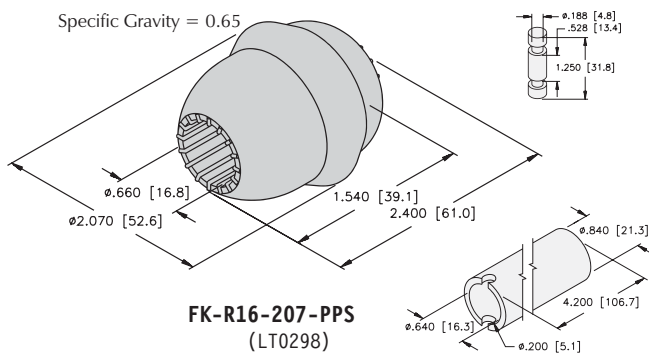
FK-R16-183-SSES (LT0296)

Float Kit (Nitrophyl)



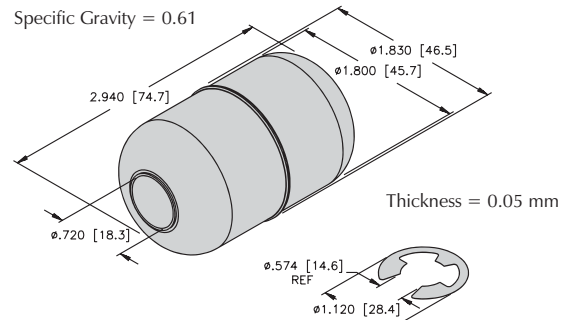
FK-R16-202-NSH (LT0297)

Float Kit (PVDF)



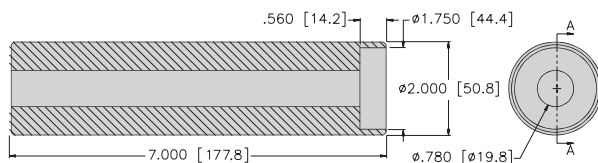
FK-R16-207-PPS (LT0298)

Float Kit (316 Polished Stainless Steel)



FK-R16-183-SSFE (LT0302)

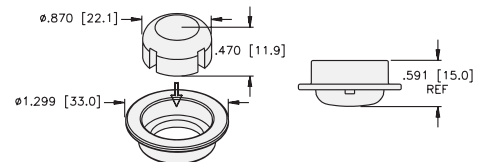
Weight Kit (316 Stainless Steel)



For use on PVDF probes 145-288 inches long.

WK-R16 Weight Kit (LT0295)

Probe Foot (ECTFE)



PF-R16 (LT0292)

TURCK

Process Automation – Instrumentation

R16 Level Probe Worksheet

Liquid to be measured _____

Fluid Properties (check all that apply)

Turbulent

Foam

Solids

Product Build-Up Yes No

Temperature Range _____ °F to _____ °F

Pressure Range _____ to _____

Viscosity Range _____ to _____

Specific Gravity _____

4 mA Starting Point Top Bottom

Approvals Required

UL CSA FM 3A Food Grade

Tank Location Indoors Outdoors

Tank Material _____

Additional Comments _____

**Allow overhead clearance for installation and removal of sensor.*

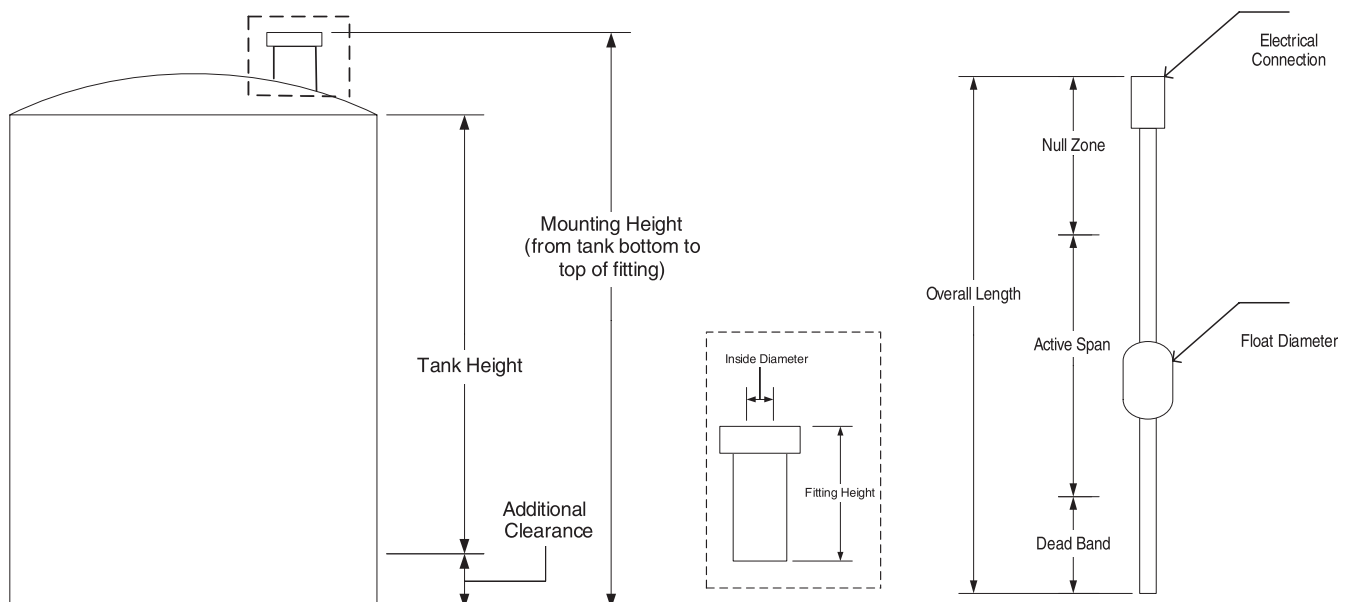
Customer

Phone Number

Date

Project

Quantity



Conductive Level Probes and Controllers

TURCK offers liquid level probes for use in conjunction with our Level control Monitors to provide a simple solution for liquid level applications. The resistance between the terminals is measured to determine the level of the medium in the tank.

Level Controllers

The level control logic is built in to the controller which offers a variety of options to fit any application.

- Adjustable Sensitivity
- Single Set-points
- Multiple Inputs
- On/Off Delay
- Programmable Outputs

These devices can be used in applications to control the filling and draining of a tank or as high and low level alarms. The level controller is able to differentiate between a variety of liquids, as well as distinguishing between liquid and foam. Many of the monitors have adjustable on and off-delays for use in turbulent liquid level applications, as well as the necessary logic to control overflow monitoring.

Level Probes and Probe Holders

TURCK also offers stainless steel probes, and stainless steel holders with ceramic insulators. The probes are used to provide single-point level control, while the holders are sealed to withstand applications up to 2500 psi at +70°F (+21°C). These parts provide reliable liquid level control in a wide variety of applications.



TURCK

Process Automation – Instrumentation

MK91-121-R.. and MK91-12-R.. Specifications

Galvanic Isolation	between input, output and supply circuits, test voltage 2.5 kVrms
Probe Voltage	0.02-5 V _{pp} /150 Hz (delta)
Sensitivity Ranges (Switching Thresholds)	
- Range 1	0.2-1 kΩ
- Range 2	0.8-4 kΩ
- Range 3	2.5-15 kΩ
- Range 4	10-100 kΩ
Hysteresis	approx. 10%
Switch-on Delay	0-20 s (adj.)
Switch-off Delay	0-20 s (adj.)
Contact Material	silver alloy + 3 μ Au
Switching Capacity	≤500 VA / 60 W
Protection	IP 20
Mounting	DIN 50022 or pull-out tabs
Operating Temperature	-25° to +60°C (-13° to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%

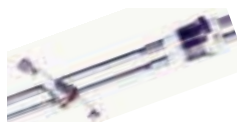
MK91-R11.. Specifications

Galvanic Isolation	between input and output circuit, insulation test voltage 4 kV/8 mm input circuit and supply voltage galvanically connected
Switching Point Deviation in	
Supply Voltage Range	≤1%
Operating Characteristics at:	V = 24 V, R _M = 40 k
- Rectangular Signal	f = 1 Hz
- Amplitude of Electrode Voltage	±2 V
- Amplitude of Electrode Current	±50 μA
Contact Material	silver alloy + 3 μ Au
Switching Capacity	≤500 VA / 60 W
Protection	IP 20
Mounting	DIN 50022 or pull-out tabs
Operating Temperature	-25° to +60°C (-13° to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%



MS91-12-R.. Specifications

Galvanic Isolation	between input, output and supply circuits
Probe Voltage	typ. 5 V _{pp} /100 Hz (delta)
Sensitivity Ranges (Switching Thresholds)	
- Range 1	0.1-1 kΩ
- Range 2	0.5-5 kΩ
- Range 3	2-20 kΩ
- Range 4	10-100 kΩ
Hysteresis	10%
Switch-on /Switch-off Delay	0.1-15 s (adj.)
Contact Material	AgCdO
Switching Capacity	≤500 Va/60 W
Protection	IP 20
Mounting	DIN 50022 or pull-out tabs
Operating Temperature	-25° to +60°C (-13° to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%



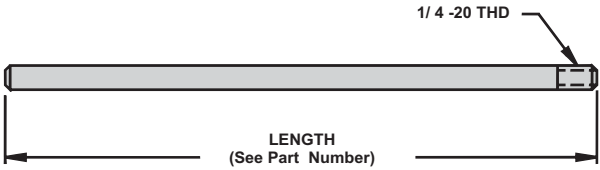
Housing Style	Part Number	ID Number	Number of Probes	Maximum Pressure (psi)	Fluid Connection
<p>Probe Holder</p>	WCC-1138	A3365	1	2500	3/8 NPT
<p>Probe Holder</p>	WCT-2	A3375	2	2500	1 in. NPT

For use with Amplifiers on pages M125 - M128.

Material

Probe Holders	303/304 Stainless Steel
Insulators	Ceramic
Probes	304 Stainless Steel



Housing Style	Part Number	ID Number	Material
<p>Stainless Steel Probes</p>  <p>1/4 -20 THD</p> <p>LENGTH (See Part Number)</p>	91-SSP 1 Ft.	A3000	304 Stainless Steel
	91-SSP 2 Ft.	A3002	304 Stainless Steel
	91-SSP 3 Ft.	A3004	304 Stainless Steel
	91-SSP 4 Ft.	A3006	304 Stainless Steel
	91-SSP 5 Ft.	A3008	304 Stainless Steel
	91-SSP 6 Ft.	A3010	304 Stainless Steel

For use with Amplifiers on pages M125 - M128.



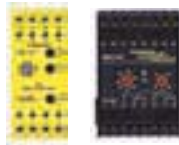
Housing Style	Part Number	ID Number	Features	Output
<p>Level Control Monitor with Fixed Switch Point</p>	MK91-R11/24VDC	M7525202	Single Level Controller 10 second delay	(1) SPDT Relay
<p>Level Control Monitor, Potentiometer/Jumper Programmable</p>	MK91-121-R/24VDC	M7545087	Dual Level Controller, Adjustable Delay	(2) SPDT Relays/Parallel
	MK91-121-R/115VAC	M7545082		
	MK91-121-R/230VAC	M7545080		

Additional specifications on pages M121.

Material

Housing	PC/ABS
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Voltage	Switching Current	Switch Point	Current Consumption	Hysteresis	Power LED	Output LED	Wiring Diagram #	Wiring Diagrams
19-29 VDC	≤3 A	40 kΩ Fixed	≤20 mA at 24 VDC	Approx. 5%	GN	YE	1	<p>Diagram 1</p> <p>Diagram 2</p>
20-28 VDC	≤3 A	0.2-100 kΩ	≤1.5 W	Approx. 10%	GN	YE	2	
98-126 VAC	≤3 A	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	2	
184-264 VAC	≤3 A	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	2	



Housing Style	Part Number	ID Number	Features	Output
Level Control Monitor 24 VDC, Dip-Switch Programmable 	MK91-12-R/24VDC	M7545077	Dual Level Controller, Adjustable Time Delay	(2) SPDT Relays/Parallel
	MK91-12-R/115VAC	M7545072		
	MK91-12-R/230VAC	M7545070		
Level Control Monitor, Potentiometer/Jumper Programmable 	MS91-12-R/24VDC	M5220700	Dual Level Controller, Adjustable Time Delay	(2) SPDT Relays
	MS91-12-R/115VAC	M5221000		
	MS91-12-R/230VAC	M5220000		

Additional specifications on page M122.

Material

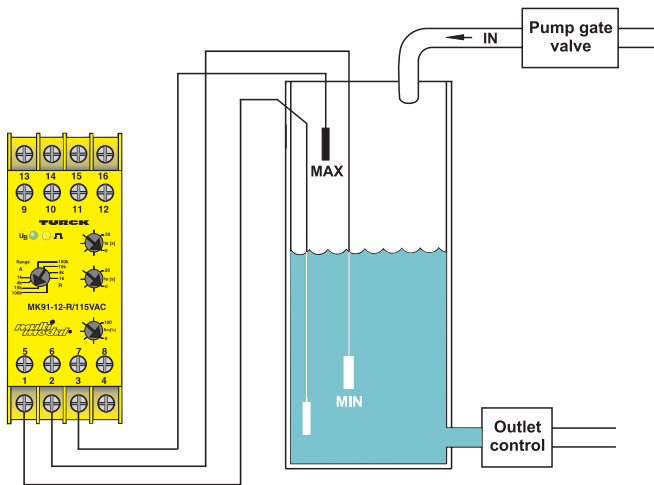
Housing	PC/ABS
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Voltage	Switching Current	Switch Point	Current Consumption	Hysteresis	Power LED	Output LED	Wiring Diagram #	Wiring Diagrams
20-28 VDC	≤3 A	0.2-100 kΩ	≤1.5 W	Approx. 10%	GN	YE	1	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #e0f2f1;">Diagram 1</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; background-color: #e0f2f1;">Diagram 2</p> </div>
98-126 VAC	≤3 A	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	1	
184-264 VAC	≤3 A	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	1	
20-28 VDC	≤4 A	0.1-100 kΩ	≤3.6 W	Approx. 10%	GN	YE	2	
98-126 VAC	≤4 A	0.1-100 kΩ	≤5 VA	Approx. 10%	GN	YE	2	
184-264 VAC	≤4 A	0.1-100 kΩ	≤5 VA	Approx. 10%	GN	YE	2	

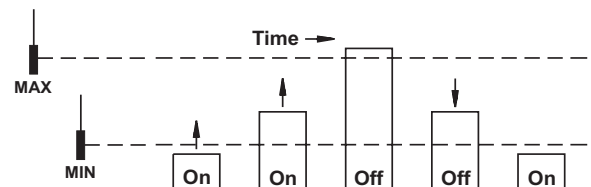
Level Detection Application Examples

Control for Pump-in "Filling" a Tank

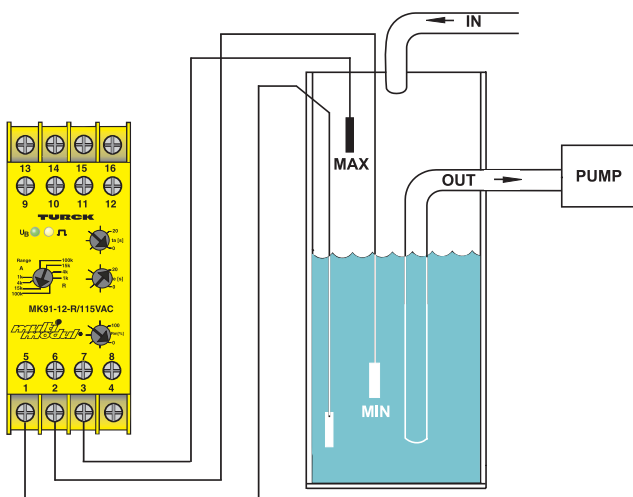


Example Application using MK91-12-R/...

The MK91-12-R will start a pump or open a fill valve when the liquid drops below the MIN level probe and will remain on until the MAX level probe is reached. The relay then de-energizes and stays off until the MIN level is reached. The pump or valve does not cycle constantly, as would be the case if only one sensor were used.



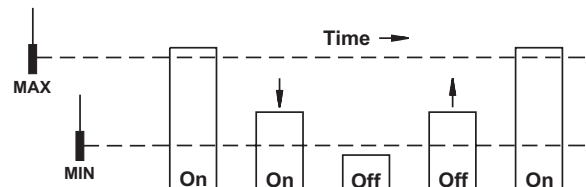
Control for Pump-out "Draining" a Tank



Example Application using MK91-12-R/...

The MK91-12-R will start a pump when the liquid reaches the MAX level probe and remain on until the MIN level probe is reached.

The relay then de-energizes and stays off until the MAX level is reached. The pump or valve does not cycle constantly, as would be the case if only one sensor were used.





Notes: