



**15-650
Liquid Level
Switch**

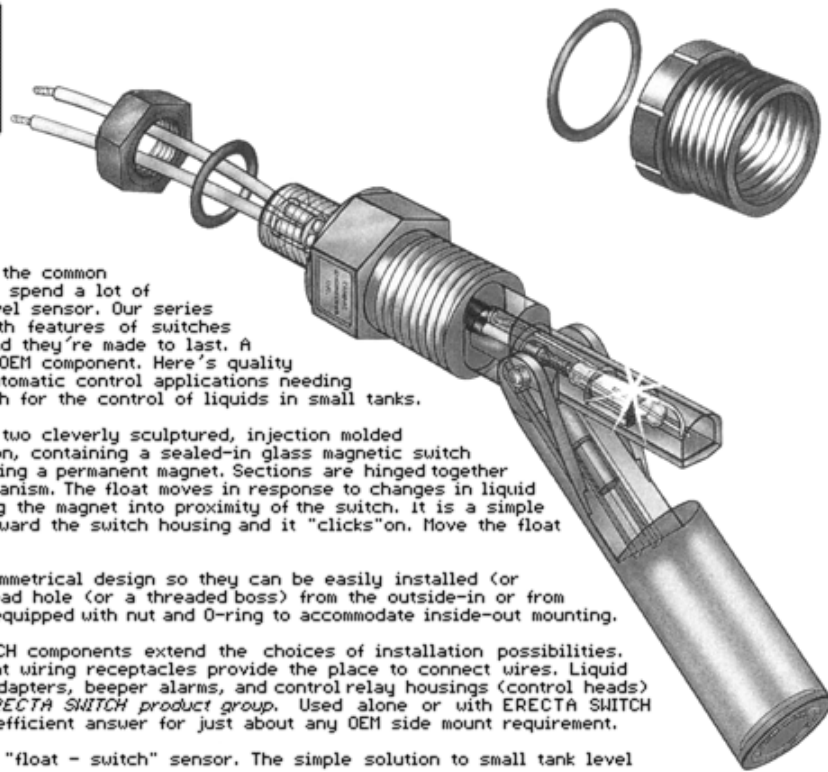
Here's proof - dispelling the common misconception you have to spend a lot of money to get a quality level sensor. Our series 15 switches are loaded with features of switches costing 100-500% more. And they're made to last. A great combination for an OEM component. Here's quality at low cost, for volume automatic control applications needing a simple, reliable approach for the control of liquids in small tanks.

The device is made up of two cleverly sculptured, injection molded sections. A housing section, containing a sealed-in glass magnetic switch and a float section containing a permanent magnet. Sections are hinged together by an integral clevis mechanism. The float moves in response to changes in liquid level, thereby transporting the magnet into proximity of the switch. It is a simple concept. Move the float toward the switch housing and it "clicks" on. Move the float away and it "clicks" off.

15's have a centerline symmetrical design so they can be easily installed (or removed) through a bulkhead hole (or a threaded boss) from the outside-in or from the inside-out. Units are equipped with nut and O-ring to accommodate inside-out mounting.

A variety of ERECTA SWITCH components extend the choices of installation possibilities. Low cost, weather resistant wiring receptacles provide the place to connect wires. Liquid tight connectors, thread adapters, beeper alarms, and control relay housings (control heads) make up the Series 15 ERECTA SWITCH product group. Used alone or with ERECTA SWITCH components, 15's are the efficient answer for just about any OEM side mount requirement.

This is the quintessential "float - switch" sensor. The simple solution to small tank level sensing problems.



G650-1A

MODES OF OPERATION

The switch action of the 15-650 can be configured for either normally open or normally closed switch action depending upon the orientation of the unit at the time of installation. An orientation arrow symbol is molded into the hex. "Up arrow" denotes float is above the unit's centerline. Conversely, "down arrow" denotes float is below the unit's centerline.

CONTACT CONDITION VERSUS FLOAT POSITION						
		WET	DRY	ARROW	ABOVE ϕ	BELOW ϕ
Open	Closed	Up	X	-		
Closed	Open	Down	-	X		

POINT OF OPERATION IN SPECIFIC GRAVITY 1.0

Contact closes as level rises	Contact opens as level falls	Float arc envelope
.12 (3.04)	.87 (22.2)	1.75 (44.65)

TRIP POINT (DRY STATE BEHAVIOR)

NORMALLY CLOSED

Contact opens when gap between float heel and hard point is not less than .015/.381 and recloses when the gap between the clevis floor and closed hard point is not less than .015/.381. The characteristic differential between closed and open states is .50/12.7 arc excursion.

NORMALLY OPEN

Contact closes when gap between clevis floor and closed position hard point is not less than .015/.381 and reopens when the gap between float heel and open hard point is not less than .015/.381. The characteristic differential between open and closed states is .50/12.7 arc excursion.

POINT OF OPERATION

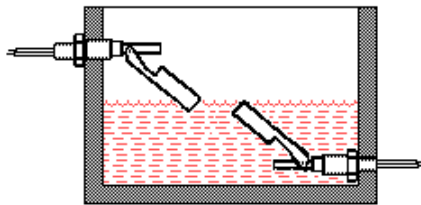
The point at which the changing liquid level will cause switch actuation is relative to the unit's centerline and the specific gravity of the liquid. Forces acting on the float change over the arc of its excursion and as a function of whether or not the float is above or below the unit's centerline. These phenomena are inconsequential when the unit is operated within its rated parameters.

ELECTRICAL RATING	
OKI™ OKI Sensor Device Corporation	
Contact life	Complete OKI Reed Switch Databook available at http://www.osdc.co.jp/
Contact rating	70 UA*, 50W* *Resistive OKI Sensor Device Corporation Reed Switch Model ORD229 Tokyo 193-8550, Japan
UL file E70063	
Max Switching Voltage	300AC, 350DC
Max Switching Current	AC 0.5AMP*, DC 0.7AMP*

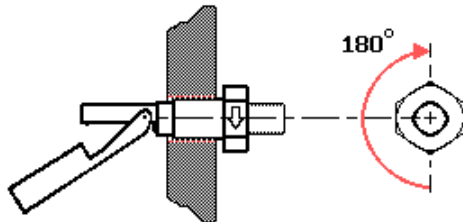
MATERIALS OF CONSTRUCTION	
15-650-PP	(Gray) Polypropylene
15-650-AC	(Red) Acetal
15-650-KR	(Natural) Kynar PVDF

APPLICATION ENVIRONMENT		
Pressure (Hollow float)	50 PSI MAX @ 20°C	Derate, Zero @ 90°C
Temperature	90°C MAX	---
Specific Gravity	.8 MIN	Clear Liquid
Position Extreme	15° Cant MAX	Off center

* UL component recognition applies to the OKI switch Model ORD229. Observe applicable electrical codes when using this product.

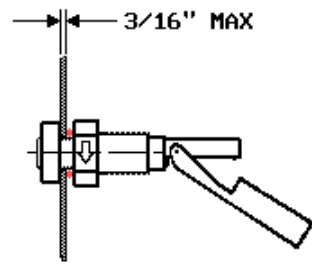


15-650s are equipped with two mounting threads. Its 1/2 NPT thread is intended to enable "outside" ->"in" mounting. In such installations, the available 1/4" thread may be useful connecting ERECTA SWITCH wiring receptacles, audible alarms or conduit fittings. The 1/4" thread is useful for "inside" <- "out" mounting to threaded bulkheads. Tank bulkheads can be drilled and tapped accordingly. With teflon tape applied to the threads prior to assembly, mounting the unit on its own threads makes a clean, uncluttered installation. Drilled and tapped mountings are advantages when bulkheads are between 1/2 to 3/4 inch thick. Tanks may be fabricated with threaded bosses to accommodate the level switch. The throat of such bosses may restrict float swing, thereby compromising reliable operation. Compac's ERECTA SWITCH 3/4 NPT adapter fitting eliminates this potential problem by providing greater clearance. Other ERECTA SWITCH accessories permit 1-1/4 NPT, 2" NPT and flange mounting.



Whenever sealing is expected on tapered pipe threads, two wraps of teflon tape should be applied to the thread prior to installation. An effective seal will occur when the mating female thread is a "spec" thread and when the switch is installed with a minimum of four full turns after "hand tight" engagement and not more than five turns after "hand tight" engagement. In this case, more is not better. Excessive torque may ultimately be absorbed in the cold flow (stretch) of the plastic parts eventually causing seal degradation. Or, equally bad, the resulting stress may upset the magnetic properties of the sensing switch causing the switch to fail.

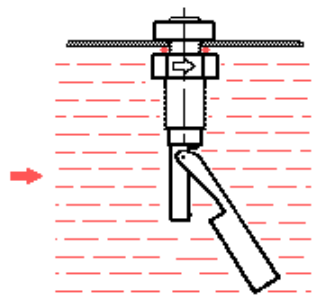
Small tanks are often fabricated of sheet metal or thin wall plastic making sealing on tapered threads impractical. Here, the best option is to punch a hole through the bulkhead and mount the device from the "inside <- "out" using the 1/4" thread, O-ring seal and jam nut provided. This method is suitable for bulkheads up to 3/16" thickness. ERECTA SWITCH flange mounting can also be applied to thin walled tanks. In all cases in which the vessel wall is sandwiched between the sensing switch and jam nut (or flange), a hole of the correct size and smooth sealing surfaces are necessary for leak tight results.



05-03-01
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The basic hinged design suggests many interesting liquid and air flow applications. The illustration below shows a 15-650 installed in an air duct. Applying the switch in this manner is also useful detecting water flow in open trenches, rivers etc. Considering the product's low cost and versatile mounting provisions, many practical applications having little to do with liquid level sensing will come to mind. Since little force is required to move the hinged float, detecting thread breakage, cam position etc. can be performed by the 15-650 at very low cost. Keep in mind, the many low cost ERECTA SWITCH building block accessories greatly expand application possibilities by modifying mounting and electrical wiring characteristics.

Series 5, 10, and 15 switch products use the same magnetic reed switch for the detection element. All are SPST switches intended to make or break a circuit, thereby switching a suitable electrical load. Diagrams showing popular relay applications presented elsewhere in this catalog are applicable to the 15-650 as well.



QUINTESSENTIAL . . . NOT INDESTRUCTIBLE

- Make sure our product's construction is compatible
- Make sure our product's construction is compatible with your chemistry and environment.
- Check your electrical load/circuit. Do what's necessary to prevent zapping the reed switch. Consider contact protection or an appropriate interface load handling relay.
- If this is your first experience using a reed switch device . . . do your homework. Learn a little about how they work, their characteristic advantages and limitations. Used correctly, "reeds" are a marvel of reliability.

FEATURES:

- Unbeatable cost/function ratio.
- Precision components throughout.
- Manufactured under "smart system" controls.
- Reliable, "sealed-in glass" contacts.
- Very small size.
- Switches small solenoid valves, lamps and relays.
- Recognized under UL component recognition program.

MODES OF FAILURE

Stuck closed contacts are symptomatic of welded contacts. Contacts will weld and then stick whenever the power switched is greater than the reed's ability to handle the load. Any stick is indicative of a catastrophically damaged, overloaded reed contact. Reed switch contacts are vulnerable to such damage when subjected to reactive loads. When switching solenoid and relay coils, include arc suppression in your circuit. See "Electrical Interfacing" section in this catalog.

Stuck open contacts are symptomatic of a stressed or otherwise broken switch. Avoid dropping the switch or bending it during the installation process.

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