

Levalarm® 1000



Reliance®
A PRODUCT OF CLARK-RELIANCE

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STORAGE AND HANDLING

All units should be inspected upon receipt to ensure that no damage has been incurred during transit. If there is a claim due to damage, it should be filed with the carrier immediately. Clark-Reliance® Boiler Trim products should be stored in a dry and sheltered area prior to installation. The equipment provided consists of electrical items that are intended for either indoor or outdoor use. As a matter of good practice, dry storage will prevent the products from exposure to the outdoor elements to eliminate the potential for water damage.

NOTE: The casting provided has a black-oxide coating to aid in preventing corrosion. To maintain this property to the maximum extent, periodic maintenance oiling is suggested. This is performed by first letting the surface cool completely, if used, cleaning the surface, oiling, and then wiping dry.

The temperature of the storage area should not exceed the following: 149°F [65°C] or drop below 32°F [0°C].

SPECIFICATIONS

Agency Approvals		UL 60730  and CRN 0H16066 for all Provinces - Electrical: 0.75A @ 120/240VAC General Use 1.00A @ 28VDC General Use (Both instances tested to 100k Cycles) - Max Operating Ambient: 131°F [55°C] - Certified to NEMA 4X Rating	
Microswitch Rating (NOTE: Listed ratings exceed the allowable limits of the REA100F's UL Certification. Information provided for reference only.)		UL, CE, CSA approved SPDT 11A @ 125/250 VAC 5A @ 30 VDC; 1/2A @ 125 VDC	
Environment:		Indoor or Outdoor	
Mechanical Properties:	Process Connection:		1" FNPT / 1" FSW
	Pressure Rating:		1000 PSI @ 546° F
	Bolt Torque:		55 ft-lbs (See <i>Maintenance Section</i> , Figure 4 for further information.)
	Max Ambient Temperature:		131°F [55°C]
	Customer Wire Size Range:		24 – 12 AWG (Uses Lever Nuts)
Electrical Properties:	Max Voltages:	AC	240 V
		DC	28 V
	Current Ratings:	AC	125V 0.75 A
		DC	28V 0.50 A

SPARE PARTS

Order genuine Clark-Reliance® replacement parts at: <http://parts.clark-reliance.com> or contact your local Clark-Reliance® Representative.

Description	Clark-Reliance® Part Number
Replacement Switch/Flange/Float Assembly	REA7277
Gasket	REA7274
Hardware Kit (Includes Nuts, Studs, & Washers)	RRK 52

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OPERATION

A stainless-steel float is attached to the end of a counterweight with a stainless-steel encapsulated magnet. The magnet travels vertically in the pressure tube. The primary magnet in the counterweight inside the switch body drives the secondary magnet, which in turn activates the switch. See [Figure 1](#). The use of repelling magnetic fields creates a positive interlocking switch that is both vibration resistant and compensates for installation misalignment. A buoyed float will cause the reaction of the magnets to hold the switch open or closed, depending on which terminals are used. As liquid falls in the chamber, the float drops and directs the magnets to the opposite position which activates the switch in the opposite direction.

MAGNET SWITCH LAYOUT

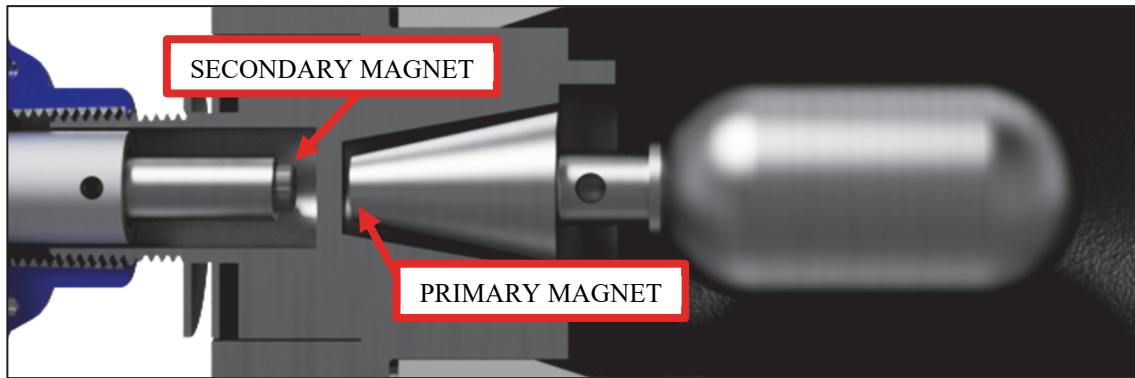


Figure 1

INSTALLATION

Caution: Before proceeding, follow all plant lock out - tag out procedures required. Verify that all power is turned off to the Levalarm®(s). If under pressure, the equipment should be isolated, or the boiler should be shut down before proceeding with the installation. Open drain valve to eliminate any trapped pressure. All inspection and installation steps should be performed by a qualified technician and should be executed in accordance with all applicable national and local codes

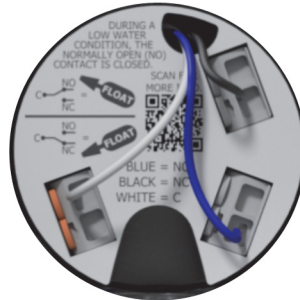
1. Inspect REA100F 1000 for any damage prior to installation. Check that the blue housing is tight and take care **not** to twist it at all during the installation steps or any maintenance step.
2. Line up the arrow or weld bead to the desired low water level situation.
**NOTE: the "T" or "Top" must be visible from the top view of the switch for the switch to be in its correct orientation. See [Figure 2](#) for a visual.
3. Utilize either the 1" NPT or 1" Socket Weld connection to connect to existing or new piping. Install valve(s) in accordance with applicable standards. A drain connection with shut off valve must be installed below the water connection and routed to a point of safe discharge for blowdowns. Reference [Figure 2](#) for a piping example.
**NOTE: The Levalarm® must be level within $\pm 10^\circ$ in all directions for proper function.
4. Use the 3/4" conduit opening on the housing to connect conduit.
5. Utilizing the provided wire connectors in the housing, wire the switch following the label on the inside of the lid or as below:

White wire = common

Black wire = normally closed

Blue wire = normally open

***NOTE: Utilize Wire Strip Gage on the side of the connector for proper wire strip back length.



6. Fully tuck all wires and connectors into the Housing Base before tightening the lid back on. If wires are not fully tucked, there is a risk of pinching the wires when the lid is re-installed.
**NOTE: See [Figure 3](#) for example wiring diagrams for connecting the low water cutout, alarms (such as lights or an audible signal), etc, are illustrated below.:

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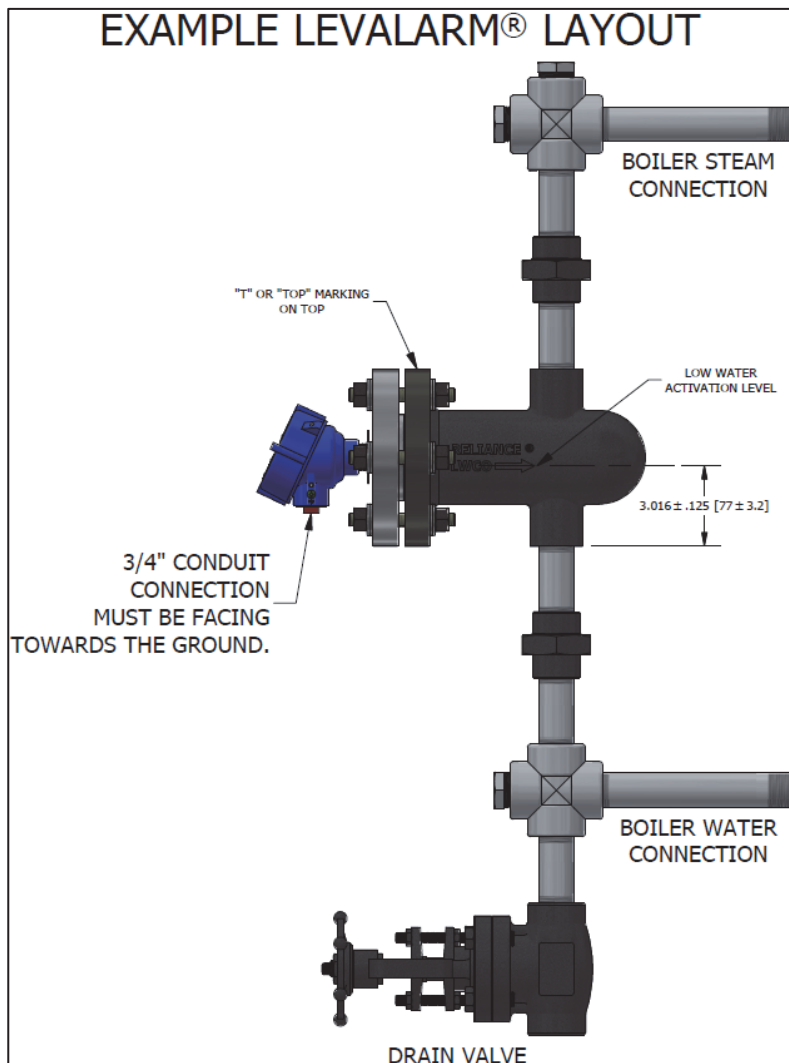


Figure 2

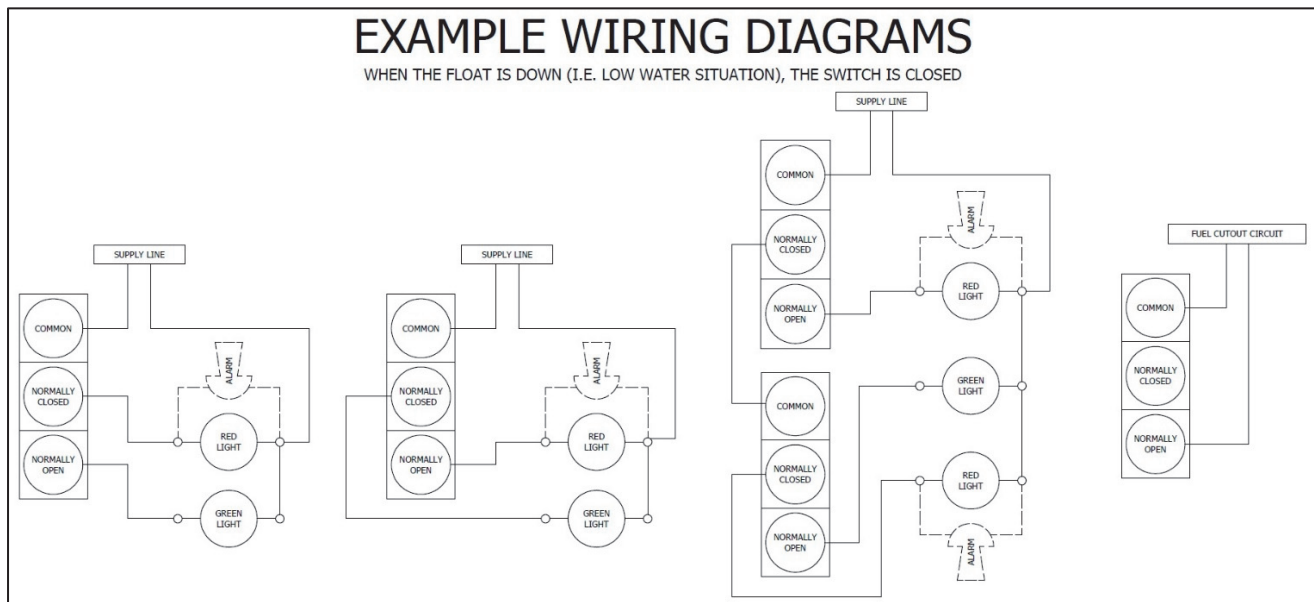


Figure 3

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MAINTENANCE

NOTE: It is recommended that periodic inspection and routine maintenance be conducted to ensure that the Levalarm® continues to work properly. This can be conducted by following the procedure:

1. When used as a LWCO (Low Water Cut Out), maintenance and inspection should be conducted when the boiler is not in service, and all pressure is relieved.
1. When using the Levalarm® for other applications isolate the device by closing the steam and water isolation valves.
2. Disconnect power from Levalarm®.
3. Open the drain valve to drain the unit and relieve any internal pressure.
4. Disconnect the wiring and conduit.
5. Remove the nuts/bolts on the flanged cover.
6. **Discard old gasket. DO NOT REUSE GASKETS.**
7. Pull switch straight out until float is clear from body.
****NOTE: Do not remove (unscrew) housing from stainless Bushing. Doing so can cause decoupling of the magnets.**
8. Inspect the float to make sure that water has not leaked directly into the float.
9. Check to make sure the float assembly freely moves up and down. Clean the float and the counterweight cavity if necessary. Can be wiped or flushed with water.
10. Clean the gasket surface by using a wire brush. Be sure to remove all gasket residue before proceeding.
11. Reinstall the switch/float assembly onto the body with a new gasket.
12. Lubricate the threads on the bolts with a high temperature anti-seize. Torque the bolting according to [Figure 4](#) waiting 1-minute between torques.
****IMPORTANT NOTE:** Each stud will have (2) Disc Springs on either side. These must be in Parallel according to [Figure 5](#).
13. Re-install the conduit and the wiring.
14. Verify proper function.

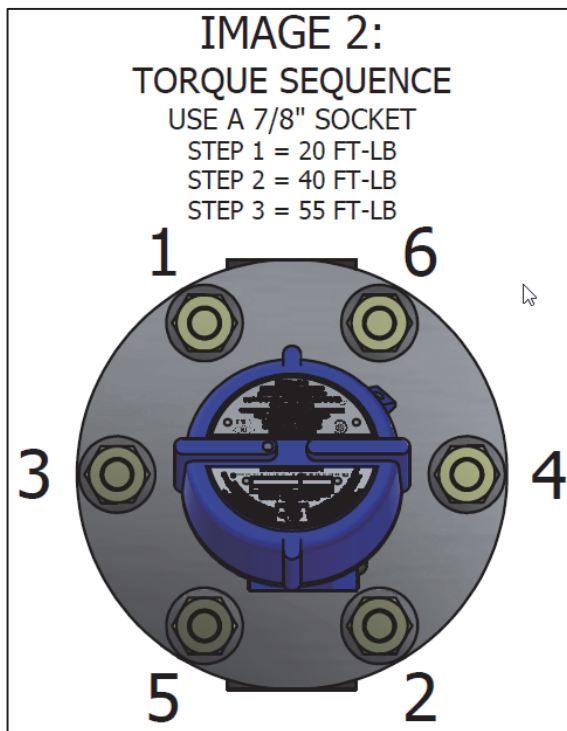


Figure 4

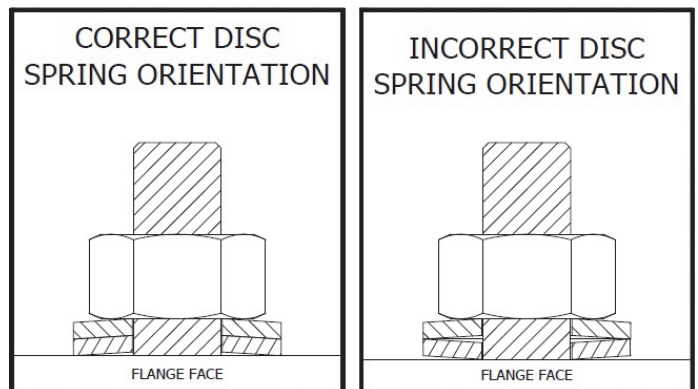


Figure 5

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BLOW-DOWNS

Note that the frequency and method of blow-down may affect service life and performance of the Levalarm®.

The connection lines to the Levalarm® can become restricted with sediment and indicate normal water levels when water may be low. After performing the blow-down procedure, if the water level does not appear to return to normal promptly, the connecting piping may be partially restricted and need to be cleaned.

Clark-Reliance® suggests the following blow-down procedure:

1. Open the drain valve fully on the bottom of the Levalarm® piping (See note 1).
2. The steam should not pass through for longer than 20 seconds.
3. Close the drain valve.
4. Water should enter the Levalarm® quickly when the blow-down valve is closed. This will indicate that the lines are free of sludge, sediment, or scale buildup.

NOTES:

1. Any trip or alarm circuits that are actuated by the equipment being blown-down should be bypassed to prevent false alarms during the blow-down process. A Clark-Reliance® Holding Switch model HS-0 or HS-1 can be used to by-pass the Low Water Cutout to prevent a false trip during the blow-down procedure.
2. Blow-down should be conducted on a weekly basis, or as necessary, based on water quality.

TROUBLESHOOTING THE REA100F SERIES LEVALARM®

Caution: Before proceeding, follow any and all plant lock out - tag out procedures required. All installation steps should be performed by a qualified technician and should be executed in accordance with all applicable national and local codes.

Symptom	Probable Cause
1) Float is stuck in the “up” position”	a) Contamination on Switch Magnet Action
	b) Water Trapped in Unit
	c) Sediment / Contamination in Chamber

Possible remedies:

1. Conduct a blow-down, to ensure there is no water trapped in the unit.
2. Inspect the internal portion of the Levalarm® Chamber
 - a. Disassemble the switch following steps 1 through 9 listed in the [Maintenance Section](#).
 - b. Examine the flange assembly to make sure there is no debris trapped inside the device.
 - c. Examine the drain path to make sure water has a clear drain path.
 - d. Inspect magnets on the action of the switch to make sure no debris have stopped the action.
3. Test the unit for proper functioning
 - a. To test the switch assembly, with the Switch/Float half removed from the casting, ensure the flat on the bushing is facing up and level with ground. Can secure in a vise if able.
 - b. Attach an ohm meter to the common (White) and Normally Open (Blue) switch contact and manually move the float up and down and verify the switch operates on both directions. The meter should indicate continuity only when the float is in the “DOWN” position.
 - c. Then, move the ohm meter terminal from the Normally Open (Blue) terminal to the Normally Closed (Black) terminal and repeat the test. The meter should indicate an open circuit only when the float is in the “UP” position.
4. If the unit fails to test properly, contact Clark-Reliance® for further instructions to obtain authorization to return the unit for factory inspection. If the switch tests OK, continue to Step 5.
5. Reassemble the unit following steps 10 through 14 in the [Maintenance Section](#).

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Symptom	Probable Cause
2) Float is stuck in the “down” position”	a) Float encased in contamination
	b) Failed float

Possible remedies:

1. Inspect the internal portion of the Levalarm® Chamber
 - a. Disassemble the switch following steps 1 through 8 listed in the [Maintenance Section](#).
 - b. If the float contains water or shows signs of obvious damage, such as collapse or a crack, contact Clark-Reliance® for further instructions to obtain authorization to return the unit for factory inspection.
2. Test the unit for proper functioning.
 - a. To test the switch assembly, with the Switch/Float half removed from the casting, ensure the flat on the bushing is facing up and level with ground. Can secure in a vise if able.
 - b. Attach an ohm meter to the common (White) and Normally Open (Blue) switch contact and manually move the float up and down and verify the switch operates on both directions. The meter should indicate continuity only when the float is in the “DOWN” position.
 - c. Then, move the ohm meter terminal from the Normally Open (Blue) terminal to the Normally Closed (Black) terminal and repeat the test. The meter should indicate an open circuit only when the float is in the “UP” position.
3. If the unit fails to test properly, contact Clark-Reliance® for further instructions to obtain authorization to return the unit for factory inspection. If the switch tests OK, continue to Step 4.
4. Reassemble the unit following steps 10 through 14 in the [Maintenance Section](#).

Symptom	Probable Cause
3) Float arm operates properly, but the switch does not change state.	a) The REA7277 switch is out of adjustment
	b) The REA7277 switch has failed

1. Test the unit for proper functioning.
 - a. Disassemble the switch following steps 1 through 8 listed in the [Maintenance Section](#).
 - b. Remove the Housing Lid to access the wire connectors.
 - c. To test the switch assembly, with the Switch/Float half removed from the casting, ensure the flat on the bushing is facing up and level with ground. Can secure in a vise if able.
 - d. Attach an ohm meter to the common (White) and Normally Open (Blue) switch contact and manually move the float up and down and verify the switch operates on both directions. The meter should indicate continuity only when the float is in the “DOWN” position.
 - e. Then, move the ohm meter terminal from the Normally Open (Blue) terminal to the Normally Closed (Black) terminal and repeat the test. The meter should indicate an open circuit only when the float is in the “UP” position.
2. If the unit fails to test properly, contact Clark-Reliance® for further instructions to obtain authorization to return the unit for factory inspection. If the switch tests OK, continue to Step 4.
3. Reassemble the unit following steps 10 through 14 in the [Maintenance Section](#).

Warning: If this equipment is used in a manner not specified by Clark-Reliance®, the protection provided by the equipment may be impaired. Only replacement parts manufactured by Clark-Reliance® should be used to ensure safety and reliable operation. The use of non-Clark-Reliance® parts will void the factory warranty and any agency approvals.

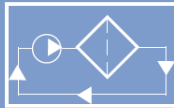
Order genuine Clark-Reliance® replacement parts at: <http://parts.clark-reliance.com> or contact your local Clark-Reliance® Representative. [See Spare Parts Table](#).

Any additional questions should be directed to your local Clark-Reliance® Representative or to the Factory at Phone: +1 (440) 572-1500

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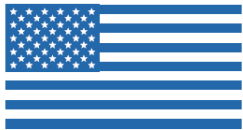
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