



**Caution:** Before proceeding, follow any and all plant lock-out/tag-out procedures required. Any trips/alarms should be bypassed to prevent any false trips/alarms when servicing the equipment. Verify that all power is turned off to any applicable equipment. 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 and plant procedures.

*Only use a properly calibrated torque wrench to guarantee that the specified torque values are achieved. Make sure all bolting is clean and lubricated per the applicable Reliance IOM.*

## **STORAGE and HANDLING**

The Reliance® Probe type devices meet or exceed all applicable specifications when shipped from the factory. The equipment should be stored in an area protected from the elements and corrosive fumes, in a secure manner where they can neither fall, nor be struck by other objects. Avoid placing any objects probes or any part of the Levalarm at any time. The temperature of the storage area should not exceed 150 degrees F. (65.5 degrees C) or drop below 32 degrees F (0 degrees C).

### **Unpacking and inspection**

Upon receipt of the Boiler Drum Level instruments, examine the contents of the container(s) for damage. Care should be exercised as the items are uncrated. The shipment may contain fragile glass components. Report any faulty conditions as soon as possible to your carrier to avoid acceptance of damaged goods. Clark-Reliance will not be responsible for goods damaged in shipping or storage, or subsequent loss or damage due to improper storage or exposure as a result of damage to shipping containers. Submit a digital photo of any damaged equipment and container to Clark-Reliance, if possible.

Verify that all materials are present as recorded on the Packing List provided with each shipment. Report any discrepancies to Clark-Reliance immediately. Have the Clark-Reliance order number and shipping waybill available at the time of your call.

### **Handling**

Your Clark-Reliance shipment has been carefully packed. However, the shipment may include spare parts, temporary water gages for “Boil-out” purposes, maintenance instructions, and engineering drawings. Upon receipt of the order, the equipment and above items should be identified and verified against the packing list. Any documentation that has been provided should be directed to the appropriate personnel.

## **Recommended Maintenance and Annual Inspections**

Regarding any recommended maintenance procedures or annual inspections, we suggest probes should be inspected annually (at a minimum) to guarantee that they are clean and not contaminated or coated with dirt or particulate. Always use a new probe gasket when replacing the probes. Refer to IOM R500-E189A for complete instructions.

Model EA15R Levalarm Assemblies are used to add a conductivity probe type option to Clark-Reliance Float Type Water Columns having a design pressure up to 450 PSIG. The EA15R along with a relay control unit will provide a necessary switch that is needed or required for the proper operation of the boiler. The EA15R is attached to the water column between the column and the water gage valves. Refer to drawing B-8705 for further dimensional or parts information required for the Levalarm assembly.

### **Installation**

- 1) Close the steam and water isolation valves between the drum and the water column (if available). If there are no isolation valves, perform the installation when the boiler is not in service. Open the drain valve to relieve any pressure in the column.
- 2) Remove the water gage glass and the water gage valves.
- 3) Install the Tee Fitting Adaptor in the upper water gage valve connection.
- 4) Install the Electrode Chamber in the lower water gage valve connection.
- 5) Remove the Electrode Fitting Housing by loosening the attachment screw. The conduit bracket has an opening for a BX or ½" conduit.
- 6) Install the Connector Adaptor Tube between the Upper Tee Fitting Adaptor and the Electrode Chamber.
- 7) Install the water gage valves in the ¾" NPT connections provided in the Tee Fitting Adaptor and at the bottom of the Electrode Chamber. Reinstall the water gage glass in the valves.
- 8) Install the relay at any convenient location as the connecting wiring may be up to 500 feet away from the probes in the Levalarm. Refer to the applicable wiring diagram for wiring information. Also see the relay specifications on page 5 of this manual or refer to IOM R500.E137 for further information.
- 9) Hot torque the probe(s) before wiring the probes to the relay control unit using the following procedure. When the hot torque procedure is complete, replace the Electrode Fitting Housing.

**Note: this procedure may be omitted if there are no shutoff valves between the water column and the drum.**

### **Hot Torque Procedure**

When a new piece of equipment, whether a Gage Glass or a Probe type device is installed, the hot torque procedure must be performed. This ensures that all bolting and components are properly seated for optimum performance. This procedure must also be performed after any maintenance is done to the equipment. Note that only the affected components, such as the installation of a new probe or glass kit, need to be hot torqued.

The hot torque procedure should be performed as follows:

- 1) Isolate the gage glass or probe device from any pressure.
- 2) Fully open the drain valve to evacuate any built-up pressures and to allow the contained steam and water to escape during equipment warm up.

- 3) Slowly open the *steam valve* to allow a gentle rush of steam to flow through the equipment. Inspect the equipment to make sure there are no obvious leaks. This should take approximately 5 – 10 minutes. The observer should see the High Temperature lubricant “sizzling” and smoke emanating from the gage of column. This is an indication that the equipment has reached operating temperatures.
- 4) When the equipment has been properly heated, close the steam valve. The drain valve should remain open to allow any residual steam or pressure to escape.
- 5) Immediately re-torque the equipment to the correct values stated in the applicable instruction manual. There should be movement of approximately 1/8 of a turn or more.
- 6) If there is no movement of the bolting or probes, the equipment was not heated properly. Repeat the procedure.
- 7) Once the hot torque procedure is completed, close the drain valve, and the equipment can be put back into service. Carefully check for any leaks in the equipment and verify proper operation of all illumination, relay controls and wiring, or other accessories.

**Note:** Please refer to the original manufacture torque recommendations for non-Clark-Reliance equipment.

Refer to IOM R500.E239-A for additional information.  
See the Hot Torque Procedure video online at  
<https://www.youtube.com/watch?v=THwWN5w64II>  
Or visit our website RelianceBoilerTrim.com

### **Interwiring**

Note: Refer to Probe Maintenance IOM R500-E189 for further information

The wires attached to the probes must be of high temperature type in order to withstand the heat. We suggest the following types of wire:

#### **Wire Specification**

**18 Ga. Stranded conductors, Teflon insulation rated at  
300 VAC and 200°C  
(Belden #83029, Alpha #5857, or equal)**

**Note: When installing the high temperature wire to the probe, use an open end wrench to prevent the Probe assembly from turning while tightening the wire terminal nut. Use a 1/4” wrench for both the compression nut and the terminal nuts on T type probes.**



The high temperature wires attached to the probes can be routed to a local junction box or directly to the control unit. If a junction box is used, a low cost 18 Ga. Multi-conductor cable may be used to carry the signal to the control unit. We suggest Belden #8467 or equal.

### **Clark-Reliance ECID-23R Relay Specifications**

Note: Refer to Relay IOM R500-E137A for further information

**Design:** Solid State components enclosed in a clear Lexan plug-in style housing

**Contact Design:** DPDT (2 form C): two normally open (N.O.) and two normally closed (N.C.)

**Contact Ratings:** 5A @ 120, 240 VAC, 5A @ 30 VDC, and 1A @ 120 VDC

**Contact Life:** Mechanical – 5 million operations, Electrical – 100,000 operations min. at full load

**Supply Voltage:** Standard units are designed for 120 VAC supply. Some custom units are fabricated for 220 VAC (Refer to appropriate wiring diagram for details)

**Supply Current:** 4.4 VA

**Probe Circuit:** 1.5mA @ 12 VAC per probe

**Sensitivity:** ECID-22R 26,000 Ohms (50 and greater mho water conductivity)

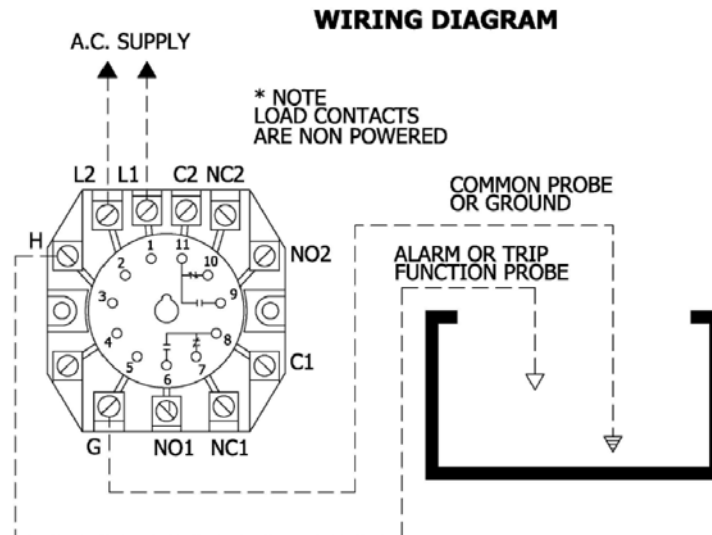
ECID-23R 50,000 Ohms (10 – 50 mho water conductivity)

ECID-24R 100,000 Ohms (.1 – 10 mho water conductivity)

**Temperature Rating:** -40 to +150 degrees F.

**Listing:** FM Global #0T8A3.AF, CSA #LR14001, and U.L. listed

**Direct Mode Operation:** When the water level rises in the column to the probe, the control energizes (LED will be lit). The control remains energized until the water level in the column falls below the probe. The relay will then de-energize (LED will not be lit)



**Typical single relay module circuit for Direct Mode operation**

### **Recommended Maintenance and Annual Inspections**

Regarding any recommended maintenance procedures or annual inspections, we suggest any device containing probes should be inspected on an annual basis for contaminated probes and wire secure terminations.

**Caution:** Before proceeding, follow any and all plant lock out - tag out procedures required. Verify that all power is turned off to the probes. 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.

With no pressure or elevated temperature, beyond ambient conditions, at least one probe should be removed for inspection. If the probe displays signs of contamination, they can be cleaned with a mild detergent and re-installed using a new sealing gasket, if applicable. Refer to the IOM # E189-A for additional details. If a probe exhibits and contamination across the length of the insulator, which cannot be easily cleaned, the probe should be replaced.

The importance of proper cleaning and maintenance of the water column, Levalarm, and the water gage glass, or sight glass, cannot be stressed enough. The water column must be kept clean to ensure the water level in the gage glass accurately represents the water level in the boiler. Note that the frequency and method of blowdown may affect service life and performance of the water column and gage glass.

Users must consider proper blowdown procedures, in order to keep the water piping clean, even if the probes remain clean for extended operational periods. By simply opening the drain valve to conduct a blowdown, this does not ensure flow thru the water piping between the drum and the water column, even when the water in the column is pushed out the drain connection with steam. The risk of blockage in the steam piping is low. The risk for sediment build-up in the water piping is greater. Therefore, period blowdowns are suggested on a quarterly to monthly basis. The frequency can be determined by the user and plant rules. The user may also consider their water quality as an influencing factor to determine the blowdown frequency. After performing the blowdown procedure, if the water level does not return to normal promptly, the connecting piping may be partially clogged and have to be cleaned.

Clark-Reliance suggests the following blowdown procedure:

1. Close both the steam and water valves between the boiler drum and the water column (if present) or water gage.
2. Open the drain valve fully on the bottom of the water column or water gage.
3. To clean the water piping, slowly open the water valve (lower valve) to allow a flow of water to pass through the line and out the drain. This will flush the water line and help keep sediment from collecting and causing a blockage in the line.
4. Allow the water to flow through the line for 20 seconds.
5. Close the water (lower) valve.
6. Crack open the steam valve (upper shutoff valve) and allow a gentle rush of steam to pass through the probe column or water gage. The steam should not pass through for longer than 20 seconds.
7. Close the steam valve.
8. Inspect the water gage to ensure that all foreign matter is flushed from the glass or mica. If the gage is not visually clean, repeat steps 6 and 7. If the gage glass is visually clean, close the steam valve.
9. Close the blowdown valve and open the steam and water valves, slowly bringing the equipment back to a normal operating level.
10. Water should enter the gage glass quickly when the blowdown valve is closed. This will indicate that the line flows freely.

**Note:**

1. Any function circuits that are actuated by the equipment being blown down must be bypassed to prevent false alarms during the blowdown process. Remove the bypass when the procedure is complete.
2. Blowdown should be conducted on a weekly basis, or as necessary, based on water quality.

**Note:** Refer to IOM R500.E156 for the complete blowdown procedure. Also visit our website [RelianceBoilerTrim.com](http://RelianceBoilerTrim.com) to view the video for Proper Blowdown Procedure.

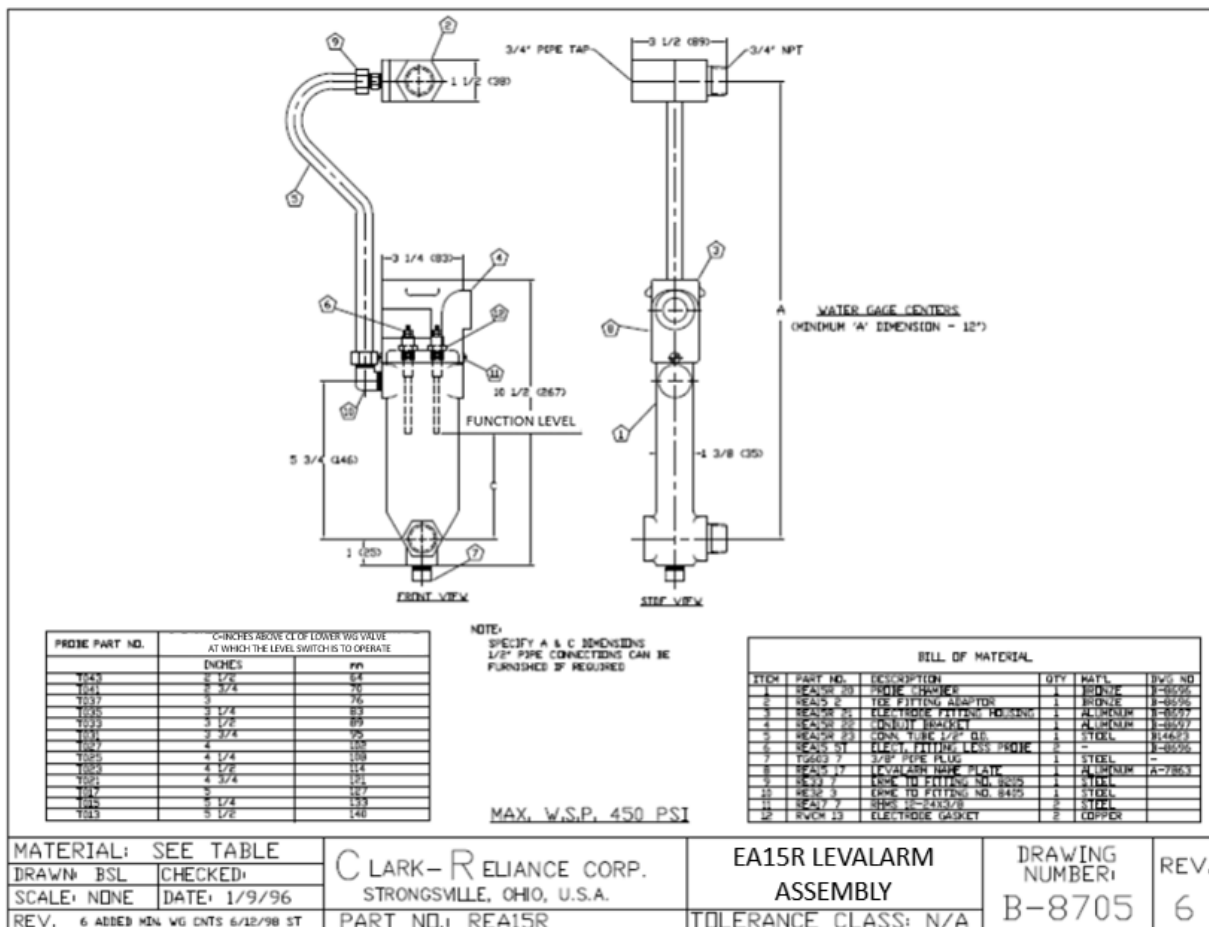
**Troubleshooting**

Troubleshooting is only necessary in the event that a control relay fails to energize or de-energize.

If the relay fails to *de-energize* during blowdown, the cause is a failed (short circuited) probe. The probe should be replaced.

If a relay fails to *energize*, the following steps should be taken:

1. Verify probe wiring to the appropriate probes from each relay.
2. Verify water level in the column.
3. Exchange relays to verify function. If the problem moves with the relay, then replace the relay.





On-Line Parts – DIRECT – for Clark-Reliance Products

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**JACOBY-TARBOX®**      **MAGNE-SONICS®**

The logo for Clark-Reliance Filter Elements, featuring a blue curved line above the text "Clark-Reliance" in a bold, blue, sans-serif font, with a trademark symbol (™) to the right, and "FILTER ELEMENTS" in a smaller, blue, sans-serif font below it.

[www.clark-reliance.com/parts](http://www.clark-reliance.com/parts)

**REPLACEMENT PARTS WARNING**

THE USE OF NON-ORIGINAL EQUIPMENT MANUFACTURER PARTS (SUCH AS GLASS, GASKETS, PROBES, MODULES, ETC.) WILL VOID THE AGENCY APPROVAL (FM, UL, CAS, CRN, ABS, ETC.) PRESSURE/TEMPERATURE RATING, AND WARRANTY OF THE EQUIPMENT. CLARK-RELIANCE REQUIRES THE USE OF OEM PARTS FOR ALL REPAIRS IN ON THIS PRODUCT IN ORDER TO MAINTAIN PLANT AND PERSONNEL SAFETY, AND RELIABLE OPERATION.

Consult the factory or your local Clark-Reliance Representative with any questions. Please have the model numbers and/or reference drawing numbers available when calling. You can also contact us at our website [www.relianceboilertrim.com](http://www.relianceboilertrim.com) or [RelianceAppEng@clark-reliance.com](mailto:RelianceAppEng@clark-reliance.com).