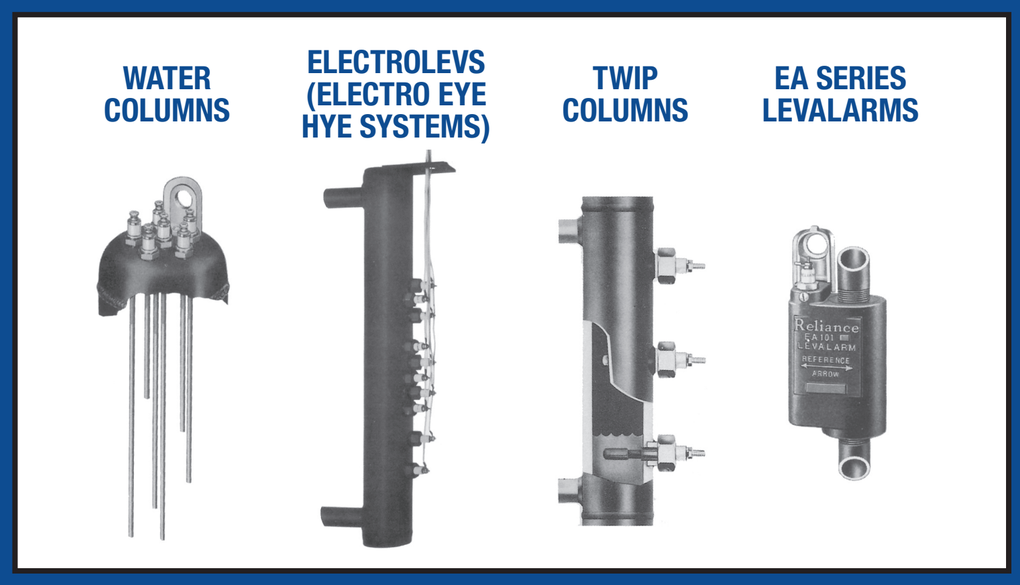
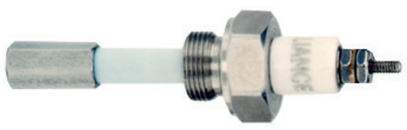
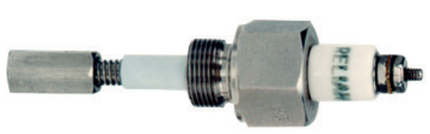
Installation and Maintenance Instructions for Reliance® Devices Containing Conductivity Probes

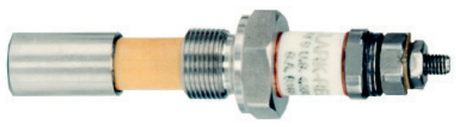




MODEL T PROBE FOR PRESSURES TO 450 PSI (TEFLON® INSULATED)



MODEL V PROBE FOR PRESSURES TO 1000 PSI (TEFLON® INSULATED)



MODEL ZG PROBE FOR PRESSURES TO 1800 PSI (ZIRCONIUM OXIDE INSULATED)

MODEL FG PROBE FOR PRESSURES TO 3000 PSI (ZIRCONIUM OXIDE INSULATED)

Replacement Probe Part Numbers

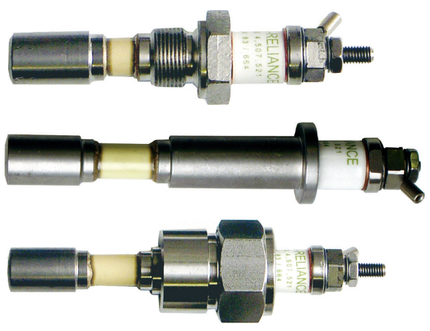
T***RK	ZG***RK
V***RK	FBRZ***RK
ZBRZ***RK	FG***RK

***** = Probe length measured from gasket surface of probe fitting body. 1st two digits (**) indicate length in whole inches, 3rd digit (*) indicates additional eighths of an inch.**

Note: Each replacement probe is furnished with 2 spare sealing gaskets (except for the FSB probe).

Patented Probes:
U.S. 4,507,521
S.A. 83/664
U.K. 2,127,976
Canada 1,200,283
Plus Others World-Wide

Brazed Probes



MODEL ZBRZ has been designed for specification or retrofit into any Reliance instrument designed for pressures up to 1800 PSI.

MODEL FBRZ has been designed for specification or retrofit into any Reliance instrument designed for 3000 PSI.

MODEL FSB has been uniquely designed and specified only for Reliance model instruments, without any sealing gaskets required.

A. Maintenance

Reliance probes require very little maintenance. We suggest monthly blow-downs of the water columns and weekly on gage glasses to prevent the build-up of contamination on the probes. A bypass switch can be installed on fuel cutout circuits. This switch will prevent a false trip during blow-down. The blow-down procedure is conducted thoroughly by closing the water valve and opening the drain valve slightly for about 20 seconds. (Refer to Reliance Form E156-B, "Recommended Blow-Down Practices for Water Columns, Electrolevs, and Water Gages") Visit relianceboilertrim.com or use QR code below to view our video on Recommended Blowdown Procedure for Boiler Level Instruments.

If blowing-down of the column does not clean the probes sufficiently, use a stainless steel wire brush or fine emery cloth to clean the stainless steel rod portion of the probe. To clean the insulator, use a soft cloth and a mild detergent.

If probes are removed at any time for replacement or inspection, the sealing gasket must be replaced. Probe replacement kits are furnished with two gaskets (one for the installation and one spare). The gasket part numbers are as follows:

Recommended Blowdown Procedure for Boiler Level Instruments

Probe Type	Gasket Part Number
T	WCM-13
V	X175500 (Formerly E10-10)
ZG or ZBRZ	E10-10S
FG or FBRZ	E10-10S

For more information, see probe instruction manual R500.E189-A.

Replacing the probes:

1. Close both steam and water valves and drain the column before starting probe maintenance.
2. Remove probe to be inspected or replaced.
3. When replacing the probes, coat threads lightly and uniformly with a high temperature anti-seize type lubricant such as 'Never-Seize', 'MolyCote G', or 'Fel-Pro C'.
4. Torque the probes as follows:
   – Type T, V, ZG, or ZBRZ probes to 40 Ft-Lb. (54 Newton-Meters)
   – Type FG or FBRZ probes to 90 Ft-Lb. (122 Newton-Meters)
5. The procedure for trimming a Reliance probe is as follows:
   a) Untrimmed Water Column Probes (for vertical installations) are normally furnished in 36" long lengths.
   b) To trim the probe to the correct length, place the probe rod in a vise and tighten. **Note:** Never put any part of the probe body or insulator into a vise and tighten it. This will severely damage the probe!
   c) While supporting the body end of the probe so it does not bend, trim the stainless steel probe rod to the desired length with a hacksaw. The probe rod length is measured from the gasket surface of the body to the tip of the probe rod.
   d) Remove any burrs from the end of the rod and file clean.
   e) Re-install the probe, using a new gasket, and tighten it to the proper torque value. (See Step 4)

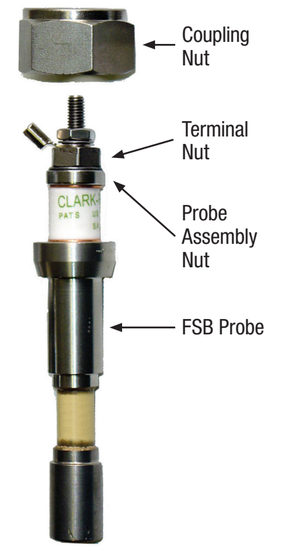
Note: When installing the high temperature wire to the probe, use an open end wrench to prevent the probe assembly from turning while tightening the wire terminal nut. Use a 1/4" wrench for both the compression nut and the terminal nuts on T and V type probes. ZG, ZBRZ, FG, and FBRZ type probes require a 1/2" wrench for the compression nut and a 3/8" wrench for the terminal nut.

Parts Statement The use of non-original equipment manufacturer parts (such as glass, gaskets, probes, modules, etc.) will **VOID** the agency approval (FM, UL, CSA, CRN, ETC.), pressure/temperature rating, and the warranty of the instrument. **http://parts.clarkreliance.com**

Instructions for FSB Compression Type Probes:

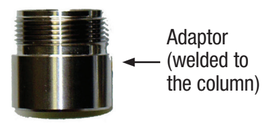
Note: Before removing and replacing any probes, make sure that the column is isolated from any pressure and the drain valve is opened. Wait until the column cools before making any repairs.

1. Remove the probe wire by loosening the terminal nut with a 3/8" wrench.
2. Remove probe coupling nut using a 1-1/8" deep wall hex socket and remove probe.
3. Insert Model FSB probe into compression fitting adaptor. Make sure that the sealing surface on both the probe and the fitting adaptor are free of any debris (no sealing gasket required).
4. Do not lubricate threads on either the nut or the fitting adaptor.
5. Place the coupling nut on to the probe. Turn on until hand tight. Then, using a 1-1/8" wrench, turn the nut an additional 1/4 turn. No specific torque value is required.
6. The coupling nut must be replaced when a new probe is installed. A new coupling nut is furnished with each replacement probe.
7. Replace the probe wire, lock washer, and terminal nut. Note: use a 1/2" wrench to hold the Probe Assembly Nut from rotating while tightening the Terminal Nut. – See illustration at the end of the previous column.
8. Hot torquing is not required with Compression Type Probes. See IOM R500.E229A for more information.



Hot torquing is required for all probes except FSB type. The column must be isolated from service with the drain valve open before retorquing the probes. The hot torquing procedure will extend probe sealing gasket life and should be performed as follows:

1. Partially open the steam valve to warm up the column with the drain valve slightly opened, for a minimum of 10 minutes.
2. Close steam (and water) valves to isolate the column.
3. Open the drain valve completely.
4. Re-torque as instructed above.
5. Return to service by closing the drain valve, and opening the steam and water valves. Refer to our on-line Hot Torque animation for complete instructions.



B. Interwiring

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:

Maximum Application Pressure (PSI)	Wire Specification
up to 1000	18 Ga. Stranded conductors, Teflon insulation rated at 300 VAC and 200°C (Belden #83029, Alpha #5857, or equal)
1001 to 3000	18 Ga. Stranded conductors, Teflon treated glass braided isulation rated at 300 VAC and 400°C, Nickel coated copper conductor U.L. #5182 (Radix #MGT-4502 or equal)

The high temperature wires attached to the probes can be routed to a local junction box or directly to the control unit. Refer to the applicable equipment IOM.

Conductor Size Allowance (Ga.)		
Min. 18	Max. 16	Probe Circuits
Min. 18	Max. 14	Indicating Circuits

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. **Caution:** See SmartLevel instruction manual for RG174 type coax wiring requirements from junction box to control unit, on SmartLevel systems. See IOM R500.E249 for SmartLevel instructions.

C. Troubleshooting

Troubleshooting is only necessary in the event that a control level detection module fails to energize or de-energize. In the event that the module fails to de-energize during blow-down, the cause is a failed (short circuited) probe. The probe should be replaced.

In the event that a module fails to energize, the following steps should be taken:

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

D. 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 secure wire 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.

Reliance®
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YOUR AUTHORIZED REPRESENTATIVE:

NOTE: *Reliance shall not be liable for damages of any kind resulting in part from failure to install its products in accordance with all applicable codes and/or state and local regulations, improper application and/or maintenance.*