

FOR THE OPERATION AND MAINTENANCE OF TRERICE INDUSTRIAL  
TYPE THERMOMETERS AND TEST WELLS

Principle of Operation

The TRERICE industrial thermometer is of the liquid in glass type. The glass tube in front of the metal scale extends into a metal chamber and has a glass bulb attached. This tube is completely sealed and the bulb contains a predetermined amount of liquid which on expanding and contracting caused by temperature changes will indicate the temperature for a given temperature range. The portion of the glass tube which is front of the scale is formed from the specially designed glass that is opaque white on the back side and forms a magnifying lens on the front side to improved readability of the liquid column. Around the outside of the sensitive bulb and the inside the metal bulb chamber, flake graphite is used to conduct the temperature that the bulb chamber is immersed in, to the glass bulb inside.

INSTRUMENT DESCRIPTION

Installation

Care should be taken in installing the TRERICE industrial thermometer as it is a fine precision type of instrument. To install in pipe line of similar service, remove union hub, install the hub in the service and then insert the thermometer in place holding the proper position to read then lock in place by tightening the coupling nut with the proper size open end wrench. To install industrial thermometer with a separable socket type connection, remove the separable socket from the instrument taking care not to lose the oil and graphite conducting bath furnished with the instrument. Install the socket first and proceed as before. If the separable socket was purchased separately from the instrument it is necessary to fill this socket sufficiently with oil and graphite mixture or heat transfer paste (107-1) to properly conduct the temperature to the thermometer bulb.

Liquid Separation

All liquid in glass thermometers are subject to separation of the liquid column. When this occurs the thermometer will not read correctly. Some ranges and types are more readily susceptible than others.

I. CAUSES OF SEPARATION

1. Rough handling in shipment causes most separations. If the thermometer is given a sudden jar, the weight of the liquid column in the bore has sufficient inertia to separate the column.
2. If the thermometer with an expansion chamber at the top of the tube (away from the bulb) is accidentally overheated, some of the liquid is driven into the expansion chamber. As the thermometer later cools, the liquid column recedes towards the bulb. If the thermometer is left in a horizontal or inverted position while cooling, part of the liquid will remain in the expansion chamber.

## II. HOW TO RE-UNITE SEPARATION LIQUID COLUMN

1. When the reservoir or expansion chamber is at the top of the tube (away from the bulb) – ranges below 400°F. Heat the bulb of the thermometer slowly, observing the rise of the liquid in the tube. The point of separation should be driven into the expansion chamber. Take care that the chamber never becomes completely filled or the internal pressure will cause the tube to break. After the separation enter the expansion chamber, put the thermometer in an upright position. Give the tube a slight jar so that particles of entrapped gas will rise above the liquid. When the liquid recedes, the column will be joined.
2. When there is no reservoir at the top of the tube – ranges below 400°F. Put the thermometer into dry ice, so as to draw all of the liquid into the bulb. Tap the bulb gently on a hard surface with the thermometer held in an upright position, bringing the liquid together. When gradual heat is applied and the liquid rises, the column will be joined.

## CONCLUSION

### Location

Care should be taken to locate the instrument on the equipment where the vibration is at a minimum.

### Corrosion

The standard bulb of a Trerice industrial thermometer is aluminum and should not be used in corrosive mediums to this material. The use of separable sockets is recommended for corrosive or highly abrasive service.

### Range

In selecting a temperature range for an industrial thermometer, it is recommended that the actual working temperatures be as near as possible in the middle of the scale. This reduces the possibility of overheating the instrument and causing failure.

### Accuracy

TRERICE standard instruments are guaranteed to be accurate within one scale division as indicated on the scale. Inaccuracy may be caused by a broken tube, scale shifting in slots from original position, liquid separation, sensitive bulb not fully immersed in the temperature to read, or by poor circulation. Poor circulation can be explained as follows: If there is poor agitation in the fluid, the temperature stratifies, higher temperature settles at the bottom. The thermometer will only read the temperature in which the sensitive bulb is immersed. It is, therefore, important to locate on installation the sensitive in the correct position.

### General

TRERICE industrial thermometers are available in ranges from 40 to 500 degrees, 7, 9 and 12" cases, straight form, regular angle form and adjustable angle form, fixed connection, union connection, separable socket connection, etc. There is a TRERICE industrial thermometer to suit your particular job and by choosing the correct instrument, the maximum efficiency will be obtained.