TELEDYNE
Analytical Instruments

Thermocouple Replacement Instructions

1) Ensure power is removed from the M501TS Converter.

2) Remove the cover from the Converter chassis.

3) Unscrew the (4) nuts that secure the front panel to the chassis. They are located just behind the Front Panel along the top.

4) Lower the Front Panel to gain easier access to the end of the quartz tube.

5) Unscrew the (3) nuts that secure the inner cover that protects the Heater Block and quartz tube. Remove this cover.

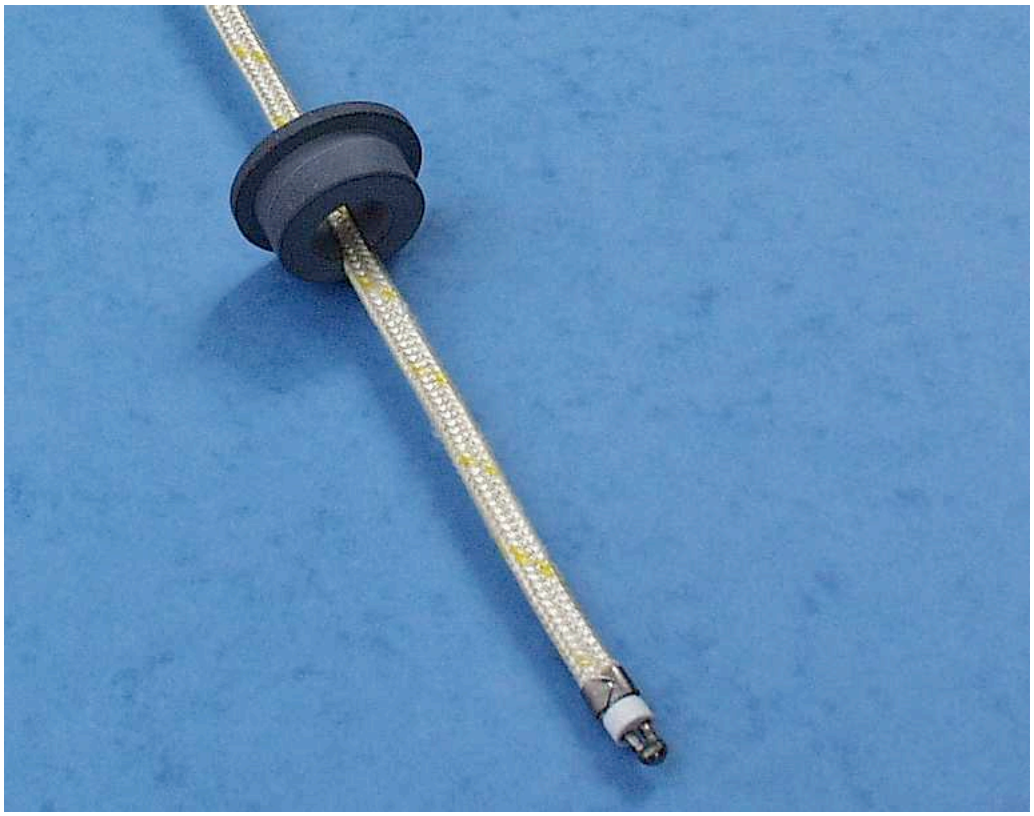
6) Cut the tie-wrap that secures the thermocouple to the fitting at the end of the quartz tube. Note the location of this tie-wrap as you will be installing another after the new thermocouple is installed.

7) Loosen the teflon fitting at the end of the quartz tube taking care not to put any stress on the tube and slide the fitting off the tube.

8) There is a ceramic end cap in the end of the Heater Block through which the thermocouple passes. Remove this ceramic end cap and the thermocouple.

9) Disconnect the thermocouple wires from the Temperature Controller noting that the ‘yellow’ wire goes to pin 1 and the ‘red’ wire goes to pin 2.

10) Place the new thermocouple into the notch of the new end cap.



11) In preparation to installing the new thermocouple, look into the end of the Heater Block. You will see that there is an indentation (cavity) in the fat part of the quartz tube. This is where the thermocouple you are installing will reside.

12) The thermocouple should be able to slide freely within the notch of the end cap which will allow you to slide it into the Heater Block and into the indentation of the quartz tube once the end cap is in place on the Heater Block.

13) Take the end cap with the thermocouple residing in the notch and slide it over the end of the quartz tube.

14) As you are sliding the end cap up the quartz tube, look at the end of the Heater Block to see where the cavity is located that the thermocouple will be inserted. Align the thermocouple with this cavity and carefully push the thermocouple all the way into the cavity until it comes to a stop, which is the end of the cavity of the quartz tube.

15) The thermocouple should now be properly residing in the cavity of the quartz tube. The end cap has not been mated to end of the Heater Block and is located out on the stem of the quartz tube.

16) Before sliding the end cap into the Heater Block, wrap glass wool around the portion of the end cap that will reside within the Heater Block when installed. This allows for a more secure fit between the end cap and Heater Block.

17) Slide the end cap along the stem of the quartz tube and thermocouple until it is close to mating with the Heater Block. Take a small tool and press the glass wool into the Heater Block opening so it becomes lodged within the Heater Block between the outside surface of the end cap and inner wall of the Heater Block.

18) Reconnect the teflon fitting that was removed earlier from the end of the quartz tube. Take care not to put any stress on the quartz tube as the teflon fitting is tightened

19) Route the thermocouple wiring so it goes past this teflon fitting and on to the temperature controller. The wire size of the thermocouple is 14AWG, so some forming will be needed to route the wires to the temperature controller. Place a tie-wrap around the teflon fitting and thermocouple wiring to hold the thermocouple in place.

20) Connect the (2) wires of the thermocouple to the Temperature Controller. The “yellow” wire should be connected to pin 1 and the “red” wire should be connected to pin 2.

21) At this point, all connections have been made, both electrically and pneumatically. A leak test should be performed on the Converter to verify that all connections are leak free.

22) Install the inner cover of the Heater Block and secure with the (3) nuts. Close the Front Panel and secure with the (4) nuts.

23) The Converter is now ready for the application of power. You will be looking for an indication from the temperature controller that it is functioning correctly and driving the heater to the desired “set” temperature. Apply power now.

24) You will need to perform a function in the Temperature Controller called “autotune”. This will tune the Temperature Controller to the new thermocouple. This procedure should be performed after the Converter comes to the regulated temperature. Otherwise, you will more than likely see the process temperature vary by as much as 20° C as the controller tries to regulate the temperature.

25) Refer to the M108A Manual to see information regarding the “autotune” procedure.