



**04- 021B
2 May, 2007**

INSTALLING M108A CONVERTER THERMOCOUPLE

I. PURPOSE:

To provide instructions for installing a new thermocouple into the Converter Heater Block. This is a Type N thermocouple (TH0000019). Teledyne API recommends updating any older thermocouples with the new version. The following instructions provide the necessary information to remove the existing thermocouple and replace it with the new one supplied in Kit 213.

II. TOOLS:

Nutdriver, $\frac{5}{16}$
Nutdriver, $\frac{11}{32}$
Diagonal Cutter

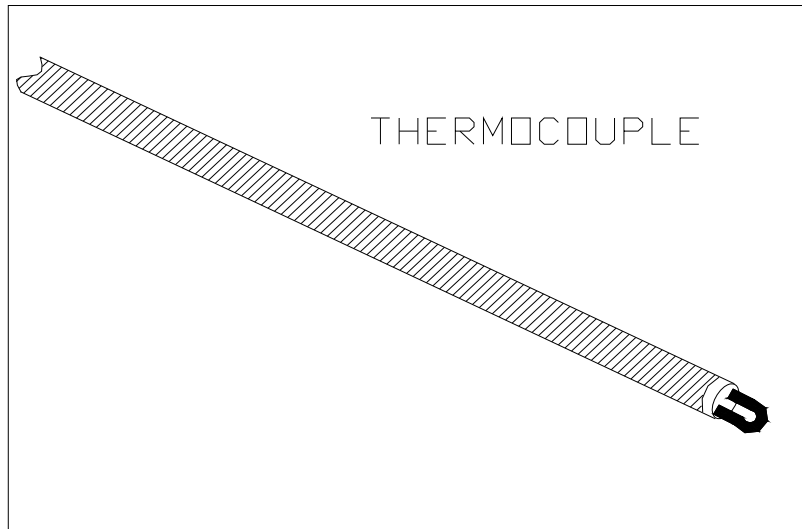
III. PARTS:

KIT000213

IV. PROCEDURE:

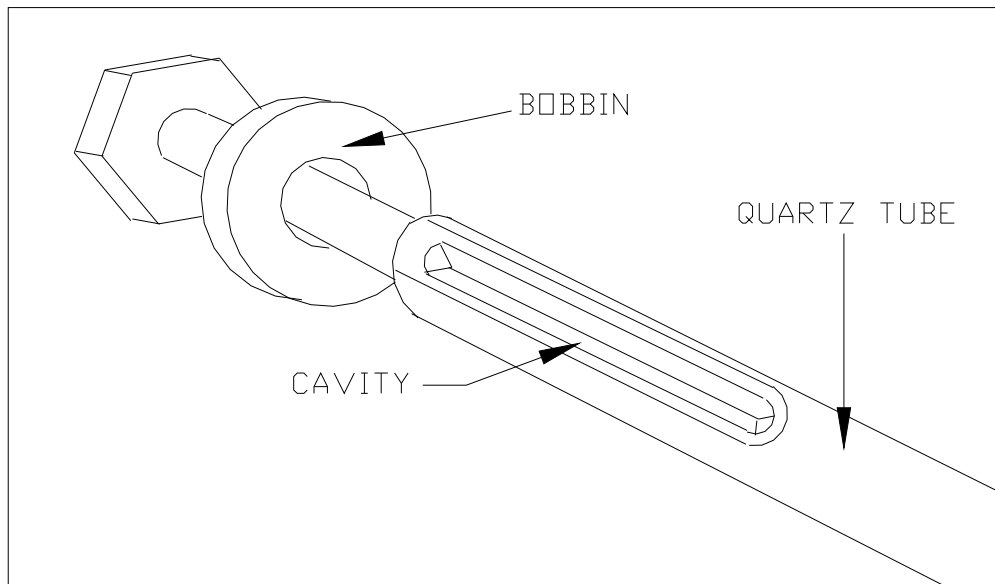
1. Ensure power is removed from the M501TS Converter. If the Converter has been operational you will need to wait for 2 hours for the Converter oven to cool before continuing with the replacement of the thermocouple.
2. Remove the cover from the Converter chassis.
3. Unscrew the (4) nuts that secure 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.
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. Remove 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.

FIGURE 1



- 1) In preparation for 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. Refer to FIGURE 2.

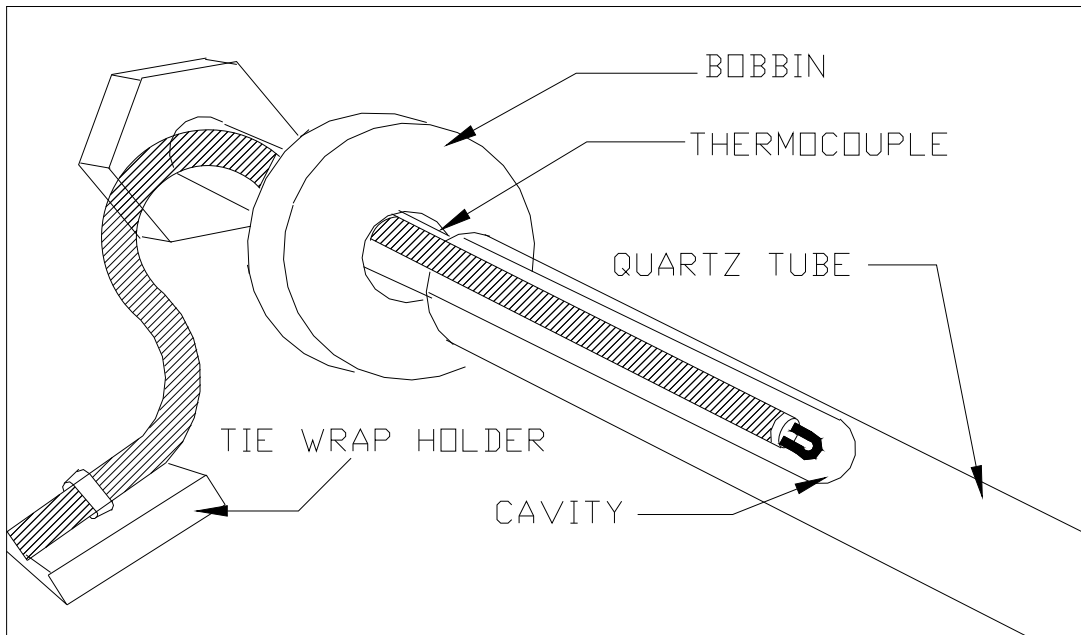
FIGURE 2



- 2) The thermocouple should slide into the Heater Block and into the indentation of the quartz.
- 3) a) 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.
b) Assure the thermocouple is seated flat. If it is not, the quartz tube will have to be replaced (Part #03710000). A few quartz tubes may need to be replaced.

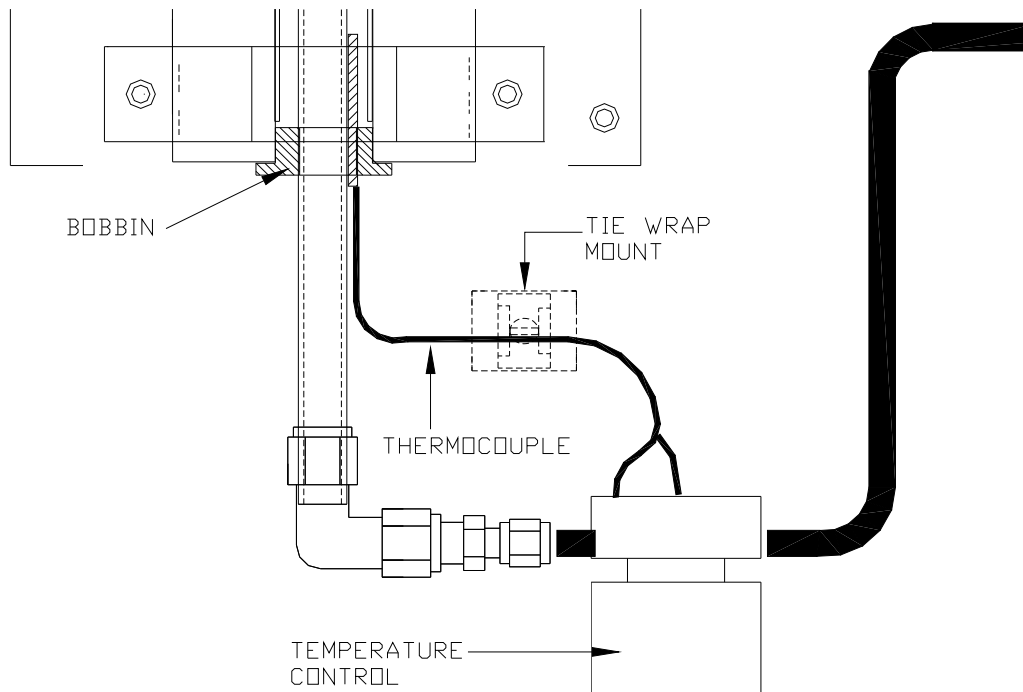
- 4) The thermocouple should now be properly residing in the cavity of the quartz tube. Refer to Figure 3

FIGURE 3



- 5) 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
- 6) Place the Tie Wrap Hold down in the location shown in the Figure 4. Be sure to clean the chassis where the Tie Wrap Hold down is to be replaced (Alcohol).

FIGURE 4



- 7) Form the Thermocouple wire so that it rests in the cavity with little movement.
- 8) Connect the (2) wires of the thermocouple to the Temperature Controller. The “orange” wire should be connected to pin 1 and the “red” wire should be connected to pin 2.
- 9) At this point, all connections have been made, both electrically and pneumatically. A leak check should be performed on the Converter to verify that all connections are leak free. If a leak is detected, the leak should be resolved before continuing.
- 10) Install the inner cover of the Heater Block and secure with the (3) nuts. Close the Front Panel and secure with the (4) nuts. Install the top cover on the Converter chassis.
- 11) 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.
- 12) You will need to change the thermocouple type from a K(3) to a N Type (12). To perform, press Sel and hold until P-N2 is displayed and change set from 3 (should be 3 which is a Type K thermocouple) to 12 (Type N thermocouple).
- 13) 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.
- 14) Refer to the M108A Manual to see information regarding the “autotune” procedure.
- 15) After the “autotune” process is completed, verify that the “process” temperature is indicating that the desired temperature is stable and being regulated.
- 16) The converter is now ready for operation.