

HOW TO REPLACE THE TEC IN SOX AND NOX ANALYZERS

I. PURPOSE:

To guide you through the replacement of the Thermo Electric Cooler (TEC) in the M100E/T100 & M200E/T200 family of analyzers including M, U and H models.

II. PARTS:

KIT000095

III. TOOLS:

7/16" wrench.
9/16" wrench.
Phillips head screwdriver.
Flat head screwdriver.
Needle nose pliers.
Soldering Iron (w/solder).
Flashlight.

IV. PROCEDURE:

1. Remove power from the instrument & remove the cover.
2. Remove the sensor assembly for M100E/T100 go to step 3 for M200E/T200 go to step 9.
3. *Remove the SO₂ Sensor assembly:*
4. Disconnect the 1/8" & 1/4" fittings from the top of the Rcell.
5. Disconnect all electrical connectors.
6. Remove the three Phillips head screws that hold the sensor assembly into the chassis.
7. Remove the sensor assembly from the analyzer by lifting straight up, slowly & carefully. If anything prevents you from lifting the sensor assembly out of the analyzer; disconnect it.
8. Go to step 15.
9. *Remove the NO_x sensor assy.*
10. Disconnect the two (or four) 1/8" lines from the top of the Rcell & the 1/4" line to the exhaust of the Rcell.
11. Disconnect all electrical connectors.
12. Remove the four Phillips head screws that hold the sensor assembly into the chassis.
13. Remove the sensor assembly from the analyzer.
14. Remove the four screws that hold the Rcell to the PMT housing, & remove the cell from the PMT housing.

How to replace the TEC in SOX and NOX analyzers

NOTE13-09 Rev A (6731) 06/05/2013

Page 1 of 5

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15. *Removing the cooler from the sensor assy. for both analyzers.*
16. Remove the cooler drive wire that goes to the TEC drive card from the PMT pre-amp board.
17. Remove the four screws that hold the TEC heat sink shroud to the PMT housing, & unplug the electrical connector that goes to the heat sink assembly from the TEC drive board.
18. Remove the four screws that are on the outside corners of the heat sink assembly.
19. Pull slowly on the heat sink so that you can just see the cold block starting to come out of the PMT housing.
20. Remove the two screws that are in the middle of the heat sink assembly.
21. Pull the heat sink & TEC off of the cold block.

NOTE: YOU MUST PAY CLOSE ATTENTION TO THE DIRECTION OF THE TEC. IF YOU INSTALL THE NEW TEC WITH THE HOT SIDE TO THE COLD BLOCK THE TEC WILL NOT WORK CORRECTLY (SEE DIAGRAM PAGE 5).

22. De-solder the TEC from the two terminals on the heat sink assembly. Please note the color of the wires & what terminals that they go to.
23. Solder the new TEC onto the two terminals on the heat sink assembly, paying close attention to the direction of the TEC. The HOT side of the TEC goes toward the heat sink assembly. Refer to Figure 2, Detail C for HOT side.
24. Install a thermal pad (HW405) between the cooler & the heat sink assembly & push the cooler to the heat sink.
25. Install a thermal pad (HW405) on the cool side of the cooler & put the cooler onto the cold block & slowly tighten the two screws that hold the heat sink assembly to the cold block.

WHEN YOU ARE TIGHTENING THE TWO SCREWS THAT HOLD THE HEAT SINK ASSEMBLY TO THE COLD BLOCK; YOU HAVE TO TIGHTEN THE TWO SCREWS EVENLY. IF YOU DO NOT TIGHTEN THEM EVENLY THE COOLER WILL NOT SIT FLUSH WITH THE COLD BLOCK & YOU WILL PREMATURELY BURN OUT THE COOLER (SEE FIGURE 4 ON PAGE 5).

26. Push the cold block & heat sink assembly back into the pmt housing & secure the heat sink assembly to the pmt housing with the four screws that you removed.
27. Re-connect the drive wires to the TEC driver board that come from the heat sink assembly.
28. Install the TEC drive board & heat sink shroud back onto the pmt housing.
29. Remove the end plate from the other end of the pmt housing.
30. Remove the desiccant baggies from the front end of the PMT housing & replace with the ones provided in the kit.

How to replace the TEC in SOX and NOX analyzers

NOTE13-09 Rev A (6731) 06/05/2013

Page 2 of 5

PRINTED DOCUMENTS ARE UNCONTROLLED

31. Replace the end plate onto the end of the pmt housing. When you are putting the end plate back onto the PMT housing to make sure that the O-ring seats against the pmt housing & that it is seated into the groove in the end plate as it should be.
32. Install the sensor assembly back into the analyzer & hook up all the wires & pneumatic connections that you removed.
22. Turn the unit back on & make sure that the PMT temp comes down to $7^{\circ}\text{C}\pm 2^{\circ}\text{C}$, $5^{\circ}\pm 2^{\circ}\text{C}$ for the 200U and $9^{\circ}\pm 2^{\circ}\text{C}$ for the 100U.
23. Recalibrate the analyzer following the instructions in your manual.

If you have questions regarding this procedure or any API equipment, please contact an API Tech Support representative at:

Phone: (858) 657-9800

Email: sda_techsupport@teledyne.com

Fax: (858) 657-9816

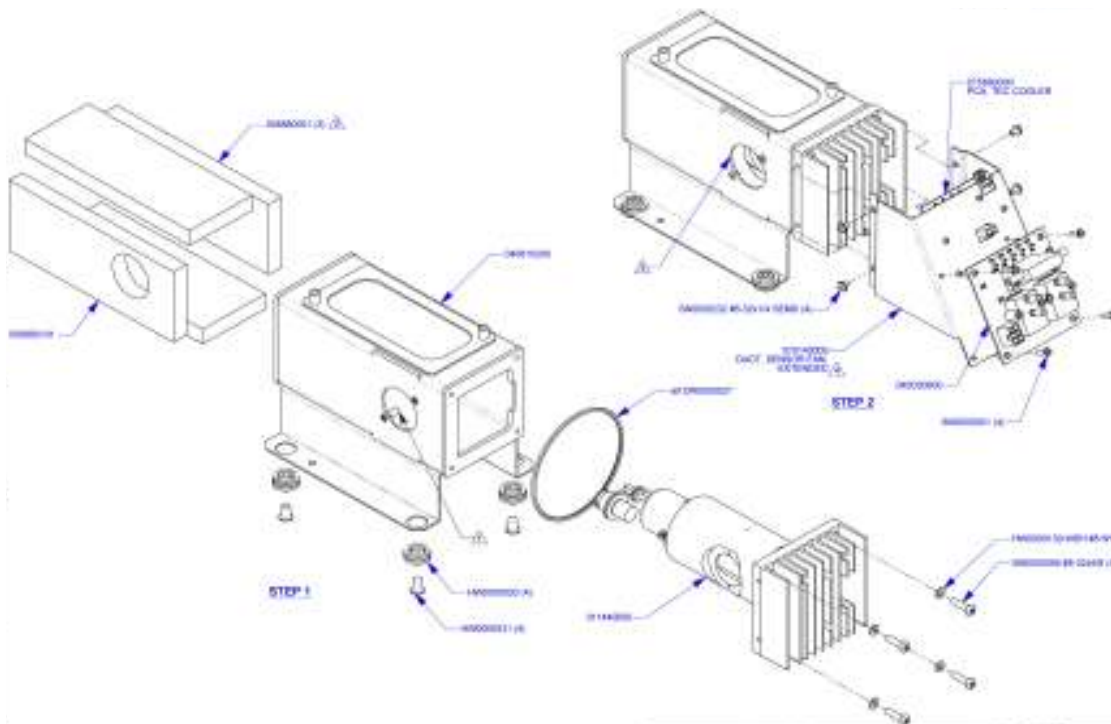


Figure 1

How to replace the TEC in SOX and NOX analyzers

NOTE13-09 Rev A (6731) 06/05/2013

Page 3 of 5

PRINTED DOCUMENTS ARE UNCONTROLLED

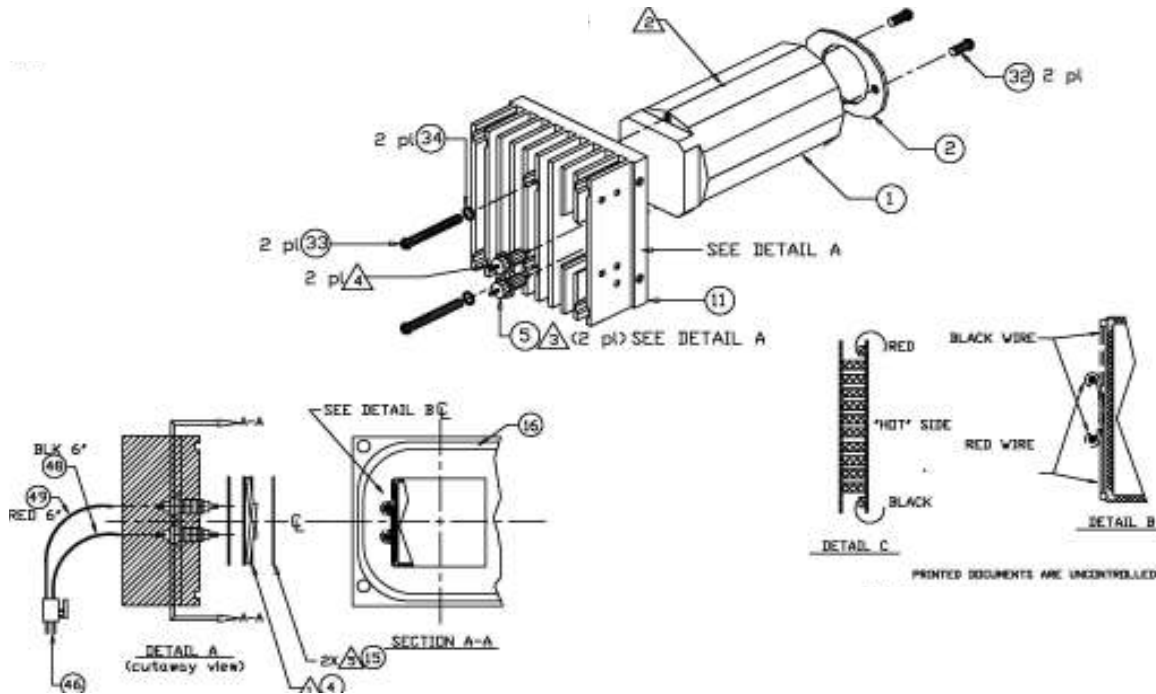


Figure 2

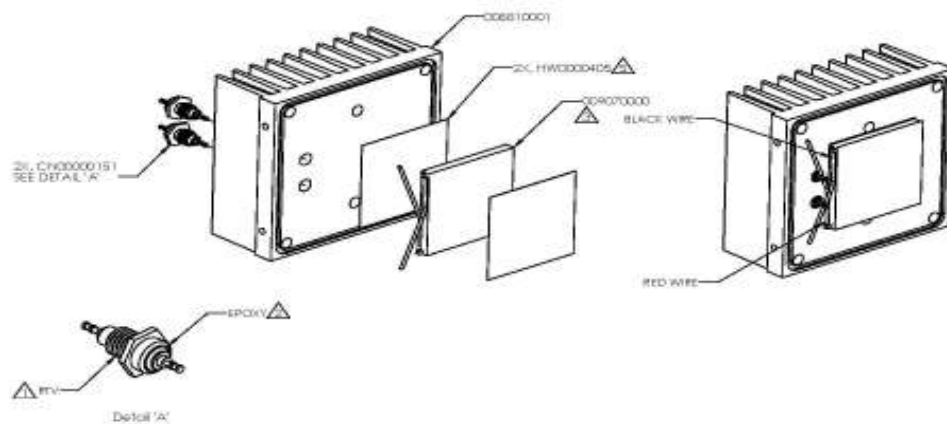


Figure 3

How to replace the TEC in SOX and NOX analyzers
 NOTE13-09 Rev A (6731) 06/05/2013
 Page 4 of 5
 PRINTED DOCUMENTS ARE UNCONTROLLED

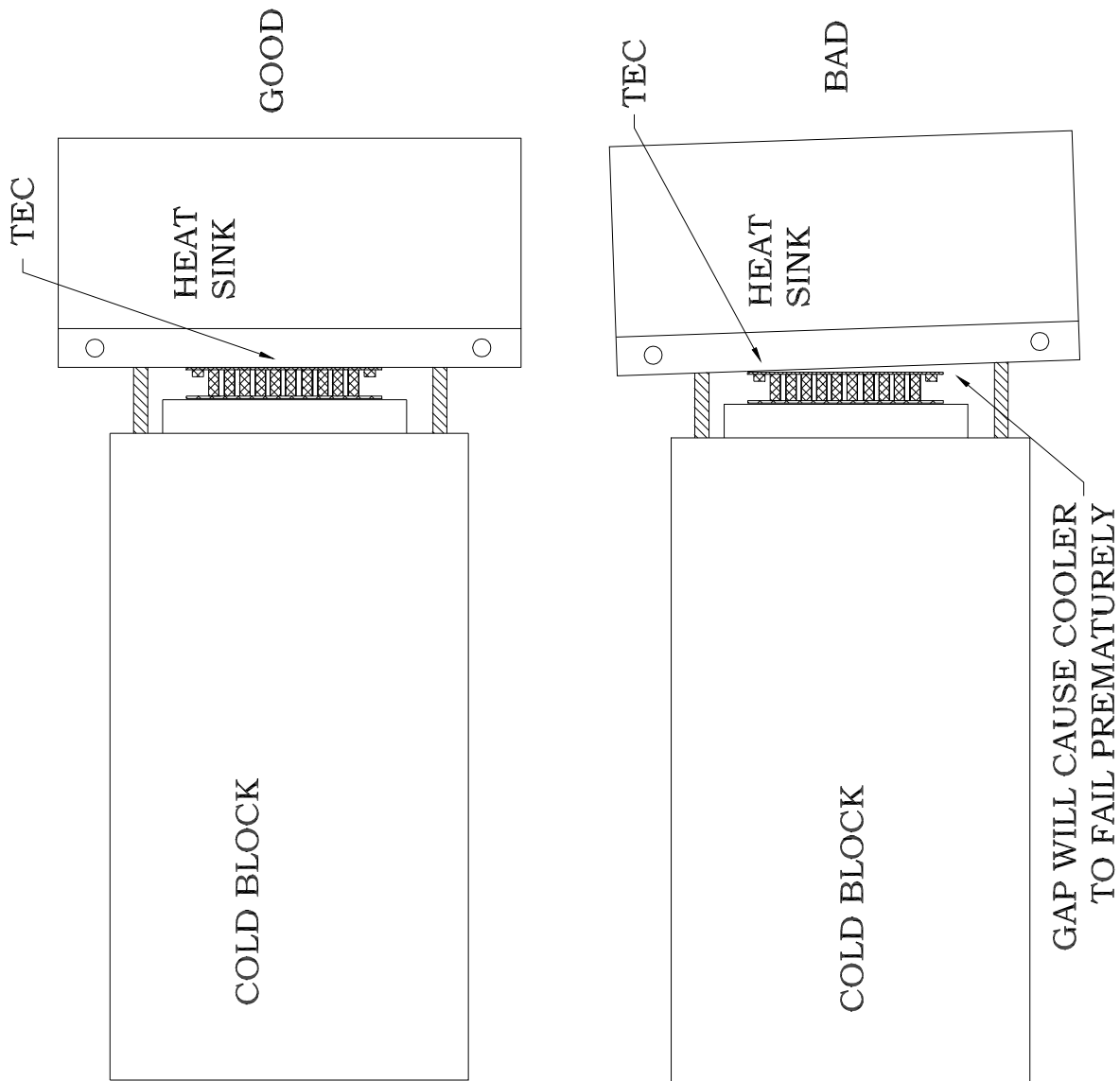


Figure 4

How to replace the TEC in SOX and NOX analyzers
NOTE13-09 Rev A (6731) 06/05/2013
Page 5 of 5
PRINTED DOCUMENTS ARE UNCONTROLLED