TELEDYNE
INSTRUMENTS
Advanced Pollution Instrumentation
A Teledyne Technologies Company

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Service Note

08-002A
13 February 2008

O_2 SENSOR RETROFIT FOR A M300E/EM

I. PURPOSE:

The purpose of this service note is to give instructions on retrofitting a M300E/EM with an O_2 sensor.

II. TOOLS:

9/16" wrench
7/16" wrench
½" wrench
Tube cutters
Phillips head screwdriver
Diagonal cutters
Exacto-knife (razor blade)
Flat head screwdriver

III. PARTS:

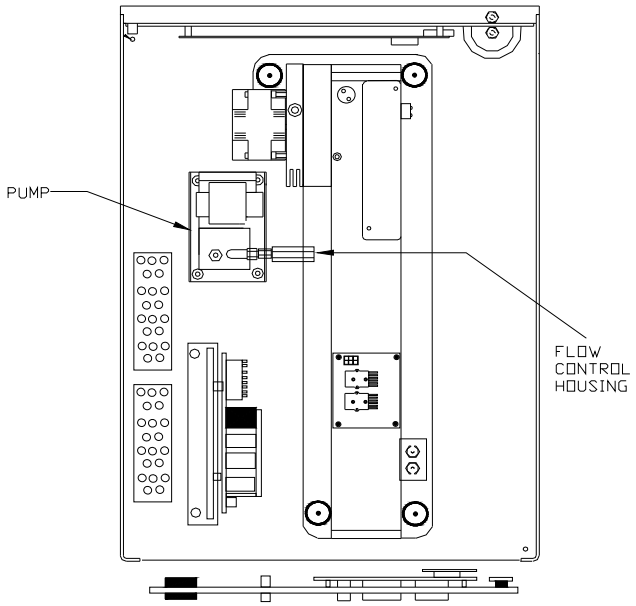
KIT000265

The electronics used in T-API analyzers are sensitive to Electrostatic Discharge (ESD). When working on any T-API device, please ensure that you are properly grounded prior to handling or touching any electronic circuitry in the analyzers! For more information on how to protect sensitive components from ESD during handling, please contact T-API customer service and ask for the ESD Service note number 03-022A.

IV. PROCEDURE:

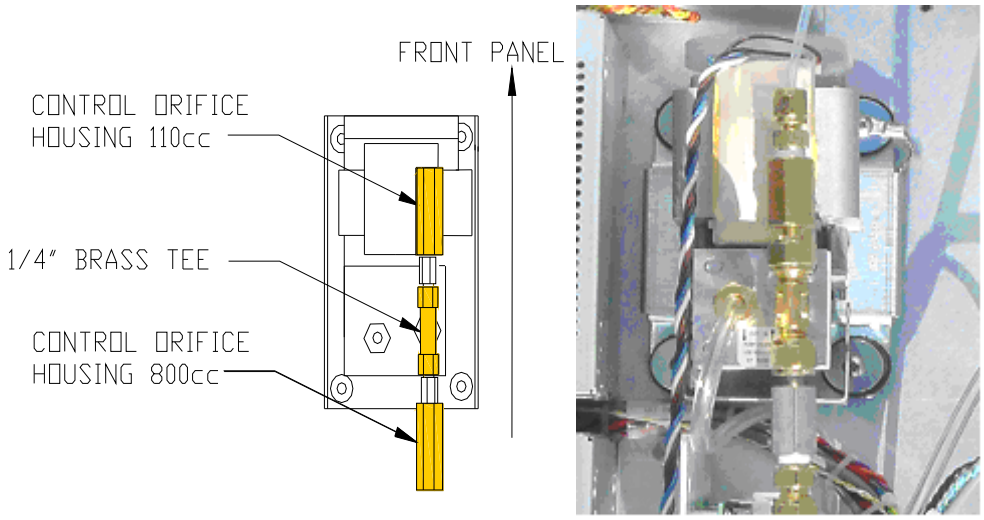
1. Turn off the instrument and remove the top cover.
2. Locate the internal pump assembly and disconnect the flow control housing from the brass elbow. Refer to FIGURE 1 for location of the flow control housing.
3. Disconnect the tube and remove the straight ¼" fitting that comes directly out of the top of the pump.
4. Remove the elbow fitting from the top of the pump. Clean the pump head and fitting threads of any remaining Teflon tape.

FIGURE 1



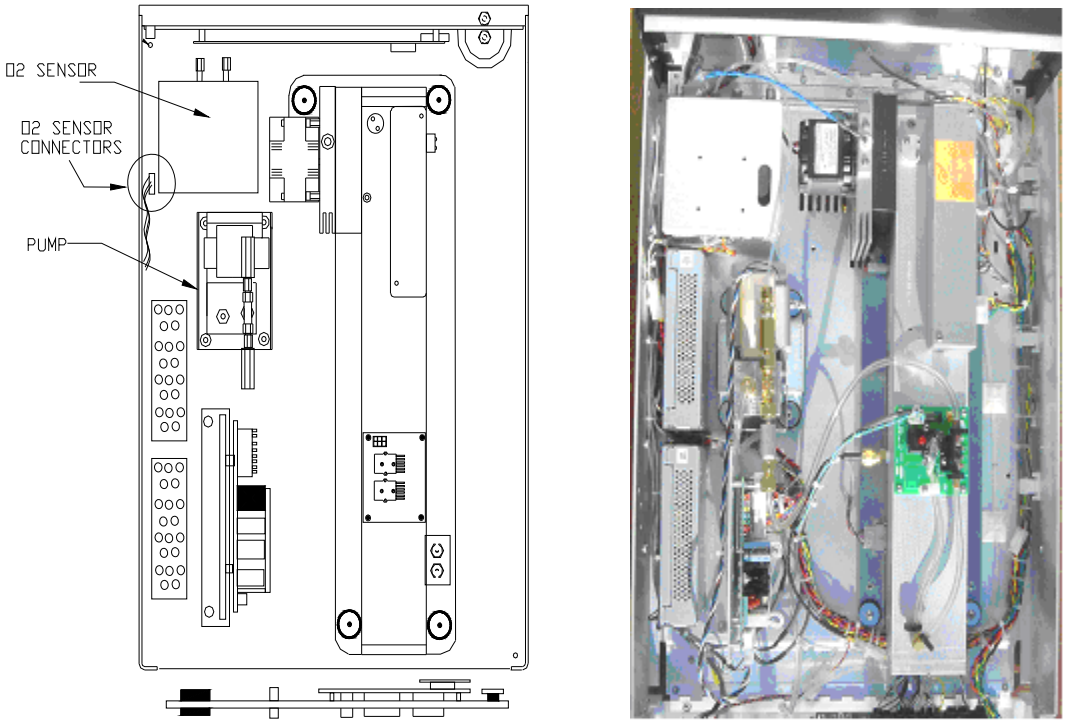
5. Install the ¼" brass tee from the KIT on to the pump using Teflon tape contained in the KIT.
6. Re-install the flow control housing on to one branch of the tee, ensuring that the ¼" line is still connected to the flow control housing.
7. Remove the new flow control housing from the KIT and attach it to the remaining branch of the tee. Refer to FIGURE 2
8. Re-install the straight ¼" brass fitting back on to the top of the pump ensuring to put Teflon tape on to the threads of the fitting.

FIGURE 2



9. Install the O_2 sensor into the instrument using the 4 screws provided in the KIT. The screws will be screwed in from the bottom of the chassis into the bottom of the O_2 sensor. The two fittings from the O_2 sensor should be facing the front panel of the instrument. Refer to FIGURE 3 for the location of the O_2 sensor.

FIGURE 3

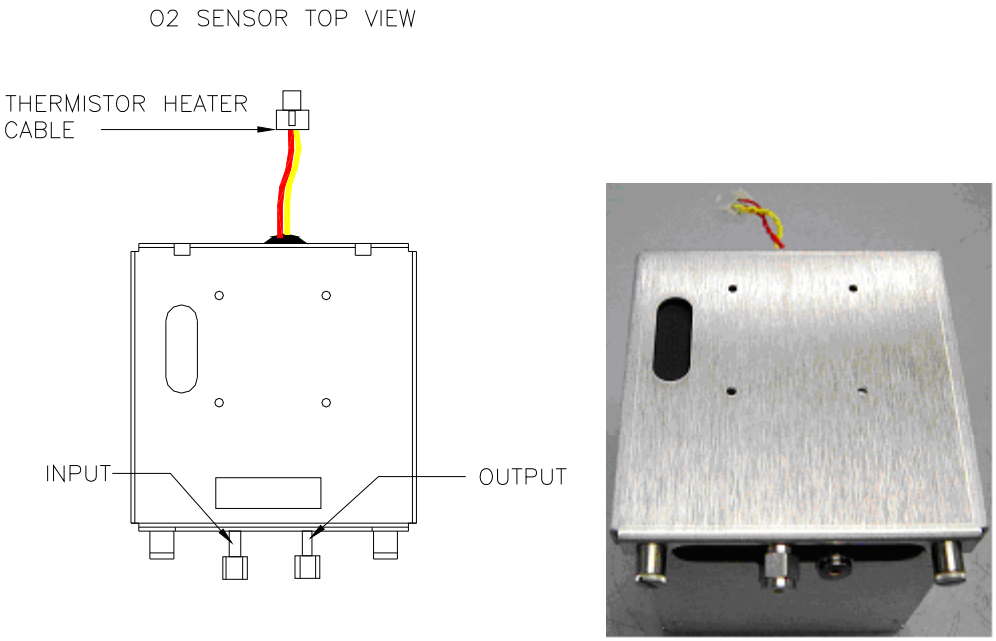


10. Once the O_2 sensor is in place, you will need to connect two connectors to the O_2 sensor. A black 16 pin connector labeled "P1" and a white 4 pin connector labeled "O_2". These connectors are tie wrapped into the wiring harness that runs along the side of the chassis. These connectors may be heat shrunk. If the connectors are heat shrunk you will need to remove the

heat shrink from the connectors in order to verify the labeling. Refer to FIGURE 3 for the location of these connectors.

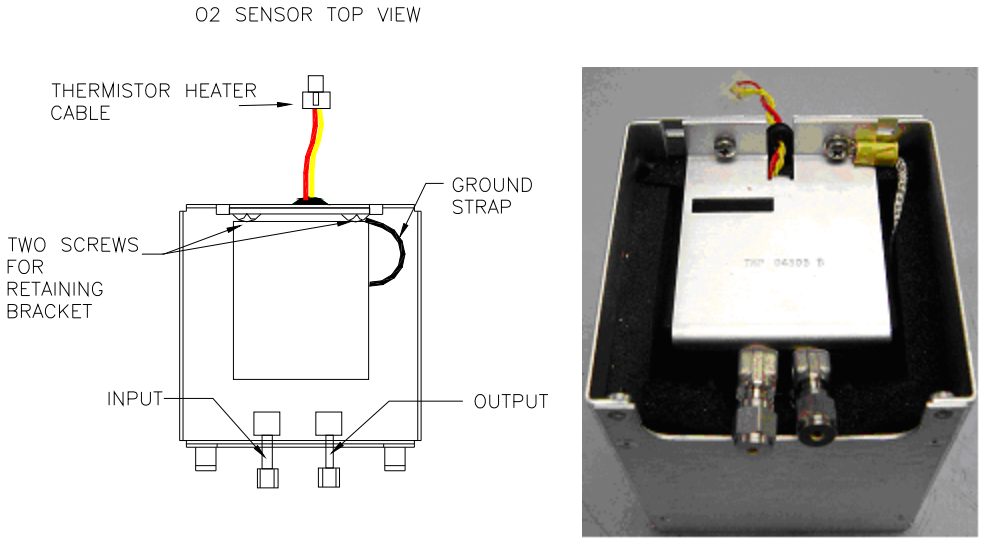
11. Remove the cover by loosening the two captive screws with the flat head screw driver. Remove the foam insert.
12. You may need to cut some tie wraps on the wiring harness in order to pull out the connectors and connect them onto the O_2 sensor.
13. Connect the 4 pin white connector labeled "O_2" to the thermistor/heater connector on the O_2 sensor. Refer to FIGURE 4

FIGURE 4



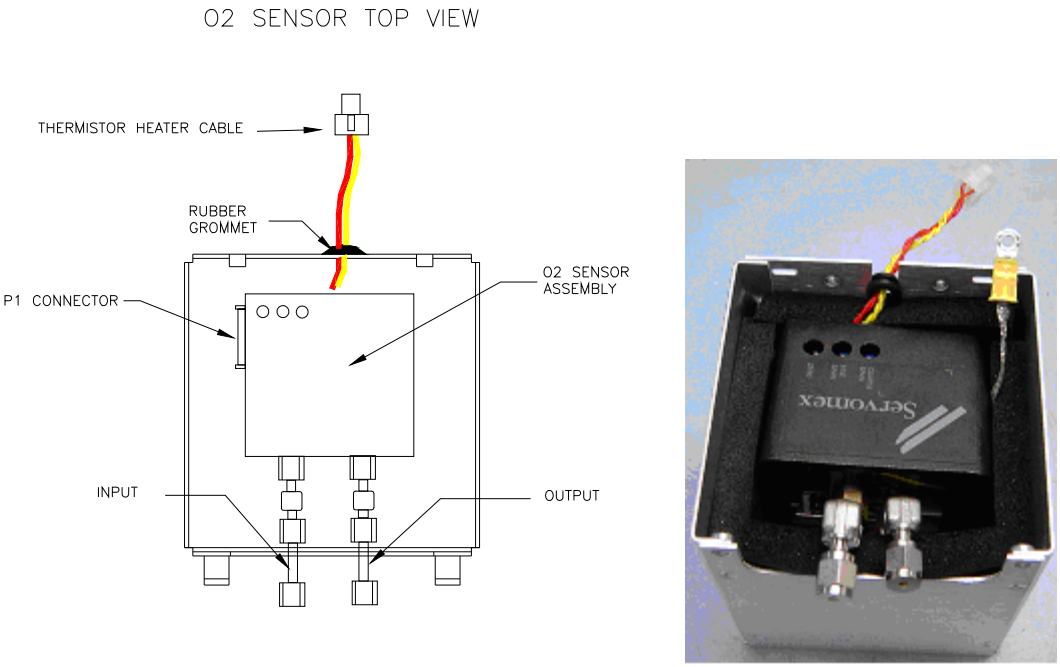
14. In order to install the P1 connector you will need to remove the top cover of the O_2 sensor using the flat head screw driver. Then remove the two screws, and ground strap, that hold the O_2 sensor mounting bracket in place. Refer to FIGURE 5.

FIGURE 5



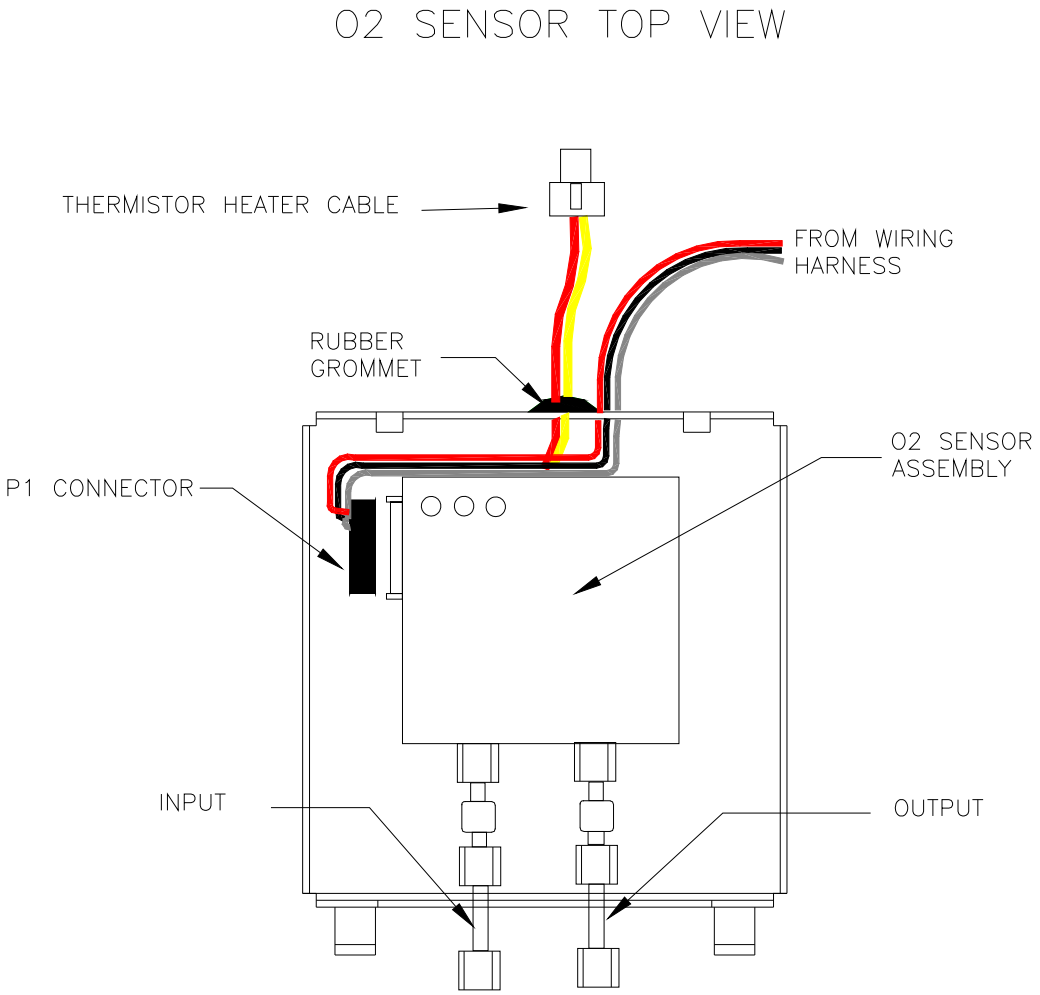
15. After removing the bracket lift up on the O_2 sensor assembly and connect the P1 connector to the bottom left hand corner of the assembly. Refer to FIGURE 6.

FIGURE 6



16. There is a tie wrap on the connector for P1 which is used to help keep the connector in place.
17. After the connection is made, route the harness towards the back of the O_2 sensor where the rubber grommet is. Refer to FIGURE 7.

FIGURE 7

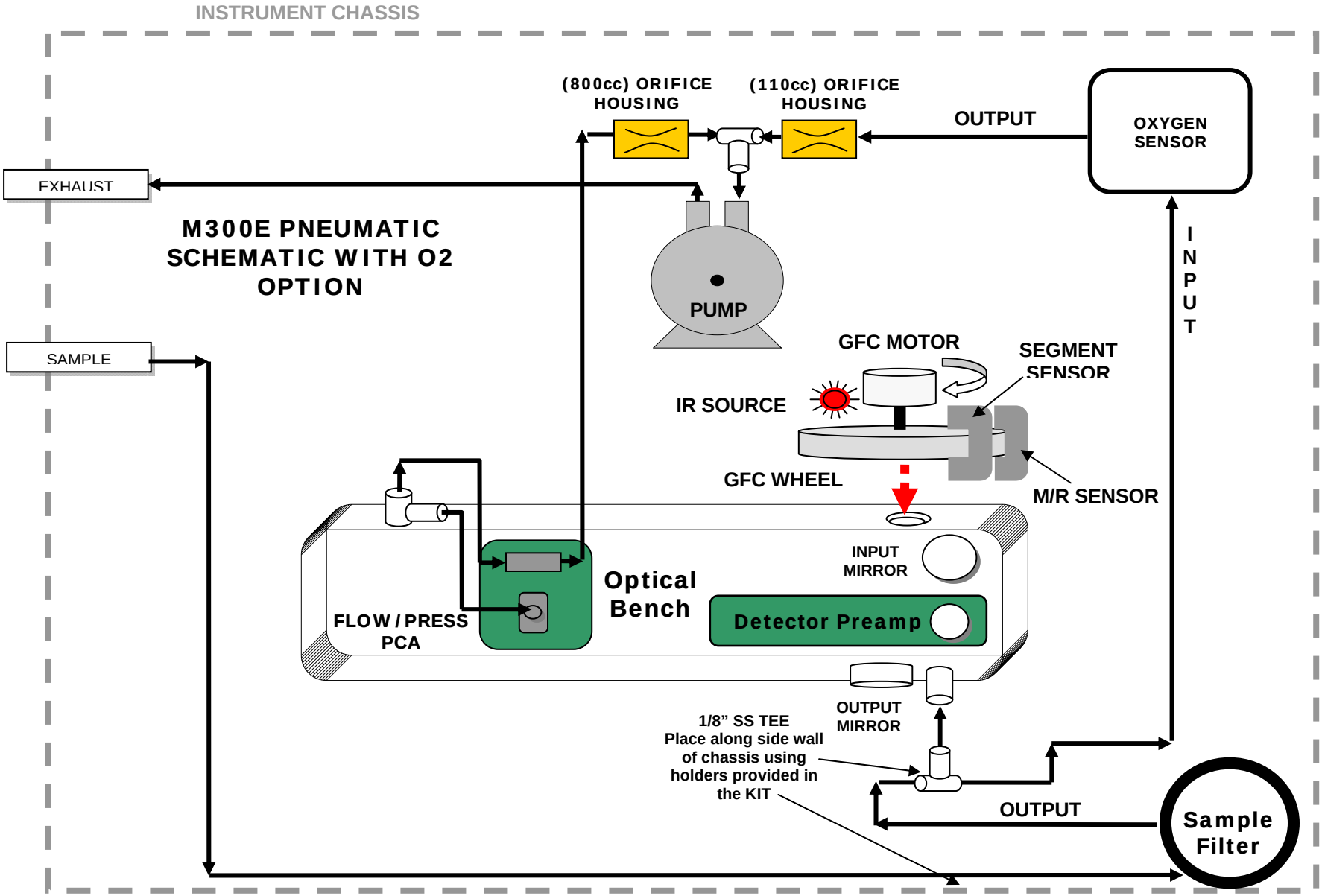


18. Re-install the mounting bracket and the two screws. Ensure that the ground strap is connected.
19. Re-install the foam insert and the cover.
20. Now that the O_2 sensor has been installed, you will need to install the tubing.

REFER TO FIGURE 8 for the next steps.

21. Take the 1/8” tubing from the KIT and use it to connect from the 110cc flow control housing on the pump to the output of the O_2 sensor.
22. Using the two tubing clamps contained in the KIT, take the 1/8” Stainless Steel tee from the KIT and install it on the chassis wall next to the sample filter assembly.
23. Connect a piece of 1/8” tubing from the input of the O_2 sensor to one branch of the SS tee.
24. Remove the outlet line from the sample filter assembly, this is the black tubing, and connect it to the other branch on the SS tee.
25. Connect a 1/8” piece of tubing from the middle branch of the SS tee to the output fitting of the sample filter.

FIGURE 8



26. After all of the pneumatic lines have been connected, you will need to install the new firmware into the instrument.

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(858)657-9800 or api-customerservice@teledyne.com

27. Once the firmware has been up-graded, turn on the instrument and let it warm up for 1 hour.
28. Perform a leak check by using the leak check procedure in the M300E/EM operators manual p/n 042880000 section 9.3.3
29. Ensure that all of the temperatures and flows are correct.
30. You are now able to use the O_2 sensor. Please follow all sections that pertain to the O_2 sensor that are contained in the Operators Manual.

If you have any questions regarding this service note please call a customer service rep. at 858-657-9800 or email: api-customerservice@teledyne.com