



09-007B
11 August, 2010

ADDING A CO₂ SENSOR OPTION TO THE M200EH

I. PURPOSE:

This service note is to provide instructions on how to add the CO₂ option (67A) (054250000 OPTION, CO₂ SENSOR 20%) to your M200EH.

II. TOOLS:

Philips screwdriver
¼ inch, 9/16, 7/16 box/open end wrenches

III. PARTS:

KIT000295 (054250000 OPTION, CO₂ SENSOR 20%)
KIT000296 (054250000 OPTION, CO₂ SENSOR 20%)
KIT000297 (054250000 OPTION, CO₂ SENSOR 20%)

To determine the kit that you will use, see the chart in section IV. PROCEDURE



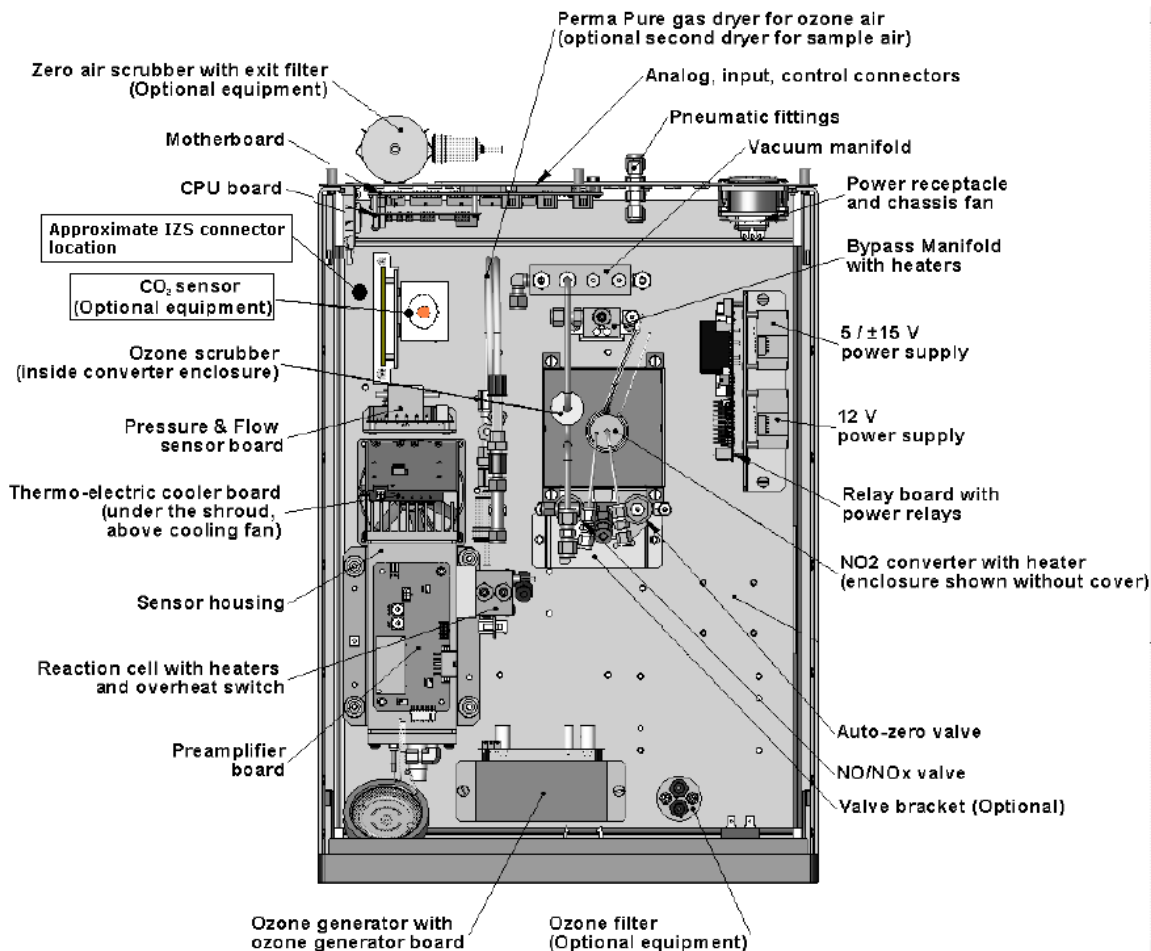
The electronics used in T-API analyzers are sensitive to Electrostatic Discharge (ESD). When working on any T-API device, please ensure that you are properly grounded prior to handling or touching any electronic circuitry in the analyzers! For more information on how to protect sensitive components from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

IV. PROCEDURE:

1. First, the pneumatic layout of your instrument must be determined. Compare your instruments serial number to the following chart. Use this chart to determine the section and figure numbers that apply to your instrument.

Starting Serial #	Ending Serial #	Service note Section	Figure #	KIT #
0	465	VII.	8	KIT000295
466	611	VI.	7	KIT000296
612	Higher	V.	2	KIT000296

2. Comparing figures 1 through 9 will help to familiarize you with the components, their arrangement, and pneumatic path.
3. The CO₂ sensor and PCA will have come to you preassembled on their bracket. Install the assembly into the chassis as depicted in figure #1. Insure that the assembly is oriented with the PCA towards the (left) chassis wall.

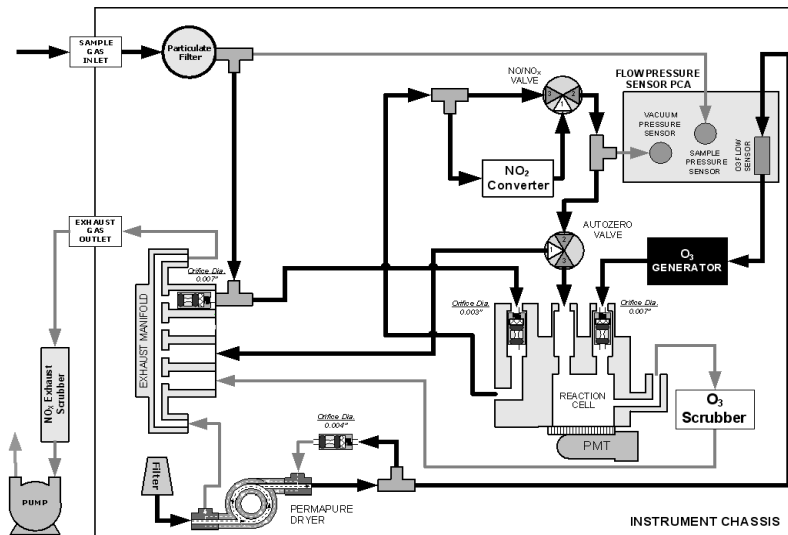


M200EH/EM Layout
Figure #1

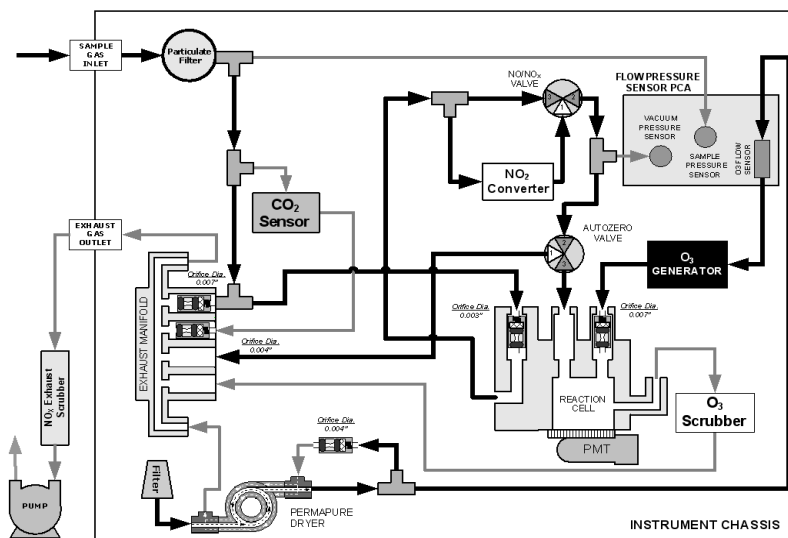
V. **M200EH with a 3 port reaction cell:**

4. Refer to Figure #2.
5. Locate the Bypass flow Tee fitting on the exhaust manifold. Note that one connection on the Tee runs back to the Sample Filter Tee fitting. Disconnect this pneumatic tube from the Tee fitting at the Bypass manifold end.
6. Install the Tee fitting that came with your kit on the loose end of the pneumatic tube from step 5, see figure #2.
7. Install the 8-inch Teflon tube that came with your kit onto one of the open ports of the newly installed Tee fitting from step 6.
8. Locate the 1/8th inch clear pneumatic tube attached to the INLET of the CO2 sensor. Connect this tube to the open port on the Tee fitting from steps 6, See figure #2.

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M200EH Pneumatic Diagram



M200EH Pneumatic Diagram with CO₂ Sensor option

FIGURE #2

9. Locate the bypass flow orifice on the vacuum manifold. Remove the fitting next to the bypass flow orifice. Install the flow control assembly that came with your kit into this unused port, see figure #3.

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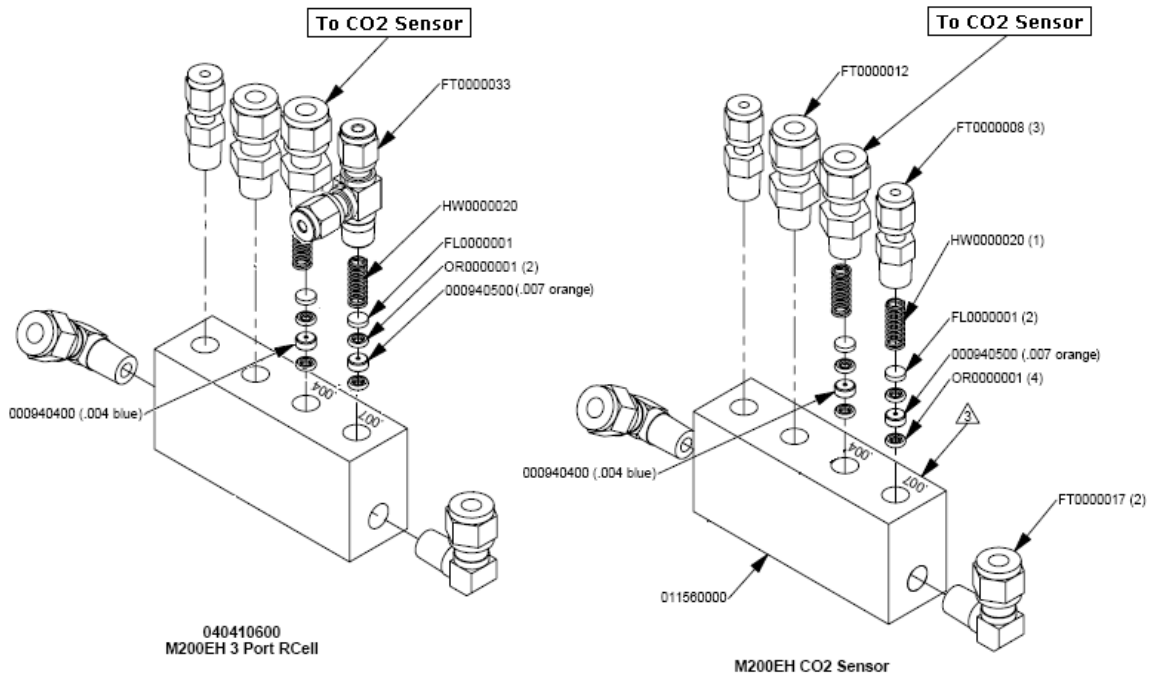


FIGURE #3

10. Locate the 1/8th inch clear pneumatic tube attached to the OUTLET of the CO₂ sensor. Connect this tube to the fitting installed in step 9, See figure #'s 2 and 4.

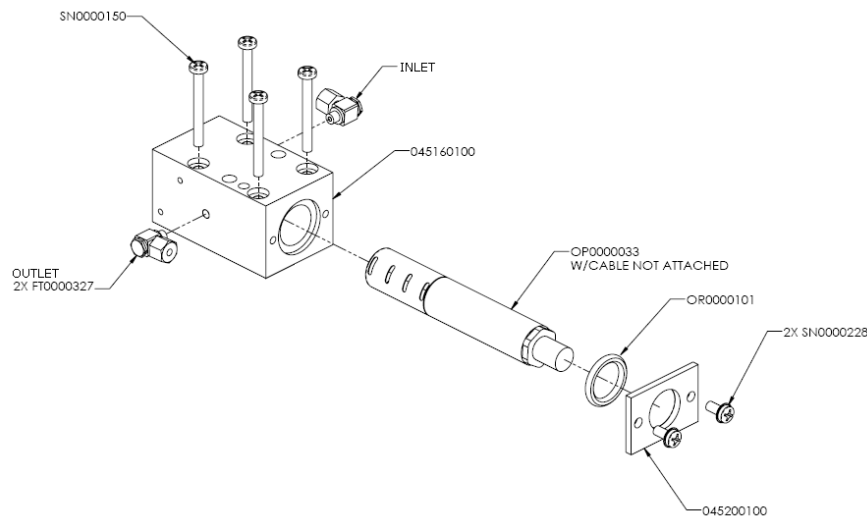


FIGURE #4

11. Comparing figure #5 to your instrument will help to familiarize you with the electrical components, their arrangement, and connections.

Electrical hookup

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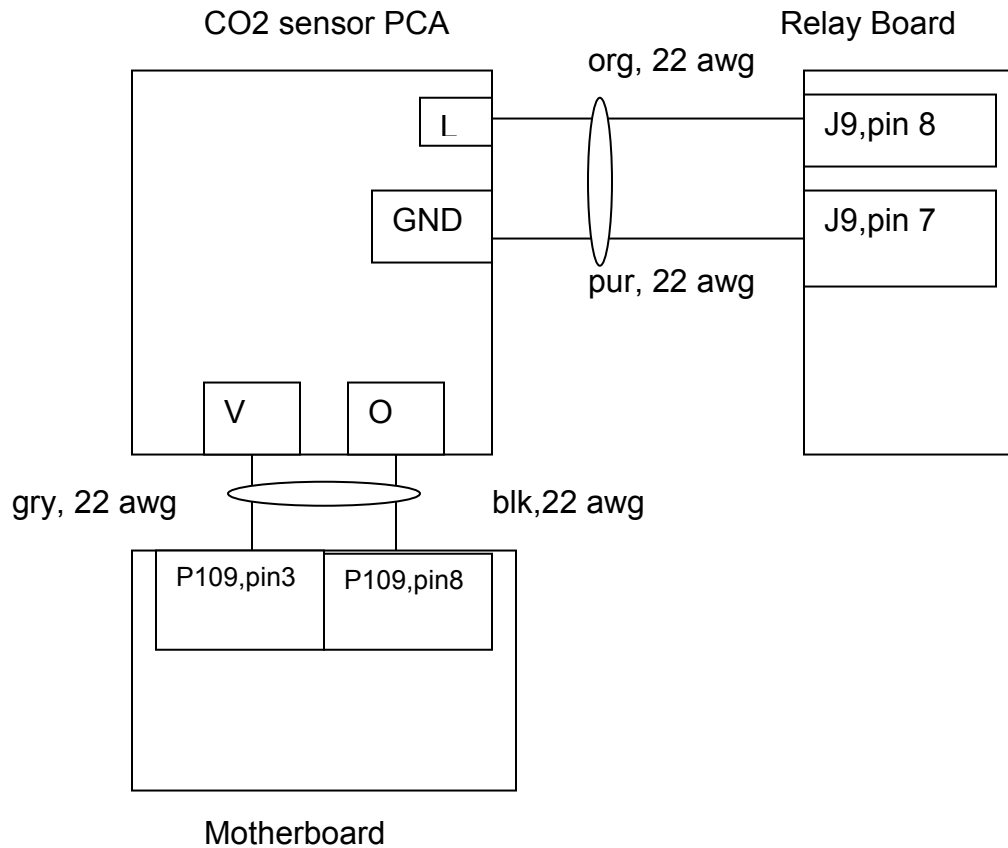


FIGURE #5

12. Locate connector J9 on the relay board. See figure #1 and #5. Install the 24-inch orange/purple cable that came with your kit by inserting the pin connectors in the white connector at J9 on the relay board, see figure #5. Connect the free end of the cable to the tie-down posts L, and GND on the CO₂ sensor PCA, see figure #5. The orange wire should connect from the relay board J9, pin #8 to the tie-down post marked L, of the CO₂ sensor PCA. The purple wire should connect from the relay board J9, pin 7 to the tie-down post, marked GND of the CO₂ sensor PCA.
13. Locate connector J109 on the motherboard. See figure #1, #4 and #5. Install the 10-inch black/gray cable that came with your kit by inserting the pin connectors in the black Microfit connector at J109 on the motherboard, see figure #5 and #6. Connect the free end of the cable to the tie-down posts V, and O on the CO₂ sensor PCA, see figure #5. The black wire should connect from the motherboard J109, pin #8 to the tie-down post marked O, of the CO₂ sensor PCA, see figure #5 and #6. The gray wire should connect from the relay board J109, pin 3 to the tie-down post marked V, of the CO₂ sensor PCA, see figure #5 and #6.

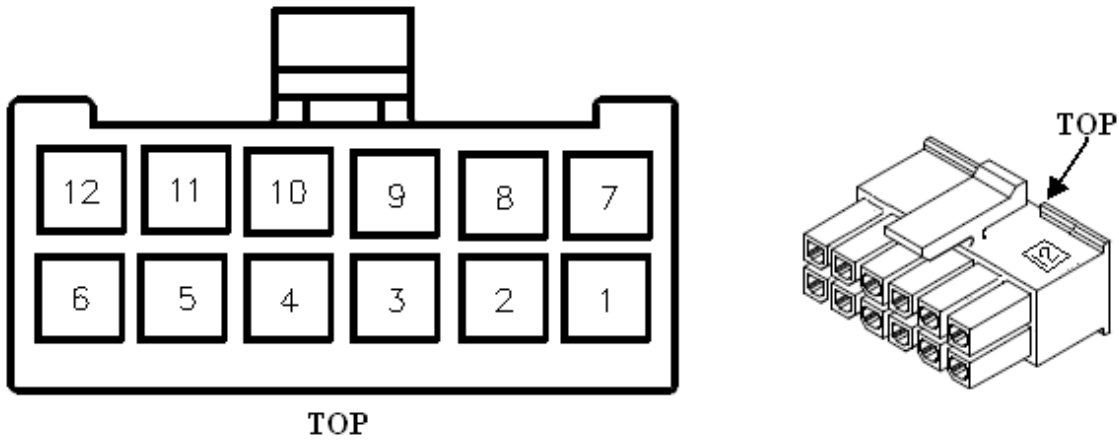


FIGURE #6

14. The CO₂ sensor's manifold is heated and will have arrived in your kit with the heater and thermistor pre-installed.
15. To connect the CO₂ sensors heater/thermistor connector, first locate the IZS connector. See figure #1 for the approximate location. The connector will be cable tied to the cable bundle and the connector will be covered with black heat shrink. There may be several unused connectors in the area covered with heat-shrink. It will be necessary to remove the black heat-shrink to identify the connector labeled "IZS." See figure #7.
16. Connect the CO₂ heater plug to the IZS connector from step 15.

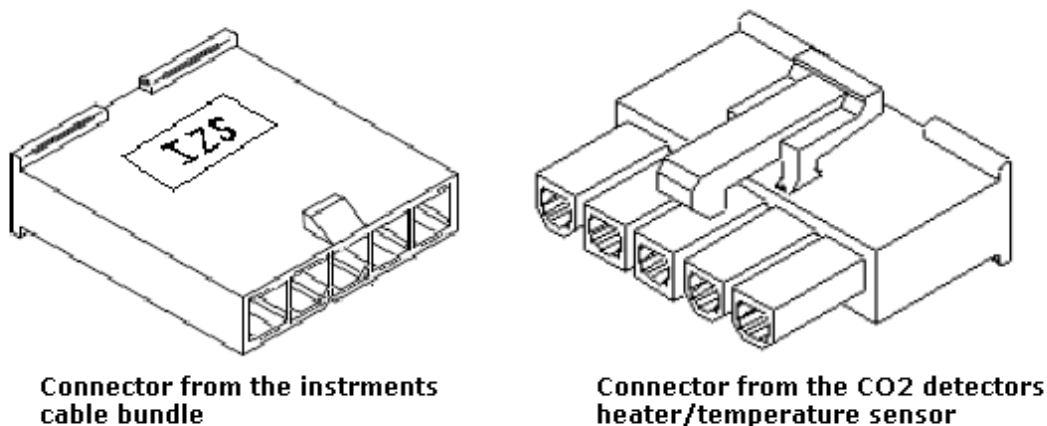


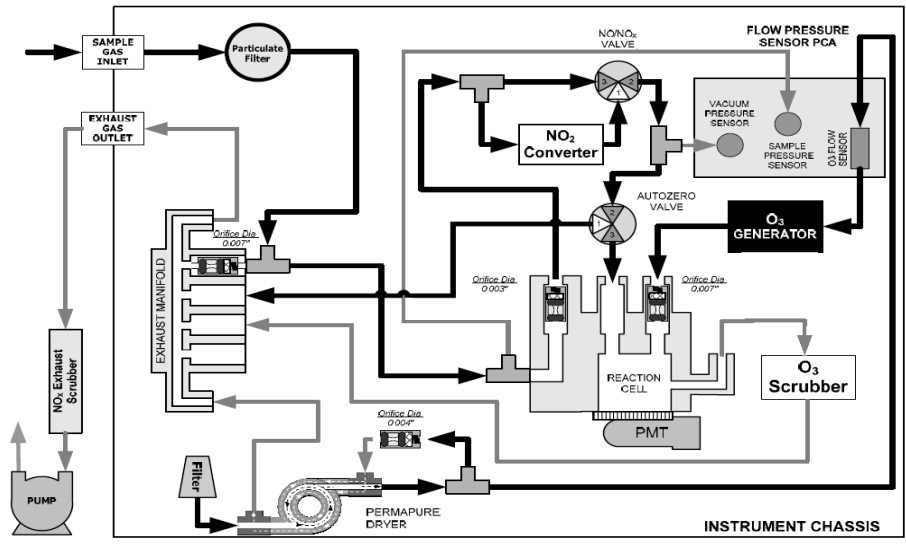
FIGURE #7

17. Connect the Orange sensor cable to the top of the CO₂ sensor and secure the locking ring.

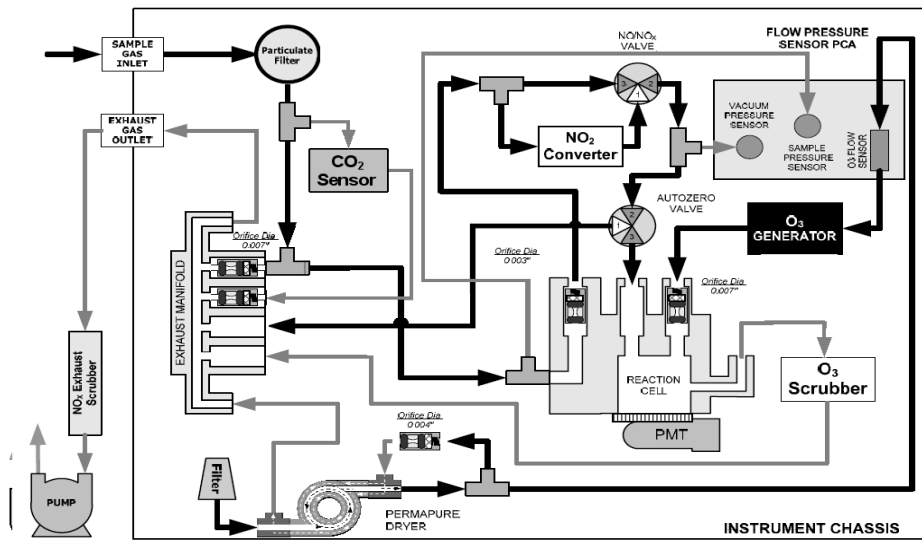
18. Install the replacement Disk On Chip containing the instruments new firmware. Refer to service note 03-013 for instruction on changing the analyzers firmware by replacing the D.O.C.
19. See the Cover Letter included in your kit for calibration instructions.

VI. M200EH with a 3 port reaction cell, old configuration:

20. Follow the CO₂ Module installation procedure in section V. **PROCEDURE.** For the pneumatic layout refer to Figure #8.



M200EH Pneumatic Diagram



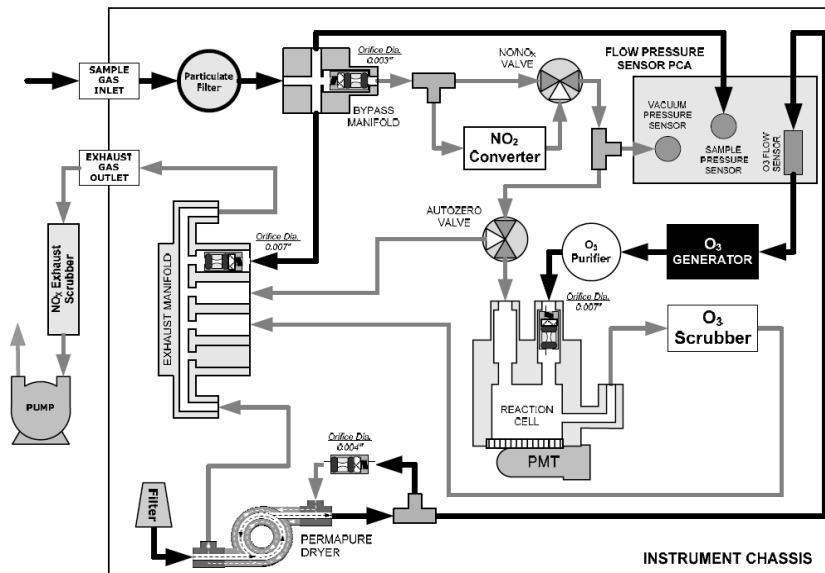
M200EH Pneumatic Diagram with CO₂ Sensor option

FIGURE #8

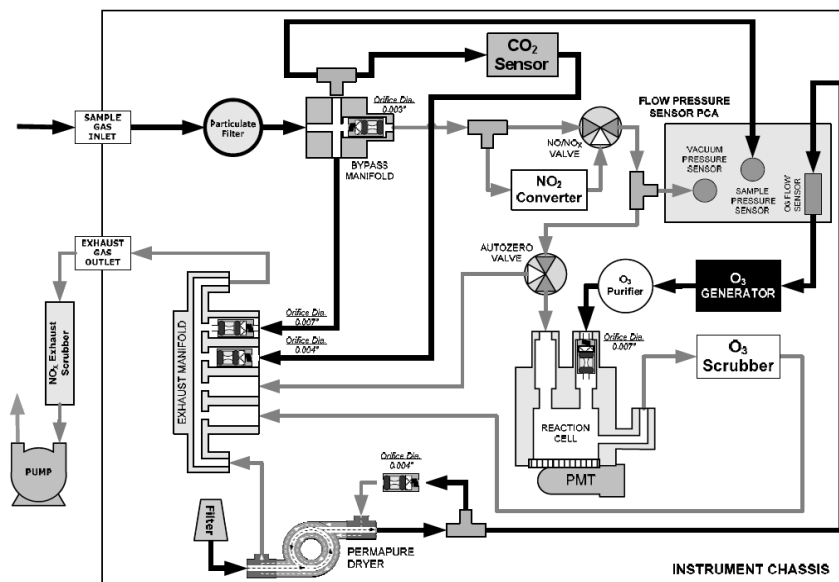
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VII. M200EH with the oldest configuration 2 port reaction cell:

21. Follow the CO₂ Module installation procedure in section **IV**.
PROCEDURE.
22. Locate the bypass flow manifold. On the bypass flow manifold, locate and remove the pneumatic tube and fitting that leads to the sample pressure sensor, see figure #9.
23. Take the Tee fitting from your kit and using Teflon tape, wrap the threads twice with the tape. Install the new fitting into the port mentioned in step 22, see figure #9.
24. Attach the pneumatic tube that leads to the sample pressure transducer that was disconnected in step 22 to one of the empty ports of the Tee fitting from step 23.
25. Install the 8-inch Teflon tube that came with your kit onto one of the open ports of the newly installed Tee fitting from step #23.
26. Locate the 1/8th inch clear pneumatic tube attached to the INLET of the CO₂ sensor, see figure #4. Connect this tube to the open port on the Tee fitting from step 23, See figure # 9.
27. Locate the port on the exhaust manifold next to the bypass flow port and remove it's fitting. Install the flow control assembly that came with your kit into this unused port, see figure #3.
28. Locate the 1/8th inch clear pneumatic tube attached to the OUTLET of the CO₂ sensor. Connect this tube to the flow control assembly from step 27; See figure #'s 3, #4 and #9.
29. Follow step's 11-17of section **V**. for connecting the CO₂ sensor electrically.
30. Install the replacement Disk On Chip containing the instruments new firmware. Refer to service note 03-013 for instruction on changing the analyzers firmware by replacing the D.O.C.
31. See the Cover Letter included in your kit for calibration instructions.



M200EH Internal Pneumatic Block Diagram - Standard Configuration



M200EH - Internal Pneumatics with CO₂ Sensor

FIGURE #9

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