



**97-030 Rev B
2 May, 2007**

CHANGING RANGES ON THE M200 FOR 1,000 PPB, 20,000 PPB AND 100 PPM

SCOPE:

To allow the analyzer to be changed to 1,000 PPB, 20,000 PPB and 100 PPM ranges.

TOOLS REQUIRED:

- 1 - 46.4K Ω ¼ watt 1% resistor
- 1 - 1 K Ω ¼ watt 1% resistor
- 1 - 499 Ω ¼ watt 1% resistor
- 1 - on/off switch
- 1 - EEROM programmed for:
 - PHYS_RANGE 0 = 1,000
 - 1 = 20,000
 - 2 = 100

PROCEDURE:

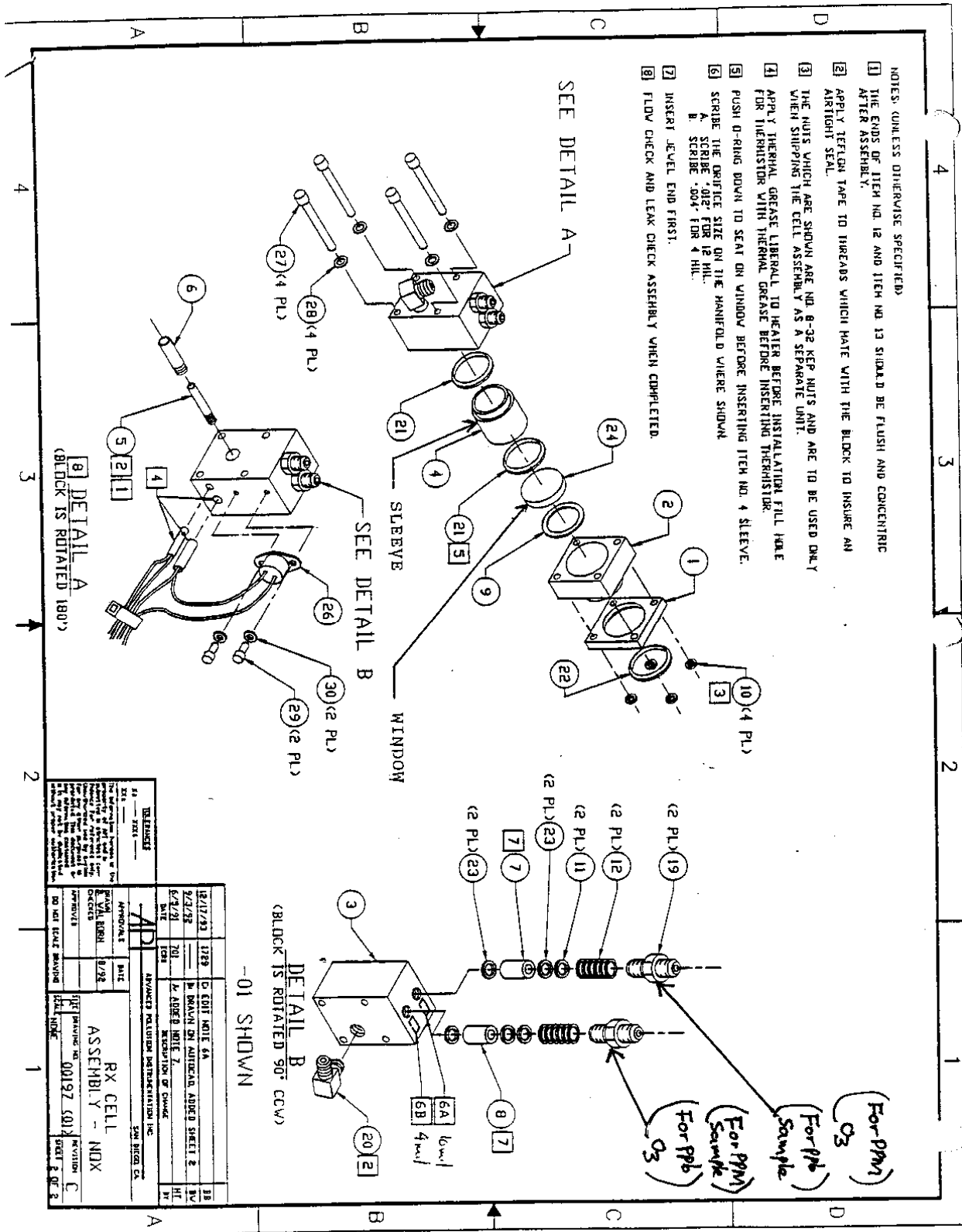
1. The mixer card will need new resistors. The R30 needs to be 46.4 K Ω ; R17 needs to be 1K and R9 needs to be 499 Ω . All resistors are ¼ watt, 1% tolerance.
2. The software ranges need to be
 - a. PHYSRANGE 0=1,000
 - b. PHYSRANGE 1=20,000
 - c. PHYSRANGE 2=100This needs to be accomplished with a computer.
3. A switch must be added to W-2 on the mixer board. One way is to solder 2 wires into W-2 and bring them out to a switch. When the switch is shorted, it will then drive the instrument into the 100 PPM range.
4. A new prom is needed. The prom is 210F2CND.0_0.
5. All hardware and software modifications are now installed and the rest can be accomplished through the front panel. For example, for 1,000 PPB range,
 - a. switch to W-2=OFF
 - b. set the range to 1,000
 - c. set the units to PPB
 - d. set the dilution factor to 1
 - e. adjust the HVPS to 700 VDC
 - f. move the tubes on the top of the reaction cell (Rx Cell) so that the sample to the Rx Cell goes to the back of the Rx Cell (farthest away from the ¼" elbow on the front of the Rx Cell). See the attached diagram for reference.

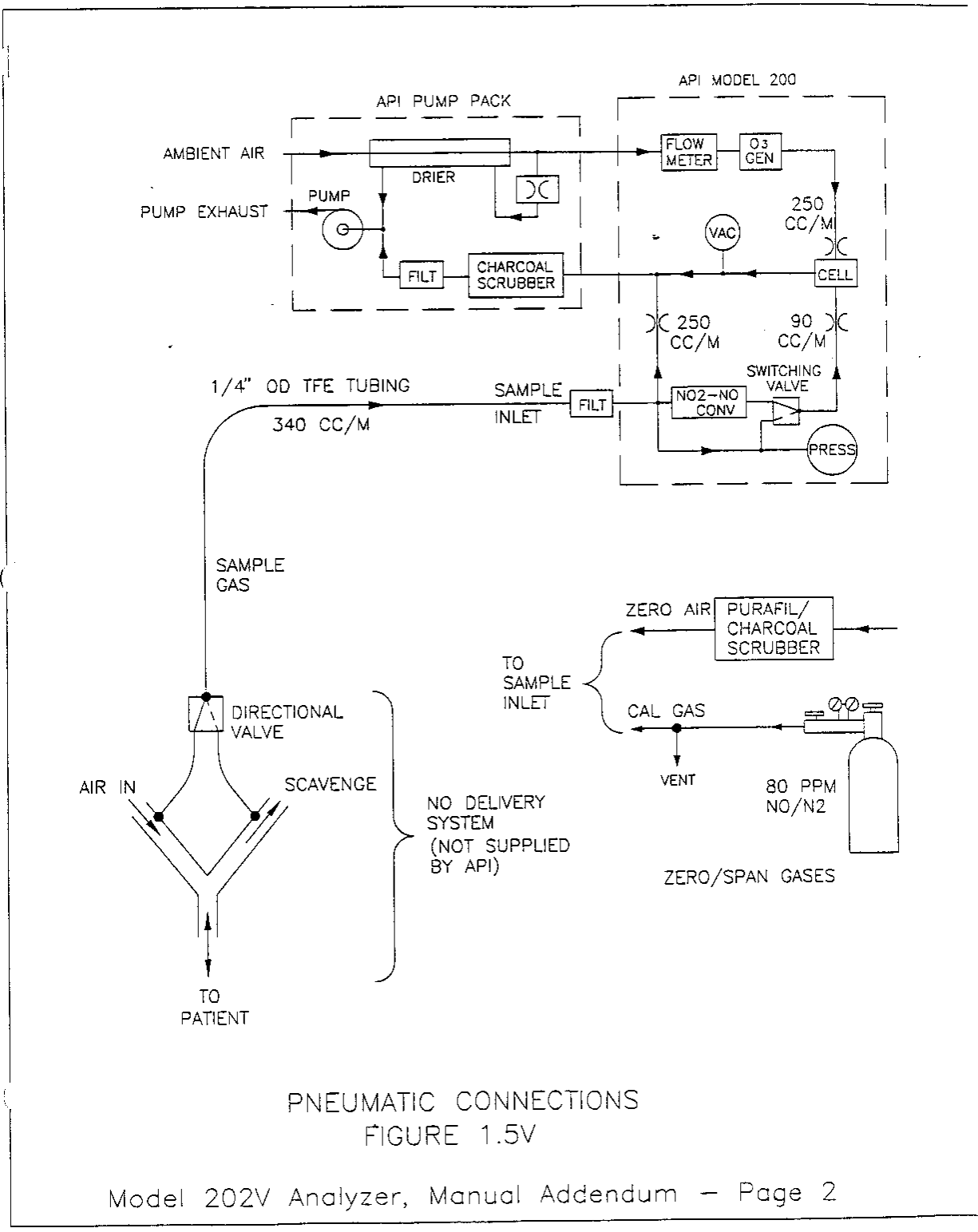
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6. Now use approximately 800 PPB of NO calibration gas and calibrate the M200. Follow the Quick Cal procedure attached.
For the 20,000 PPB range,
 - a. switch to W-2=OFF
 - b. set the range to 20,000
 - c. set the units to PPB
 - d. set the dilution factor to 1
 - e. adjust the HVPS to 700 VDC
 - f. follow instructions for 1,000 PPB range
7. Now use approximately 16,000 PPB of NO calibration gas and calibrate the M200.
For 100 PPM range,
 - a. switch to W-2=ON
 - b. set the range to 100
 - c. set the units to PPM
 - d. set the dilution factor to 1,000
 - e. set the HVPS to 400 VDC
 - f. move the tubes on the top; of the Rx Cell so that the sample to the Rx Cell goes to the front of the Rx Cell (closest to the $\frac{1}{4}$ " elbow on the front of the Rx Cell). The ozone tube goes to the back of the Rx Cell (farthest away from the $\frac{1}{4}$ " elbow on the front of the Rx Cell). See attached diagram for reference.
8. Now use approximately 80 PPM of NO calibration gas and calibrate the M200. Follow the Quick Cal procedure attached. Once the software and mixer card are set up, steps A-F are all that is necessary to accomplish 1,000 PPB range to 100 PPM.





PNEUMATIC CONNECTIONS
FIGURE 1.5V