

## MEASURING AND ADJUSTING CO<sub>2</sub>

MODELS: 250SX, 250SXO, 635ES, 635ESO



### WARNING

LP & NG ARE EXTREMELY FLAMMABLE SO TAKE EXTRA PRECAUTIONS WHEN PERFORMING ANY WORK TO THE HEATER

The CO<sub>2</sub> levels can only be adjusted by a certified gas technician with a calibrated CO<sub>2</sub> analyzer.



One factor that may affect CO<sub>2</sub> levels is improper gas pressure. Please see bulletin QB48 for the procedure to measure gas pressure and record your findings below:

Static Gas Pressure:  " WC

P1 Operating Pressure:  " WC

The P1 minimum operating pressure is 5" WC for Natural Gas and 11" WC for Propane. Do not proceed in adjusting CO<sub>2</sub> until pressure has been verified to be at or above these levels, but not to exceed 14" WC.

#### A. Once Pressure is good:

1. Turn ON/OFF switch to the OFF (O) position.
2. Remove brass flat head screw on the exhaust collar as seen in Fig. 1.
3. Insert CO<sub>2</sub> analyzer probe into the measuring port. The tip of the probe should be in the center of the flue pipe (approx 1.5" inserted).
4. While holding the Program (M) button, move the ON/OFF switch to ON (I) position (see fig 2). As soon as '188' flashes on the display, release the Program button. The display should now read P2.

#### B. Measuring CO<sub>2</sub> (Cover Installed):

1. Open hot water taps to achieve a flow rate of at least 4 gallons per minute. (1 tub and 2 sinks should be sufficient)
2. Record the CO<sub>2</sub> reading in P2 on the next page. (Analyzer reading may take several minutes to stabilize)
3. Press the '+' button until P1 appears. Unit will ramp up to high fire and the flow should increase.
4. Record the CO<sub>2</sub> reading in P1 on the next page.

FIGURE 1

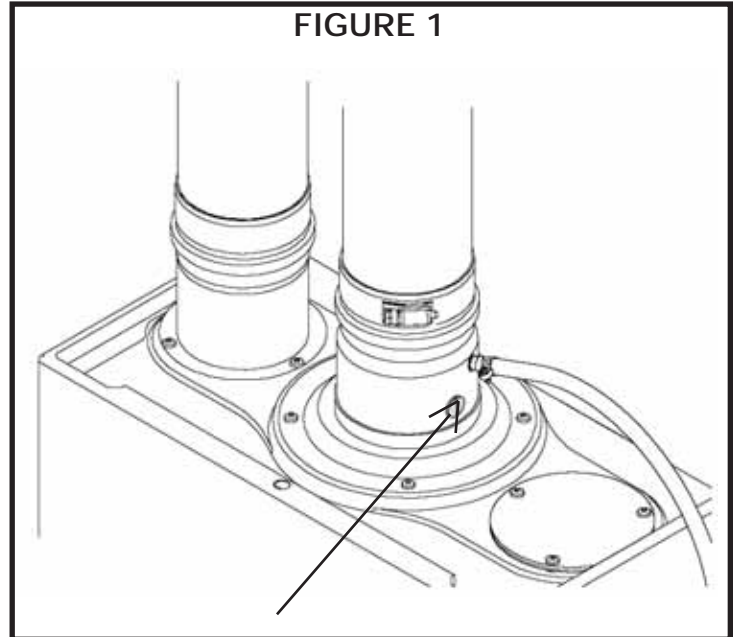
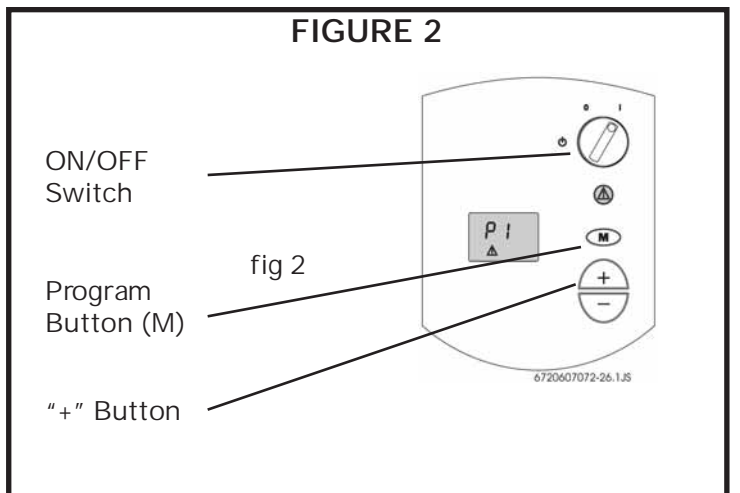


FIGURE 2



## MEASURING AND ADJUSTING CO<sub>2</sub>

 P2 CO<sub>2</sub> Reading:  % CO<sub>2</sub>

 P1 CO<sub>2</sub> Reading:  % CO<sub>2</sub>

5. Compare your readings to those found in table 1 under the “With Front Cover” column. If CO<sub>2</sub> readings are off make adjustments as outlined below.

**Note: The “Without Front Cover” column gives approximate values with the cover off to ease the adjustment process. Final readings should be taken with the cover on.**

### C. Adjusting CO<sub>2</sub>:

**Note: P1 adjustment will change the P2 reading. Confirm the P1 value BEFORE adjusting the P2 level.**

1. P1 CO<sub>2</sub> level off:
  - a. Loosen yellow painted Philips screw and cover should rotate down revealing a brass slotted screw. (fig. 3)
  - b. Adjusting the brass slotted screw counter clockwise will raise P1 CO<sub>2</sub> levels and clockwise will lower P1 CO<sub>2</sub> levels.
2. P2 CO<sub>2</sub> level off:
  - a. Remove yellow painted #40 Torx cover from the front of the gas valve. (fig. 4) A plastic #40 Torx screw will be revealed.
  - b. Adjusting the plastic #40 Torx screw counter clockwise will lower P2 CO<sub>2</sub> levels and clockwise will raise P2 CO<sub>2</sub> levels.

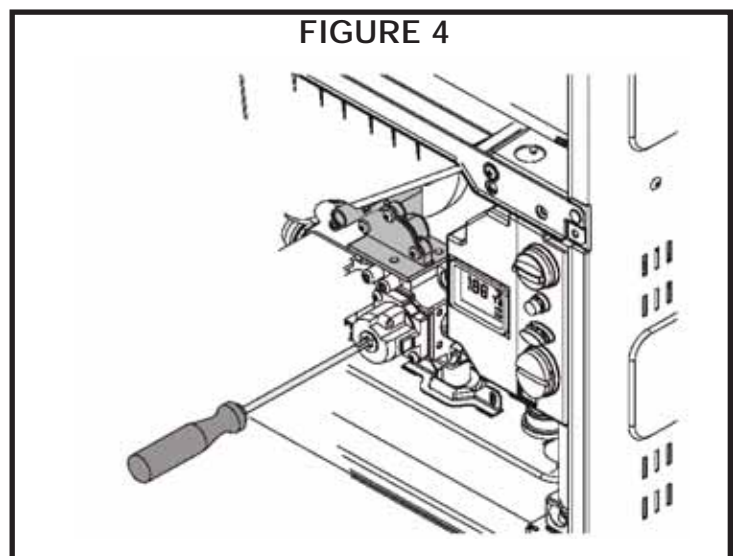
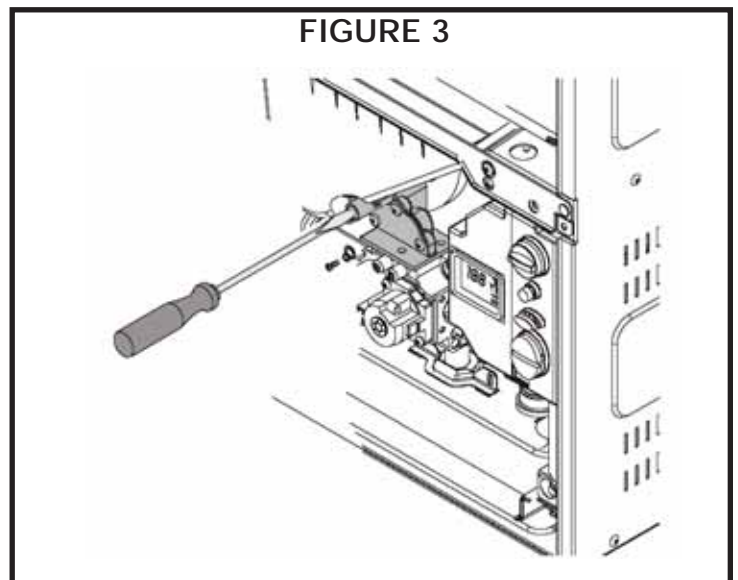
**Note: These screw adjustments are very sensitive and may take several minutes to stabilize.**

3. Verify both P1 and P2 are within the ranges specified in table 1 under the “With Front Cover” column. Repeat steps 1 and 2 as necessary until CO<sub>2</sub> values are within the specified ranges.

### D. Returning to Service:

1. Return slotted cover to original position.
2. Reinstall Torx cover.
3. Remove CO<sub>2</sub> analyzer probe and reinstall brass flathead screw in exhaust collar.
4. Turn ON/OFF switch to the OFF (O) position and then back to the ON (I) position.
5. Heater is ready for normal operation.

TABLE 1		
	Without Front Cover	With Front Cover
	Nat. Gas	Nat. Gas
Max Input P1	9.1 ± 0.1 %	9.7 ± 0.1 %
Min Input P2	9.4 ± 0.1 %	9.7 ± 0.1 %
	LP Gas	LP Gas
Max Input P1	10.1 ± 0.1 %	10.7 ± 0.1 %
Min Input P2	10.4 ± 0.1 %	10.7 ± 0.1 %



### FINAL READINGS:

 P2 CO<sub>2</sub> Reading:  % CO<sub>2</sub>

 P1 CO<sub>2</sub> Reading:  % CO<sub>2</sub>