



August 2, 2010

I would like to thank you for your interest in Navien. I realize there have been some concerns regarding CO emissions and proper testing methods.

If Gas & Air Ratio is not set to the correct rate, unburned gas goes through the exhaust vent and will raise the CO level. Gas & Air Ratio is really important for our unit as we use a system known as a premixing burner system.

For proper testing purposes, Navien requires that the unit runs on high fire for five minutes in order for the burner to stabilize in the rate of modulation. Ensure that the fresh air inlet screen is clear and free of any type of debris. Testing should be performed with a digital combustion analyzer while in high fire at either the termination outside or a minimum of one foot from the exhaust collar. This is to ensure that we are testing in the exhaust airstream. If testing is performed in the airstream and a test hole is made for testing, this hole should be properly sealed after testing is complete. The use of the aluminum foil tape is acceptable.

Navien allows levels up to 400 PPM in accordance with ANZI Z21.10.3 standard. This standard states that a water heater shall not produce flue gases which contain carbon monoxide in excess of 0.04 percent (400 PPM), on an air free basis, in a sample of the flue gases at a maximum input rate. If CO Level is higher than 400 PPM, there could be two main causes.

1st - Really high or really low gas pressure.

➔ Must correct gas pressure because we are using a premix system and it requires correct Air & Gas ratio to be correct for proper burn.

2nd - Manifold gas pressure.



➔ Within the unit the Air & Gas ratio pressures are not set correctly. Using a dual port manometer we can adjust these settings to attain proper mixture within the unit as attached.

After adjusting Air & Gas ratio, the CO levels should be below the 400 PPM level.

I am attaching instructions on how to adjust the Air & Gas ratio.

If there are any questions or concerns, please feel free to contact me.

Regards,

Navien Technical Department
1-800-519-8794

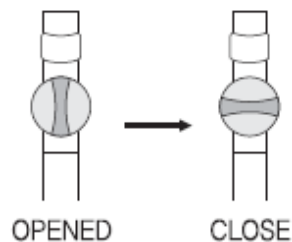
13.1 How to Check Inlet Gas Pressure

The Navien water heater cannot operate properly without sufficient inlet gas pressure and volume. Below are instructions on how to check the inlet gas pressure.

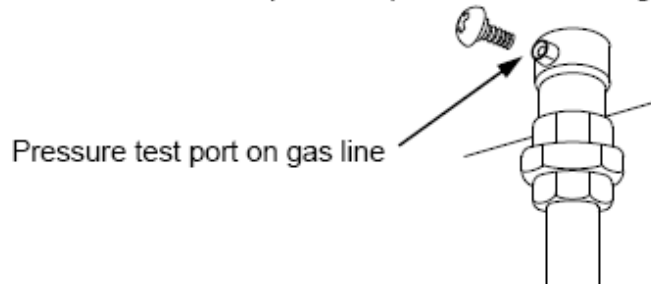
THIS SECTION IS ONLY TO BE DONE BY A LICENSED PROFESSIONAL

Procedure to measure the inlet gas pressure :

1. Shut off the manual gas valve on the supply gas line.
2. Open a hot faucet. The unit should turn on and the gas in the gas pipe line should purge. Leave the faucet on to keep the unit running until the unit shuts down due to lack of gas supply. Then shut off the hot faucet.



3. Remove the screw for the pressure port located on the gas inlet of the water heater.



4. Connect a manometer to the pressure port and reset it to zero.
5. Re-open the manual gas valve. Check to see that there are no gas leaks.
6. Open multiple fixtures that have high flow rates (bathtub, showers, kitchen sink) to ramp the water heater up to its maximum burn.
7. When the Navien water heater is at maximum burn, check the inlet gas pressure reading on the manometer; it should read between 5"~10.5" W.C for Natural gas between 8.0"~13.5" W.C for Liquid Propane.
8. The maximum inlet gas pressure must not exceed the value specified by the manufacturer and that the minimum value listed is for the purposes of input adjustment.



Procedure to measure the gas-air pressure setting :

1. Close the gas shut off valve on the supply gas line.
2. Remove four screws securing the front panel. Remove front panel
3. Connect a manometer of pressure gauge to the gas pressure sensor tube (high pressure) and the air pressure sensor tube (low pressure) like following picture in next page.
4. Re-open the gas shut off valve. Check to see that there are no gas leaks.
5. Set the DIP switches for the 3rd stage minimum operation mode(#1:ON, #2:ON).
Open a hot faucet.
6. When the Navien water heater is burning at the 3rd stage minimum, check the gas-air pressure difference reading on the manometer. Compare the gas-air pressure difference with FACTORY setting chart in bottom page. When the gas-air pressure difference is out of standard range, adjust the pressure difference by rotating the proportional valve. (refer to the following picture in next page)
7. Shut off the hot faucet after checking and adjusting the gas-air pressure difference.
8. Set the DIP switches for the 3rd stage maximum operation mode(#1:ON, #2:OFF).
Open a hot faucet that have high flow to ramp the water heater up to its maximum burn.
9. When the Navien Water Heater is burning at the 3rd stage maximum, check the gas-air pressure difference reading on the manometer. Compare the gas-air pressure difference with FACTORY setting chart in bottom page. When the gas-air pressure difference is out of standard range, adjust the pressure difference by rotating the variable resistance on the PCB board (Controller). (refer to 42 page)
10. Shut off the hot faucet after checking and adjusting the gas-air pressure gap.
Close the gas shut off valve. Set the DIP switches for normal mode and replace tubes.

13.3 Standard Setting Chart of the Gas-Air Pressure

Model	Type	Gas-Air Pressure Difference	
		3 Stage Min. Burn	3 Stage Max. Burn
NR/NP-180(A)	Natural Gas	0.87" \pm 0.06" W.C	2.68" \pm 0.08" W.C
NR/NP-180(A)	Propane Gas	1.57" \pm 0.06" W.C	4.60" \pm 0.08" W.C
NR/NP-210(A)	Natural Gas	0.67" \pm 0.06" W.C	1.73" \pm 0.08" W.C
NR/NP-210(A)	Propane Gas	1.30" \pm 0.08" W.C	3.19" \pm 0.08" W.C
NR/NP-240(A)	Natural Gas	0.67" \pm 0.06" W.C	2.20" \pm 0.08" W.C
NR/NP-240(A)	Propane Gas	1.30" \pm 0.08" W.C	3.86" \pm 0.08" W.C

