

Navien Condensing Water Heater

Propane Gas Conversion Guide

(Altitude : 0 - 10,100 ft)
Do Not use for Natural gas

Model

NPE-180A2/210A2/240A2
NPE-150S2/180S2/210S2/240S2

This Water Heater is configured for Natural Gas at the factory.

- If conversion to Propane Gas is required by the Water heater, use the Propane CONVERSION KIT supplied with the water heater.

Note

- For NG high altitude conversion, use the HIGH ALTITUDE CONVERSION KIT.
- For LP high altitude conversion, use the PROPANE CONVERSION KIT. Note that the Gas Orifice from the PROPANE CONVERSION KIT covers the water heater's installation at an altitude of 0 to 10,100 ft.

WARNING

This conversion kit must be installed by a qualified service agency* in accordance with Navien's instructions and all applicable codes and requirements of the authority having jurisdiction. The information in these instructions must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death. The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.

* A qualified service agency is any individual, firm, corporation or company which either in person or through a representative is engaged in and is responsible for the connection, utilization, repair or servicing of gas utilization equipment or accessories; who is experienced in such work, familiar with all precautions required, and has complied with all of the requirements of the authority having jurisdiction.

In Canada: The conversion shall be carried out in accordance with the requirements of the provincial authorities having jurisdiction and in accordance with the requirements of the CAN-B149.1 and CAN1-B149.2 Installation Code.

Tools Required:

- Phillips Screwdriver
- Flathead Screwdriver
- ⁵/₃₂ in or 4 mm Allen Wrench
- Combustion Analyzer or Dual Port Manometer
- Gas Leak Detector

4. Use a Phillips screwdriver to remove the two screws at Location A - the connection below the Gas Valve where it connects to the pipe. See Figure 3 for reference. Once the screws are removed, carefully separate the pipe from the Gas Valve.
5. Once the gas inlet pipe is detached from the Gas Valve, find Location B - the connection above the Gas Valve where it is attached to the Fan Motor Assembly. Carefully remove the four screws by hand using a Phillips screwdriver and pull the Gas Valve away from the Fan Assembly to access the Gas Orifice.

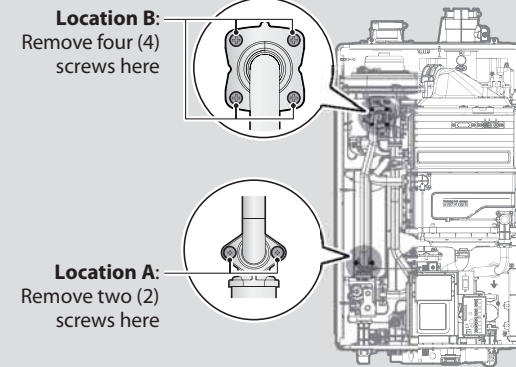


Figure 3. Detaching Gas Valve from Gas Inlet Pipe and Fan Motor Assembly

6. Once the Gas Orifice is exposed, remove the two screws that hold the part in place. Remove the Gas Orifice from its housing and prepare the new Gas Orifice for the propane conversion for installation.

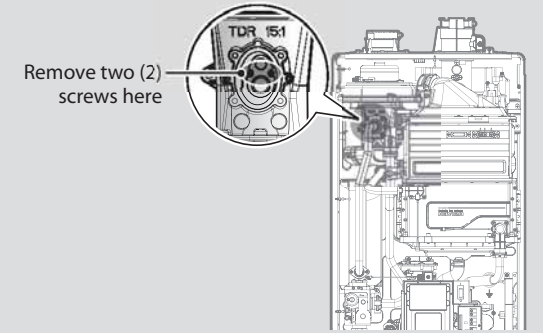


Figure 4. Access to Gas Orifice in Fan Assembly

WARNING

- DO NOT adjust or attempt to measure gas valve outlet pressure. The gas valve is factory-set for the correct outlet pressure. This setting is suitable for natural gas and propane, requiring no field adjustment.
- Attempting to alter or measure the gas valve outlet pressure could result in damage to the valve, causing potential severe personal injury, death or substantial property damage. Navien water heaters are shipped ready to fire natural gas ONLY.

Included Items:

- Gas Orifice (refer to below table)

NPE-A2/S2 Propane Gas Orifice Identification

Model Type	Gas Type	Altitude	Orifice	Orifice Size
NPE-150S2	Propane Gas	0 - 10,100 ft		Ø5.10
NPE-180A2/S2		0 - 10,100 ft		Ø3.65 / Ø4.95
NPE-210A2/S2 NPE-240A2/S2		0 - 10,100 ft		Ø3.90 / Ø5.65

Table 1. Orifice Size

WARNING

- Be careful not to confuse the PROPANE CONVERSION KIT and HIGH ALTITUDE CONVERSION KIT. Do NOT use the HIGH ALTITUDE CONVERSION KIT for natural gas when converting to propane gas.
- Make sure that the conversion is completed with the proper orifice. If the installed orifice does not conform to the specifications in Table 1, incomplete combustion may occur, resulting in personal injury or property damage.

Procedure:

1. Turn off both gas and water supply to the water heater.
2. Using a Phillips hand screwdriver, remove 4 screws (2 from the top and 2 from the bottom) of the front cover assembly to gain access to the internal components. See Figure 1 for illustration of the front cover on the unit.



Figure 1.

NPE-A2/S2 Series Front cover

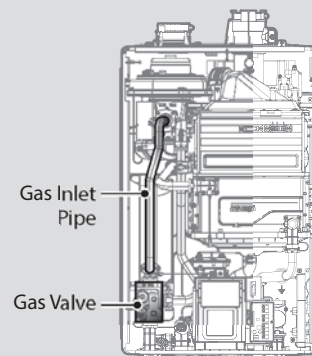


Figure 2. NPE-A2/S2 Series Internal Components

3. Once the front cover is removed, place it in a safe location to prevent accidental damage. With the internal components exposed, locate the gas inlet pipe and the Gas Valve near the left side of the unit which are highlighted in Figure 2.

1 3
2 4

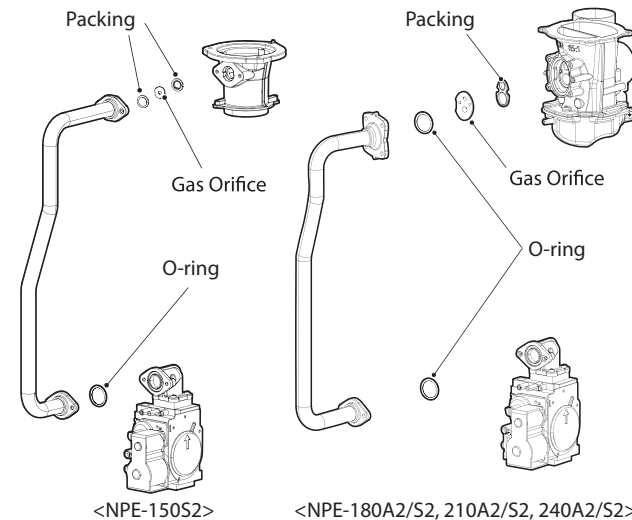


Figure 5. Exploded view of Gas assembly

DANGER

See Figure 5. Inspect the O-ring between the gas valve and gas valve inlet adapter whenever they are disassembled. The O-ring must be in good condition and must be installed. Failure to comply will cause a gas leak, resulting in severe personal injury or death.

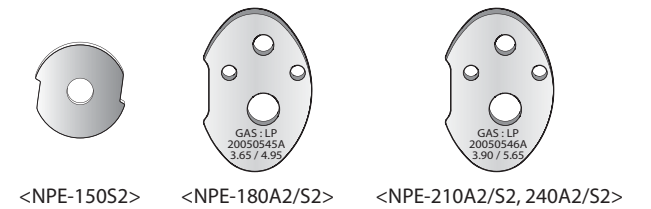
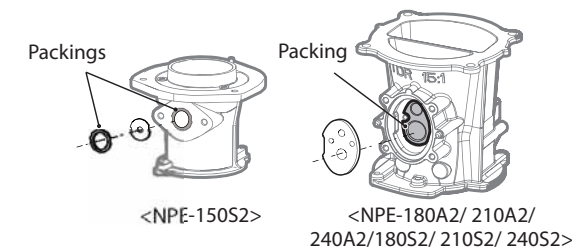


Figure 6. Orifice identification

7. Remove the Gas Orifice, ensure that the packing is properly seated inside the port, and then install the new Gas Orifice. Ensure that the Orifice is properly seated on the packing inside the port before proceeding to the next step.



8. Replace the gas inlet pipe to its original position and use all screws to secure all connections.

Note

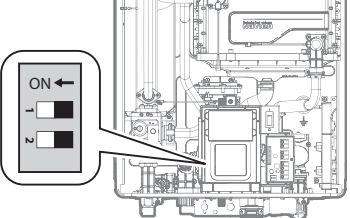
Do not overtighten as this may damage or crack the components.

**DANGER**

Inspect the O-ring between the gas valve and gas valve inlet adapter whenever they are disassembled. The O-ring must be in good condition and must be installed. Failure to comply will cause a gas leak, resulting in severe personal injury or death.

**WARNING**

Ensure that you have turned off the power to the water heater before accessing the DIP switches.



Switch	Function	Setting	
1	Gas Type	Natural Gas	OFF
		Propane Gas	ON

9. When converting to propane gas, configure the DIP switch setting as shown below.
- a. Set front panel DIP switch 1 to ON to change the gas type.

b. Turn on the power to the water heater. Then, error 788 will occur.

12. Measure and adjust the gas/air ratio.
- Option 1. Using Combustion Analyzer (recommended)
- a. Open the cover of the emissions monitoring port as shown in Figure 7.

b. Insert the analyzer into the port.

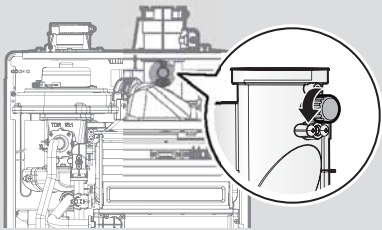


Figure 7

Water Heater	Altitude	Fuel	High Fire	Low Fire
			%CO ₂	%CO ₂
NPE-150S2	0 - 10,100 ft	Propane Gas	10.7	11.0
NPE-180A2 NPE-180S2	0 - 10,100 ft	Propane Gas	10.5	10.7
NPE-210A2 NPE-210S2	0 - 10,100 ft	Propane Gas	10.5	10.7
NPE-240A2 NPE-240S2	0 - 10,100 ft	Propane Gas	10.5	10.7

Table 2. CO₂ and CO value
(CO₂ values must be within 0.5% of the values listed.)

- c. In error display mode, press the Back button (↩) to execute the Gas Type Check menu under Start-Up Wizard.

d. Set the Gas Type Check option to Propane Gas.

e. When the gas type is identified as changed in the Gas Conversion Kit Required option, the error is cleared and the water heater starts to operate normally.
10. Set the panel setting corresponding to the installation altitude.
- a. Press and hold the Menu button (M) and the Back button (↩) simultaneously for 3 seconds on the front panel to access the Service/Installer menu.

b. Select **1. Installer Menu > 2. Parameter Settings > 14. Altitude Setting** by pressing the OK button (OK) and set up the altitude.

Function	Menu	Description
Altitude Setting	1. Installer Menu	1. 0-2,000 ft
	1.2. Parameter Settings	2. 2,000-5,400 ft
	1.2.14. Altitude Setting	3. 5,400-7,700 ft
		4. 7,700-10,100 ft

11. Turn on the gas and water supply to the water heater.

**DANGER**

Failure to properly set up the altitude could cause carbon monoxide poisoning, resulting in severe personal injury or death.

- c. Fully open several hot water fixtures and set the water heater to operate at 1-stage MIN mode (refer to page 8). Measure the CO₂ value at low fire. If the CO₂ value is not within 0.5% of the value listed in Table 2, the gas valve set screw will need to be adjusted. If adjustment is necessary, locate the set screw as shown in Figure 8. Using a ⁵/₃₂ in or 4 mm Allen wrench, turn the set screw no more than ¹/₄ turn clockwise to raise or counterclockwise to lower the CO₂ value.

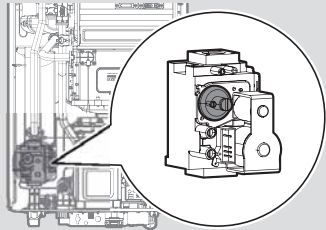


Figure 8. Set Screw Location

Note The set screw is located behind the screw-on cover. This must be removed first.

- d. Fully open several hot water fixtures and set the water heater to operate at 2-stage MAX mode (refer to page 8). Measure the CO₂ value at high fire. If the CO₂ values do not match Table 2 at high fire, do not adjust the gas valve. Check for the proper Gas Orifice.

**DANGER**

Improper gas valve settings can cause severe personal injury, death or substantial property damage.

- Option 2. Using Digital Manometer
- a. Open the offset pressure port by loosening the screw two turns as shown in Figure 9.

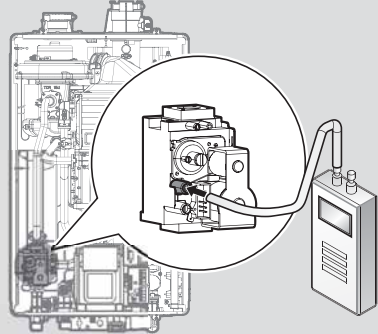


Figure 9

- b. Connect a manometer to the offset pressure port. For dual port manometers, use the positive pressure side.

Model	Altitude	Kit Part No.	Gas Type	Offset
NPE-150S2	0 - 10,100 ft	NAC-L150	Propane Gas	-0.03 in ± 0.01 in
NPE-180A2 NPE-180S2	0 - 10,100 ft	NAC-L180	Propane Gas	-0.02 in ± 0.01 in
NPE-210A2 NPE-210S2	0 - 10,100 ft	NAC-L210	Propane Gas	-0.02 in ± 0.01 in
NPE-240A2 NPE-240S2	0 - 10,100 ft	NAC-L240	Propane Gas	-0.02 in ± 0.01 in

Table 3. Offset value for low fire

13. Once the CO₂ or offset values have been confirmed, apply the included conversion stickers to show that the appliance has been converted to propane gas. Place this labels adjacent to the rating plate as shown in Figure 11.

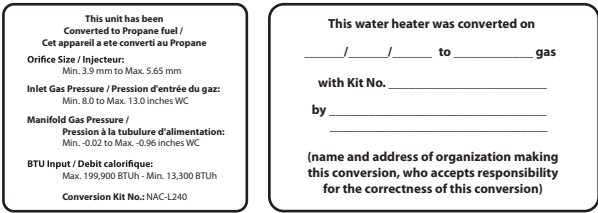


Figure 11. Proper Placement of Gas Conversion Labels

Note Manifold Gas Pressure ratings can change due to updated orifice sizes. Please confirm new manifold pressures approved by CSA before production of gas conversion labels.

- c. Fully open a hot water fixture and set the water heater to operate at 1-stage MIN mode (refer to page 8). Measure the offset value at low fire and compare it to the values in Table 3. If the offset value is out of range, the gas valve set screw will need to be adjusted. If adjustment is necessary, locate the set screw as shown in Figure 10. Using a ⁵/₃₂ in or 4 mm Allen wrench, turn the set screw no more than ¹/₄ turn clockwise to raise or counterclockwise to lower the offset value.

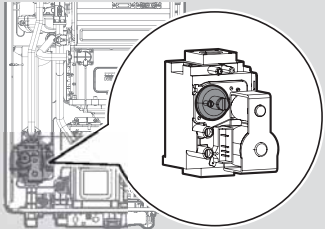


Figure 10

Note The set screw is located behind the screw-on cover. This must be removed first.

- d. At high fire, do not check the offset value and never adjust the gas valve.

**DANGER**

Improper gas valve settings can cause severe personal injury, death or substantial property damage.

Setting the Operation Mode

1. Press and hold the Menu button (M) and the Back button (↩) simultaneously for 3 seconds and then select **4. Special Operations**.
2. Press the Up button (▲) or the Down button (▼) to switch between the special operation modes. Press the OK button (OK) to select a parameter or to run a special operation mode.

Item	Description
1. Normal	Set the water heater to run in the normal mode.
2. 1 st MIN	Set the water heater to run in the 1-stage minimum operation mode.
3. 1 st MAX	Set the water heater to run in the 1-stage maximum operation mode.
4. 2 nd MIN	Set the water heater to run in the 2-stage minimum operation mode.
5. 2 nd MAX	Set the water heater to run in the 2-stage maximum operation mode.

3. Press the Back button (↩) to return to the previous screen or menu.

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