Navien

Non-Condensing Water Heaters

Gas Conversion Guide

Model

NHW700-120SE/160SE/180SE/199SE
NHW700-160SU/180SU/199SU
NHW700-160AI/180AI/199AI
NHW700-160AE/180AE/199AE

This water heater is configured for Natural Gas or Propane Gas from the factory. If a gas conversion is required from Natural Gas to Propane, then the included gas conversion kit must be used and the conversion process must be completed by a qualified service agency to ensure a proper conversion and operation as specified in this manual.

⚠ DANGER

Do not perform a gas conversion without an officially approved conversion kit and the instructions supplied by Navien. Gas conversion using any other parts or the failure to strictly conform to conversion instructions will result in excessive carbon monoxide emissions and extremely dangerous conditions which may include but are not limited to fire, explosion, severe personal injury, and/or death.

⚠ WARNING

Fire and Explosion Hazard

To prevent serious injury or death:

- ONLY a qualified service agency* is required to install a conversion kit in accordance with Navien's instructions and all applicable codes and requirements of the authority having jurisdiction.
- 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.

BEFORE starting the gas conversion:

- ALWAYS turn off electrical power supply to the water heater and close the manual gas shut-off valve.
- ALLOW the water heater to cool if it has been operating.

* 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.

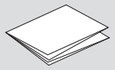
⚠ WARNING

Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

Tools Required:

- Phillips Screwdriver
- Dual Port Manometer
- Gas Leak Detector

Included Items:

		
8 Screws (for Manifold, 4X14) and 2 Screws (for Gas Valve, 4X10)		Spare Gas Valve Gasket
		
Gas Manifold Assembly	Gas Pressure and Conversion Kit Number Labels	Gas Conversion Guide (Installation Manual)

Procedure:

1. Turn off both gas and water supply to the water heater.
2. Remove the two upper screws from the front cover assembly using a Phillips head screwdriver. Then, release the toggle latch 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.

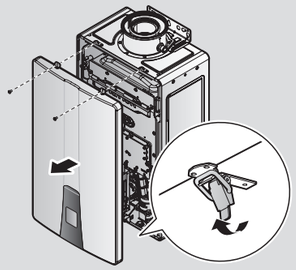
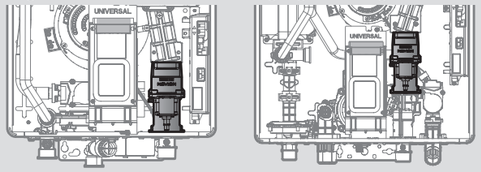


Figure 1. NHW700 Series Front cover

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 right side of the unit which are highlighted in Figure 2.



[SE/SU Models] **[AE/AI Models]**

Figure 2. NHW700 Series Internal Components

4. Use a Phillips screwdriver to detach the Front Panel from the water heater by removing the 2 screws at the bottom of the water heater.

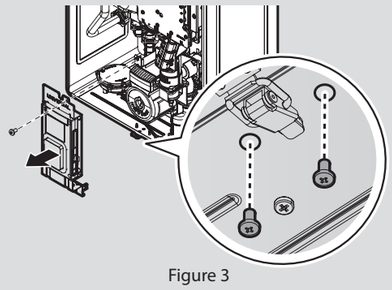


Figure 3

5. Remove the ignition transformer and disconnect the flame detector cable and the multi-stage gas valve cable. Then, remove the 8–10 bolts as shown in Figure 4-2 to detach the original Gas Manifold Assembly from the water heater.
   *AE/AI Models differ only in the shape of the multi-stage valve body.

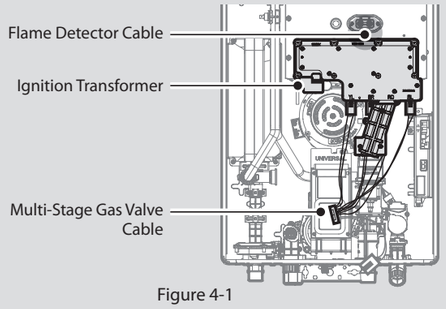


Figure 4-1

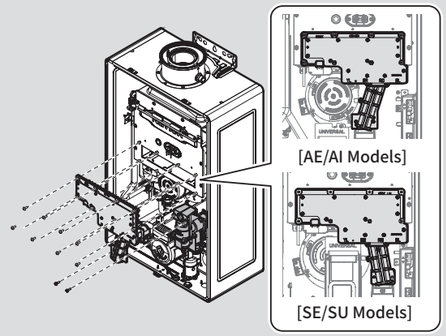


Figure 4-2

6. Reinstall the new Gas Manifold Assembly and the Front Panel to their original positions. (Use the 8–10 bolts for the Gas Manifold Assembly and the 3 screws for the Front Panel.) Then, reinstall the ignition transformer and reconnect the flame detector cable and the multi-stage gas valve cable.

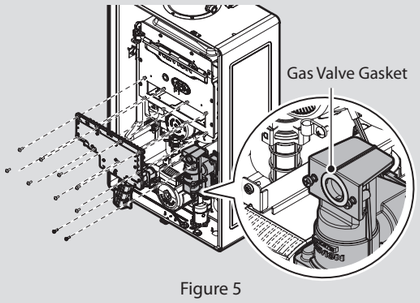
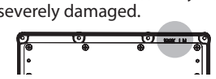


Figure 5

⚠ DANGER

To prevent serious injury or death:

Ensure that the gas you use matches the indicated NG (LN)/LP gas type. Otherwise, the water heater may not operate properly or may become severely damaged.



⚠ WARNING

Fire and Explosion Hazard

To prevent serious injury or death:

Ensure that the Gas Valve Gasket is in place and in good condition. Otherwise, it may result in a dangerous gas leak. Replace if needed.

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

7. Configure the Front Panel DIP switch setting according to the gas type.

⚠ WARNING

To prevent serious injury or death:

- ALWAYS check the panel DIP switch 1 is set according to the supply gas type.
- Be sure to turn off the power before removing the front cover and changing the DIP switch settings.

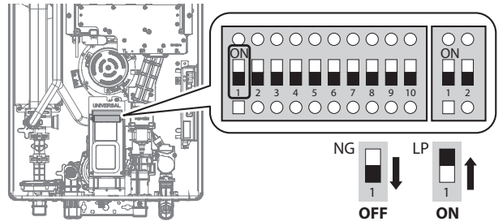


Figure 6-1. NHW700 Universal/Indoor Models

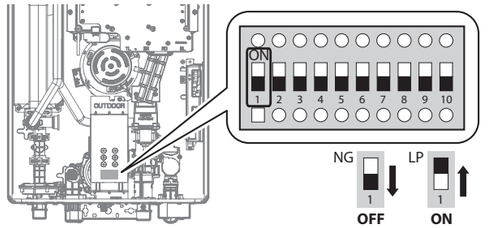


Figure 6-2. NHW700 Outdoor Models

⚠ DANGER

Carbon Monoxide Hazard

To prevent serious injury or death:

- When conversion is required, ALWAYS make sure to set the Front Panel DIP switches according to the supply gas type.
- Failure to properly set the DIP switches could cause carbon monoxide poisoning, resulting in severe personal injury or death.

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

9. Measure and adjust the gas ratio using Manometer.
   a. Open the offset pressure port by loosening the screw.
   b. Before connecting the other end of the hose to the manometer, ensure that the manometer is zeroed.
   c. Connect a silicone hose to the port, ensuring that it is airtight as shown in Figure 7.

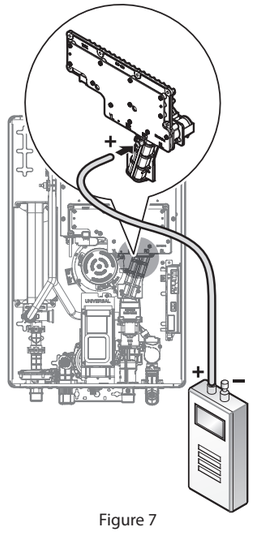
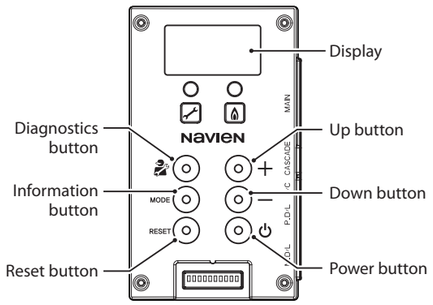


Figure 7

10. Using the panel, run at MIN/MAX as shown in Figure 8 to measure and adjust the gas ratio.
    a. Press the [Diagnostic] button for more than 5 seconds to enter the <Test Information Menu> mode.
    b. In the <Test Information Menu> mode, when the 5.GAS item is displayed in the segment by pressing the [+] or [-] button, press the [Info] button once to enter.
    c. Press the [+] or [-] button to enter "MIN" mode.

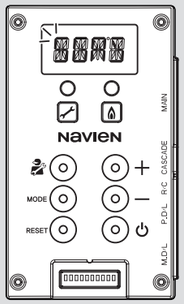
d. If the manifold pressure is out of range and has to be adjusted, adjust the tact switch on the upper part of the controller shown in Figure 10. Press the Up/Down switch on the controller to raise or lower the manifold pressure.

[For Universal/Indoor Models]



[For Outdoor Models]

Figure 8



<Test information Menu>

<Gas pressure Setting mode>

<MIN Setting mode>

<MAX Setting mode>

Figure 9

Gas Type	Model	Manifold Pressure
NG	NHW700-120SE-NG	0.7 ±0.01 inWC
	NHW700-160SE-NG	0.8 ±0.01 inWC
	NHW700-180SE-NG	0.8 ±0.01 inWC
	NHW700-199SE-NG	0.8 ±0.01 inWC
	NHW700-160SU-NG	0.7 ±0.01 inWC
	NHW700-180SU-NG	0.7 ±0.01 inWC
	NHW700-199SU-NG	0.7 ±0.01 inWC
	NHW700-160AE-NG	0.8 ±0.01 inWC
	NHW700-180AE-NG	0.8 ±0.01 inWC
	NHW700-199AE-NG	0.8 ±0.01 inWC
	NHW700-160AI-NG	0.7 ±0.01 inWC
	NHW700-180AI-NG	0.7 ±0.01 inWC
	NHW700-199AI-NG	0.7 ±0.01 inWC
LP	NHW700-120SE-LP	1.3 ±0.01 inWC
	NHW700-160SE-LP	1.4 ±0.01 inWC
	NHW700-180SE-LP	1.3 ±0.01 inWC
	NHW700-199SE-LP	1.3 ±0.01 inWC
	NHW700-160SU-LP	1.3 ±0.01 inWC
	NHW700-180SU-LP	1.3 ±0.01 inWC
	NHW700-199SU-LP	1.3 ±0.01 inWC
	NHW700-160AE-LP	1.4 ±0.01 inWC
	NHW700-180AE-LP	1.3 ±0.01 inWC
	NHW700-199AE-LP	1.3 ±0.01 inWC
	NHW700-160AI-LP	1.3 ±0.01 inWC
	NHW700-180AI-LP	1.3 ±0.01 inWC
	NHW700-199AI-LP	1.3 ±0.01 inWC

Table 1. Manifold differential pressure for low fire

e. Fully open several hot water fixtures and press the [+] or [-] button on the panel to enter "MAX" mode.
f. In the same way as in "MIN" mode, Measure the manifold pressure and compare it to the values in Table 2. If the manifold pressure is out of range and has to be adjusted press the [+] or [-] button on the controller to raise or lower the manifold pressure.

* Refer to Figure 9 for entering and returning to gas pressure setting mode.

⚠ DANGER

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

Gas Type	Model	Manifold Pressure
NG	NHW700-120SE-NG	3.3 ±0.01 inWC
	NHW700-160SE-NG	3.2 ±0.01 inWC
	NHW700-180SE-NG	2.6 ±0.01 inWC
	NHW700-199SE-NG	3.2 ±0.01 inWC
	NHW700-160SU-NG	2.8 ±0.01 inWC
	NHW700-180SU-NG	2.3 ±0.01 inWC
	NHW700-199SU-NG	2.8 ±0.01 inWC
	NHW700-160AE-NG	3.2 ±0.01 inWC
	NHW700-180AE-NG	2.6 ±0.01 inWC
	NHW700-199AE-NG	3.2 ±0.01 inWC
	NHW700-160AI-NG	2.8 ±0.01 inWC
	NHW700-180AI-NG	2.3 ±0.01 inWC
	NHW700-199AI-NG	2.8 ±0.01 inWC
LP	NHW700-120SE-LP	6.4 ±0.01 inWC
	NHW700-160SE-LP	6.1 ±0.01 inWC
	NHW700-180SE-LP	4.9 ±0.01 inWC
	NHW700-199SE-LP	6.0 ±0.01 inWC
	NHW700-160SU-LP	5.8 ±0.01 inWC
	NHW700-180SU-LP	4.5 ±0.01 inWC
	NHW700-199SU-LP	5.4 ±0.01 inWC
	NHW700-160AE-LP	6.1 ±0.01 inWC

Gas Type	Model	Manifold Pressure
LP	NHW700-180AE-LP	4.9 ±0.01 inWC
	NHW700-199AE-LP	6.0 ±0.01 inWC
	NHW700-160AI-LP	5.8 ±0.01 inWC
	NHW700-180AI-LP	4.5 ±0.01 inWC
	NHW700-199AI-LP	5.4 ±0.01 inWC

Table 2. Manifold differential pressure for high fire

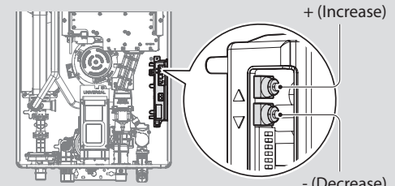
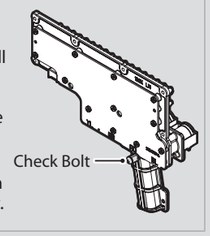


Figure 10

11. When the pressure setting is completed, press the reset button twice to change to <Normal operation mode>.

⚠ DANGER

- After checking the gas differential pressure setting, remove the manometer hose and ALWAYS reinstall the check bolt located on the front of the manifold body. Otherwise, gas may leak, potentially leading to severe personal injury, death, or substantial property damage.
- Ensure the leak prevention gasket is in place when reinstalling the check bolt.



12. Once the manifold pressure values have been confirmed and the gas conversion has been properly completed based on the provided instructions, apply the included conversion stickers to show that the appliance has been converted to natural gas or propane gas. Complete the label and place it adjacent to the rating plate as shown in Figure 11.

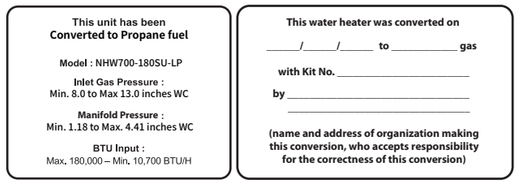


Figure 11. Proper Placement of Gas Conversion Labels

Gas Conversion Check List:

Connecting the Gas Supply	Yes	No
Does the gas supply match the gas manifold assembly and the DIP SW setting?		
Is the gas line at least $^{1}/_{2}$ in or $^{3}/_{4}$ in ID (Inner Diameter)?		
Is the gas supply line sufficient in length and diameter to deliver the required BTUs?		
Have you measured the pressure of the gas supply line?		

Connecting the Gas Supply	Yes	No
Is the gas supply pressure within the recommended ranges specified in this manual?		
Is the gas supply line equipped with a manual full port valve?		
Have you tested the gas line pressure and all fittings for leaks? (Including internal components)		
Has the gas company inspected the installation, if required?		
Have you reinstalled the check bolt located on the front of the gas valve after setting the manifold and feedback differential pressure?		
Have you returned the DIP S/W #1 and #2 settings to OFF after setting the manifold and feedback differential pressure?		

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