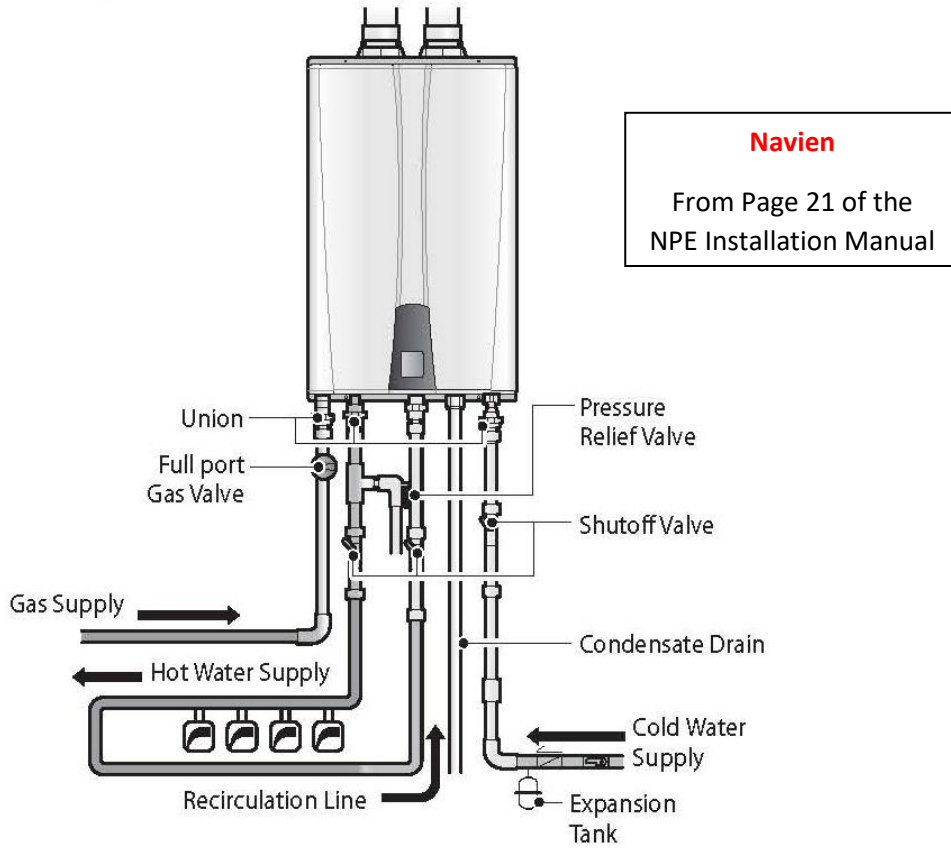




Review of OnDemand Water Heaters and their need for thermal expansion tanks

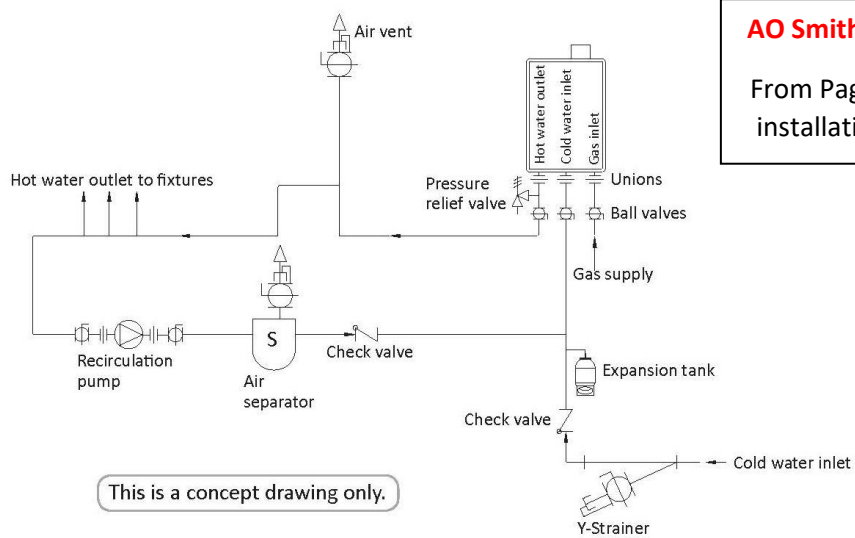


- The following is a typical water piping example for NPE-180A/210A/240A models.



**Navien**  
From Page 21 of the  
NPE Installation Manual

**[NPE-180A/210A/240A]**

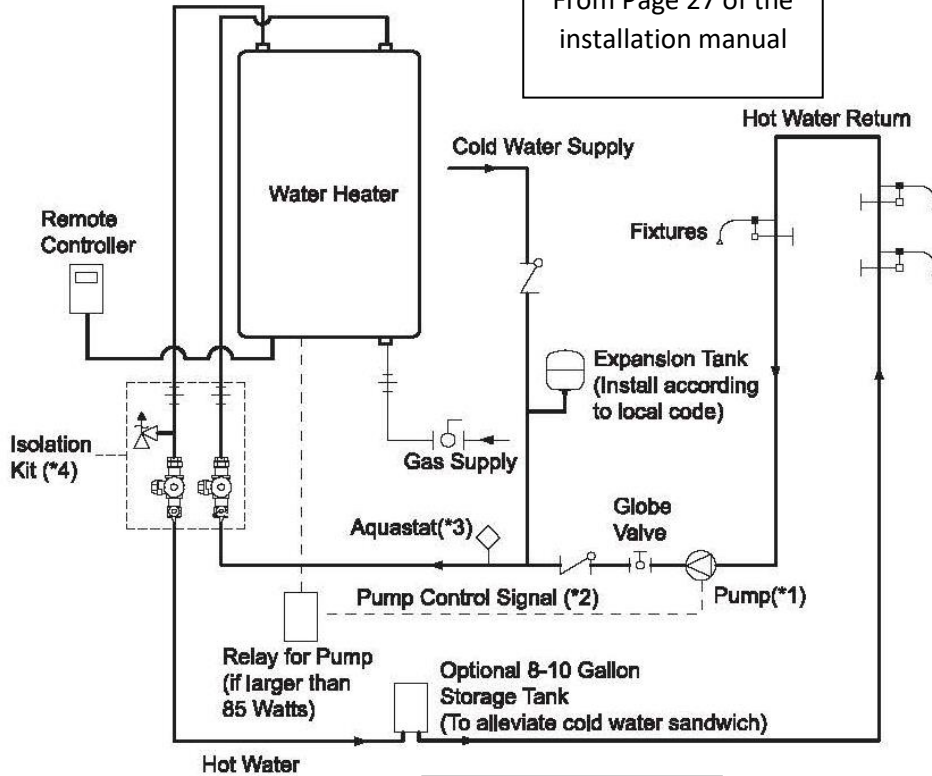


**AO Smith Example 1**  
From Page 40 of the  
installation manual

This is a concept drawing only.

**Noritz Example 1**

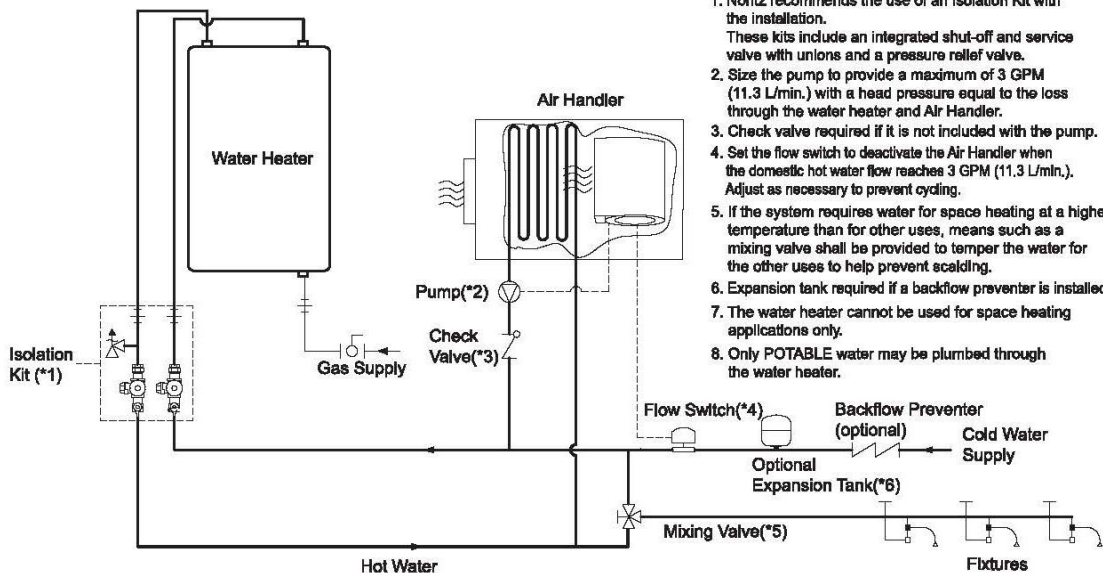
From Page 27 of the installation manual



**Noritz Example 2**

From Page 27 of the installation manual

**Combination Potable Water and Space Heating System**



Notes:

1. Noritz recommends the use of an Isolation Kit with the installation. These kits include an integrated shut-off and service valve with unions and a pressure relief valve.
2. Size the pump to provide a maximum of 3 GPM (11.3 L/min.) with a head pressure equal to the loss through the water heater and Air Handler.
3. Check valve required if it is not included with the pump.
4. Set the flow switch to deactivate the Air Handler when the domestic hot water flow reaches 3 GPM (11.3 L/min.). Adjust as necessary to prevent cycling.
5. If the system requires water for space heating at a higher temperature than for other uses, means such as a mixing valve shall be provided to temper the water for the other uses to help prevent scalding.
6. Expansion tank required if a backflow preventer is installed.
7. The water heater cannot be used for space heating applications only.
8. Only POTABLE water may be plumbed through the water heater.

### RHEEM Example 1

#### Standard Mode

From page 47 of the installation manual

1. Only POTABLE water may be plumbed through the water heater.
2. The water heater cannot be used for space heating applications.
3. Expansion tank is required if a backflow preventer is installed.
4. Isolation valve kits are recommended for this installation.

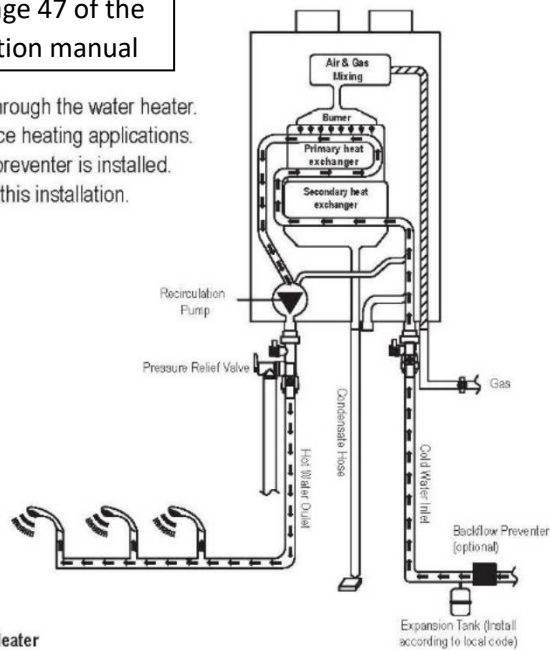


Figure 25 – Standard Mode Piping, Single Water Heater

### RHEEM Example 2

From page 47 of the installation manual

#### External Recirculation mode

The recirculation pipe must be installed in the field in order to use 'External Recirculation Mode'.

This mode allows the water heater to recirculate heated water through the system and additionally serves as a freeze protection function.

When using external recirculation mode with the built-in pump, check the following maximum recirculation pipe lengths including fittings (3/4" pipe is recommended):

- 1/2" Pipe- 200' (60m) of equivalent length
- 3/4" Pipe- 500' (150m) of equivalent length

Lengths in excess of these limits will require an external recirculation pump.

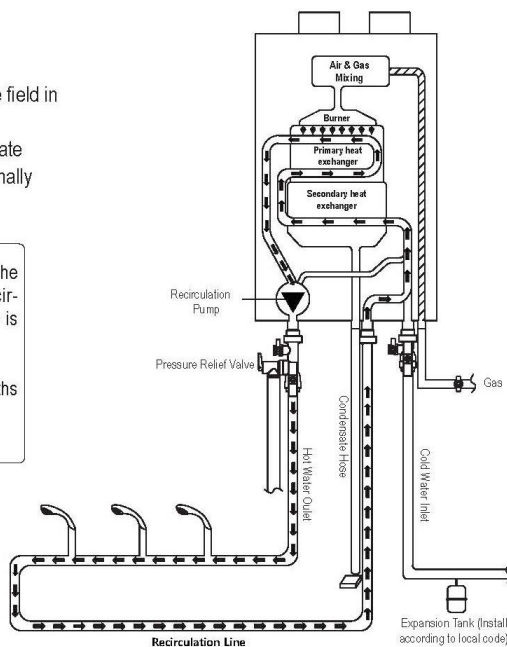


Figure 26 – Piping with External Recirculation Mode

**BOSCH Example 1**

From page 36 of the Greentherm  
installation manual

