User's Manual

MODEL

DPW-099  DPW-120

1. Safety Warnings .......................... 2
2. Names of Components .................. 8
3. Proper Operation
   - Before Operation ..................... 10
   - Cautions when in use ................. 11
   - Cautions to Prevent Freezing during
     the Winter Months .................. 12
   - How to use the thermostat .......... 15
   - How to clean the filter .............. 20
   - How to refill water .................. 24
4. Checkpoints before using phone reservation .................. 26
5. Specification ............................ 27
6. Troubleshooting .......................... 32

WARNING
This product must be installed and serviced by a licensed plumber, a licensed gas fitter, or a professional service technician and/or in accordance with all local code. Improper installation and/or operation, or installation by an unqualified person, will void the warranty.

WARNING
Operation of this unit creates carbon monoxide gas and flue gases which can cause serious injury or death. In addition, if the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

※This User’s Manual can be modified without prior notification for product quality improvement purpose.

Please use this product after reading this User’s Manual for your safety.
The cautions issued by this user’s manual include critical information for the safety while using the product. When the user fails to adhere to the following requirements can cause death, serious damages, and a great property loss.

For safety, according to the level of danger, we have indicated by “Danger”, “Warning”, “Caution” and the definitions for these terms are as follow:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Danger" /></td>
<td>When the required terms are not followed, it indicates an urgent danger that may cause death or serious bodily injury</td>
</tr>
<tr>
<td><img src="image" alt="Warning" /></td>
<td>When the required terms are not followed, it indicates latent danger that may cause death or serious bodily injury</td>
</tr>
<tr>
<td><img src="image" alt="Caution" /></td>
<td>When the required are not followed, it indicates latent danger that may cause light injury or semi-serious injuries</td>
</tr>
</tbody>
</table>

The definitions of the symbols indicated on the product and user’s manual are as follows:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates a &quot;Must&quot; follow sign</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates a &quot;No touch allowed&quot; sign</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates a &quot;General prohibition&quot; sign.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates a &quot;No Fire&quot; sign</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates &quot;Grounding for prevention of electric shock&quot;</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates &quot;Caution for electric shock&quot;</td>
</tr>
</tbody>
</table>
Danger

Please check for gas leak on the gas connection portion frequently with soapy water.

- In case of gas leakage leading to an explosion that can cause serious bodily injury or property damages.
- Management in case of gas leak
  ▶ If there is a bubble or you can smell gas (like rotten onion), there is gas leak
    ① Please immediately stop using and close the gas shut-off valve.
    ② Open the window for ventilation.
    ③ Please contact your gas supplier, dealer where you purchased or main office service center.

If there is gas leak, please don’t act like follow, it may cause an explosion.

- Do not use a lighter or match and do not unplug.
- Do not use any electricity and do not touch the ventilator fan or switch.

Always be sure to check the ventilation.

- Please close all the doors leading to the inside of the house from the appliance room when using the appliance. Otherwise Carbon monoxide (CO) may cause poisoning by incoming of exhaust fumes.
- If the ventilation is not good, it may cause shorten the use life imperfect combustion.
- Please always keep the air vent and ventilation opening of the appliance.
- Please keep the appliance room window opening.

Do not leave any combustibles or inflammable near the appliance.

- If there are any combustible material such as petroleum, gas or vinyl, they may cause an explosion of fire.
**Warning**

Please do not use the appliance for any other purpose than for heating and water.
- If used for drying laundry, a fire may occur.
- If used domestic hot water for cooking, some harm to the person may occur.

Please use after checking the type of gas used.
- If you use the product first or when you move, please check the type of gas used. (LP gas/NG)
- If it don’t match supplied gas and specified gas, a fire or explosion may occur due to improper combustion.
- The gas type specified on the front case of the appliance.

Please do not touch the outlet cord with wet hands.
- This may cause an electric shock.

Please check air intake pipe and flue outlet pipe whether they are unconnected or have some cracks.
- If they were, it might cause CO poison.

Please do not touch the flue or pipe while the appliance is turned on and operating.
- While operating, the flue or pipe are extremely hot and can cause burns.

Please check domestic hot water temperature before using domestic hot water.
- When you use the domestic hot water, please be careful not to be burned specially for children and aged man. Because if you use small quantity of hot water, extremely hot water can be serve
Warning

Please don't open the appliance cover.
- If you open the appliance cover and repair or remodel, it may cause electric shock or burns.
- After you get the service, please close the cover proper.

Please request for any gas pipe repair at the gas pipe professional installers.
- Any such repair by non-accredited gas pipes installer can cause gas leakage and accidents.

Please submit a request for inspection of your unit at least once a year.
- We are not responsible the accident that you don't have regular A/S inspection.
- If important function became low such as fan, safety valve, temperature sensor, PCB, pump and expansion tank, it may cause and accident. Please receive A/S regular inspection at least once a year from the dealer where you purchased the unit or mail office service center for safe and lengthened use of your water heater for dual purpose.

Caution

When the unit operates, please make sure that the distributor valve is opened at least one.
- If you operate while the distributor valve is all closed, it may cause fire, noisy and make shorten the product life.
Caution

Do not unplug the unit even when not in use for a long time during winter.
• Freeze guard function uses electricity to operate. Thus, when the cord is unplugged, the freeze guard will not function properly causing freezing leading to appliance and pipe damages.

Please leave distributor valve and gas shut-off valve when not at home for a long time during the winter.
• For freeze guard, the appliance must be left on. If the appliance distributor valve and gas shut-off valve are closed then the appliance will not operate properly to cause freezing leading to damages to appliance and pipes.

Please insulate the exposed pipes.
• Not covering the exposed pipes with insulation material will cause damages to the pipes due to freezing.
• Specially, please insulate supply water pipe and domestic hot water pipe.

Please completely drain the water from the pipes when not in use for a prolonged period.
• Pipes may freeze when not in use for a prolonged period.

Please unplug when you clean the heater.
• When clean the appliance with water or wet towel, it may cause electric shock.
**Caution**

Please use after checking the power source.
- The power source for the appliance should be checked before use. Higher or lower power supply may cause a fire, appliance function reduction and shorten its use life.

**Please entirely open the valve.**
- If you just open the valve in half, it may cause shorten its use life.

**When you refill water, please don’t leave the water supply valve for prolonged period.**
- Leaking of water may cause flooding in house.

**Please don’t put user’s manual or install certification in the unit.**
- It may cause a fire.

**When you clean the central heating filter, please follow this user’s manual.**
- Please be careful hot water in the appliance when you clean the filter (refer 20 page)

- Please don’t operate a remote control and don’t change the water temperature while using domestic hot water.
- It may cause burns due to sudden hot water.

※ After reading this user’s manual, please place this user’s manual in a location where you can see easily. And when you move to other place please hand over next user.
2 Names of Components

It is convenient to know names of components.

[Bottom of DPW-099A and DPW-120A]
The Water Heater Indication

**WARNING**
- When using hot water or heating, check the temperature that it has on your hands. Otherwise, you may get scalded.
- Do not leave the water in the heater or the air intake or exhaust. Otherwise, a fire could occur.
- Ventilation Warning (Indoor Only)
  - Take care to provide ventilation during winter use. However, do not use a range hood ventilation fan. Otherwise, carbon monoxide poisoning could occur.
- Corrugated pendants (prohibited)
  - Do not use corrugated pendants on the outdoor heater; it may cause carbon monoxide poisoning or a fire.
  - Corrugated pendants (prohibited)

**CAUTION**
- Burn Caution
  - During heater use or when it is not in use, do not touch high temperature parts such as the heater body, exhaust flue or exhaust outlet.

Please read Owner's Manual thoroughly to ensure proper use of the water heater.

**DANGER**

Vapors from flammable liquids explode and catch fire causing death or severe burns. Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area as the water heater.

**KEEP FLAMMABLE PRODUCTS:**
1. Far away from heater.
2. In approved containers.
3. Tightly closed.

**DANGER**

Hot Water Heater temperature over 125°F can cause severe burns instantly or death from scalding.

- Children, disabled and elderly are at the highest risk of being scalded.
- Feel water temperature before bathing or showering.

**WARNING:** California proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances, as their origin from fuel combustion (gas, oil) or components of the product itself.

A temperature and pressure relief valve is installed as complying with the standard for Relief Valve and Automatic Gas Shutoff Devices for Hot Water Supply System, ANSI: Z21.22. It shall be installed at the time of installation of the heater in the location specified by the manufacturer. Local codes shall govern the installation of relief devices for safety and operation of the water heater. The relief valve must not be removed or plugged.
3 Proper Operation

Before operation

1. Check the gas type
   - When using the unit for the first time or moved, check whether the type of gas specified in the product and the supplied gas match (LP gas/NG).
   - The type of gas is indicated on the rating plate located on front of the appliance.

2. Check for power supply
   - Please check whether the appliance is plugged in properly.

3. Check the water supply valve
   - Please leave the appliance water supply valve at all times for automatic replenishing water valve to be operate since the appliance will not ignite when the check lamp is on due to insufficient water or no water in the heating pipes. (Please follow page 24, except automatic system)

4. Check the gas valve
   - Please check to make sure the gas shut-off valve connected to the appliance is open.

5. Check each room valve connection
   - Please check to make sure each room valve connected to the appliance is open.

6. Check the area around the appliance room
   - Please remove any combustible or flammable materials and do not place any wet laundry over the exhaust pipe. This may cause a fire.
1. Caution for Gas leaks.
   - Please check for gas leak on the gas connection portion frequently with soapy water.
     (If any bubble form or smell then there is a gas leak, contact the nearest gas supplier immediately.)

**Management in case of gas leak**

1. If you think there is gas leak, please stop using

2. Close the gas shut-off valve

3. Open the window or door for ventilation

4. Please contact a your gas supplier, dealer where you purchased or main office service center.

5. Please don’t act like below while gas is leaking:
   - **Danger**
     Do not use a lighter or match and do not unplug
   - **Danger**
     Do not use any electricity and do not touch the ventilator fan or switch
2 Caution for ventilation
- Please make sure there is sufficient inflow and
  outflow of air for ventilation when using the unit.
  (supply vent, ventilation open)
- If the ventilation is improper then the combustion
  condition deteriorates inside the appliance and
  it may cause shortened use life of the appliance.
  Also, seepage of exhaust gas into the house may
  cause Carbon Monoxide poisoning.
- Please always keep the air vent and ventilation
  opening of the appliance.

3 Burn Warning
- While operation, please be careful not to
  burn yourself on the flue or pipes since
  they are extremely hot.

4 Combustibles and flammable material Warning
- Please do not use the appliance for
  any other purpose than for heating
  and hot water.
- Please do not store combustibles or
  flammable material such as gasoline
  near the appliance.
  This may cause a fire.

Cautions to Prevent Freezing during the Winter Months

⚠️ Caution

Exposed pipes must be insulated.
- Please insulate the exposed pipes. It is safer
  to protect the pipes exposed to outside ele-
  ments with insulation material.
- Particularly, domestic hot water inlet pipe and
  domestic hot water outlet pipes must be
  insulated.
1. When not using the unit for short-term (2~3 days)

※When not using the unit for 2~3 days during the winter, please select the "❄" function for 2~3 days of outing to facilitate freezing guard device for effective and convenient operation.

1. Check for power connection
   • Please check to be sure that the appliance is plugged in securely. The freezing guard operates only with power on.
     (Except, when the heating water and any other water inside the appliance are drained, or when there is no water available, do not plug in the unit. This may cause malfunction in the pump or overheating.)

2. Check water supply valve
   • Please check whether the domestic hot water inlet valve connected to the appliance is open.

3. Check the Gas shut-off valve
   • Please check whether the Gas shut-off valve connected to the appliance is open.

4. Check each room valve connection
   • Please check whether each room valve of distributor connected to the appliance is open.
2. Long term Non-Use

※When not using for long term please unplug the unit and open the hot water valve to drain the hot water.

1. Shut-off the Power Supply
   • Please unplug the unit from the wall power supply.

2. Shut-off the Gas Supply
   • Please close the Gas shut-off valve.

3. Shut-off the Water Supply
   • Please close the domestic hot water inlet valve.

4. Exhaust of central heating water
   • Please discharge water inside of appliance by turning water drain nipple where is left bottom of appliance to the left.
   • Open all the distributor valves in the room to drain all the water.
Temperature Control Indicator and Button Function (DSR-100F)

Water level detection failure lamp
If there is not enough water in appliance, this lamp turns on.

Indoor Temperature Indicator
Indicates the current room temperature of around room controller

Domestic hot water temperature indicator (Temperature) (DSR-100F)
After pressing Domestic hot water temperature button, please set domestic hot water temperature by using the key ▲▼
98~114°F, 120°F
130°F, 140°F

Burn lamp
When the appliance is operating, Burn lamp is on.

Repeated timer setting button
• Running for 20 minutes after space heating stops as set time (periodically repeat)
• After press the repeated timer setting button, use the key ▲▼ to set the time
• Set range: 1~12 hours

Stand by button.
It is used when you go out, it will operate up to 77°F then freezing guard function is on

Hot water button (Temperature)
Press this button and use up-down key (▲▼) to set hot water temperature you want
98~114°F, 120°F
130°F, 140°F

Central heating Button
Set the temperature of central heating water which circulates in pipe or radiator by using ▲▼ setting range
77°F, 122~176°F (unit:2°F).
When this button is off it doesn’t indicate LCD central heating and turn to only domestic hot water.

Power button and Lamp
• Button: Use this button to turn on/off the water heater.
• Lamp: If the unit is operating normally, the lamp is green.
  If it needs to be checked, the lamp is red on or blinking (in case of failure, failure code is displayed at the indoor temperature indicator)

▲▼ Button
• Central heating temperature setting
• Repeated timer setting
• Domestic hot water temperature setting (DSR-100F)
When using "Ⅲ (Central heating)" button

1. Please press power button. Then the lamp will turn on.

2. Please press the "Ⅲ" button. Then the current temperature of central heating water will blinking

3. Please set the desired central heating water temperature by pushing the up-down key(▲▼) when current temperature of central heating water will blinking
   - You can set the heating water temperature. 77°F, 122~176°F (unit: 2°F)
   - Set temperature is indicating the central heating water temperature which runs through the radiant heating methods such as radiators or under floor heating pipes.
   - If you set your desired temperature, DPW models will maintain the temperature automatically repeating on and off.

When using "❄" button

- In running for central heating, if you press "❄" button, the "❄" lamp is on. Then the room temperature 77°F will be off, the appliance will revert to now heating temperature.
- In state of "❄" ("❄" lamp is on), if you again press this button, it is reverted to the condition of central heating
- In state of using the Repeated timer function, if you press the "❄" button, the "❄" lamp is on. Then the room temperature 77°F will be off, the appliance will revert to now central heating temperature.
- the function of repeated timer will be swept away. In state of this, you press the "❄" button, it is reverted to the repeated timer.
When using "④ (Repeated timer setting)" mode

• What is repeated timer?
  ▶ The appliance will stop for set time and will operate for 20 minutes (You can choose the set time from min. 1 hour to max. 12 hours) periodically repeats this mode.
  ▶ This time, the heating water temperature is automatically set at 176°F. From the point you choose the repeated timer function by using the key ▲▼, space heating stops for set time.

1. Press the power button and the lamp is on.
2. Press repeated timer button.

3. Please press the up-down key to select the time you want, then the space heating will not operate for set time.

4. When it press the timer button again, the DPW models will revert to the heating mode.
Can be used in central heating and repeated timer heating mode

1. Press the power button and the lamp is on.

2. 1) DSR-100F
   - The domestic hot water temperature will be indicated on the temperature indicator.
   - Please set the desired domestic hot water temperature by pushing button ▲▼.
   - Setting range: 98~114°F (unit: 2°F), 120°F, 130°F, 140°F

3. If you open the domestic hot water tab, the domestic hot water will be supplied.
   - When you stop using domestic hot water, it will automatically revert to central heating mode.
   - Domestic Hot water flux is set by regulator in heater

When using "Water heater" mode

Can be used domestic hot water, without operation central heating

1. Press the power button and the lamp is on.

2. Please turn off room temperature indicator by pushing it.

3. When you open the domestic hot water tab, appliance starts the operation. And domestic hot water will be supplied.
   - When you close the domestic hot water tab, appliance will not operate. It waits for next use. Then when you open the domestic hot water tab again, appliance will operate again.
   - When you set water heater mode, the central heating mode doesn’t operate, you can only use domestic hot water. So if you use during the summer time, it might be more convenient.

Regulator?

Regardless of water pressure of the place where the appliance is installed, it has regulator function to supply domestic hot water with same flow rate.
Button Functions

- "Low water" lamp “💧” (Red): In case of water supply error, this lamp is on, after finishing water supply properly, this lamp is out.
- "Burn" lamp “🔥” (Green): During the appliance is operating, this lamp is on when stop operating, the lamp is out.
- "Stand by" lamp “✱” (Green): When set stand by, this lamp is on, and the function is removed, the lamp is out. (set heating temperature is 77°F)
- "Power lamp" “☀” (Green/Red): When the power is on, it is green. When has an error, it is red. When the power is off, the lamp is out.

Displayed error code

- If the boiler become to failure, the power lamp will be blinking(red) and display the following error code

<table>
<thead>
<tr>
<th>No.</th>
<th>Error Code</th>
<th>Error contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>Low water level</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
<td>Abnormality of hall sensor</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
<td>Pump detection switch short</td>
</tr>
<tr>
<td>4</td>
<td>A4</td>
<td>Overheated Thermostat open</td>
</tr>
<tr>
<td>5</td>
<td>A5</td>
<td>Pump detection switch open</td>
</tr>
<tr>
<td>6</td>
<td>A6</td>
<td>Failure of ignition</td>
</tr>
<tr>
<td>7</td>
<td>A7</td>
<td>Gas valve relay short</td>
</tr>
<tr>
<td>8</td>
<td>A8</td>
<td>Abnormality of flame detection</td>
</tr>
<tr>
<td>9</td>
<td>A9</td>
<td>Operation of frozen detection</td>
</tr>
<tr>
<td>10</td>
<td>AA</td>
<td>Prevention of boiling</td>
</tr>
<tr>
<td>11</td>
<td>Ab</td>
<td>Central heating Temp. Thermostat Abnormality</td>
</tr>
<tr>
<td>12</td>
<td>Ac</td>
<td>DHW Temp. Thermostat Abnormality</td>
</tr>
<tr>
<td>13</td>
<td>Ad</td>
<td>Leakage of condensed water</td>
</tr>
</tbody>
</table>

Please refer to troubleshooting (page 32～42)
How to clean the heating filter

- If install the unit first time or use for long time, rooms are not as well heated as before even can hear strange noise due to dirt in pipe and it cause shorten the use life.
- Please remove the dirt when use first time in winter and more than twice in a year.

⚠️ Caution

Please unplug the unit from the power source when you clean.
- When clean with water or wet towel, it may cause electric shock.

Please follow the below when you clean the heating filter.
- When clean the heating filter, hot water in the appliance may cause burns

Domestic hot water filter cleaning

1. Stop Power Supply
   Please unplug the unit from the power source.

2. Stop Gas Supply
   Please close the gas shut-off valve.

3. Stop Water Supply
   Please close the domestic hot water inlet valve.
4 Detach DHW filter
- Please unfasten DHW outlet nut ①
- Please take out the filter from DHW nipple attached the unit ②

5 Domestic hot water filter cleaning
Please clean the domestic hot water filter with clean water.

6 Reattach the domestic hot water filter
After cleaning the domestic hot water filter, please reattach it in reverse order item 4.

7 Water Supply
Please open the domestic hot water inlet valve.

8 Power Supply connection
Please plug the unit to the power supply.

9 Gas Supply
Please open the gas shut-off valve.
Central heating filter cleaning

1. Stop Power Supply
   Please unplug the unit from the power source.

2. Stop Gas Supply
   Please close the gas shut-off valve.

3. Stop Water Supply
   Please close the domestic hot water inlet valve.

4. Drain valve separation
   Please drain the water about 5 ℓ in the appliance by turning the drain valve to the left.

   **Caution**
   When you running out the hot water, be careful not to burn yourself since there may be hot water.

5. Detach the fixing clip of the central heating filter.
   Please detach the fixing clip of the central heating filter(A) by using tool.
6 Detach central heating filter
Please separate a central heating filter
(Please pull down the heating filter)

⚠️ Caution
When you running out the hot water,
be careful not to burn yourself since
there may be hot water

7 Central heating filter cleaning
Please clean the central heating filter
with clean water.

8 Reattach the central heating filter
After cleaning, please reattach the central
heating filter.
Order ①: Reinsert the central heating filter.
Order ②: Reinsert the fixing clip of the
central heating filter.
Order ③: Please insert the drain screw
valve by turning to the right.

9 Water Supply
Please open the domestic hot water
inlet valve.

10 Power Supply connection
Please plug the unit to the
power supply.

11 Gas Supply or water refill
Please open the gas shut-off valve
then please refill the water by method
of refilling water. (Refer 24 page)
How to supply the water

When the temperature control indicator lamp is on or "A" mark, the power lamp is red, hot water is not enough. Please supply the water as follows.

Bottom of the unit

1. Central heating inlet connection
2. Domestic hot water outlet connection
3. Gas inlet connection
4. Domestic hot water inlet connection
5. Water supply valve
6. Central heating outlet connection
7. Condensed water discharge

How to supply the water with pressure gauge model (Air Close type)

1. Please power off the remote controller.
2. Please close gas shut-off valve.
3. Please open each room valve.
4 Please open the domestic hot water supply screw by turning to the left at the bottom of the unit.

5 If the front of the unit's pressure gauge indicator indicates 1～2kgf/cm² (14～28psi), water is fully supplied. Then please close the domestic hot water supply screw by turning to the right.

6 Please open gas shut-off valve.

7 ▶ Please check that the operating of the unit is good by turning on the power.
▶ After the air is out in the unit or pipe by automatic air vent the water level failure indicator will be on. Please supply water by the order above.
▶ Please close each room valve that doesn’t need to be central heating. But keep open the distributor at least one.
## Checkpoints before making Repair Work Order

- In case of malfunction, please check the following items then please call an A/S center or dealer for repairs.
  - When the accidents happened in case that is served, repaired, changed, installed and moved in unrelated place with manufacture, manufacture is not responsible of this.
- After has service, please check service payment and changed part.
  Then please sign on service register and keep this copy.

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Cause</th>
<th>Countermeasure</th>
</tr>
</thead>
</table>
| When smelled gas. (Similar to rotten onion) | Please close shut-off gas valve then open all window for ventilation, and please contact gas supplier or our company service center.  
  Never allowed to use combustibles or flammable material such as plug, inside light switch, match and lighter.  
  Please check for gas leak on the gas connection portion frequently with soapy water |                                                                            |
| When smelled the exhaust. (When feel dizzy and nausea) | If the exhaust fumes leaks into the house, carbon monoxide (CO) may cause poisoning (suffocation)  
  1. Chimney is unconnected?  
  2. Chimney is blocked?  
  3. Heating and supply pipe are blocked?  
  4. No water supply in condensed water trap? (Please check the air is circulate while operating) | Please check the chimney connection.  
  Please clean the chimney.  
  Please check heating and supply pipe are opened.  
  Please call for inspection at A/S center. |
| When the ignition spark is not working. | 1. The power cord is connected?  
  2. Gas is supplying normally?  
  3. Setting water temperature is low? | Please plug the power cord.  
  Please open gas shut-off valve.  
  If there is no gas in case of LPG, please exchange to new one.  
  Please set water temperature higher than water temperature of the pipe |
| When hear strange sound during operation. | 1. Air is left in the pipe?  
  2. Shut-off valve in the pipe is closed (including distributor)?  
  3. The appliance is attached properly on the wall? | Please open shut-off valve.  
  Please open a hand air vent and let the air out in the heating pipe.  
  Please fix the appliance on the wall.  
  *After this measure you still hear large noise, please call for inspection. |
| Room is not warm enough. | 1. The indicator is set to domestic hot water only?  
  2. Setting central heating water temperature is too low?  
  3. Distributor valve is closed?  
  4. Distributor valve is opened properly according to each room size?  
  5. Central heating filter is blocked?  
  6. Let the air out in the pipe? | Please set the indicator to central heating mode.  
  Please adjust central heating water temperature properly.  
  Open the distributor valve.  
  Please check each room distributor valve is opened.  
  Clean the filter. (Please refer 22 page)  
  Please open air vent valve in the distributor and let the air gone. |
| Domestic hot water is not available. | 1. Domestic hot water valve is closed?  
  2. Domestic hot water filter is blocked. | Please open domestic hot water valve,  
  Clean the filter. (Please refer 20 page) |
### Heating System Data

<table>
<thead>
<tr>
<th></th>
<th>DPW-099A</th>
<th>DPW-120A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Input (Btu/h)</td>
<td>47,800 - 99,000</td>
<td>47,800 - 120,000</td>
</tr>
<tr>
<td>AFUE (%)</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Htg Water Temp (DegF)</td>
<td>122 to 176 DegF leaving unit Heat Exchanger</td>
<td>122 to 176 DegF leaving unit Heat Exchanger</td>
</tr>
<tr>
<td>Working Pressure (psi)</td>
<td>15 - 20</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Freeze Protection Device</td>
<td>Thermistor, will energize pump/combustion</td>
<td>Thermistor, will energize pump/combustion</td>
</tr>
<tr>
<td>Heating Min Flow (GPM)</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Htg Heat Exch Water Volume (gal)</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Ignition Type</td>
<td>Electronic Spark</td>
<td>Electronic Spark</td>
</tr>
</tbody>
</table>

### Domestic Hot Water

<table>
<thead>
<tr>
<th></th>
<th>DPW-099A</th>
<th>DPW-120A</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHW Production Energy Factor</td>
<td>0.83</td>
<td>0.85</td>
</tr>
<tr>
<td>Temperature Setting</td>
<td>Controlled : Settings of 98 - 114°F, 120°F, 130°F, 140°F</td>
<td>Controlled : Settings of 98 - 114°F, 120°F, 130°F, 140°F</td>
</tr>
<tr>
<td>DHW Minimum Flow Rate (GPM)</td>
<td>0.5 to 0.7 GPM</td>
<td>0.5 to 0.7 GPM</td>
</tr>
<tr>
<td>GPM at 50F in 100F Out</td>
<td>3.7</td>
<td>4.5</td>
</tr>
<tr>
<td>GPM at 50F in 110F Out</td>
<td>3.1</td>
<td>3.7</td>
</tr>
<tr>
<td>GPM at 50F in 120F Out</td>
<td>2.6</td>
<td>3.2</td>
</tr>
<tr>
<td>GPM at 50F in 130F Out</td>
<td>2.3</td>
<td>2.8</td>
</tr>
</tbody>
</table>

### General Data

<table>
<thead>
<tr>
<th></th>
<th>DPW-099A</th>
<th>DPW-120A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Voltage</td>
<td>24V DC - Requires X-X or Zero Voltage Contact for Zone applications</td>
<td>24V DC - Requires X-X or Zero Voltage Contact for Zone applications</td>
</tr>
<tr>
<td>Fuel Type</td>
<td>NG or Field Conversion to LP</td>
<td>NG or Field Conversion to LP</td>
</tr>
<tr>
<td>Natural Gas Inlet Press (&quot;WC)</td>
<td>Minimum 3.5&quot; WC to Maximum 10.5&quot; WC</td>
<td>Minimum 3.5&quot; WC to Maximum 10.5&quot; WC</td>
</tr>
<tr>
<td>LP Gas Inlet Pressure (&quot;WC)</td>
<td>Minimum 8&quot; WC to Maximum 13&quot; WC</td>
<td>Minimum 8&quot; WC to Maximum 13&quot; WC</td>
</tr>
<tr>
<td>Gas line Size (inch)</td>
<td>Min Size 3/4&quot;</td>
<td>Min Size 3/4&quot;</td>
</tr>
<tr>
<td>Unit Voltage (V)</td>
<td>115V-1Ph-60Hz</td>
<td>115V-1Ph-60Hz</td>
</tr>
<tr>
<td>Power Consumption (W)</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>Pump Flow @ 10ft Head</td>
<td>2.5 GPM</td>
<td>2.5 GPM</td>
</tr>
<tr>
<td>NOX Levels (ppm)</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### Venting

<table>
<thead>
<tr>
<th></th>
<th>DPW-099A</th>
<th>DPW-120A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Flue Temp (DegF)</td>
<td>136</td>
<td>136</td>
</tr>
<tr>
<td>Venting Material</td>
<td>Ø3&quot; Schedule 40 PVC</td>
<td>Ø3&quot; Schedule 40 PVC</td>
</tr>
<tr>
<td>Max Vent Length (feet)</td>
<td>45ft Equivalent each for both Intake and Exhaust</td>
<td>45ft Equivalent each for both Intake and Exhaust</td>
</tr>
<tr>
<td>Max number of Elbows*</td>
<td>3 per Individual Vent pipe</td>
<td>3 per Individual Vent pipe</td>
</tr>
</tbody>
</table>

*One Elbow = 5 ft equivalent length, which must be deducted from the total vent length

### Dimensions

<table>
<thead>
<tr>
<th></th>
<th>DPW-099A</th>
<th>DPW-120A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs)</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Unit Height (less vent conns) (&quot;)</td>
<td>27 5/8&quot;</td>
<td>27 5/8&quot;</td>
</tr>
<tr>
<td>Width (&quot;)</td>
<td>18 1/8&quot;</td>
<td>18 1/8&quot;</td>
</tr>
<tr>
<td>Depth (&quot;)</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Gas Connection Size (&quot;)</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Heating Supply/Return (&quot;)</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>DHW Inlet/Outlet (&quot;)</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Flue/Air Intake (&quot;)</td>
<td>Vent Connection Ø3.5&quot; to accept 3&quot; PVC</td>
<td>Vent Connection Ø3.5&quot; to accept 3&quot; PVC</td>
</tr>
</tbody>
</table>

Quietside maintains a policy of continuous product development and specifications can change.
Water Line
### Parts List

<table>
<thead>
<tr>
<th>No</th>
<th>Part No</th>
<th>Part Name</th>
<th>No</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>2100372</td>
<td>Front Case Assembly</td>
<td>222</td>
<td>3010834</td>
<td>Burner</td>
</tr>
<tr>
<td>102</td>
<td>3070249</td>
<td>APS measuring connector</td>
<td>223</td>
<td>3100125</td>
<td>M4 X 14 Screw</td>
</tr>
<tr>
<td>103</td>
<td>3040379</td>
<td>Flue collar</td>
<td>301</td>
<td>3080138A</td>
<td>Flue Connector Packing</td>
</tr>
<tr>
<td>104</td>
<td>3040267</td>
<td>Air Intake Cover</td>
<td>302</td>
<td>2070364</td>
<td>Collector Hood</td>
</tr>
<tr>
<td>105</td>
<td>2070459</td>
<td>Chassis Assembly</td>
<td>303</td>
<td>2070457</td>
<td>Latent Heat Exchanger Assembly</td>
</tr>
<tr>
<td>106</td>
<td>3080177</td>
<td>Condensate Outlet Hose</td>
<td>304</td>
<td>2130035</td>
<td>Duct Assembly</td>
</tr>
<tr>
<td>107</td>
<td>3090257</td>
<td>Flue collar sealing packing</td>
<td>305</td>
<td>3090177</td>
<td>Heat Cut off Board</td>
</tr>
<tr>
<td>108</td>
<td>2100285</td>
<td>Air Pressure Switch</td>
<td>306</td>
<td>3090176</td>
<td>Duct Seal</td>
</tr>
<tr>
<td>109</td>
<td>3040255</td>
<td>PCB Box</td>
<td>307</td>
<td>3108026</td>
<td>Extremity Fin</td>
</tr>
<tr>
<td>110</td>
<td>2090609</td>
<td>PCB Assembly</td>
<td>308</td>
<td>3108027</td>
<td>Exchanger Fin</td>
</tr>
<tr>
<td>111</td>
<td>310426</td>
<td>13 + 21 Pin Wire</td>
<td>309</td>
<td>2080390</td>
<td>Overheat Thermostat</td>
</tr>
<tr>
<td>112</td>
<td>3040378</td>
<td>Air intake Connector</td>
<td>310</td>
<td>2090887</td>
<td>Supply Pipe</td>
</tr>
<tr>
<td>113</td>
<td>2060278</td>
<td>Condensate 'S' Trap Assembly</td>
<td>311</td>
<td>2090913</td>
<td>Return Pipe</td>
</tr>
<tr>
<td>114</td>
<td>3120101</td>
<td>Condensate Outlet Hose Flexing Clip</td>
<td>312</td>
<td>2070346</td>
<td>Expansion Vessel Assy'y</td>
</tr>
<tr>
<td>115</td>
<td>3011080</td>
<td>Junction Box</td>
<td>313</td>
<td>3010807</td>
<td>Expansion Vessel Bracket</td>
</tr>
<tr>
<td>116</td>
<td>3100132</td>
<td>24 X 12 Tapping Screw (STS)</td>
<td>314</td>
<td>2050121</td>
<td>Pump</td>
</tr>
<tr>
<td>117</td>
<td>3100132</td>
<td>24 X 12 Tapping Screw</td>
<td>315</td>
<td>2080621</td>
<td>Pressure Gauge</td>
</tr>
<tr>
<td>118</td>
<td>3100125</td>
<td>M4 X 14 Screw</td>
<td>316</td>
<td>3080161</td>
<td>Expansion Vessel Connection Hose</td>
</tr>
<tr>
<td>119</td>
<td>3100051</td>
<td>24 X 10 Tapping Screw</td>
<td>317</td>
<td>2090914</td>
<td>Pump Detection Switch Connection Pipe</td>
</tr>
<tr>
<td>201</td>
<td>2010373</td>
<td>Combustion Chamber Front Assembly</td>
<td>318</td>
<td>2060164A</td>
<td>Pump Detection Switch</td>
</tr>
<tr>
<td>202</td>
<td>2010316</td>
<td>Combustion Chamber Surround Assembly</td>
<td>319</td>
<td>2060258</td>
<td>Air Vent Assembly</td>
</tr>
<tr>
<td>203</td>
<td>3100033</td>
<td>24 X 8 Tapping Screw</td>
<td>320</td>
<td>2060253</td>
<td>Return + Pump Bracket Set</td>
</tr>
<tr>
<td>204</td>
<td>3014005</td>
<td>Fan Guide</td>
<td>321</td>
<td>2060274</td>
<td>Pressure Relief Valve</td>
</tr>
<tr>
<td>205</td>
<td>3100051</td>
<td>24 X 10 Tapping Screw</td>
<td>322</td>
<td>3040394</td>
<td>T Socket</td>
</tr>
<tr>
<td>206</td>
<td>2100253</td>
<td>Combustion Fan (DPW-09)A</td>
<td>323</td>
<td>3040261</td>
<td>Return Filter Cap</td>
</tr>
<tr>
<td>207</td>
<td>2100262</td>
<td>Combustion Fan (DPW-120)A</td>
<td>324</td>
<td>3120100</td>
<td>Return Filter Fixture Clip</td>
</tr>
<tr>
<td>208</td>
<td>2080608</td>
<td>Ignitor + wire</td>
<td>325</td>
<td>3120030</td>
<td>Pump Fixing Clip</td>
</tr>
<tr>
<td>209</td>
<td>3011107</td>
<td>Spark Plug Bracket</td>
<td>326</td>
<td>2060239</td>
<td>RW + CW Block Body</td>
</tr>
<tr>
<td>210</td>
<td>2020359</td>
<td>Spark Plug</td>
<td>327</td>
<td>2060185A</td>
<td>Plate to Plate Heat Exchanger</td>
</tr>
<tr>
<td>211</td>
<td>3010835</td>
<td>Air Baffle (Mask)</td>
<td>328</td>
<td>2060245</td>
<td>SW + HW Block Body</td>
</tr>
<tr>
<td>212</td>
<td>2020344</td>
<td>Manifolder Assembly (NG)</td>
<td>329</td>
<td>2040119</td>
<td>3-Way Motor</td>
</tr>
<tr>
<td>213</td>
<td>3090100</td>
<td>Manifolder Packing</td>
<td>330</td>
<td>2060229</td>
<td>Flow Switch</td>
</tr>
<tr>
<td>214</td>
<td>2090847</td>
<td>Gas Connection Pipe</td>
<td>331</td>
<td>3030180</td>
<td>Return/Supply Connection Nipple</td>
</tr>
<tr>
<td>215</td>
<td>308043</td>
<td>1/2&quot; Packing</td>
<td>332</td>
<td>3030193</td>
<td>Cold Water Inlet Connection Nipple</td>
</tr>
<tr>
<td>216</td>
<td>3050077</td>
<td>Gas Adaptor</td>
<td>333</td>
<td>3030181</td>
<td>Hot Water Outlet Connection Nipple</td>
</tr>
<tr>
<td>217</td>
<td>3080164</td>
<td>Gas Valve packing</td>
<td>334</td>
<td>3030180</td>
<td>Return/Supply Connection Nipple</td>
</tr>
<tr>
<td>218</td>
<td>2030279</td>
<td>Gas Valve (UP23)</td>
<td>335</td>
<td>3010944</td>
<td>Nipple Fixing Bracket</td>
</tr>
<tr>
<td>219</td>
<td>3060115</td>
<td>Gas Valve O-ring</td>
<td>336</td>
<td>2060228</td>
<td>Water Supplementation Device</td>
</tr>
<tr>
<td>220</td>
<td>3050079</td>
<td>Gas Valve Connection Nipple</td>
<td>337</td>
<td>3050198</td>
<td>CHW Return connector</td>
</tr>
<tr>
<td>221</td>
<td>3010836</td>
<td>Burner Fixing Bracket</td>
<td>338</td>
<td>3100133</td>
<td>M4 X 6(0.7p)</td>
</tr>
<tr>
<td>222</td>
<td>3105045</td>
<td>Condensate temp-DHW Temp. Sensor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>109</td>
<td>2080610S</td>
<td>PCB assembly</td>
</tr>
<tr>
<td>209</td>
<td>2020360S</td>
<td>Spark plug + Flame rod sensing rod</td>
</tr>
<tr>
<td>211</td>
<td>2020362</td>
<td>Burner assembly</td>
</tr>
<tr>
<td>217</td>
<td>2030279S</td>
<td>Gas Valve A/S Assembly</td>
</tr>
<tr>
<td>302</td>
<td>2070457S</td>
<td>Latent heat exchanger assembly</td>
</tr>
</tbody>
</table>
## Troubleshooting

### Error Code: "A" (Low Water Level)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>This occurs in the heating or sealed system.</td>
<td>- check the pressure gauge it should read between 0.5<del>1.5kg/cm² (7</del>21psi)</td>
<td>-</td>
</tr>
<tr>
<td>1) Low Water level in heating system</td>
<td>- Purge air from the heating system.</td>
<td>-</td>
</tr>
<tr>
<td>2) Air in the heating system</td>
<td>- Please check the pump and check for air inside the pump assembly. If the impeller is out of order, pump has to be replaced.</td>
<td>-</td>
</tr>
<tr>
<td>3) The circulation pump is working but there is not enough RPM or the impeller is damaged.</td>
<td>- When the unit is running and the pump detection switch contact is closed (correct position), the resistance should be 0 Ohms. If it shows infinity or no reading the switch not making and has to be replaced.</td>
<td>-</td>
</tr>
<tr>
<td>4) There is no contact made by the pump detection switch.</td>
<td>- Check the leakage of water at the pipe or radiator of heating zones.</td>
<td>-</td>
</tr>
<tr>
<td>5) Leakage of water at the pipe of space heating zones</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>
## Error Code: "A2" (Abnormality of Hall sensor)

### Wiring
- **Red**: Fan Speed (0~40V DC)
- **Yellow**: Standard Voltage (12V)
- **Black**: Common (GROUND)
- **White**: RPM input

![Combustion Fan](Fig.1)

### Symptom and Cause | Solution | Reference
---|---|---
1) Wiring connection is bad. | Reconnect the molex connector. Check the pins for looseness or damage. | (Fig.1)  
2) The fan does not rotate. | Measure the voltage. The standard voltage across Black and Yellow is 12V DC. The standard voltage across Black and Red is 0~40V DC. If these voltage are normal, the fan is replaced with new fan. If these voltage are abnormal, the PCB is replaced with new PCB. | (Fig.1)  
3) The fan motor RPM is too slow. | Replace the fan assembly. To replace the fan assembly remove the 2 self tapping screws at the bottom of combustion chamber. |
Error Code: "A3" (Pump detection switch "SHORT")

Pump Detection Switch
(Fig. 1)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the pump detection switch is made (ON = &quot;SHORT&quot;) before the pump operates, &quot;A3&quot; error is displayed.</td>
<td>- Measure the resistance of the pump detection switch.</td>
<td>(Fig. 1)</td>
</tr>
<tr>
<td>1) Pump detection switch is made (ON) although the unit's pump is not operating due to no call for heat or DHW or off cycle for the pump.</td>
<td>- When the pump is not working, resistance should indicate infinity or no reading (switch in the open position) and 0 when the pump is working and the switch is closed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- If there is no change in the switch resistance when the pump is cycled off and on, clean the pump detection switch or replace the pump detection switch.</td>
<td></td>
</tr>
</tbody>
</table>
**Error Code: “A4” (Oveheat thermostat “OPEN”)**

<table>
<thead>
<tr>
<th>Diagram</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>check the valve position</td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>Space heating filter  ⟨Fig.2⟩</td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>Pump  ⟨Fig.3⟩</td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>3-Way valve  ⟨Fig.4⟩</td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>DHW Flow switch  ⟨Fig.5⟩</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the water temperature inside of heat exchanger exceeds 221°F, the sensor opens, shuts down the unit and indicates error code “A4”</td>
<td>- Open the valves.  ⟨Fig.1⟩</td>
</tr>
<tr>
<td>1) All of the shut off valve are closed.</td>
<td>- Clean the filter.(refer to page 22~23)  ⟨Fig.2⟩</td>
</tr>
<tr>
<td>2) Clogged space heating filter.</td>
<td>- Check the operation of the pump and the motor condition.  ⟨Fig.3⟩</td>
</tr>
<tr>
<td>3) The pump is not working.</td>
<td>- Measure the voltage across the Black and White pump wires using multi meter. If the pump is not working although the voltage reading is 120V, the pump should be replaced.</td>
</tr>
<tr>
<td>4) 3-way valve is defective.</td>
<td>- There is a possibility of sticking of ball in 3-way valve. If the ball blocks the space heating line in spite of space heating mode, the 3-way valve should be replaced.  ⟨Fig.4⟩</td>
</tr>
<tr>
<td>5) DHW flow switch is not working.</td>
<td>- Check the resistance and if it reads 0 Ohms when DHW is not flowing, it is defective and should be replaced.  ⟨Fig.5⟩</td>
</tr>
</tbody>
</table>
Error Code: "A5" (Pump detection switch "OPEN")

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Pump detection switch is made (OFF) although the unit's pump is operating</td>
<td>Measure the resistance of the pump detection switch. When the pump is working, resistance should indicate 0 and infinity or no reading (switch in the open position) when the pump is not working. If the resistance indicates infinity or no reading when the pump is working, clean the pump detection switch or replace the pump detection switch. Check the operation of the pump and the motor condition. If the pump is not working although the voltage reading is 120V between Black and White pump wire, the pump should be replaced.</td>
<td>(Fig.1)</td>
</tr>
<tr>
<td>2) The pump is not working.</td>
<td>- Measure the resistance of the pump detection switch. When the pump is working, resistance should indicate 0 and infinity or no reading (switch in the open position) when the pump is not working. If the resistance indicates infinity or no reading when the pump is working, clean the pump detection switch or replace the pump detection switch. Check the operation of the pump and the motor condition. If the pump is not working although the voltage reading is 120V between Black and White pump wire, the pump should be replaced.</td>
<td>(Fig.2)</td>
</tr>
</tbody>
</table>
**Error Code: “A6” (Pump detection switch “OPEN”)**

<table>
<thead>
<tr>
<th>Modulating Gas control valve</th>
<th>Ignitor</th>
</tr>
</thead>
</table>

### Symptom and Cause

1. Gas Supply is not normal.
2. Modulating gas control valve is not normal.
3. Ignitor is not working.

### Solution

Before adjusting the gas valve to compensate for an code “A6” check the incoming gas pressure.

- Inlet gas pressure required
  - LNG: 3.5~10.5 inch W.C.
  - LPG: 8~13 inch W.C.

- Check supply gas pressure and call the gas company if outside required range. Check inlet gas pressure during combustion. Check the gas line size—minimum 3/4” is required.

- Measure the voltage across the Black and White gas valve wires or Black and Blue using multi meter. If the solenoid valve become to be closed although the voltage reading is 120V, the gas valve should be replaced.

- Check the power supply from the 13+21Pin wiring to the ignitor. Should be 120V.
  - If there is no power supply, check the connection.
  - The secondary voltage should be 15kV and if it measure very lower than 15kV, the ignitor should be replaced.

**Caution:** Only check this with gas supply turned off.
### Error Code: "A7" (Abnormality of Hall sensor)

![Modulating Gas control valve](Fig.1)  
![PCB (Printed Circuit Board)](Fig.2)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
</table>
| If the gas valve relay is closed ("SHORT") when the unit is not working, the error code "A7" is displayed.  
1) PCB is not normal. | - When the unit is not working, measure the voltage across the Black and White gas valve wires or Black and Blue using multi meter. If the voltage reading is 120V DC, PCB relay is destroyed. PCB should be replaced. | ![Fig.1](Fig.1)  
![Fig.2](Fig.2) |
### Error Code: "A8" (Abnormality of flame detection (Pseudo flame))

#### Diagrams
- Modulating Gas control valve (Fig.1)
- PCB (Printed Circuit Board) (Fig.2)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>What's a pseudo flame?</td>
<td>- There is a problem with the diaphragm inside the gas control valve. Replace the gas control valve. - If the symptoms remain after performing the checks described above, then the main PCB is defective and should be replaced.</td>
<td>Fig.1, Fig.2</td>
</tr>
<tr>
<td>Combustion occurs but the flame is detected in the combustion chamber before the modulating gas control valve starts opening. In this case, error code &quot;A8&quot; is displayed. 1) There is no voltage to the gas valve but there are small flames in the combustion chamber area when the unit stops running.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Fig.1
- Fig.2

---

**User's Manual**
### Error Code: "A9" (Operation for frozen prevention)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
</table>
| If the water temperature in unit becomes to lower than 41°F, the error code "A9" is displayed. Then, the unit runs automatically to prevent frozen. | - Please insulate the exposed pipes.  
- When not using for long term, please refer to page 14 |           |

### Error Code: "Ab" and "Ac" (Abnormality of thermostat)

![Temperature Thermostat](Fig.1)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Error code "Ab" is abnormality of central heating temp. thermostat. Error code "Ac" is abnormality of DHW temp. thermostat.  
1) A bad connection between the temperature thermostat and 13+21pin connector.  
2) The thermostat is short circuited.                                                                 |

- Check the connector, especially the pin inside the connector - reconnect if necessary  
- The temperature thermostat is defective and has to be replaced. Check resistance.  
  68°F=10330 Ohms, 86°F=7042 Ohms, 104°F=4905 Ohms, 122°F=3485 Ohms, 140°F=2523 Ohms, 158°F=1859 Ohms, 176°F=1395 Ohms.  
- If there is nothing wrong with the above, the controller is defective and should be replaced. |           |
Error Code: "AA" (Prevention of boiling)

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the water temperature inside of heat exchanger exceeds 197°F, shuts down the unit and indicates error code &quot;AA&quot; If the temperature become to lower than 176°F, the unit runs normally.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) All of the shut off valve are closed.</td>
<td>- Open the valves.</td>
<td>〈Fig.1〉</td>
</tr>
<tr>
<td>2) Clogged space heating filter.</td>
<td>- Clean the filter. (refer to page 22-23)</td>
<td>〈Fig.2〉</td>
</tr>
<tr>
<td>3) The pump is not working.</td>
<td>- Check the operation of the pump and the motor condition.</td>
<td>〈Fig.3〉</td>
</tr>
<tr>
<td></td>
<td>- Measure the voltage across the Black and White pump wires using multi meter. If the pump is not working although the voltage reading is 120V, the pump should be replaced.</td>
<td></td>
</tr>
<tr>
<td>4) 3-way valve is defective.</td>
<td>- There is a possibility of sticking of ball in 3-way valve. If the ball blocks the space heating line in spite of space heating mode, the 3-way valve should be replaced.</td>
<td>〈Fig.4〉</td>
</tr>
<tr>
<td>5) DHW flow switch is not working.</td>
<td>- Check the resistance and if it reads 0 Ohms when DHW is not flowing, it is defective and should be replaced.</td>
<td>〈Fig.5〉</td>
</tr>
</tbody>
</table>
**Error Code: "Ad" 〈Blockage of condensate & Flue system〉**

〈Condensate 'S' trap〉
〈Fig.1〉

<table>
<thead>
<tr>
<th>Symptom and Cause</th>
<th>Solution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) If the condensate 'S' trap is blocked by debris etc., the error code &quot;Ad&quot; is displayed.</td>
<td>- Clean the condensate 'S' trap</td>
<td>〈Fig.1〉</td>
</tr>
<tr>
<td>2) If the flue gas outlet pipe is blocked, the error code &quot;Ad&quot; is displayed.</td>
<td>- &quot;Ad&quot; error can be appeared in case of blocked flue system and wind for flue terminal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- When the unit is running normally and the unit stops operation, the air pressure switch is &quot;SHORT &quot; circuit. In these case, if the resistance of air pressure switch is 0 Ohms, the air pressure switch is normal. But if the resistance shows infinity or no reading, the air pressure switch should be replaced.</td>
<td></td>
</tr>
</tbody>
</table>
4 How to install

Warning

Please install on a durable wall.
- When install the product, about 31kg (66lb) is added on a wall. So if it is installed on not lasting wall, it may cause damages, submersion, gas leak and a fire by falling the product.
- If there is not enough strength to preserve the product, please do reinforcement work.
- The weight of the product is marked on 27 page of this manual.

Please don’t install on a group exhaust port wall.
- It may cause fall off the product due to an erosion of sticking screw (anchor bolt) by condensed water in the winter.
- It may cause damages, submersion, gas leak and a fire by falling the product.

Please fix the sticking clip strongly by using anchor bolt
- If the sticking clip is not strong enough, the appliance can fall.
- It may cause damages, submersion, gas leak and a fire by falling the product.
How to attach

1. The method of attaching sticking clip.
   ① Please mark attached position on the wall.
   ② Please make a hole around 5cm with hammer drill (Ø 10) on the marked position and fix the sticking clip with wall plug.
   ③ Please tighten the wall plug screw.
      ※ Please use a horizontal ruler before tightening the wall plug screw then check the horizon. When the wall plug screw becomes horizon, please tighten it.
   ④ If add a buffer as rubber not to have vibration while operating, it is much better.

2. Please match a fixed sticking clip and a hasp in the back.

3. Please fix tight a bracket of the bottom portion of the product.

4. Please keep tight all pipes using teflon or packing.
# Installation Clearance

Before Installing, check for the following:
Install in accordance with relevant building and mechanical codes, as well as any local, state or national regulations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Check</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from combustible</td>
<td>Maintain the following clearances from both combustible and non-combustible materials.</td>
<td><img src="image1" alt="Illustration" /></td>
</tr>
<tr>
<td>Piping side (Bottom)</td>
<td>Min. 12”</td>
<td></td>
</tr>
<tr>
<td>Front (Maintenance space)</td>
<td>Min. 24”</td>
<td></td>
</tr>
<tr>
<td>Back of heater</td>
<td>1”</td>
<td></td>
</tr>
<tr>
<td>Sides of heater</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>Top of heater</td>
<td>12”</td>
<td></td>
</tr>
<tr>
<td>Securing of space for repair/inspection</td>
<td>If possible, leave 8” or more on either side of the unit to facilitate inspection.</td>
<td><img src="image2" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td>If possible, leave 24” or more in front of the unit to facilitate maintenance and service if necessary.</td>
<td></td>
</tr>
<tr>
<td>Outdoor Clearance to Opening into Any Building</td>
<td>There must be a clearance of 24” or more in front of the Flue terminal.</td>
<td><img src="image3" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td>This restriction will not be applied to an area where an effective shield makes a clearance of 24” or more in front of the exhaust outlet.</td>
<td></td>
</tr>
</tbody>
</table>
Clearance Requirements from Vent Terminations to Building Openings

- All Clearance requirements are in accordance with ANSI Z21.10.3 and the National Fuel Code, ANSI Z223.1.

![Diagram of clearance requirements]

### Clearance

| A | Above grade, veranda, porch, deck, or balcony | 12"(12") |
| B | Window or door that may be opened | 12"(36") |
| C | Permanently closed window | * |
| D | Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet from the center of the terminal. | * |
| E | Unventilated soffit | * |
| F | Outside corner | * |
| G | Inside corner | * |
| H | Each side of center line extended above meter/regulator assembly | 3' within a height 15' above meter/regulator assembly |
| I | Service regulator vent outlet | 3' |
| J | Nonmechanical air supply inlet or combustion air inlet to any other appliance | 12"(36") |
| K | Mechanical air supply inlet | 3’ above if within 10’ (6’1) |
| L | Above paved sidewalk or paved driveway located on public property | (7’ *** |
| M | Under veranda, porch, deck, or balcony | * (12’ - Canada Only ****) |

(*) = indicates clearances required in Canada.

* Maintain clearances in accordance with local installation codes and the requirements of the gas supplier.

*** A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

**** Permitted only if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.
7 Flue plumbing

⚠️ Warning

- The venting system must be properly installed. Failure to properly install the vent system could result in property damage, personal injury, or death.
- Do not install damaged venting system components. If damage is evident then please contact the supplier where the water heater was purchased or the manufacture listed on the rating plate for replacement parts.
- Use only the vent terminals and vent/air intake components available for venting this appliance.
- Do not connect exhaust vent into an existing vent pipe or chimney.
- All of the exhaust venting connections must be leak checked with a soap solution upon initial start up of the appliance. Any leaks must be repaired before continuing operation of the appliance.
- Do not terminate the venting where noise from the exhaust or intake will be objectionable. This includes locations close to or cross from windows and doors. Avoid anchoring the vent and intake pipes directly to framed walls, floors, or ceilings unless rubber isolation pipe hangers are used. This prevents any vibrations from being transmitted into the living spaces.
- Do not exceed the venting distances or the number of elbows listed in this manual. Exceeding the maximum venting distances may cause the appliance to malfunction or cause an unsafe condition.

⚠️ Caution

- The vent shall terminate a minimum of 12 inches above expected snowfall level to prevent blockage of the vent termination.

VENTING

The venting instructions must be followed to avoid restricted combustion or recirculation of flue gases. Such condition cause sooting or risks of fire and asphyxiation.

For DPW Model, PVC pipes can be used.

<table>
<thead>
<tr>
<th>DPW Models</th>
<th>Intake</th>
<th>3” Schedule 40 PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flue Gas</td>
<td>3” Schedule 40 PVC</td>
</tr>
<tr>
<td></td>
<td>Maximum Number of 90 Deg Elbows : Three</td>
<td></td>
</tr>
</tbody>
</table>
Vent Terminal Installation Precautions
Note the following vent terminal installation requirements

- Do not install the vent terminal indoors.
- Install the vent terminal with a upward slope (2~3") – DPW-099A DPW-120A

- If multiple units are installed, terminals must be separated by 12" or more in a plain view regardless of the vertical clearance.
- Avoid installing the terminal where obstacles will block it.

- Do not install the vent terminals vertically in-line. Do not cover the vent terminal with any type of protective screen or enclosure. In-line or blocked terminals can cause abnormal combustion resulting undesired performance from the appliance.

- Avoid storing hazardous objects near the terminal.

installation Manual

50
Typical (and recommended) Venting design

Note
1. DPW-099A ~120A : 3" Schedule 40 PVC.
2. Maximum Three 90° Elbows.
3. Maximum Vent Length : 45 Feet Equivalent
4. Sloping up 2~3°

90° elbow should be installed to the intake air to prevent inhalation of flue gas.
Bird screen should be installed.

Min. 10 inch

Min. 12" from ground or as per local code requirements

Maximum Flue Length = 45 feet

Terminal Kit

Schedule 40 PVC Pipe

Must be sealed by silicon gel.

DPW Unit
Installation of Venting System

1. Drill 2 holes. (Air intake hole and flue gas outlet hole)

2. The length between air intake pipe hole and flue gas pipe hole (Z) is different according to the model type.

The length, Z, is as following:

<table>
<thead>
<tr>
<th>Model</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPW-099A~120A</td>
<td>115mm (4.53 inch)</td>
</tr>
</tbody>
</table>
3. Insert the air intake and flue gas outlet PVC pipe.
The length of PVC pipe from the wall is as following:

<table>
<thead>
<tr>
<th>Model</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPW model</td>
<td>50~60mm</td>
<td>120~130mm</td>
</tr>
<tr>
<td></td>
<td>(1.97~2.36 inch)</td>
<td>(4.72~5.12 inch)</td>
</tr>
</tbody>
</table>

4. Insert the flue terminal into the flue gas outlet PVC pipe.

5. Fasten a flue terminal to the PVC pipe by using the Stainless band supplied.
6. Insert the terminal kit to the air intake and flue gas outlet pipe.

Distinguish the air intake hole and flue gas outlet hole of terminal kit.

The sticker for discriminating between air intake hole and flue gas outlet hole is adhered at the inside of terminal kit.

7. Fixing the terminal kit to the wall by using screws (4 points)

8. Insert the 90 degree PVC elbow to the air intake pipe.

The 90 degree PVC elbow must have a bird screen.

The 90 degree PVC elbow have to turn towards down position to prevent indraft of water or snow.
When the intake/exhaust pipes pass through an enclosed space:
- Inspection openings are suggested for the vent intake and exhaust pipes if they are installed in an enclosure. Those openings should be near the entrance and exit of the vent into the enclosure.
- These openings should be 18” X 18”.

![Diagram of intake and exhaust pipes]

### Venting Precautions

- **Maximum vent length**

<table>
<thead>
<tr>
<th>Number of 90 degree elbows</th>
<th>Maximum straight pipe distance (Vertical and Horizontal)</th>
<th>Maximum total equivalent feet(meters) of vent pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>45</td>
<td>45 (13.7 meters)</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>45 (13.7 meters)</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>45 (13.7 meters)</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>45 (13.7 meters)</td>
</tr>
</tbody>
</table>

Each 90 degree elbow is equivalent to 5 feet in straight vent pipe length. Each 45 degree elbow is equivalent to 1.5 feet(0.46m) in straight pipe length. The total maximum equivalent vent pipe distance cannot 45 feet(13.7 meters) for horizontal & vertical venting distance.

- Exceeding the maximum vent length is dangerous and may result in bad combustion.
- If possible, don’t install the vent pipe through enclosed area. If necessary, consult the pipe manufacture’s instructions for clearances.
- Install the vent terminal so that all exhaust is directed to and all intake air is taken from outdoors.
- Do not store hazardous or flammable substances near the vent terminal.
- For DPW models, slop the intake pipe at 2~3° down towards the termination and slop the exhaust pipe at 2~3° up towards the termination.
- Connects the vent pipe firmly so that it will prevent exhaust gases from leaking.
- Steam or condensed water may drip out of the vent terminal. Dispose of this condensed water according to local codes and in order to prevent injury or property damage.
- If this product will be installed in an area where snow is known to accumulate, protect the vent termination from blockage by snow drifts or damage from snow falling off of roofs.
- Support the vent pipe with hangers at 3ft intervals.
- Install the vent terminal so that it is easily accessible for maintenance both from the indoors and the outdoors.
- Make the vertical pipe as short as possible.
8 Gas plumbing

- Gas plumbing should be committed and installed to an export as gas institution and gas supplier.

⚠️ Warning

After gas plumbing, please check the gas leak.
- When there is gas leak, it may cause serious bodily injury and a great property loss.

Please check whether the type of gas specified in the product and the supplied gas match.
- If it don’t match indicated on the rating plate located on the front case of appliance, it may cause a fire and explosion from imperfect combustion.

- Please meet the standard requirement of the gas pipe.
  - Please use metallic flexible hose for gas pipe being approved as metal pipe.
  - If don’t use standard product, it may cause a fire or explosion by gas leak.

- Please don’t use gas pressure as described.
  - It may cause damage on the product and a fire.

- Please close shut-off valve and use gas pressure as described while gas leak checking.
  - It may cause a fire and an explosion.
Pipe Sizing Example:
This table below is for Natural Gas piping supply straight to the appliance without any tabs to other gas appliances.

<table>
<thead>
<tr>
<th>Distance from Gas Meter</th>
<th>Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0'-20'</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>30'-80'</td>
<td>1&quot;</td>
</tr>
<tr>
<td>90'-200'</td>
<td>1-1/4&quot;</td>
</tr>
</tbody>
</table>

Natural Gas Supply Piping
Maximum Capacity of Natural Gas Based on a 0.60 specific gravity at a 0.5" WC pressure drop

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>kBTU of Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length 10' 20' 30' 40' 50' 60' 70' 80' 90' 100' 125' 150' 200'</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>372 255 205 175 156 142 130 121 114 107 95 86 74</td>
</tr>
<tr>
<td>1&quot;</td>
<td>702 482 387 331 293 266 245 228 213 202 179 162 139</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>1441 990 795 680 603 546 503 468 439 415 367 332 285</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>2158 1483 1191 1019 903 819 753 701 658 621 550 499 427</td>
</tr>
<tr>
<td>2&quot;</td>
<td>4155 2856 2293 1963 1740 1576 1450 1349 1266 1195 1060 960 822</td>
</tr>
</tbody>
</table>

Propane(LP) Gas Supply Piping
Maximum Capacity of propane(LP) Gas Based on 11" WC supply pressure at a 1.0" WC pressure drop

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>kBTU of Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length 10' 20' 30' 40' 50' 60' 70' 80' 90' 100' 125' 150' 200'</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>567 393 315 267 237 217 196 185 173 162 146 132 112</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1071 732 590 504 448 409 378 346 322 307 275 252 213</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>2205 1496 1212 1039 913 834 771 724 677 630 567 511 440</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>3307 2299 1858 1559 1417 1275 1181 1086 1023 976 866 787 675</td>
</tr>
<tr>
<td>2&quot;</td>
<td>6221 4331 3465 2992 2646 2394 2205 2047 1921 1811 1606 1496 1260</td>
</tr>
</tbody>
</table>
TO TURN OFF GAS TO APPLIANCE

1. Turn off all electric power to the appliance if service is to be performed.
2. Turn the manual gas valve located on the outside of the unit clockwise to the off position. (This unit has a switch (gas cut-off device) on junction box in the appliance, locate the switch button to off position)

FOR YOUR SAFETY, READ BEFORE OPERATING:

1. This appliance does not have a pilot. It is equipped with an electronic ignition device that automatically lights the burner. Do not try to light the burner manually:
2. Before operating, check all around the appliance area for gas leaks.
   Be sure to check next to the floor as some gases are heavier than air and will settle on the floor;
3. Use only your hand to turn the gas valve knob. Never use tools. If the knob will not turn by hand, do not attempt to repair it. Call a qualified service technician. For or attempted repair may result in a fire or explosion.

- Check that the type of gas matches the rating plate located on the cover of your appliance.

- The minimum and maximum inlet gas pressure are:

| Natural Gas | Min, 3.5” WC – Max, 10.5” WC |
| Propane Gas | Min, 8” WC – Max, 13” WC |

- Gas pressure below this specified range for the DPW models and/or insufficient gas volume will adversely affect performance. Inlet gas pressure must not exceed the above maximum values: gas pressure above the specified range will cause dangerous operating conditions and damage to the unit. Until testing of the main gas line supply pressure is completed, ensure the gas line to the DPW models is disconnected to avoid any damage to the appliance.

- Size the gas pipe appropriately to supply the necessary volume of gas required for the DPW models using ANSI 233.1/NAPA 54 in the USA or CAN/CSA B149.1 in Canada or local codes. Install a manual gas shut-off valve between the DPW models and the gas supply line. When the gas connections are completed, it is necessary to perform a gas leak test either by applying soapy water to all gas fittings and observing for bubbles or by using a gas leak detection device. Always purge the gas line of any debris before connecting to the appliance gas inlet.
Domestic hot water plumbing

This appliance is suitable for potable water and space heating applications. Do not use this appliance if any part has been underwater. Immediately call a qualified service technician to inspect the appliance and replace any part of the control system and gas control which has been underwater.

A pressure relief valve is installed in this dual purpose water heater that is rated in accordance with and complying with either The Standard for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 or The ANSI/ASME Boiler and Pressure Vessel Code, Section IV (Heating Boilers). The relief valve must be installed such that the discharge will be conducted to a suitable place for disposal when relief occurs. The discharge line must be installed to allow complete drainage of both the valve and the line. If this unit is installed with a separate storage vessel, the separate vessel must have its own temperature and pressure relief valve. This valve must also comply with The Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 (in the U.S. only). A temperature relief valve is not required, but if one is used, do not install the valve with the probe directly in the flow of water. This may cause unwarranted discharge of the valve.

Piping and components connected to the appliance shall be suitable for use with potable water. Toxic chemicals, such as those used for boiler treatment, shall not be introduced into the potable water. A water heater used to supply potable water may not be connected any heating system or components previously used with a nonpotable water heating appliance. When the water is required in one part of the system at a higher temperature than in the rest of the system, means such as a mixing valve shall be installed to temper the water to reduce the scald hazard.

- Do not reverse the inlet and outlet (cold and hot water) connections on the appliance. This may cause a hazardous operating condition or the appliance may be inoperable.
- Flush water through the pipe to clean out metal powder, sand and dirt before connecting it.
- Take appropriate heat insulation measures (e.g., wrapping with heat insulation materials, using electric heaters) according to the climate of the region to prevent the pipe from freezing.
- Use a union coupling or flexible pipe for connecting the pipes to reduce the force applied to the piping.
- Do not use piping with a diameter smaller than the coupling.
- When feed water pressure is too high, insert a depressurizing valve, or take water hammer prevention measures.
- Avoid using joints as much as possible to keep the piping simple.
- Avoid piping in which an air holdup can occur.
- Use approved piping materials.
10 Electric Wiring

⚠️ Warning

- Turn off or disconnect the electrical power supply to the appliance before servicing. Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

- All electrical wiring must be installed and grounded in accordance with local codes, or in the absence of local codes, the National Electrical Code, ANSI/NFPA 70 and/or CSA 22.2 Electrical Code.

The appliance must be wired to a 120 VAC, 60Hz.

If wiring in conduit is required, install an electrical conduit connector. A disconnect switch should be provided near the appliance for servicing. Connect the wires exactly as shown in the wiring diagram of this manual and on the inside cover panel.

⚠️ Caution

- Do not energize the electric circuit before the water heater tank is filled with water.

- Do not turn on the power until the electrical wiring is finished.

- Do not disconnect the power supply when not in use. When the power is off, the freeze prevention in the appliance will not activate, resulting in possible freezing damage.

- Do not let power code contact the gas piping

Tie the redundant power cord outside the water heater.
(2) Factory Installed Brown Zone Control Wires Attached To Terminals 9 & 12

Thermistor (DC 5V)
Air pressure switch (DC 5V)
Over heat thermostat (DC 5V)
Pump detection switch (DC 5V)
Flame rod (AC 24V)
Water flow sensor (DC 5V)
Fan flow sensor (DC 12V)

Gas valve (modulating valve) (DC 24V)
Pump (AC 120V)
3way valve (AC 120V)
Gas valve (solenoid valve) (DC 120V)
Ignition (AC 120)
Fan (DC 8~43V)
Power (AC 120V)
Room controller (DC 24V)
11 Condensate Discharge

1. Condensing gas water for dual purpose needs discharge in the appliance due to condensed water.
2. Please connect in reserve condensed water discharge hose to condensed water trap and please tie them with cable tie or hose band.
3. Please put the end of hose into sewers or discharge.
4. Condensed water trap in the appliance always should be full of water.
   Please check it is full or not when operate again after not using for a while.
5. Please supply water in a condensed water trap through pipe connection or condensed water rubber pipe.
   △ Caution: ① Please connect condensed water rubber pipe as it was when supply through this pipe.
   ② Please be careful not to splash to other parts when supply water.
6. Please don’t use condensed water as drinking water.
7. Please clean condensed water trap more than once in a year.
8. Please untie a fixing screw and hose band when clean and please clean a rubber hose separately.
9. Please make a measurement to prevent freezing when install condensed water discharge hose.
DPW Dip Switch Settings

Depending on the application of the DPW unit it may be necessary to alter the Dip Switch settings from the standard positions

The unit has 5 Dip Switches located on the Microprocessor

<table>
<thead>
<tr>
<th>Dip Switch</th>
<th>Standard Setting</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON</td>
<td>Fuel Gas Type</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>Fuel Gas Type</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
<td>Unit Options</td>
</tr>
<tr>
<td>4</td>
<td>OFF</td>
<td>Forced Maximum Firing rate</td>
</tr>
<tr>
<td>5</td>
<td>OFF</td>
<td>Forced Minimum Firing rate</td>
</tr>
</tbody>
</table>

Setting for Natural Gas Operation

<table>
<thead>
<tr>
<th>Dip Switch</th>
<th>Setting for NG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Setting for LP Gas Operation

<table>
<thead>
<tr>
<th>Dip Switch</th>
<th>Setting for LP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
</tr>
</tbody>
</table>

Unit Options

Switch Dip Switch #3 to ON

On DSR-100F press the Timers and Anti Freeze buttons simultaneously for 5 seconds. This will allow unit to enter the programming mode

Temperature display can be changed between DegF and DegC by pressing the Timer button 3 times until Lc is displayed in the top RH corner of the unit display, and f is displayed in the center of the screen

Press the Up temperature arrow and the f will change to a c

Hit the Power On/Off button to exit and switch Dip Switch #3 to OFF, the unit will now display in DegC.
Zone Control
This can be also be set up using this control (see zone control wiring section for more detail)

Maximum Firing Rate
Setting Dip Switch #4 to ON will lock the unit into the maximum firing rate at all times. This is occasionally used for troubleshooting and gas pressure set up purposes. Move the switch back to OFF to allow the unit to modulate capacity.

Minimum Firing Rate
Setting Dip Switch #5 to ON will lock the unit into the minimum firing rate at all times. This is occasionally used for troubleshooting and gas pressure set up purposes. Move the switch back to OFF to allow the unit to modulate capacity.
Specific requirements for installation in Massachusetts

In the Commonwealth of Massachusetts these units must be installed by a licensed gas fitter or plumber

Venting:

For the Quietside models DPW-099A, DPW-120A where the bottom of the vent termination and combustion air intake is installed at a height **BELOW** 4 ft above the grade level the following requirements must be satisfied

1. If there is not one presently installed, on each floor level where there is a bedroom(s), a Carbon Monoxide detector and alarm shall be installed in the living area outside the bedroom(s). The Carbon Monoxide detector shall comply with NFPA 720 (2005 Edition)

2. A Carbon Monoxide detector shall be installed in the room where the ODW unit is installed, the detector shall be:
   a) Powered from the same power circuit that provides power for the ODW unit. A single electrical service switch shall be used to service both the unit and the detector
   b) Have battery back up power
   c) Meet ANSI/UL std 2034 and comply with NFPA 720 (2005 Edition)
   d) Approved and listed by a NRTL recognized under 527 CMR

3. A Quietside approved vent termination must be used. Installation of the vent terminal must be in strict compliance with Quietside’s written instructions, and a copy of these instructions must remain with the unit after the installation is completed.

4. A metal or plastic identification plate shall be mounted on the exterior of the building, 4ft above the vent termination. The plate shall read “**Gas Vent Directly Below**” with text size visible from a minimum of 8ft.
For the Quietside models listed above where the bottom of the vent termination and combustion air intake is installed at a height of 4ft ABOVE the grade level the following requirements must be satisfied

1. If there is not one presently installed, on each floor level where there is a bedroom(s), a Carbon Monoxide detector and alarm shall be installed in the living area outside the bedroom(s). The Carbon Monoxide detector shall comply with NFPA 720 (2005 Edition)

2. A Carbon Monoxide detector shall be installed in the room where the ODW unit is installed, the detector shall be:
   a) Powered from the same power circuit that provides power for the ODW unit. A single electrical service switch shall be used to service both the unit and the detector
   b) Have battery back up power
   c) Meet ANSI/UL std 2034 and comply with NFPA 720 (2005 Edition)
   d) Approved and listed by a NRTL recognized under 527 CMR

3. A Quietside approved vent termination must be used. Installation of the vent termination must be in strict compliance with Quietside’s written instructions, and a copy of these instructions must remain with the unit after the installation is completed.

**Vent Termination requirements**

**As the DPW unit is a condensing product**

The Vent for all Quietside DPW units shall not terminate

Over Public Walkways; or

Near soffit vents or crawl space vents or other area where condensate or vapor could create a nuisance or hazard or cause property damage; or

Where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment
Specific requirements for installation in Canada

The provinces of Ontario and Alberta have adopted standard ULC S636 requiring the following additional items to be noted.

1. Maximum flue temperature as tested is 136 DegF, allowing these units to be vented with Schedule 40 PVC under the regulation of ULC S636.

2. Under the new requirements of ULC S636 regarding vent connections to the unit, Quietside requires the Schedule 40 Vent piping to be secured to the unit using approved PVC cement, following the cement manufacturers instructions regarding methodology and curing time. A bead of high temperature silicone should be also run around the joint to ensure no leaks can occur.
Combustion and Leak Testing of DPW units

As the front cover of the unit is mechanically attached and cannot be removed in operation without the use of a tool, it is not permissible to conduct combustion testing or leak testing of the unit with the front cover removed.

Combustion testing must be achieved by using a calibrated combustion tester, with the probe inserted either in the flue exhaust of the vent termination or it is permissible to take reading by accessing the flue pipe approximately 12” above the unit, providing adequate provisions are made for sealing any access after testing to ensure no leakage of flue gases into the occupied space.

Leak testing must take place with the end of the “sniffer probe” at least 1” from any surface of the unit to ensure that false readings cannot be obtained.

Auto Fill – Closed Loop System

The DPW unit is fitted with a MANUAL Auto Fill valve, supplied in the closed position.

The Fill Valve is not pressure regulated therefore care must be used when opening the valve to prevent overfilling of the closed loop system and opening of the pressure relief valve.

Quietside recommends that the valve be left in the closed position and an external Boiler Feed Valve e.g. Taco 335/329 be installed in the piping system to maintain an even pressure in the closed loop system.

Manual Auto Fill Valve located on base of cabinet
Zone control of DPW unit

Zone control of the DPW unit is performed by a zero voltage or X-X contact from a relay or zone control panel closing when unit operation is required.

You will find two brown wires attached to the upper Molex connector of the main PC board. These wires can be extended with 18 gauge thermostat wire and only connected to dry contacts from your zone control panel end switch. See example wire diagrams on the last four pages of this manual.
**Anti Freeze & Freeze Protection**

For Anti Freeze protection in the Quietside units the following products are recommended

- “No Burst”
- “Fernox Alphii”

The maximum concentration allowed is 30% by volume which will protect the unit down to approximately 5 DegF or -11 DegC

**Water Quality**

DPW models potable side must have the water quality within the following limits for long life and reliable operation. The water supply should be tested to make sure the quality is within specified limits. If there is a problem with the water quality, contact your local water conditioning company for equipment to condition the water supply to these appliances.

Operating this water heater with water conditions outside the specified limits will void the warranty.

<table>
<thead>
<tr>
<th>Description</th>
<th>PH</th>
<th>TDS (Total Dissolved Solids)</th>
<th>Total Hardness</th>
<th>Aluminum</th>
<th>Chlorides</th>
<th>Copper</th>
<th>Iron</th>
<th>Manganese</th>
<th>Zinc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Levels</td>
<td>6.5 to 8.5</td>
<td>Up to 500 ppm</td>
<td>Up to 200 ppm or 11.7 grains hardness</td>
<td>Up to 0.2 ppm</td>
<td>Up to 250 ppm</td>
<td>Up to 1.0 ppm</td>
<td>Up to 0.3 ppm</td>
<td>Up to 0.05 ppm</td>
<td>Up to 5 ppm</td>
</tr>
</tbody>
</table>
Pump Curves & Primary – Secondary Piping

The DPW units include a pump assembly that is used to provide the flow through the unit heat exchangers, and has a nominal flow of heating water for external piping arrangements.

This pump is not designed to be the system pump providing flow to radiant loops or baseboard.

Therefore Quietside insists on using a Primary – Secondary pumping arrangement, the recommended method uses the traditional large diameter Primary loop

The main circulation pump or the zone pumps will then provide circulation into the zones or the heating system.

The only exception to this Primary – Secondary rule is for Air Handling units with a hot water coil where the Air Handling unit is located less than 10ft from the DPW unit.

Unit Controls & Zoning

A DSR-100F Controller is provided with the unit.

This is not used as a thermostat, but is a unit controller and should be mounted adjacent to the DPW unit. It is connected to the DPW via the 2 Yellow wires and is powered by 20V DC.

The DSR controller allows both the heating loop and DHW water temperatures to be set.

When the unit is started using the X – X or dry contacts on the microprocessor it will operate and provide heating loop water at the set temperature until the zone(s) are satisfied. If a DHW call is experienced during heating operation the unit will automatically switch over to provide DHW.

**DO NOT APPLY 24V AC OR LINE VOLTAGE TO THE X – X CONTACTS UNIT MICROPROCESSOR WILL FAIL IF IT RECEIVES 24V AC OR LINE VOLTAGE ON THESE CONTACTS**

It is not permissible to power the secondary loop pump from the Primary loop pump installed in the unit.
Power for the Secondary loop pump should come from a switching relay e.g. Taco SR501
Cold Water Supply from House to 1/2" male connection on DPW Use 1/2" Unions

Shut Off Valves to isolate both Inlet and Supply of DHW system from DPW

"Boiler Drains" to allow maintenance of the DHW Plate Heat Exchanger

Pressure Relief Valve (Factory Supplied) Pipe to building drain (See local codes)

Boiler Feed Valve with Backflow prevention See local codes

Use 1 1/4" pipe diameter for heating primary loop

Shut Off Valves to isolate both Supply & Return

"Boiler Drain" - see notes

Notes:
- When brazing always wrap valves, drains etc with a wet rag to prevent damage
- Check system design for requirement for additional expansion tank on closed loop system
- Boiler drain installed on Primary Loop should be below DPW Isolation valve to allow closed loop system to be filled with DPW isolated from the closed loop to protect unit
- A Drain can also be installed on return piping above shut off valve to drain the unit or Pressure Relief valve on the unit can be used to provide a drain

Anti Scald Valve MANDATORY Set for Maximum of 120DegF

Air Vent at highest point

System Circulation Pump Field Installed

Supply to Heating zones (No detail shown)

Return from Heating zones (No detail shown)
Cold Water Supply Notes:
- from House to 1/2" male connection on DPW
- Use 1/2" Unions

Notes:
- When brazing always wrap valves, drains etc with a wet rag to prevent damage
- Boiler drain installed on piping should be below DPW Isolation valve to allow closed loop system to be filled with DPW isolated from the closed loop to protect unit
- A Drain can also be installed on return piping above shut off valve to drain the unit or Pressure Relief valve on the unit can be used provide a drain

- "Boiler Drains" to allow maintenance of the DHW Plate Heat Exchanger
- Pressure Relief Valve (Factory Supplied) Pipe to building drain (See local codes)
- Boiler Feed Valve with Backflow prevention See local codes
- Shut Off Valves to isolate both Inlet and Supply of DHW system from DPW
- "Boiler Drain" - see notes

Use max ø1" pipe for Supply & Return to AHU. Max total pipe length (Supply & Return) 20ft

System is designed for the Air Handler to be located no more than 10ft from the DPW and no more than 5ft above or below the DPW

Air Handler should not have it's own circulator installed Disconnect pump if installed

8750 Pioneer Blvd, Santa Fe Springs CA 90670
Tel: 562 699 6066, Fax: 562 699 4351, Web: www.Quietside.com
Title: DPW Recommended Piping Layout, AHU (No Pump) & DHW
Drg #: QUI-DPWP-002 Drawn: JLM 8/26/2008 Rev: 001
Closed Loop Heating System Notes:
When brazing always wrap valves, drains etc with a wet rag to prevent damage.

Check system design for requirement for additional expansion tank on closed loop system.

Boiler drain installed on Supply to closed loop should be below DPW Isolation valve to allow closed loop system to be filled with DPW isolated from the closed loop to protect unit.
A Drain can also be installed on return piping above shut off valve to drain the unit or Pressure Relief valve on the unit can be used provide a drain.

Pressure Relief Valve
Pipe to building drain (See local codes)

3/4" Unions to connect to 3/4" Male Supply and Return connections on DPW

Air Vent at highest point

"Boiler Drain" - see notes

Use ø1 1/4" pipe for Primary Loop

Supply to Heating zones
(No detail shown)

Return from Heating zones
(No detail shown)

Secondary or Zone Pump

QSDHS DHW System Notes:
Tank system also includes Tank Drain and P/R Valve (supplied loose)
These should be installed and piped in accordance with local codes.

Anti Scald Valve
MANDATORY
Supplied with QSDHS
Max Setting 120DegF
ø3/4" NPT Connection

Title: DPW Piping, Primary Loop Htg c/w QSDHS DHW Storage
Drg #: QUI-DPWP-003  Drawn: JLM  9/18/2008  Rev: 001
Closed Loop Heating System Notes:
When brazing always wrap valves, drains etc with a wet rag to prevent damage

System is designed for the Air Handler to be located no more than 10ft from the DPW and no more than 5ft above or below the DPW

Boiler drain installed on Supply to closed loop should be below DPW isolation valve to allow closed loop system to be filled with DPW isolated from the closed loop to protect unit.
A Drain can also be installed on return piping above shut off valve to drain the unit or Pressure Relief valve on the unit can be used provide a drain

Pressure Relief Valve
Pipe to building drain
(See local codes)

3/4" Unions to connect to 3/4" Male Supply and Return connections on DPW

Air Vent at highest point

"Boiler Drain" - see notes

Use max ø1" pipe for Supply & Return to AHU. Max total pipe length (Supply & Return) 20ft

Closed Loop Return
DHW Cold In
DHW Hot Out
Closed Loop Supply

DPW
DPWH

To DPW DHW Inlet

Shut Off Valves to isolate DPW from Air Handler

DPW DHW Inlet & Outlet connection sizes are 1/2"

From DPW DHW Outlet

ø3/4"NPT

Anti Scald Valve
MANDATORY
Supplied with QSDHS
Max Setting 120DegF
ø3/4" NPT Connection

Use max ø1" pipe for Supply & Return to AHU. Max total pipe length (Supply & Return) 20ft

Taco 008 Bronze Pump c/w IFC and Shut offs Supplied with QSDHS

QSDHS DHW STORAGE TANK SYSTEM 20 GAL CAPACITY

Cold Water Inlet from House supply

Title: DPW Piping, Close coupled AHU c/w QSDHS DHW Storage
Drg #: QUI-DPWP-004  Drawn: JLM  9/18/2008  Rev: 001
NOTES
TO SET DSR-100F

1 PRESS UNIT ON/OFF BUTTON

2 PRESS HEATING SET TEMPERATURE BUTTON

3 USE UP AND DOWN ARROWS TO SELECT DESIRED HEATING WATER TEMPERATURE RANGE 122-176 DEGF

4 PRESS DHW SET TEMPERATURE BUTTON

5 USE UP AND DOWN ARROWS TO SELECT DESIRED DHW WATER TEMPERATURE 98-114 DEGF, 120, 130, 140 DEGF

WHEN X-X CONTACT IS CLOSED UNIT WILL START AND PROVIDE CLOSED LOOP HEATING WATER AT THE TEMPERATURE SELECTED

DHW PRIORITY WILL BE MAINTAINED

WHEN THE ZONE(S) SATISFY THE UNIT WILL SHUT DOWN, DSR WILL REMAIN LIT AT ALL TIMES

THIS IS THE PREFERRED METHOD TO CONTROL THE SECONDARY LOOP PUMP REQUIRED IN ALL NON CLOSE COUPLED AHU & HW COIL APPLICATIONS
NOTES
TO SET DSR-100F

1 PRESS UNIT ON/OFF BUTTON

2 PRESS HEATING SET TEMPERATURE BUTTON

3 USE UP AND DOWN ARROWS TO SELECT DESIRED HEATING WATER TEMPERATURE RANGE 122-176 DEGF

4 PRESS DHW SET TEMPERATURE BUTTON

5 USE UP AND DOWN ARROWS TO SELECT DESIRED DHW WATER TEMPERATURE 98-114 DEGF, 120, 130, 140 DEGF

WHEN X-X CONTACT IS CLOSED UNIT WILL START AND PROVIDE CLOSED LOOP LOOP HEATING WATER AT THE TEMPERATURE TEMPERATURE SELECTED

DHW PRIORITY WILL BE MAINTAINED

WHEN THE ZONE(S) SATISFY THE UNIT WILL SHUT DOWN, DSR WILL REMAIN LIT AT ALL TIMES

DIAGRAM SHOWS AN SR504, HOWEVER DIAGRAM CAN BE USED WITH ALL ZONE CONTROL PANELS (SR, ZV, ETC) WITH AN X - X OR 0V CONTACT
NOTES

TO SET DSR-100F

1 PRESS UNIT ON/OFF BUTTON

2 PRESS HEATING SET TEMP
   BUTTON (LHS OF ON/OFF BUTTON)

3 USE UP AND DOWN ARROWS
   TO SELECT DESIRED HEATING
   WATER TEMPERATURE
   RANGE 122-176 DEGF

4 PRESS DHW SET TEMP
   BUTTON (RHS OF ON/OFF BUTTON)

5 USE UP AND DOWN ARROWS
   TO SELECT DESIRED DHW
   WATER TEMPERATURE
   98-114 DEGF, 120, 130, 140 DEGF

WHEN DRY CONTACT IS CLOSED UNIT
WILL START AND PROVIDE CLOSED
LOOP HEATING WATER AT THE
TEMPERATURE SELECTED

DHW PRIORITY WILL BE MAINTAINED

WHEN THE ZONE(S) SATISFY THE UNIT
WILL SHUT DOWN, DSR WILL REMAIN LIT
AT ALL TIMES

THIS IS THE PREFERRED METHOD TO
INTEGRATE ZONE VALVES AND
THE SECONDARY LOOP PUMP
NOTES
WIRING DIAGRAM FOR CONTROL OF A
AIR HANDLER & HW COIL, WHERE
PRIMARY PUMP IN DPW IS CAPABLE
OF PROVIDING FLOW TO FAN COIL

TO SET DSR-100F CONTROLLER

1 PRESS UNIT ON/OFF BUTTON

2 PRESS HEATING SET
TEMPERATURE BUTTON

3 USE UP AND DOWN ARROWS
TO SELECT DESIRED HEATING
WATER TEMPERATURE
RANGE 122-176 DEGF

4 PRESS DHW SET
TEMPERATURE BUTTON

5 USE UP AND DOWN ARROWS
TO SELECT DESIRED DHW
WATER TEMPERATURE
98-114 DEGF, 120, 130, 140 DEGF

6 INSTALL AN AQUA STAT IN THE HTG COIL
OF THE AIR HANDLER - WIRE TO FAN
MOTOR TO STOP FAN OPERATION IF
COIL TEMPERATURE FALLS e.g. DHW
PRIORITY OR INITIAL START UP

WHEN T-STAT CALLS FOR HEAT, RELAY WILL
CLOSE AND DPW UNIT WILL START
WHEN T-STAT IS SATISFIED RELAY WILL OPEN AND
UNIT WILL STOP
DSR CONTROL WILL REMAIN LIT AT ALL TIMES