Troubleshooting — Common problems and possible solutions

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<td>Locate thermostat on inner wall away from heat sources or cool drafts.</td>
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<tr>
<td>Heat anticipator in thermostat adjusted incorrectly</td>
<td>Adjust thermostat per manufacturer’s instructions.</td>
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<tr>
<td>Incorrect limit setting</td>
<td>Set limit according to system needs. Maximum setting is 250°F. Increase limit setting to decrease cycling.</td>
<td>Set limit according to manufacturer’s instructions.</td>
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<tr>
<td>Insufficient water flow through boiler</td>
<td>Check all valves to and from boiler. Return to proper setting.</td>
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<tr>
<td>Frequent release of water through relief valve</td>
<td>Expansion tank sized too small</td>
<td>Call qualified service technician to check expansion tank operation and size.</td>
</tr>
<tr>
<td>Need to frequently add makeup water</td>
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<td>Have qualified service technician repair leaks as once to avoid constant use of makeup water.</td>
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<tr>
<td>Black water condition</td>
<td>Oxygen corrosion due to leaks in boiler and piping</td>
<td>Have qualified service technician repair at once. Keep pH of water between 7.0 to 8.5.</td>
</tr>
<tr>
<td>Popping or parselating noise heard in boiler</td>
<td>Mineral deposits in sections due to constant use of makeup water</td>
<td>Call qualified service technician to de-lime boiler, if necessary.</td>
</tr>
<tr>
<td>Incorrect pH of boiler water</td>
<td>Have qualified service technician happy to need for constant use of makeup water.</td>
<td>Call qualified service technician to adjust pH to 7.0 to 8.5.</td>
</tr>
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<td>Insufficient water flow through boiler</td>
<td>Check all valves to and from boiler. Return to proper setting.</td>
<td>Ensure all valves are open and flowing properly.</td>
</tr>
<tr>
<td>Metal flakes found in vent outlet or vent — flyway corrosion</td>
<td>Contaminated combustion air supply. — See page 2 in this manual.</td>
<td>Remove any contaminating products. — See page 2 in this manual.</td>
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<tr>
<td>Air in system</td>
<td>Check all valves to and from boiler. Return to proper setting.</td>
<td>Ensure all valves are open and flowing properly.</td>
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<tr>
<td>Low system pressure</td>
<td>Check for leaks in boiler or piping. Have qualified service technician repair at once.</td>
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</tr>
<tr>
<td>Insufficient water flow through boiler</td>
<td>Have qualified service technician inspect system piping and controls to verify proper regulation of return temperature.</td>
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<td>Some radiators or baseboard units do not heat or are noisy</td>
<td>Condensation of combustion gases in boiler sections</td>
<td>Have qualified service technician inspect system piping and controls to verify proper regulation of return temperature.</td>
</tr>
<tr>
<td>Domestic water from tankless heater is not heated suddenly turns cold. — or — Domestic water from tankless heater is always lukewarm</td>
<td>Mineral deposits in sections due to constant use of makeup water</td>
<td>Have qualified service technician de-lime or replace coil.</td>
</tr>
<tr>
<td>Boiler stop leak-compound has been added to boiler water and is insolubilizing outside of coil</td>
<td>Boiler stop leak-compound has been added to boiler water and is insolubilizing outside of coil</td>
<td>Have qualified service technician remove clean coil and drain and flush boiler to remove stop-leak.</td>
</tr>
<tr>
<td>Domestic flow rate too high</td>
<td>Insufficient water flow through boiler</td>
<td>Have qualified service technician raise tankless control setting.</td>
</tr>
<tr>
<td>Incorrect tankless heater control</td>
<td>Insufficient water flow through boiler</td>
<td>Have qualified service technician adjust mixing valve setting.</td>
</tr>
</tbody>
</table>

Service and maintenance

1. To avoid electric shock, disconnect electrical supply before performing maintenance.
2. To avoid severe burns, allow boiler to cool before performing maintenance.
3. You must maintain the boiler as outlined in the manual and have the boiler started up and serviced at least annually by a qualified service technician to ensure boiler system reliability.

Boiler operation

5. DO NOT block flow of combustion or ventilation air to boiler. If vent or air blockage is easily accessible and removable, remove it. If blockage is not obvious or cannot be removed, have the boiler and system checked by a qualified service technician.
6. Should overheating occur or oil supply fail to shut off, do not turn off or disconnect electrical supply to pump. Instead, shut off the oil supply at a location external to the appliance.
7. Have the building monitored when it is vacant for an extended period. Safety controls can shut down the boiler at any time. The loss of heat can result in significant damage due to freezing.

Air contamination

8. Carefully read and follow instructions on page 2.

Failure to adhere to the guidelines on this page can result in severe personal injury, death or substantial property damage.

At the beginning of each heating season, contact your qualified service technician to inspect, clean and start-up the boiler per the Boiler Manual. Failure to comply could result in boiler failure, leading to potential severe personal injury, death or substantial property damage.

User’s Information Manual

Hazard definitions

DANGER
Hazards that will cause severe personal injury, death or substantial property damage.

WARNING
Hazards that can cause severe personal injury, death or substantial property damage.

CAUTION
Hazards that will or can cause minor personal injury or property damage.

NOTICE
Special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

Boiler water

9. DO NOT use petroleum-based cleaning or sealing compounds in boiler system. Water seal deterioration will occur, causing leakage between sections and damage to heating system components. This can result in substantial property damage.

Glycol — potential fire hazard —

12. DO NOT add cold water to hot boiler. Thermal shock can cause sections to crack.

Glycols — potential fire hazard —

13. All glycol is flammable when exposed to high temperatures. Use of glycol in the boiler system can lead to hazardous leakage of glycol in the boiler system.

SERVICE AND MAINTENANCE

The User’s Information Manual provides information to the boiler owner/user for routine operation and maintenance and emergency shutdown. Detailed information on boiler installation, operation, start-up, service and parts is included in the Boiler Manual. The Boiler Manual is intended only for use by a qualified installer/service technician.
Please read this page first

Air contamination
To prevent potential of severe personal injury or death, check for products or areas listed in table below before installing boiler. If any of these contaminants are found, do one of the following:
- Remove contaminants permanently.
- or
- Isolate boiler and provide outside combustion air. See applicable codes for further information.
- or
- Contact your qualified service technician to install an outside air kit (if available) for the burner. An outside air kit allows ducting of outside air directly to the burner.

Products to avoid
- Spray cans containing chloro-fluorocarbons
- Permanent wave solutions
- Chlorinated waxes/cleaners
- Chlorinated swimming pool chemicals
- Calcium chloride used for thawing
- Sodium chloride used for water softening
- Refrigerant leaks
- Paint or varnish removers
- Hydrochloric acid/muriatic acid
- Elements and glues
- Artificial fabric softeners used in clothes dryers
- Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
- Adhesives used to fasten building products and other similar products

Areas likely to have contaminants
- Dry cleaning/laundering areas and establishments
- Swimming pools
- Metal fabrication plants
- Beauty shops
- Refrigeration repair shops
- Photo processing plants
- Auto body shops
- Plastic manufacturing plants
- Furniture refinishing areas and establishments
- New building construction
- Remodeling areas
- Garages with workshops

❖ Start-up
1. If burner does not fire, check for:
   - Boiler switch turned off?
   - Fuses blown or breaker tripped?
   - Thermostat set below room temperature?
   - Fuel valves turned off?
   - Not enough oil in tank to supply burner?
2. Correct problems found in step #1. If burner does not fire, press the reset button on burner primary control only once. Repeated presses will deposit oil in chamber, creating a fire hazard.

Gasoline and other flammable vapors and liquids. Ensure that no air-contaminating materials (see above) are present in the room and/or building area.

❖ Check monthly

Oil system piping
1. Visually inspect for leaks around piping, circulators, relief valve, and oil filters. Check oil lines and boiler air for signs of oil leakage. Immediately call a qualified service technician to repair any leaks.

❖ Check monthly

Boiler relief valve
1. Inspect the boiler relief valve and the relief valve discharge pipe for signs of weeping or leakage.
2. If the relief valve often weeps, the expansion tank may not be working properly.
   - Immediately contact your qualified service technician to inspect the boiler and system.

Automatic air vents (if used)
1. Remove the cap from any automatic air vent in the system and check operation by depressing valve B slightly with the tip of a screwdriver.
2. If the air vent valve appears to be working freely and not leaking, replace cap A, twisting all the way on. Loosen cap A one turn to allow vent to operate.
3. Have vent replaced if it does not operate correctly.

Air openings
1. Verify that combustion and ventilation air openings to the boiler room and/or building are open and unobstructed.

Pressure/temperature gauge
1. Pressure gauge should not show more than 24 psig. Higher pressure may indicate a system problem. Contact a qualified service technician if high pressure occurs.

End of season shutdown
- Do not drain boiler unless exposure to freezing temperatures will occur.
- Always keep manual fuel supply shut off if burner is shut down for an extended period.
  - a. Turn off switch to boiler.
  - b. Close fuel valves.
  - c. Turn off water feed valve.
  - d. Cover burner to protect from dust and dampness.

Every 6 months

Oil motors equipped with oil cups
1. Burner or circulator motors may require oiling. Such motors are fitted with oiling cups. Use a few drops only of SAE. 20 detergent oil. Do not use household oils. Excessive oiling can damage motors. Do not attempt to "fill up" the oiling cup.

Periodically

Operate boiler relief valve every 6 months
To avoid water damage or scalding due to valve operation, a metal discharge line must be connected to relief valve outlet and run to a safe place of disposal. This discharge line must be installed by a qualified heating installer or service technician in accordance with the instructions in the Boiler Manual. The discharge line must be terminated so as to eliminate possibility of severe burns should the valve discharge.

1. Before proceeding, verify that the relief valve outlet has been piped to a safe place of discharge, avoiding any possibility of scalding from hot water.
2. Read the boiler pressure/temperature gauge to make sure the system is pressurized.
3. Lift the relief valve top lever slightly, allowing water to relieve through the valve and discharge piping.
4. If water flows freely, release the lever and allow the valve to seat. Watch the end of the relief valve discharge pipe to ensure that the valve does not weep after the line has had time to drain. If the valve weeps, lift the seat again to attempt to clean the valve seat. If the valve continues to weep afterwards, contact your qualified service technician to inspect the valve and system.
5. If water does not flow from the valve when you lift the lever completely, the valve or discharge line may be blocked. Immediately turn off switch to the boiler and close fuel valves. Call your qualified service technician to inspect the boiler and system.

Test low water cut-off (if installed)
1. If the boiler or system is fitted with a low water cut-off device, test the device following the cut-off manufacturer’s instructions.
Air contamination

To prevent potential of severe personal injury or death, check for products or areas listed in table below before installing boiler. If any of these contaminants are found, do one of the following:

- Remove contaminants permanently.
- Isolate boiler and provide outside combustion air. See applicable codes for further information.
- Contact your qualified service technician to install an outside air kit (if available) for the burner. An outside air kit allows ducting of outside air directly to the burner.

Products to avoid

- Spray cans containing chloroﬂuorocarbons
- Permanent wave solutions
- Chlorinated waxes/cleaners
- Chlorine-based swimming pool chemicals
- Calcium chloride used for thawing
- Sodium chloride used for water softening
- Refrigerant leaks
- Paint or varnish removers
- Hydrochloric acid/muriatic acid
- Elements and glass
- Antistatic fabric softeners used in clothes dryers
- Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
- Adhesives used to fasten building products and other similar products

Areas likely to have contaminants

- Dry cleaning/laundry areas and establishments
- Swimming pools
- Metal fabrication plants
- Beauty shops
- Refrigeration repair shops
- Photo processing plants
- Auto body shops
- Plastic manufacturing plants
- Furniture refinishing areas and establishments
- New building construction
- Remodeling areas
- Garages with workshops

Check daily

Boiler area
1. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids. Ensure that no air contaminating materials (see above) are present in the area.

Start-up
1. If burner does not fire, check for:
   - Boiler switch turned off?
   - Fuses blown or breaker tripped?
   - Thermostat set below room temperature?
   - Fuel valves turned off?
   - Not enough oil in tank to supply burner?
2. Correct problems found in step #1. If burner does not fire, press the reset button on burner primary control only once. Repeated presses will deposit oil in chamber, creating a fire hazard.

WARNING
Burner must never be ﬁred when oil is in combustion chamber. Immediately call a qualiﬁed service technician.

3. If burner still does not fire, call a qualiﬁed service technician.

Boiler pressure/temperature gauge
1. Visually inspect all parts or the flue gas venting system for leaks.
2. If the relief valve often weeps, the relief valve discharge pipe for signs of weeping or leakage.
3. Have vent replaced if it does not work properly.
4. If water does not flow from the valve when you lift the lever completely, the valve or discharge line may be blocked. Immediately turn off switch to the boiler and close fuel valves.

WARNING
Failure to inspect the vent system as noted above can result in vent system failure, causing severe personal injury or death.

Boiler relief valve
1. Inspect the boiler relief valve and the relief valve discharge pipe for signs of weeping or leakage.
2. If the relief valve often weeps, the expansion tank may not be working properly.
   - Immediately contact your qualiﬁed service technician to inspect the boiler and system.

Automatic air vents (if used)
1. Remove the cap from any automatic air vent in the system and check operation by depressing valve B slightly with the tip of a screwdriver.
2. If the air vent appears to be working freely and not leaking, replace cap A, twisting all the way on. Loosen cap A one turn to allow vent to operate.
3. Have vent replaced if it does not operate correctly.

Pressures/temperatures
1. Pressure gauge should not show more than 24 psig. Higher pressure may indicate a system problem. Contact a qualiﬁed service technician if high pressure occurs.

Air openings
1. Verify that combustion and ventilation air openings to the boiler room and/or building are open and unobstructed.

Check monthly

Boiler and system piping
1. Visually inspect for leaks around piping, circulators, relief valve and other ﬁttings. Check oil lines and boiler air for signs of oil leakage. Immediately call a qualiﬁed service technician to repair any leaks.

WARNING
Never light burner or circulator motors may require oiling. Such motors are ﬁtted with oiling cups. Use a few drops only of SAE 20 detergent oil. Do not use household oils. Excessive oiling can damage motors. Do not attempt to “ﬁll up” the oiling cup.

WARNING
Bleed boiler pressure may indicate a system problem. Contact a qualiﬁed service technician if high pressure occurs.

Panasonic instruction manual

Figure 1

Boiler and components

<table>
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<tr>
<th>Component</th>
<th>Description</th>
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<tr>
<td>Burner harness</td>
<td>Supports burner and circulator motors</td>
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<tr>
<td>Circulator limit control</td>
<td>Regulates water temperature</td>
</tr>
<tr>
<td>Burner primary control</td>
<td>Controls burner operation</td>
</tr>
<tr>
<td>Pressure/temperature gauge</td>
<td>Monitors system pressure</td>
</tr>
</tbody>
</table>

Operating safety

- Do not drain boiler unless exposure to freezing temperatures will occur.
- Always keep manual fuel supply shut off if burner is shut down for an extended period.

- a. Turn off switch to boiler.
- b. Close fuel valves.
- c. Turn off water feed valve.
- d. Cover burner to protect from dust and dampness.

Every 6 months

- Operate boiler relief valve every 6 months
- To avoid water damage or scalding due to valve operation, a metal discharge line must be connected to relief valve outlet and run to a safe place of disposal. The discharge line must be installed by a qualiﬁed heating installer or service technician in accordance with the instructions in the Boiler Manual. The discharge line must be terminated so as to eliminate possibility of severe burns should the valve discharge.
- Read the boiler pressure/temperature gauge to make sure the system is pressurized.
- Lift the relief valve top lever slightly, allowing water to relieve through the valve and discharge piping.
- If water ﬂows freely, release the lever and allow the valve to seat. Watch the end of the relief valve discharge pipe to ensure that the valve does not weep after the line has had time to drain. If the valve weeps, lift the seat again to attempt to clean the valve seat. If the valve continues to weep after the line has had time to drain, contact your qualiﬁed service technician to inspect the valve and system.
- If water does not ﬂow from the valve when you lift the lever completely, the valve or discharge line may be blocked. Immediately turn off switch to the boiler and close fuel valves.
- Contact your qualiﬁed service technician to inspect the boiler and system.

End of season shutdown

- Do not clean boiler unless exposure to freezing temperatures will occur.

- Always keep manual fuel supply shut off if burner is shut down for an extended period.

- a. Turn off switch to boiler.
- b. Close fuel valves.
- c. Turn off water feed valve.
- d. Cover burner to protect from dust and dampness.

Troubleshooting

- Test low water cut-off (if installed)
  1. If the boiler or system is ﬁtted with a low water cut-off device, test the device following the cut-off manufacturer’s instructions.

- Test boiler pressure valve
  1. Turn off switch to boiler.
  2. Close fuel valves.
  3. Turn off water feed valve.
  4. Cover burner to protect from dust and dampness.
Troubleshooting — Common problems and possible solutions

Symptom | Common Causes | Possible Corrections
--- | --- | ---
Rapid cycling — boiler turns on and off frequently | Thermostat installed where drafts or heat affect reading | Locate thermostat on inner wall away from heat sources or cool drafts.

Heat anticipator in thermostat adjusted incorrectly | Adjust thermostat per manufacturer's instructions.

Incorrect limit setting | Set limit according to system needs. Maximum setting is 220°F. Increase limit setting to decrease cycling.

Insufficient water flow through boiler | Check all valves and from boiler. Return to proper setting.

Frequent release of water through relief valve | Expansion tank sized too small | Call qualified service technician to check expansion tank operation and size.

Rooled expansion tank | Call qualified service technician to check expansion tank operation.

Inoperative limit control | Call qualified service technician to replace limit control.

Need to frequently add makeup water | Leaks in boiler or piping | Have qualified service technician inspect leak sites and to prevent constant use of water. Makeup water can cause mineral deposits which, in turn, can cause boiler section failure. Do not use petroleum-based stop leak compounds.

Oxygen corrosion due to leaks in boiler and piping | Have qualified service technician repair any leaks at once. Keep pH of water between 7.0 to 8.5.

Popping or paraculating noise heard in boiler | Mineral deposits in sections due to constant use of makeup water | Call qualified service technician to de-scale boiler, if necessary. In some cases, deposits will be too heavy to remove with de-scaling procedures.

Incorrect pH of boiler water | Have qualified service technician inspect boiler water supply. 

Insufficient water flow through boiler | Have qualified service technician inspect system piping and controls to verify proper regulation of return water temperature.

Metal flakes found in vent outlet or vent — flameout corrosion | Contaminated combustion air supply — See page 2 in this manual.

Air in system | Provide outside air for combustion. Kit available through local distributor. Have qualified service technician install a gas pipe.

Low system pressure | Condensation of combustion gases in boiler sections | Have qualified service technician inspect system piping and controls to verify proper regulation of return water temperature.

Some radiators or baseboard units do not heat or are noisy | In system | Bleed air from system through air vents in radiators or baseboard units.

Low system pressure | Fill to correct pressure. Return to proper setting.

High limit set too low | Check for leaks in boiler or piping. Have qualified service technician repair at once.

High limit set too high | Adjust high limit to higher setting.

Domestic water from tankless heater is not hot or suddenly turns cold | Mineral deposits in sections due to constant use of makeup water | Have qualified service technician de-lime or replace coil.

Domestic water from tankless heater is always lukewarm | Boiler stop leak compound has been added to boiler water and is ingesting outside of coil | Have qualified service technician inspect leak and correct.

Insufficient mixing valve setting for tankless heater | Have qualified service technician adjust mixing valve setting.

Domestic flow rate too high | Have qualified service technician inspect flow check valve set to rating of tankless heater.

Incorrect setting on tankless heater control | Have qualified service technician inspect tankless heater setting.

Air pollution control | Have qualified service technician inspect tankless heater control. Adjust differential on tankless control to lower setting.

Service and maintenance

1. To avoid electric shock, disconnect electrical supply before performing maintenance.

2. To avoid severe burns, allow boiler to cool before performing maintenance.

3. You must maintain the boiler as outlined in the manual and have the boiler started and serviced at least annually by a qualified service technician to ensure boiler system reliability.

Boiler operation

4. DO NOT block flow of combustion or ventilation air to boiler. If vent or air blockage is easily accessible and removable, remove it. If blockage is not obvious or cannot be removed, have the boiler and system checked by a qualified service technician.

5. Should overheating occur or oil supply fail to shut off, do not turn off or disconnect electrical supply to pump. Instead, shut the oil supply at a location external to the appliance.

6. DO NOT use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any burner control that has been under water.

7. Have the building monitored when it is vacant for an extended period. Safety controls can shut down the boiler at any time. The loss of heat can result in significant damage due to freezing.

Air contamination

8. Carefully read and follow instructions on page 2.