Quick Reference Installation Guide

Boiler Mounting (Section 4.4 of the manual)

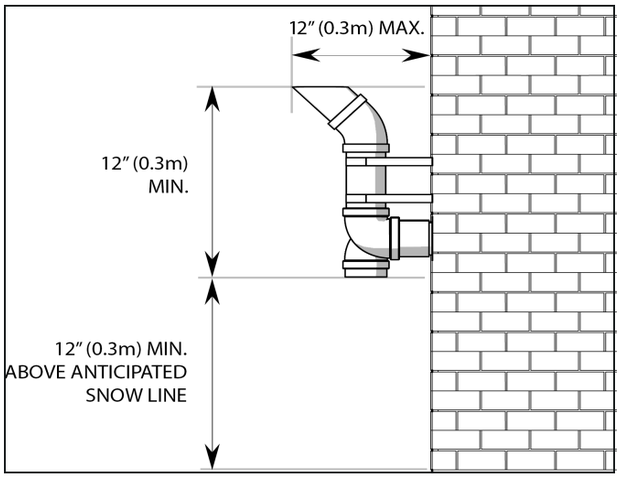
1. Ensure that the boiler's mounting bracket is securely bolted to the wall structure.
2. Fasten the bottom of the boiler to the wall.

Important: Not applicable for construction-related failures such as fouled fans, burners and ignitors not covered under warranty.

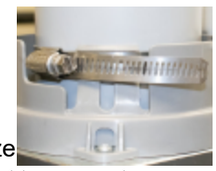
Venting (Section 4.5 to 4.7)

Follow the venting specifications and information for the correct venting material and venting length provided in the above sections of the manual.

Important: Use appropriate appliance adapters when using polypropylene (PP) or stainless steel venting.



- Ensure that sidewall configurations have adequate vertical separation, and that exhaust plumes are well away from all building air intake vents.
- Ensure that all venting material is sloped towards the boiler. PP venting must be sloped at a minimum of ⅝″ per foot to ensure that no leaks occur via gaskets.
- Ensure that PP venting is supported every 36" (min).
- On longer horizontal runs of PVC and CPVC, increase the grade to ⅜″ or more.



- Fully insert approved venting material (during twisting stabilize the lower part of the internal duct to prevent rotation) into the boiler's exhaust outlet with an approved lubricant. Then tighten the clamp to lock the venting in place.
- Check that the venting is securely attached to the exhaust flue of the boiler by pulling on the venting.

Condensate Trap (Section 4.9)

1. At the bottom of the boiler, remove the trap door.
2. Fill the trap assembly with water.
3. Attach the trap to the drain spout.
4. Re-install the trap door.
5. Check for leaks.

Gas Supply (Section 4.12)

For gas delivery to the boiler, we recommend using hard piping rather than flexible piping. If you use flexible piping, ensure that the gas pipe size is appropriate for the maximum BTU input of the boiler.

Minimum Gas Pressure	4" w.c.
Maximum Gas Pressure	14" w.c.

Size piping for sufficient sustained gas delivery at sufficient pressure to the boiler.

Recommended Supply Pressure at Full Load	
Natural Gas	7"
Propane	10"

- Ensure that there is a minimum of 6 feet of piping between the boiler and gas regulators
- Use a manometer to test that gas delivered to the boiler is delivered at sufficient pressure and that "lock up" does not exceed the maximum pressure
- If using a 5 psi to inches vented gas regulator, always oversize the vent pipe to prevent hunting of the gas regulator when boilers are firing at lower output levels
- In retrofits with existing copper gas pipes, clean and clear the gas piping of any debris before connecting to the boiler. Failure to do so can result in a blocked gas valve. and inconsistent performance.

Maximum Pipe Length by Model	1/2" IPS	3/4" IPS	1" IPS	1-1/4" IPS
Boiler 85 /Boiler 115 (Natural Gas)	30'	125'	400'	
Boiler 85 /Boiler 115 (Propane Gas)	90'	350'	1,000'	
Boiler 160 (Natural Gas)	10'	70'	200'	
Boiler 160 (Propane Gas)	50'	200'	600'	
Boiler 199 (Natural Gas)	10'	40'	150'	600'
Boiler 199 (Propane Gas)	30'	125'	400'	1,600'

LWCO Errors

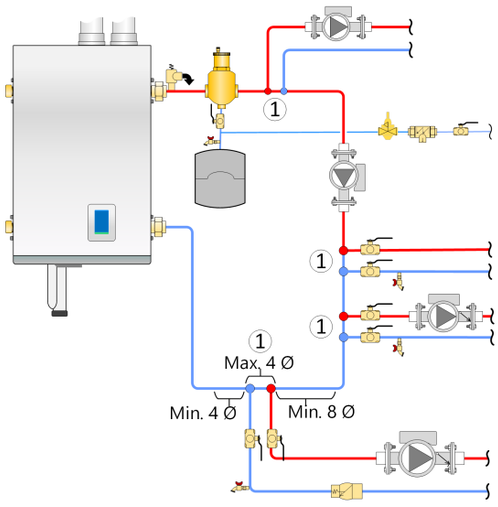
To clear LWCO errors caused by air:

1. Ensure that there is no air trapped in the boiler and boiler piping.
2. On the touchscreen controller **Status** Menu, go to **Clear Errors** > **Yes**

Important: Before turning off the boiler, make sure it is in "Standby" mode.

Water Piping (Section 4.11)

It is recommended that you always use a primary/ secondary piping configuration (see below for a basic configuration).



① Closely-spaced tees: min. 8 pipe diameters (Ø) straight pipe before, 4 Ø after, and maximum 4 Ø between.

In the case of hard water, use distilled or purified water. Glycol systems require the use of propylene glycol. For systems of more than 40 gallons, the optimum TDS is 10-30 ppm.

Water Chemistry Allowable Limits	
Acidity pH	6.6 - 8.5
Chloride	< 125 mg/l
Iron	< 0.3 mg/l
Copper	< 0.1 mg/l
Conductivity	< 300µS/cm (at 25°C), > 20µS/cm
Total Dissolved Solids	< 150 ppm, > 10 ppm
Hardness	< 9 grains, > 1 grain

- Place air separators at the highest points.
- Install the pressure relief valve in a vertical position. Do not use an isolation valve between the boiler and relief valve.
- Support all piping with appropriate piping brackets.
- Plumb an appropriately sized expansion tank and make up the water station into a fitting on the suction side of the circulator.
- Size boiler piping and pumps for the BTU output of the boiler.

For non-oxygen barrier piping systems, use a dirt separator and/or a side stream filter. Ensure that the system is free of iron components, and treat with an inhibitor.

Electrical (Section 4.13)

1. Connect the boiler to a dedicated (max.)15 Amp breaker.
2. Wire the AC to the black and white wires labeled in the Field wiring box.
3. Ensure that the boiler is properly bonded (grounded).
4. Wire the primary/ boiler pump to the yellow and white wire labeled “Primary Pump” (see image).
5. Wire the load pumps into the TB1 Terminal; for example, PV1.

Refer to the “Appendices - Wiring Diagrams” section in the Installation and Operating manual for more information.

6. Wire thermostats or end switch dry contacts to Therm 24 Vac, and Therm 1, 2, 3, or 4 corresponding to the load pump PV1, 2, 3, 4.
7. For a DHW load, wire either an Aquastat to the appropriate Therm. connection or a 10K Ω type II/B curve thermister to the DHW sensor connection.

   The boiler requires proper grounding, which conforms to all electrical codes, ensuring proper flame rectification.

Note: If a load is defined as Reset Heating, the outdoor sensor must be used for proper operation.

Load Setup

1. On the V-10 Touchscreen controller bottom navigation bar, tap the **Setup** icon
2. Select a load and then select the load type.
3. Accept the defaults, or change any of the settings. You can find more substantial settings in **More** > **Advanced Setup**
4. Tap the **Save** button.

Manual Pump Purge

After the system is pressurized and you have defined loads, perform a manual pump purge to ensure air is purged.

On the touchscreen controller, go to **More**> **System Settings** > **Site Settings**>Set **Manual Pump Purge** to "On">**OK** > **Save**.

The manual pump purge runs until it is turned off, or when there is a call for heat.

Checklist	
Treated water or Polypropylene glycol mixture in the pipes.	☐
Boiler system is pressured and flushed ≥ 8 psi.	☐
All gas connections soap-tested for leaks and now leak free.	☐
Voltage supply to the boiler tested for voltage (nominal 120 Vac), polarity, and properly grounded.	☐
The boiler requires a dry set of contacts in the Therm connections.	☐
Boiler power turned on.	☐
Use the “Express Setup” in the touchscreen controller to set up the required loads. See above for instructions.	☐
Steps followed in the “7.3 Commissioning” section of the Installation and Operating Instructions manual.	☐
Completed the Installation & Commissioning Report in the Installation and Operating Instructions manual - Combustion Readings recorded. High-fire: CO2_____%, O2 _____%, CO_____ ppm Low-fire: CO2 _____%, O2 _____%, CO_____ ppm	☐