Quick Reference Installation Guide

Boiler Mounting (Section 4.4 of the manual)

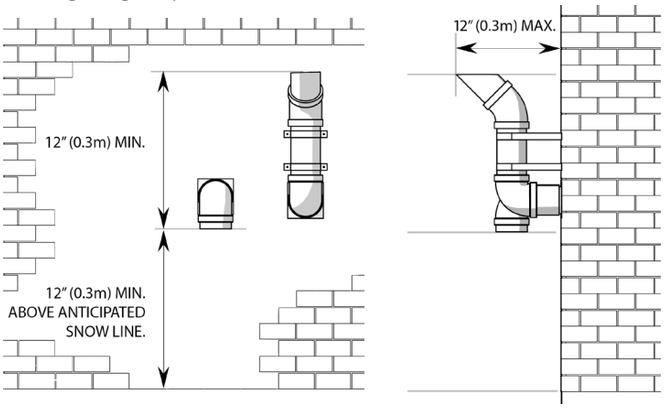
1. Ensure that the boiler's mounting bracket is securely bolted to the wall structure.
2. Fasten the bottom of the boiler to the wall.

Important: Not applicable for construction heating. Parts such as fans, burners, and ignitors fouled by construction are not covered under warranty.

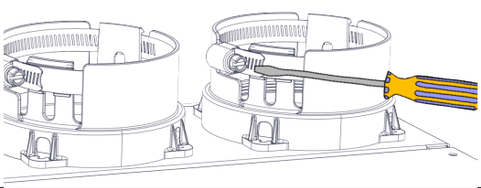
Venting (Sections 4.5 and 4.7)

Important: To protect against wind loads, terminate exhaust venting as shown, or use the appropriate direct vent kit.

Follow the venting specifications for the correct materials and venting lengths provided in the above sections of the manual.



- Ensure that sidewall configurations have a minimum 12" 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 into the boiler's exhaust outlet. Then, tighten the clamp to lock the venting in place. For PP venting, a transition adapter is not required.
- Pull on the venting to check it's securely attached to the boiler exhaust outlet.



Condensate Trap (section 4.9)

1. Place the vacuum breaker cap over the vacuum breaker opening and push firmly
2. Fill the condensate trap with water.
3. Attach the trap to the drain hose, and tighten the drain compression (including washer)
4. Slide the trap over the boiler drain outlet, and tighten upper union nut. Secure the upper union nut with the outlet clip.
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.
- We strongly recommend against using copper gas lines. In retrofits with existing copper gas pipes, we highly recommend replacing the pipes with black iron or stainless steel piping sized correctly for the boiler. If the copper gas pipes must remain, 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	½" IPS	¾" IPS	1" IPS	1¼" IPS
110,000 BTU/hr (Natural Gas)	30'	125'	400'	1,600'
110,000 BTU/hr (Propane)	90'	350'	1,000'	2,000'
150,000 BTU/hr (Natural Gas)	20'	80'	200'	900'
150,000 BTU/hr (Propane)	50'	200'	600'	2,000'
199,000 BTU/hr (Natural Gas)	10'	40'	150'	900'
199,000 BTU/hr(Propane)	30'	125'	400'	1,400'

LWCO Errors

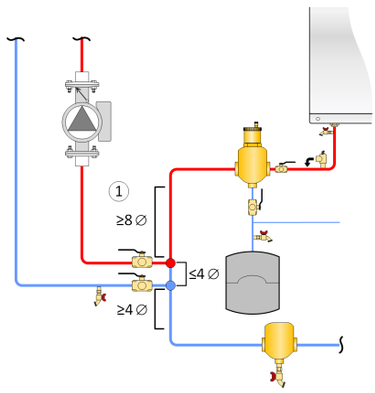
To clear LWCO errors caused by air:

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)

We recommend that you always use a primary/secondary piping configuration (see below for a basic configuration).



①	Closely-spaced tees: install tees with straight piping (min. pipe diameter lengths as shown), with tees maximum 4 pipe diameters apart with no restrictions between fittings

In the case of hard water, use distilled or purified water (but not reverse-osmosis). Glycol systems must use propylene glycol. For large volume systems, the optimum hardness is the optimum TDS is 10-20 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
Hardness	< 9 grains, > 1 grain
Total Dissolved Solids-TDS	< 150 ppm, > 10 ppm

- Place air separators at the highest point.
- Install the pressure relief valve on the outlet piping of the boiler 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 water station into a fitting on the suction side of the circulator.
- Size boiler piping and pump for the BTU output of the boiler.

For non-oxygen barrier systems, use an isolating heat exchanger.

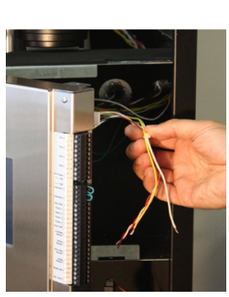
Electrical (Section 4.13)

1. Connect the boiler to a dedicated (max.)15 Amp breaker.

2. Wire the AC to the black and white wires labeled "AC In" in the Field wiring box. Ensure that the boiler is properly bonded (grounded).

3. Wire the primary/boiler pump to the yellow and white wires labeled "Primary Pump" (see image).

4. Wire the respective load pumps into the TB1 Terminal; for example, PV1, 2, 3, 4.



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

Electrical continued (Section 4.13)

5. Wire one of the thermostat or endswitch dry contacts to Therm 24 Vac, and the other to Therm 1, 2, 3, 4, corresponding to the load pumps PV1, 2, 3, 4.
6. 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.

- For multiple-boiler setup, use a secondary loop sensor.
- For zone valves or external peripherals such as wi-fi thermostats, use external transformers.

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, an external sensor, or External Control signal.	☐
Boiler power turned on.	☐
Use "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: CO_2 _____% O_2 _____ % CO ____ ppm Low-fire: CO_2 _____% O_2 _____ % CO ____ ppm	☐