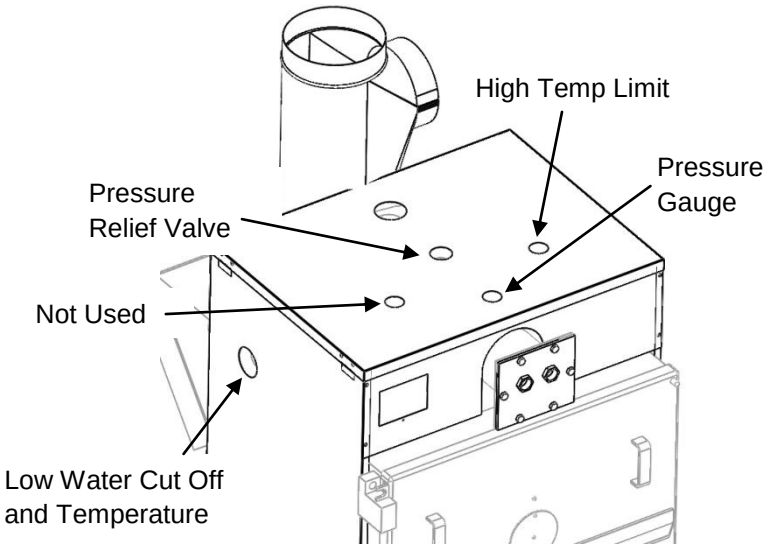
Manual Addendum for New Control Assembly

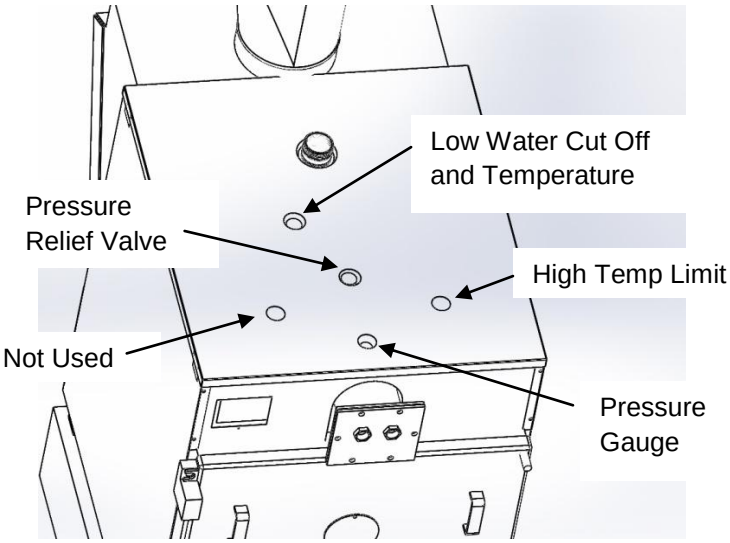
4.2 Boiler Control Assembly Installation

4.2.1 Boiler Ports

The boiler ports used for the control and safety devices are shown in the figures below.



Ports on EL-200B



Ports on EL-375B or EL-500B

4.2.2 Control Cabinet Install

The boiler control cabinet is pre-wired at the factory. Install the cabinet as follows:

1. Remove the cabinet assembly from the carton.
2. Remove the cover and locate the plastic parts bag.
3. Find the ½" MP x ¼" FP and ¼" MP x 1/8" FP bushings. Install in the pressure gauge port location. Use appropriate sealant or Teflon tape to prevent leaks.
4. Position the control cabinet assembly on top of the boiler by centering the clearance hole over the pressure port fittings.
5. Attach the control cabinet base to the top of the boiler cabinet with at least three (3) self drilling, sheet metal screws and star washers.

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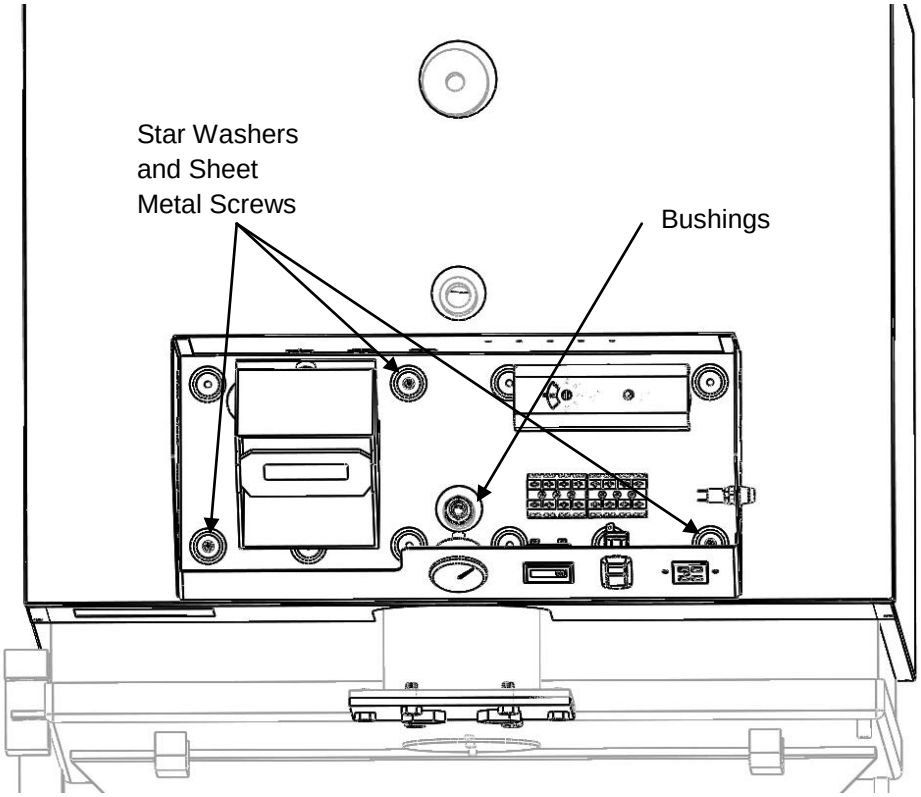
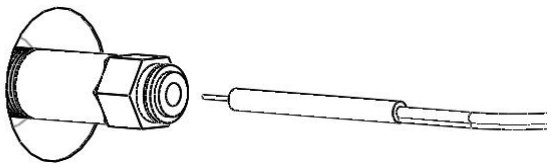


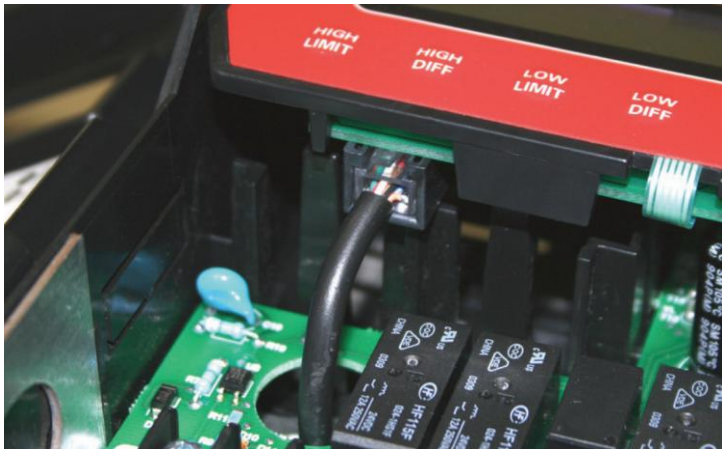
Bushing Install and Cabinet Alignment

4.2.3 Low Water Cutoff and Temperature Well and Probe Installation.

1. Remove the black thermowell from the packaging and install in the location shown above for the correct boiler model.
2. Apply pipe sealant to the thermowell threads and install it securely into the port. **CAUTION** *USE ONLY TEFLON TAPE OR RECTORSEAL NO. 5 PIPE SEALANT.*
3. Tighten with 1-1/8” open end or box wrench (torque requirement: 185 - 200 in./lbs.). Pipe wrenches, pliers, and adjustable wrenches will damage/round-off the hex.
4. Insert the sensor probe into the thermowell so that the pin is fully engaged in the clip.



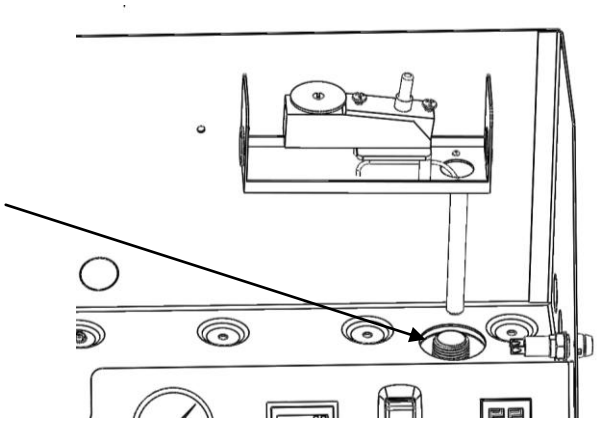
5. Route the green and black wires from the sensor probe through one of the knockouts in the control cabinet (use plastic insert in knockout hole). Attach the green wire to one of the ground screws. Plug the black cable into the Aquasmart Temperature controller as shown below.



4.2.4 High-Limit Temperature Controller Installation.

1. Remove the cover from the high-limit temperature control.
2. Fill the well (locate according to figures) with thermal conductive grease.
3. Insert the aquastat probe into the thermal well until it bottoms out.

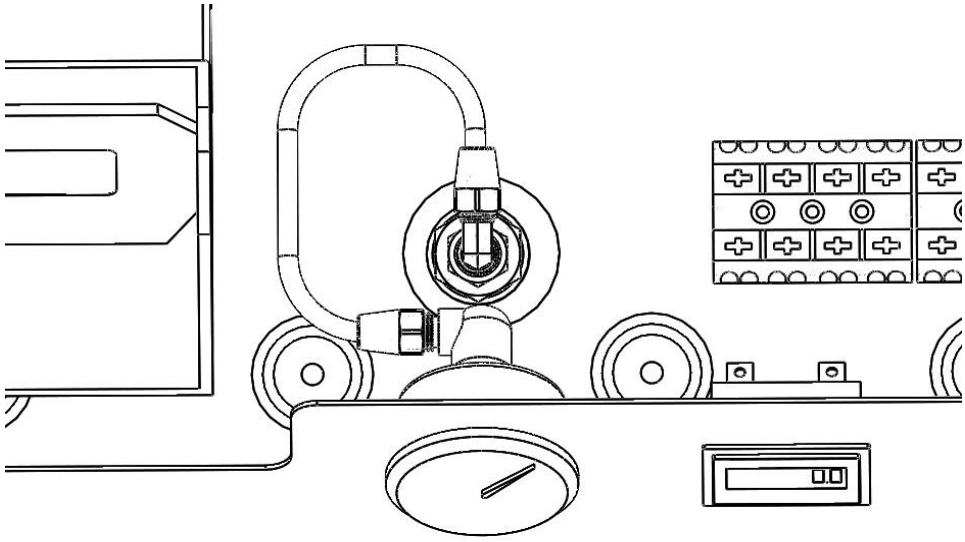
Fill High-Limit Controller Well with Thermal Conductive Grease before inserting probe.



4. Install the control over the thermal well. Using the clamp provided on the bottom of the control, secure the control to the well. The screws to tighten the clamp are located inside of the control, on either side of the probe opening.
5. Make sure that the control is set to 230°F. **CAUTION** Do not increase the setting.

4.2.5 Pressure Gauge Installation.

1. Install the 1/8” MP x 3/16” flare fitting in the previously installed bushing. Use appropriate sealant or Teflon tape to prevent leaks. Orient the elbow as shown in the figure below.



2. Carefully bend the 3/16” flared copper tube assembly provided to mate with the two elbows.
3. Tighten the flare fittings using a 7/16” wrench.

4.2.6 Aquasmart Temperature Controller Settings.

1. Wire power (120V/60 Hz, Single Phase) to L1 (line) and L2 (neutral) of the terminal block and attach the ground wire to one of the green ground screws provided (see wiring diagram). **⚠ DANGER** This work should only be done by qualified personell.
2. Turn on the power switch on the front of the cabinet to power up the control. Open the door of the Aquasmart. The control is pre-wired except for zone control connections.
3. Set the control settings to the desired temperatures. The default HI setting is 180°F. The default LO setting is 140°F. The default DIFF HI and LO is 10°F. Set HI to the temperature that you want the water to reach during a call for heat. Set Lo to the temperature that you want the water to maintain in the vessel when there is not a call for heat. Set DIFF to an amount that you want the Lo setting temperature to cycle between. Note: The Hi limit cannot be set less than 15°F above the Lo limit setting. **CAUTION** Do not set the low limit below 140°F.
4. If a room thermostat (or other device) is to be used to call for heat, the factory-installed jumper wire will need to be removed from the TW-TR terminals and replaced with wiring (24VDC) from the thermostat. If the jumper is not removed, the control will always sense a call for heat. If this is the case, the burner will always cycle between the high temperature limit and its set differential, and the water circulation pump will be powered (if this control is used for the circulation pump).
5. If using the circulation pump control on the AquaSmart, wire the pump control across terminals Blu and W of the terminal block (see wiring diagram) using a 115V coil relay to provide separate power to the pump. The relay is necessary to make sure that the controller is not overloaded by the addition of the pump. Make sure to connect according to NEC code, with approved metal conduit. Note: Many installations use separate controls for the pump. **CAUTION** Regardless of the pump control method used, be aware of the requirement for a minimum of 140°F return water temperature. If this requirement is not met, the vessel warranty is void.

8.6 Seasonal Shut Down & Start Up

EnergyLogic strongly recommends that you remove power from the preheater when the boiler will not be in use for two weeks or longer. This is accomplished by simply switching the control box switch to off (0).

9.3.10 Boiler Control Testing / Wiring Troubleshooting

Tools Required:
Flat blade screwdriver, nut driver, volt meter.

Controller Function:

- Low Water Cut-Off (function of AquaSmart Control): Will shut off power to the burner in the case that the water level in the vessel is too low.
- High Temperature Limit Controller: Will shut off power to the burner in the case that the water temperature exceeds the limit set on the controller.
- Temperature Control (function of AquaSmart control): Operates the burner and circulation pump based on a call for heat and the low limit setting (minimum temperature maintained in the vessel).

Note: During this test, if the Controllers do not function as stated, call Technical Services for assistance, or Customer Service to order a service part.

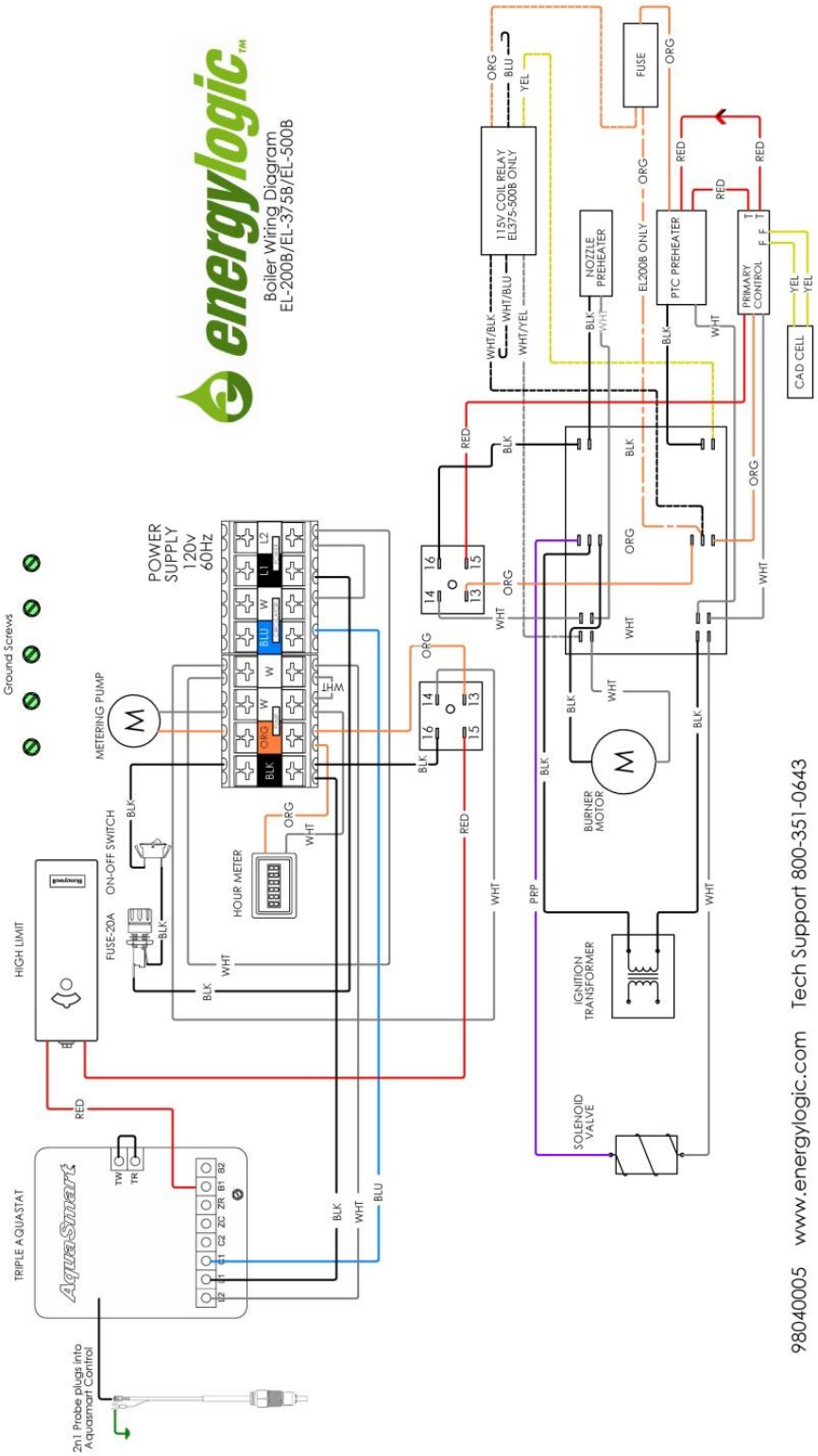
⚠DANGER ***During a portion of this test, high voltage electrical components will be energized. Only a certified electrician is to perform the following procedures, and with extreme caution.***

Procedure:

1. Look at the control display which can be seen through the window in the control box cover. If the display is blank, check to see that the on-off switch is in the on (1) position. If there is still no display, then check the fuse in the right side of the control box. If the fuse is good, go to step 2
2. Take the control box cover off of the control box. The unit wiring diagram is on the inside of the cover. Loosen the screw holding the door to the AquaSmart control and swing the door open. Check for voltage between L1-L2. If there is no voltage, then check the power supply to the boiler. If there is voltage between L1-L2, then the AquaSmart control has failed and must be replaced.
3. The AquaSmart control will display the condition of the system:
    a. HEATING WATER WTR: 74° F. This means the control is sending voltage out on B1-B2 to run the burner. Also, the water temperature is indicated. Check for voltage. If there is no voltage between B1-B2 then the AquaSmart has failed and must be replaced.
    b. STANDBY WTR: 162°F The boiler is at a temperature set point and the AquaSmart has turned off voltage at B1-B2.
    c. LOCKOUT WATER LOW: The control has sensed low water in the vessel. Pull the sensor from the well and inspect for damage or corrosion. If the sensor is OK, put it back into the well ensuring that the tip is bottomed in the well so that it is in the clip in the bottom of the well. Confirm that the green wire from the sensor is not damaged and is connected to a ground screw in the control box. If the probe, well and grounding wire are OK, then check the vessel for water level. Once water in the vessel is established, press and hold the ENTER (RESET) button on the AquaSmart control for 5 full seconds. The control should go to state “a” above.
4. If there is voltage between B1-B2 on the AquaSmart, then check that the red button on the High Limit is pushed in and the setting is at 230°. Check for voltage between terminals 14-15 of the receptacle for the burner plug. If there is no voltage there, the High Limit is failed and must be replaced.
5. If there is voltage at 14-15 of the receptacle then proceed to Paragraph 9.3.1.

10. Appendices

10.1 Boiler Wiring and Oil Schematic



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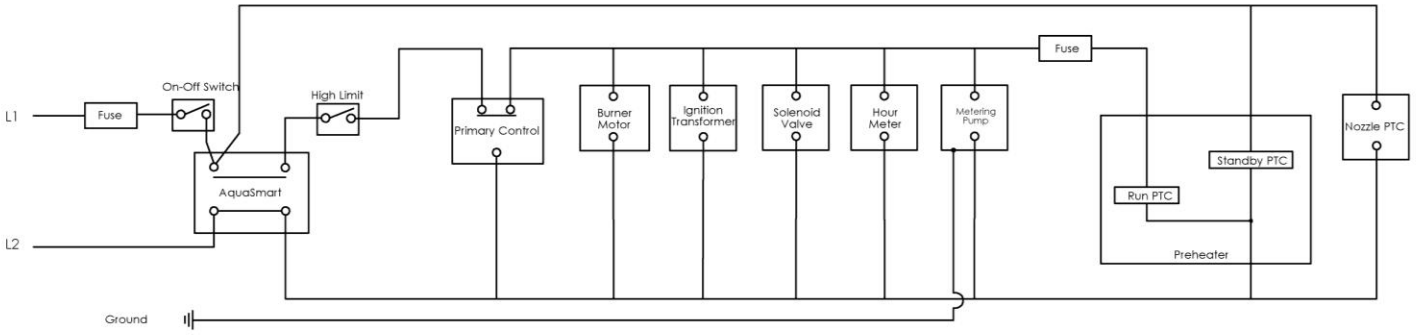
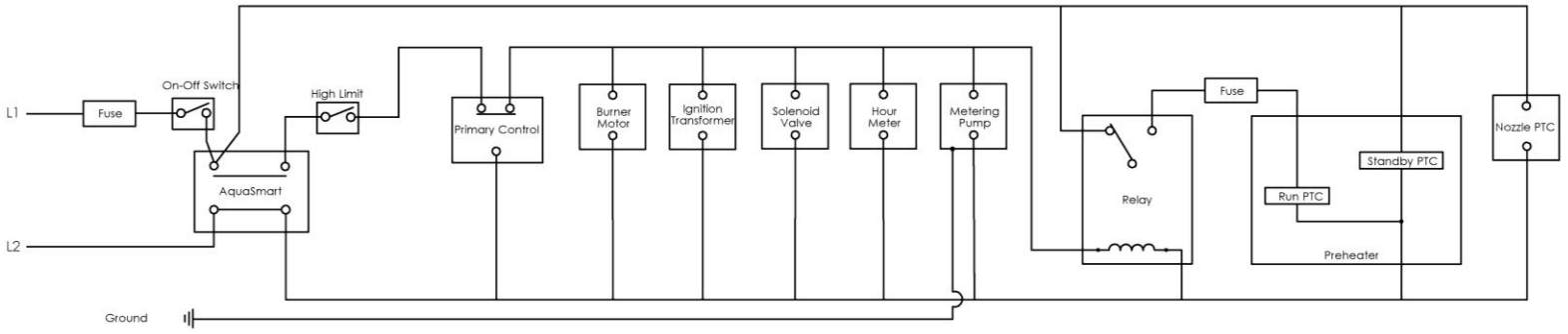
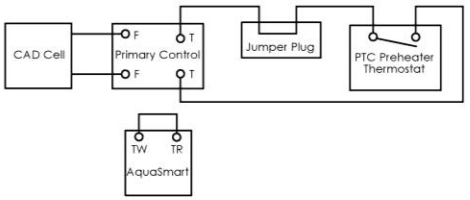
Model 200 Boiler



Model 375 and 500 Boiler



Control Circuit All Models



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