ALDRICH COMPANY

VERTICAL FIRETUBE BOILER

AVR SERIES

OPERATING & MAINTENANCE MANUAL

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GENERAL INFORMATION

- The AVR Series boiler is a single pass firetube boiler designed for hot water applications. These boilers are manufactured to the specifications set forth by Section IV of the ASME Boiler and Pressure Vessel Code. Each boiler is inspected and stamped in accordance with Section IV.

- The boiler is designed specifically for forced draft firing.

- Inspection:
  Inspect shipment carefully for any signs of damage.
  All equipment is carefully inspected and packed at factory.
  Any claims for damage or shortage in shipment must be filed immediately against the carrier by the consignee.

- Minimum Water Temperature:
  The AVR Series boiler is a non-condensing boiler. To prevent condensing a minimum return temperature of 140°F is required. For lower return temperatures a thermostatic mixing valve is required. Consult factory for job specific piping recommendations.

INSTALLATION

- Installation:

  Install boiler(s) in a separate room with a lockable door that is part of a permanent building. Boiler room atmosphere must be clean and dry. Boiler room atmosphere must always have a neutral or positive pressure with no direct openings to exhaust fans creating a vacuum. There must be adequate combustion air/ventilation supply, adequate floor support and spacing for equipment installation along with sufficient maintenance and service access. Consult local codes and jurisdictions for minimum clearances required for front, rear, top and sides of boiler.

- Setting The Boiler:

  The boiler includes a structural channel base with ports for ease of handling with forklift.

  Boiler can also be rolled into position using roller skids under the structural channel base.

  The boiler is supplied with lifting lugs/loops to be used in maneuvering the boiler into position when a crane is required for setting of boiler.

- Inspecting Factory Piping:

  Inspect all factory piping and tighten re-install as necessary. Some piping may loosen during shipment.

- Water Level Controls:

  Boiler should be equipped with one or more low water cut-off (LWCO) controls. LWCO may be either float or probe type. Standard package includes a probe type LWCO factory mounted and wired.

- Boiler Controls:

  Boiler is supplied with operating control, manual reset high limit control and for either two-stage or modulation firing rates the appropriate firing rate control is supplied. These controls are factory set, but may not be specific for your application. Reset each control for correct operation depending on site specific variables.

- Boil Out:

  During the manufacturing and installation process residues of metal particles, oil, grease, pipe joint compound, etc. are typically produced. These items must be removed before placing boiler into service.

  - Remove loose construction and installation debris from boiler furnace.
  - Remove any controls that may be damaged by chemicals to be used.

INSTALLATION

- Boil Out (Continued):
    - Remove plug at highest available opening.
    - Mix 1 pound of trisodium phosphate for each 50 gallons of water content to make a pourable concentrate.
    - Fill boiler half full of clean water.
    - Pour concentrated trisodium phosphate solution into boiler.
    - Replace any plugs or valves removed for access.
    - Fill steam boiler to normal waterline.
    - Start burner, checking operating and limit controls per burner instructions.
    - Operate boiler as if in full service, maintaining design operating pressure. Operate water boiler for one full day with full system circulation.
    - After boil out is complete, discard solution to drain observing local codes and waste water regulations.
    - Refill hot water system with fresh water. Heat boiler water to 200°F minimum to drive off air. Necessary water treatment chemicals may be added. Do not allow the boiler to stand full of unheated fresh water.
    - Tighten plugs and fittings while boiler is hot. Check all connections and tighten as necessary.
    - Boiler may now be placed into service.

AIR SUPPLY / VENTING

- Combustion Air Supply:

  All burners require an adequate supply of fresh air for efficient and safe operation. A sufficient air supply must be maintained at all times to the boiler room for proper performance of the boiler. Refer to burner OMM for exact requirements of job specific burner.

- Breeching/Venting:

  Aldrich Classic Series boilers are positive pressure category III appliances and require category III flue stack materials. Run entire breeching full size of flue outlet as provided on boiler. Do not reduce the size of the flue outlet or breeching/venting materials.

  On installations where a natural draft stack is used, causing high breeching drafts, the boiler locking blade damper may require adjusting.

  Note: The manual type stack damper is to be installed at flue connection on boiler top. In multiple boiler installations, or in installations where the breeching draft may vary considerably, automatic draft controls in combination with a motorized damper may be required. When considering the stack and breeching, the design should take into account that the boiler/burner combination will work best when the pressure at the boiler flue outlet is in the range of + or – 1/10 inch WC.

MAINTENANCE

- Boiler Heating Surfaces:

  At the end of the heating season, clean boiler heating surfaces thoroughly. Access to boiler firetubes may be gained by removal of the top boiler cover. Remove the turbulators located in the firetubes. Clean firetubes with flue brush and reinstall turbulators. Carefully check condition of turbulators. If turbulators are corroded or deteriorated replace them to ensure optimum boiler efficiency.

- Water Treatment:

  Heating boiler water treatment is site specific/job specific. Consult with a local boiler chemical specialist for recommendations in your area. Every step should be made to minimize fresh water make-up. All boiler and system leaks should be repaired as soon as they are observed.

- Water Level Controls:

  Probe Type Low Water Cut Off: The probe is exposed to possible contamination in the boiler water. It is important to physically remove the probe from the boiler tapping annually and inspect it for accumulation of scale or sediment.

  Float Type Low Water Cut Off: During the heating season, if external low water cutoff is on the boiler, the blow off valve should be opened at least once a month (use greater frequency where conditions warrant), to flush out the sediment chamber so the device will function properly.

  Low water cut offs and water feeders should be dismantled annually by qualified personnel and inspected, to ensure proper function.