Pennant
Pump-Mounted Water Heater

Model PNCV 200-400 Indoor/Outdoor

Specification

Date: Bid Date:

Project #: Location:

Project Name: Engineer:

Contractor: Prepared By:

Contractor shall supply and install Qty.: _____ Laars Model No. PNCV_____ pump-mounted water heater(s).

The heater shall be a Laars Pennant Model PNCV_____, rated at the input and output shown on the schedule. The unit(s) shall be design certified to comply with the current edition of the Harmonized ANSI Z21.10.3 / CSA 4.3 Standard for Gas Water Heaters, and shall be design certified for both indoor and outdoor use. The unit(s) shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) working pressure, and shall bear the ASME "H" Stamp. The unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1.

The water tube heat exchanger shall be a straight tube design with ten 5/8" (16mm) inner diameter integral finned copper tubes. The tubes shall be rolled directly into glass-lined headers, with a heat exchanger rating of 160 psi (1103 kPa) working pressure. The heat exchanger shall be a low water volume design. All gaskets shall be non-metallic, outside the jacket, and separated from the combustion chamber to eliminate deterioration from heat. Headers shall have covers permitting visual inspection and cleaning of all internal surfaces. The heat exchanger shall have a ten year warranty.

The piping side header shall have removable flanges, and the heater design shall permit removal of the complete heat exchanger for service from either the front or top, to facilitate maintenance.

The heater shall come complete with an in-line pump, mounted and wired, and sized to provide the correct heater flow rate for the heater and thirty feet of 1-1/2" pipe, with a normal number of fittings. Each unit shall have a pump time delay. The pump time delay shall be adjustable from 0.1 to 10 minutes, for continued pump circulation after the call for heat has been satisfied, to remove residual heat from the unit's combustion chamber.

The units shall use a proved hot surface ignition with a 15 second pre-purge cycle to clean out the combustion chamber. Upon a call for heat, if a flame is not detected, the ignition module shall try two more times, and then lockout. If there is a loss of flame signal during a call for heat, the ignition control shall attempt three re-ignition cycles before locking out. There shall be indicators on the ignition control for internal control failure, airflow fault, erroneous flame signal, and lockout. The ignition control shall have terminals for checking flame signal without having to remove or access ignitor. The control circuit shall be 24V. Unit shall be 120V, single phase, less than 12 Amps.

Burners shall be multi-port design, and shall be constructed of high temperature stainless steel. The burners shall be designed to mix air and gas, and burn cleanly with NOx emissions not exceeding 30ppm. Burners shall be in easily-removable burner tray assemblies with no more than 4 burners per tray.

The combustion chamber shall made of a one-piece, formed, lightweight, ceramic fiberboard insulation to retain heat, and shall be approved for service temperatures of not less than 2000°F (1093°C). The outer jacket shall be a unitized shell finished with acrylic thermo-set paint baked at not less than 325°F (163°C). The frame shall be constructed of galvanized steel for strength and protection. Chamber shall include a sight glass for viewing flame.

Heaters shall have a forced draft design and shall meet a minimum 85% efficiency. The unit shall be designed for vertical venting with standard B-vent as a fan-assisted Category I appliance, and for horizontal venting as a Category III appliance and shall not require an external draft hood. The unit shall accept ducted combustion air, or shall be able to pull combustion air from the boiler room. Vent and ducted combustion air shall each be able to be piped to either the top or the back of the unit, in any combination. Changing from top-to-back or from back-to-top piping orientation shall be easily accomplished in the field.

Temperature control shall be an electronic PID temperature control with 3-character display and two buttons for easy control parameter viewing and programming. The heater shall have connections for an external staging control, and a selector switch to enable the user to choose between the heater's staging control or a field-supplied staging control, without bypassing any of the heater's safety controls. The heater display shall have diagnostic lights which include power on, call for heat, air flow, high limit, water flow, stage 1, stage 2 (if applicable) and remote. The heater display shall be visible without the removal of any jacket panels or control panels. Dry alarm contacts for ignition failure shall be included. The heater shall have a flip-up control panel for easy access to all controls components.

Two gas trains shall be used, each serving a portion of the burners. Each gas train shall have a gas shutoff valve and main gas valve with built-in redundant valve seats and gas regulator. Gas valves shall be flanged, to permit easy removal of the each gas valve, gas train and burner tray assembly from the front of the unit.

The heater shall be provided with an integral, washable combustion air filter. The air filter shall provide 83% arrestence to protect the burners and blower(s) from debris. The air filter shall be constructed out of open-cell polyurethane foam.

Heater shall include as standard equipment the following controls and trim:

- ASME 160 psi working pressure heat exchanger
- ASME "H" stamp
- Flanged water connections
- Glass-lined cast iron headers
- In-line pump, mounted and wired
- External header gaskets
- 125 psi (861 kPa) ASME rated pressure relief valve
- Flow switch
- Temperature and pressure gauge
- Multiple operating gas valve/pressure regulators
- Manual "A" gas valve
- Intake air filter
- Multiple, removable burner trays
- Stainless steel burners
- Built-in draft fan(s) for Category I or III venting
- Air pressure switch
- Blocked vent switch
- Fusible link (model 200)
- Burner site glass
- 24V control system
- 115/24VAC 50VA power from class 2 transformer
- Manual reset high limit
- Electronic PID staging control with 3-character display
- External controller connections with selector switch
- Hot surface ignition
- On/Off toggle switch
- Pump time delay
- Diagnostic lights

LAARS Heating Systems Company
A subsidiary of BRADFORD WHITE Corporation

800.900.9276 • Fax 800.559.1583 ***(Customer Service, Service Advisors)***
20 Industrial Way, Rochester, NH 03867 • 603.335.6300 • Fax 603.335.3355 ***(Applications Engineering)***
1869 Sismet Road, Mississauga, Ontario, Canada L4W 1W8 • 905.238.0100 • Fax 905.366.0130
www.Laars.com

Litho in U.S.A. © Laars Heating Systems 0810 Document 5084-56