

# Rheos Hydronic Boiler

Model RHCH 1200-2400 Indoor/Outdoor

## Specification

Date: \_\_\_\_\_ Bid Date: \_\_\_\_\_  
Project #: \_\_\_\_\_ Location: \_\_\_\_\_  
Project Name: \_\_\_\_\_ Engineer: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Prepared By: \_\_\_\_\_

Contractor shall supply and install Qty.: \_\_\_\_\_ Laars Model No. RHCH\_\_\_\_\_ boiler(s).

The boiler shall be a Laars Rheos Model RHCH\_\_\_\_\_, modulating, sealed combustion, Category IV (condensing) boiler with a modulating input and output rate as shown on the schedule. The Rheos hydronic boiler shall have a minimum 85% combustion efficiency as certified by AHRI.

The Rheos shall be design certified to comply with the current edition of the Harmonized ANSI Z21.13 / CSA 4.9 Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers. The Rheos shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) working pressure.

The Rheos shall be capable of normal operation and full input with supply gas pressure as low as 4" w.c. Boiler shall automatically compensate for large fluctuations of gas supply pressure between 4" w.c. and 13" w.c.

The water tube heat exchanger shall be a vertical round design, with 7/8" (22mm) inner diameter integral finned copper tubes. The tubes shall be rolled directly into lined ASME headers rated for 160 psi (1103 kPa) working pressure. All waterways shall be non-ferrous. The heat exchanger shall be a low water volume design. All gaskets shall be non-metallic, and separated from the combustion chamber by at least 3.5" (89mm) to eliminate deterioration from heat. Headers shall have covers permitting visual inspection and cleaning of all internal surfaces.

The piping side header shall have threaded nipples to facilitate maintenance and permit removal of complete heat exchanger for service or replacement. The heat exchanger shall be removable from the front of the unit, without extensive disassembly of the Rheos' combustion chamber.

The boiler shall use a proven hot surface ignition with a 15 second pre-purge cycle to clear the venturi assembly and combustion chamber. Rheos shall start in low fire, and shall remain in low fire for 15-seconds at the start of each cycle. Rheos shall be 120V, single phase, 20A.

The burner shall be cylindrical type with woven metal fiber to provide a cleaner, more complete fuel combustion and low NOx emissions, not exceeding 10 PPM.

The combustion chamber shall be compact, utilizing a lightweight alumina-silica insulation tile board rated to 2200°F (1204°C). The outer jacket shall be a unitized shell finished with acrylic thermo-set paint baked at a temperature not less than 325°F (163°C).

The frame shall be constructed of 2" x 2" x 11 gauge box steel. The flue collector shall be constructed of 10 gauge steel for strength and durability.

The jacket shall have access panels on each side of the Rheos, to facilitate inspection and service of internal components. The flue collector shall have an access panel to allow inspection of the outside of the finned copper heat exchanger tubes.

The boiler shall have a forced draft design that is capable of precisely mixing the air and gas to achieve a minimum 87% steady-state combustion efficiency. The Rheos shall employ a pre-mix fan that is approved for use with flammable gas and air mixtures. The air intake will use single-wall galvanized steel pipe, 24 gauge minimum, to a maximum of 50 linear feet with a maximum of 5 elbows. The Rheos shall be designed for vertical venting or for horizontal direct venting applications using stainless steel vent. Venting applications will use type AL29-4C stainless steel pipe to a maximum of 50 linear feet with a maximum of 5 elbows. The venting configuration for direct combustion air and/or direct exhaust venting shall be installed using the Laars optional vent connector(s.)

The boiler gas train shall be for modulating firing and shall consist of a safety gas valve and a gas-air ratio control valve that precisely controls the air and gas mixture, and enables the Rheos to modulate, to closely match heat load conditions.

The boiler shall be provided with an integral, washable combustion air filter. The air filter shall provide 83% arrestence to protect the burner and blower from debris. The air filter shall be constructed out of open cell polyurethane foam. The air filter shall be mounted in the Rheos, and shall be intended for permanent use in the unit, (not only for the construction phase of the project).

The boiler shall be built with a selector switch which enables the user to choose between the unit's mounted modulation control and a labeled terminal strip for connection to an external 0-10VDC control source (such as a building automation system or multiple boiler controls). The boiler shall have dry alarm contacts for ignition failure, and shall have the following diagnostic lights: Amber light to indicate power on; Amber light to indicate a call for heat; Amber light to indicate that the unit is in pre-purge; Green light to indicate that the main gas valve has been energized; Red light to indicate ignition failure.

The boiler shall include, as standard equipment, the following controls and trim:

- Flow Switch
- Electronic Low Water Cut-Off complete with test light and manual reset button
- Manual reset high limit
- High gas pressure switch
- Low gas pressure switch
- Air pressure switch
- Pump time delay
- Low-fire start time delay
- Selector switch for internal or external (0-10VDC) control
- 75 psi (517 kPa) ASME rated Pressure relief valve
- Temperature and pressure gauge