

# Mighty Therm2

## Water Heater

Model MT2V 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. MT2V \_\_\_\_\_ water heater(s).

The heater shall be a Laars Mighty Therm2 Model MT2V \_\_\_\_\_, 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, 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 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. The ignition control shall pre-purge and post-purge the heater's blower, and 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.

The heater shall be standard on/off firing, with an option for two-stage firing. The heater shall be equipped with an on/off adjustable temperature control with SPST switch that breaks on temperature rise to the dial setting, and a fixed 5°F differential. Optionally, the heater may be equipped with a two-stage adjustable temperature control with a fixed 3.5°F switch differential, and an adjustable interstage differential. In addition to the temperature control, the heater shall be equipped with a non-adjustable manual reset temperature high limit device. A 0-10 minute adjustable pump time delay shall be standard, to allow for selectable pump post-purge. A terminal strip shall be used for ease of wiring and troubleshooting. The heater shall have a control panel cover, such that jacket panels do not have to be removed to access control components.

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 10ppm. Burners shall be in easily-removable burner tray assemblies with no more than 4 burners per tray.

The combustion chamber shall be 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.

The gas train shall have a gas shutoff valve and main gas valve(s) with built-in redundant valve seat(s) and gas regulator(s). Gas valves shall be flanged, to permit easy removal of 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% arrestance to protect the burners and blower(s) from debris. The air filter shall be constructed out of open-cell polyurethane foam.

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**Standard features shall include:**

- Certified for indoor or outdoor use
- Less than 10ppm NOx
- ASME 160 psi working pressure heat exchanger
- ASME "H" stamp (opt HLW)
- Flanged water connections
- Glass-lined headers
- Low lead construction
- External header gaskets
- 125 psi (861 kPa) ASME rated pressure relief valve
- Temperature pressure gauge
- Water flow switch
- 24V control system
- 115/24V transformer
- Temperature controller
- Manual reset high limit
- On-off firing (2-stage optional)
- Adjustable pump time delay
- Hot surface ignition
- On/off toggle switch
- CSD-1 compliant
- Removable burner tray(s)
- Multiple operating gas valve/pressure regulators
- Manual "A" gas valve
- Burner site glass
- Fusible link (model 200)
- Intake air filter
- Built-in fan for Category I or III vent systems
- Blower pre-purge and post-purge
- Air pressure switch
- Blocked vent switch