*NEOTHERM*

Water Heater

with Pump

Model NTV 150-500 Indoor

96%

96%

95%

97%

95%

Thermal Efficiency

500

399

285

199

150

Size

*continued >>*

The control shall have installer-level password, and verification feature to ensure that safety-related parameters are not altered by mistake.

Allowable control adjustments shall include: heater temperature setpoint; domestic water temperature setpoint; automatic high limit: °F or °C

display; DHW setpoint for time of day input; DHW PID gain parameters; manual firing rate control; pump delay time; pump exercise interval;

automatic remote signal detection; anti-shortcycle feature enable/disable.

The control shall have the ability to accept a 4-20mA or 0-10VDC input connection from an external control or building automation system, to

modulate the flame. The control shall have dry alarm contacts for ignition failure.

The control shall have the ability to recognize a domestic water sensor or closure from a tank stat on the same terminals. The heater shall be

shipped with the domestic water heater sensor, as standard equipment.

The control shall have the ability to control the domestic water pump, with a time delay and exercise feature.

The control shall have the ability to control the heater pump with delay features. The control shall be able to cascade and lead-lag with other

NeoTherm controllers, without additional system controllers.

When a display or control is field-replaced, the device shall have the ability to read parameter setpoints from the original set-up, so the system does

not have to be re-programmed.

The heater control shall be an integrated electronic PID temperature and ignition control with large touchscreen and color display and shall control

the heater operation and firing rate. The heater display shall be visible without the removal of any jacket panels or control panels.

The heater shall be equipped with an ASME certified pressure relief valve set at 125psi (861kPa). Optional pressure relief valves with settings of

30psi (207kPa), 50psi (345 kPa), 60psi (413 kPa), 75psi (517 kPa) or 150psi (1034 kPa) shall be available.

The heater shall meet the standards of US Public Law 111-380, Reduction of Lead in Drinking Water Act (CA AB-1953, VT S152, LA Act 362 and

MD HB 372) and NSF/ANSI-61 requirements.

The water tube heat exchanger shall be stainless steel, rated for 160 psi (1103 kPa) working pressure. The heat exchanger shall be a low water volume design, welded construction, with no gaskets, o-rings or bolts in the header. Heat exchanger shall be accessible for visual inspection and cleaning of all surfaces of the flue side of the heat exchanger. The heater shall be fully condensing design with built-in condensate drain and trap. The heat exchanger shall have a limited five-year warranty.

Each heater shall be fully test fired, (with water, gas, and venting connected), and all safety components tested, at the factory.

The heater shall be sealed combustion, and removal of jacket panels shall not affect the combustion seal. The heater 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. Heater shall be certified for zero clearance to combustible surfaces.

All water, gas, vent and air connections shall be on the top of the heater, and the top jacket panels shall be split, such that they are removable without disconnecting the water, gas, vent or air pipes.

The heater shall be shipped with a pump that has conduit, wiring and terminals wired to the pump. The heater shall have a flanged inlet water connection that allows the pump to be connected directly to the top of the heater in the field. The pump shall be capable of serving the heater's heat exchanger and 30 feet of piping that is the same size as the heater's water connections, with a normal number of pipe fittings.

Heater shall operate on 4-13" w.c. gas pressure, and shall need no component changes to operate at high altitude, up to 10,000 feet.

The heater shall use a premix burner with a stainless steel woven metal fiber wrap, and a negative pressure gas valve to burn cleanly, with NOx emissions not exceeding 10ppm. The heater shall meet the emissions requirements of SCAQMD 2012.

The heater shall be designed for vertical or horizontal Category IV venting, up to 100 equivalent feet, with 3" diameter PVC, CPVC or stainless steel vent material. Air may be taken from the room, or ducted directly to the heater, using up to 100 equivalent feet of 3" diameter ABS, PVC, CPVC or galvanized pipe. The heater shall be shipped with PVC sidewall vent and air terminals, for use with horizontal systems. The first section of CPVC vent pipe shall be shipped with each heater.

Unit shall be 120VAC, single phase, 7 Amps (including pump) for connection to a 15A breaker. The control circuit shall be 24VAC.

20-100% of full fire. 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. 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) maximum working pressure, and shall bear the ASME "H" Stamp and be listed by the National Board. The unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1. The water heater shall have minimum thermal efficiencies of:

The heater shall be a Laars NeoTherm Model NTV , rated at the input and output shown on the schedule. The heater shall modulate

Contractor shall supply and install Qty.: Laars Model No. NTV modulating, pump-mounted water heater(s).

***Specification***

Prepared By:

Contractor:

Engineer:

Project Name:

Location:

Project #:

Bid Date:

Date:

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Electronic PID modulating control with large

color touchscreen display

Password-protected parameters

for installer use

Test feature allows forced min or

max firing

Complete diagnostics for analog and digital inputs

Displays holds, alerts and errors in clear text form

Dray alarm contacts for ignition failure

High condensing efficiency

Modulation down to 20% of full fire (5:1

turndown)

Sealed combustion chamber

Pre-mix stainless steel burner

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Water flow switch (399-850 only)

Temperature & pressure gauge

Drain valve

Integrated PID temperature and ignition

controls

Alarm output

Accepts external 4-20mA (0-10V with optional convertor) modulation signal

On/off toggle switch Manual reset high limit Burner site glass

Zero clearance to combustible surfaces

Built-in cascade function for multiple units, up

to 8 total.

8 year limited heat exchanger warranty

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Low NOx system exceeds the most stringent regulations for air quality - less than 10ppm NOx

Horizontal or vertical direct vent

Horizontal vent and air terminals

Vent and air pipe lengths of up to 100

equivalent feet (each)

Built-in condensate trap

Vent temperature cutoff feature Direct spark ignition system Sensor for domestic water tank

160 psi maximum working pressure

Stainless steel heat exchanger with welded construction (no gaskets)

ASME "H" stamp

125 psi (861 kPa) ASME rated pressure relief valve

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***Standard features shall include:***

The control shall differentiate between a lockout, a hold, or an alert. If an issue occurs, the system will display a brief description of the issue on the

control screen. The user shall be able to tap the display to be presented with a more detailed explanation of the issue.

The control shall have a clock with a battery backup and will allow the user to access the burner run time, and cycle counts for the burner and DHW pump.

Control diagnostics shall include, at a minimum, the following: ignition failure, grounded flame rod, safety chain interrupt, heater high limit exceeded,

domestic water high limit exceeded, temperature rise limit exceeded, stack limit exceeded, pressure sensor fault, combustion pressure fault, blocked air intake, sensor errors (open or shorted), 24VAC voltage low or high, modulation fault, pump fault, AC input phases reversed, and fan speed proving rate failure.

The controller shall be able to send information through a modbus connection, including (but not limited to) inlet and outlet water temperatures,

stack temperature, DHW temperature, status of sensors, fan speed, setpoints, remote control input, burner status, lockout codes, alarm reasons,

domestic water pump status.

The control shall have the ability to accept a 4-20mA or 0-10VDC input connection from an external control or building automation system, to

modulate the flame.

The control shall graphically depict the firing rate of each burner in system, if the controller is the master of other NeoTherm heaters in a multiple

heater system.

• inlet temperature

• fan

• domestic water pump

• domestic hot water

• burner control

• demand and modulation

• flame detection

• statistics

• stack limit

A control that is chosen as master in a system with multiple controllers shall display an icon of each of the controls that it is controlling. The color

of the icon shall indicate if the control is in normal operation, in lockout, in standby mode, in a hold state, or if there is a communication error. In addition to adjustable parameters, the master display shall also be able to show information about the following for each heater it is monitoring:

The control shall easily allow the user to force the heater into minimum or maximum firing rate, for setup and diagnostic purposes, and shall have a

cleaning mode that allows the user to wipe the screen without activating any functions from the touchscreen.

in multiple heater systems, the master control shall choose to bring on all heaters at low firing rates, instead of one heater at a high rate, to meet

the system needs.

The heaters shall be controlled to keep each one in the lowest firing rate possible, based on system demand, to maximize efficiency. For example,

The control shall be able to cascade and lead-lag with other NeoTherm controllers, for a total of eight NeoTherm heaters, without additional system

controllers.