

- 36 - 144 kW (122,800 - 491,300 BTU/hr.)
- Certified Lead-Free Design
- New & Improved Pressure Drop Advantage
- Variable modulation from 0 to 100% of the rated kW
- Standard NEMA 4 enclosure
- Independent Safeties
- ETL and cETL certified to UL and CSA Standards
- Liquid-Cooled Solid State Relays
- Internal fusing (included) adds safety and permits single power connection
- Door cutoff switch
- Emergency stop button
- ASME and NB Certified Options available
- Freeze protection options available

## Standard Equipment

### Tankless Water Heating Specifications

Laars Commercial Tankless Electric Water Heaters, Powered by Keltech™ N Series are designed to accommodate most heavy industrial fluid heating applications where demand is 36 kW - 144 kW and flow rates from 1.5 to 50 GPM are required. Standard units: activation flow  $\geq$  1.5 GPM . N Series are designed for environments requiring precise temperatures to 160°F as an alternative to boilers. N Series units are suited to applications where 480V, and 600V, 50/60 Hz 3-Phase Delta is required. The heat exchanger features O-ring seals that outlast typical gasket construction. 1-1/4" NPT female inlet and outlet connections. NEMA 4X and explosion proof purge system options available.

## Construction

### Temperature Controller

The Laars PID Temperature Controller is more energy efficient and reliable than traditional microprocessors using staged elements. Power is infinitely variable, with no fixed inputs. The PID controller makes it possible to modulate the amount of power applied to the elements while also dispersing the required power evenly across all elements. This unique feature increases the product's life cycle.

### Heating Element

Each heater features a heavy-duty, low watt density, incoloy 800 sheathed resistive element. The design ensures greater protection, durability and resistance to scaling from hard water because water is only heated when flowing; this means sediment will not collect in the heat exchanger.

### Solid State Relays

The liquid cooled solid state relays provide silent switching, which has a fast response and works in conjunction with the PID controller to infinitely modulate and add to the life of the heater.

### Electrical

The N Series requires only one service feed per unit. Includes internal fusing as standard. Internal fusing provides superior protection so the incoming circuit can be higher than 48 amps (NEC). Each heating element is protected with fusing.

### Cabinet Enclosure

The floor-mounted standard cabinet enclosure is NEMA 4 rated and made from 14 gauge mild steel and powder coated with ANSI 61 gray, corrosive resistant paint. The optional NEMA 4X enclosures are for harsher environments and made from 16 gauge 304 stainless steel.

### Independent Safeties

The internal thermostat with auto reset high limit switch ensures that when the temperature limit is reached, the unit will power down a bank of elements; when the temperature drops back down to the set point, power is restored. The surface mounted bi-metal thermostat with manual reset acts as a fail-safe and must be manually reset before power can be restored to the elements if the temperature limit is exceeded.



## Code Compliance and Certifications



### Lead-Free

Products marked with the Lead-Free logo comply with the Safe Drinking Water Act (SDWA) requirements of a weighted average of less than 0.25% lead content on wetted surfaces of pipes, pipe fittings, plumbing fixtures, and fixtures.



ETL listed to UL499

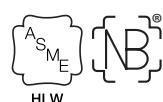
ETL listed to UL 50E (Requires NEMA 4X Option)\*

Intertek ETL listed to NFPA 496 (Requires EXP2CFPM Option)\*

cETL listed to CSA-C22.2 No. 88



Standard product selections contained within this document are third party CERTIFIED to NSF/ANSI 372 meeting the Lead-Free content requirement. Any product configured with custom options will be COMPLIANT with NSF/ANSI 372 meeting the Lead-Free content requirement.



ASME certification available. Laars units 58kW (200,000 btu) and higher are the only electric tankless water heaters National Board certified with the HLW stamp. (Requires HLW or HLW-TE Option)

\* Must be specified when ordering

## Product Options

### Internal Fused Disconnect and Ground Fault Package

The FDS part of this option interlocks with enclosure door when energized, prohibiting access to a live cabinet. It adds an additional level of safety and convenience at the heater location. GF senses leakage current to ground > 1 Amp. If a fault is detected, this will terminate the high voltage power supply to heating elements and disable operation of the unit.

### Freeze Protection

The standard required ambient temperature is 33°F (0.6°C). For environments lower than 33°F, Laars offers two levels of freeze protection. ENHT offers protection to -20°F (-28°C). The ENHT30 offers protection to -30°F (-34°C). Each level of protection utilizes the normal heater supply voltage. No additional dedicated circuit to the unit is required during field installation. Freeze protection (ENHT option) includes an internally insulated NEMA 4/4X enclosure and thermostatically controlled forced air heater to maintain internal temperatures above freezing.

ENHT options also include a connection point for DCS monitoring. In the event of a power interruption or ENHT system failure when internal enclosure temperatures reach 40°F (4.4°C) or lower, the unit will notify a facilities control/monitoring system that the unit is unable to maintain freeze protection. Regardless of state of power to the unit, this warning notifies maintenance personnel and provides an opportunity to correct the condition before any damage occurs to the unit.

### Continuous Flow Explosion Proof Purge System

The EXP2CFPM option makes heaters compliant for classified areas; Class 1, Division 2, Groups A-D, T5. The Purge System requires a supply of clean instrument air or inert gas (provided by installer). This supply maintains a positive internal pressure and prevents the enclosure from filling with flammable gasses, dusts or vapors from the ambient environment. In addition to manufacturer certifications on the purge system, Laars independently tests and 3rd party certifies all finished product with EXP2CFPM to comply with NFPA 496.

### ASME Heat Exchanger

Laars offers any product above 58 kW (equivalent to 200,000 BTU/hr.) the option to be fitted with internal plumbing certified to Section IV of the ASME Boiler and Pressure Vessel Code - an industry exclusive certification. HLW certification represents not only an approved design and method of construction, but an intensively audited construction and documentation process that concludes with a pressure test witnessed by an ASME official. Upon completion of this process, each heat exchanger is issued a unique serial number for registration in the National Board. This information is supplied with the unit via Form "HLW-6 Manufacturer Data Report" for verification and reference by local inspection officials. The HLW options also include additional features such as dry-fire protection, an auto bleed valve, and boiler drain valves, adding an extra level of quality and durability to Laars heaters.

Select the HLW-TE options for deionized or mild corrosive applications requiring a HLW (ASME) Pressure Vessel. The TE2 option, which provides a Xylan Fluoropolymeric Coating, is not available with an ASME heat exchanger.

### Building Management System (BMS) Integration

The D1 option has 4-20mA input and allows Building Management Systems to set temperature and view heater outlet temperature via the BMS display. This allows the BMS to command the temperature setting of the unit and verify unit performance with actual process values. The D1 option requires BMS input to establish a temperature setting; local adjustment of set-point per standard interface on the heater control display is not permitted.

The DC option is a RS-485 Modbus RTU and allows Building Management Systems to view heater outlet temperature and heater activation via BMS display as well as changing the temperature set-point from the BMS. This allows the BMS to command the temperature setting of the unit and verify unit performance with actual process values. Local adjustment of set-point per standard interface on the heater control display is permitted.

### Alarm Selection

For critical process applications, the high/low temperature alarm (AL option) alerts you to an over or under temperature situation. The visual indicator alarm is located on the heater control panel. If the process temperature strays from the defined temperature range, an alert is sent to the controller.

### Remote Emergency Stop

RES is an internal communication option that is wired into a Building Management System. Allows power to be removed remotely from the heat exchanger.

### Other Product Options

For additional heater options and installation accessories, reference the appropriate section at the end of this document.

### Electrical Specifications for the Heater (3-Phase)



All internal fuses necessary for installation are included with the unit.

Capacity (kW)	Voltage	Maximum Amperage	Minimum AWG Wire Size*
36	480	43	6
36	600	35	8
54	480	65	4
54	600	52	6
63	480	76	4
63	600	61	4
72	480	87	3
72	600	69	4
108	480	132	1
108	600	104	2
126	480	152	1/0
126	600	121	1
144	480	174	2/0
144	600	139	1/0

\* Based on the NEC Table 310.16 (Formerly 310.15) for 75°C insulated copper wire @ 30°C Ambient. Aluminum wire requires larger gauges.

### Low Pressure Drop Advantage\*\*

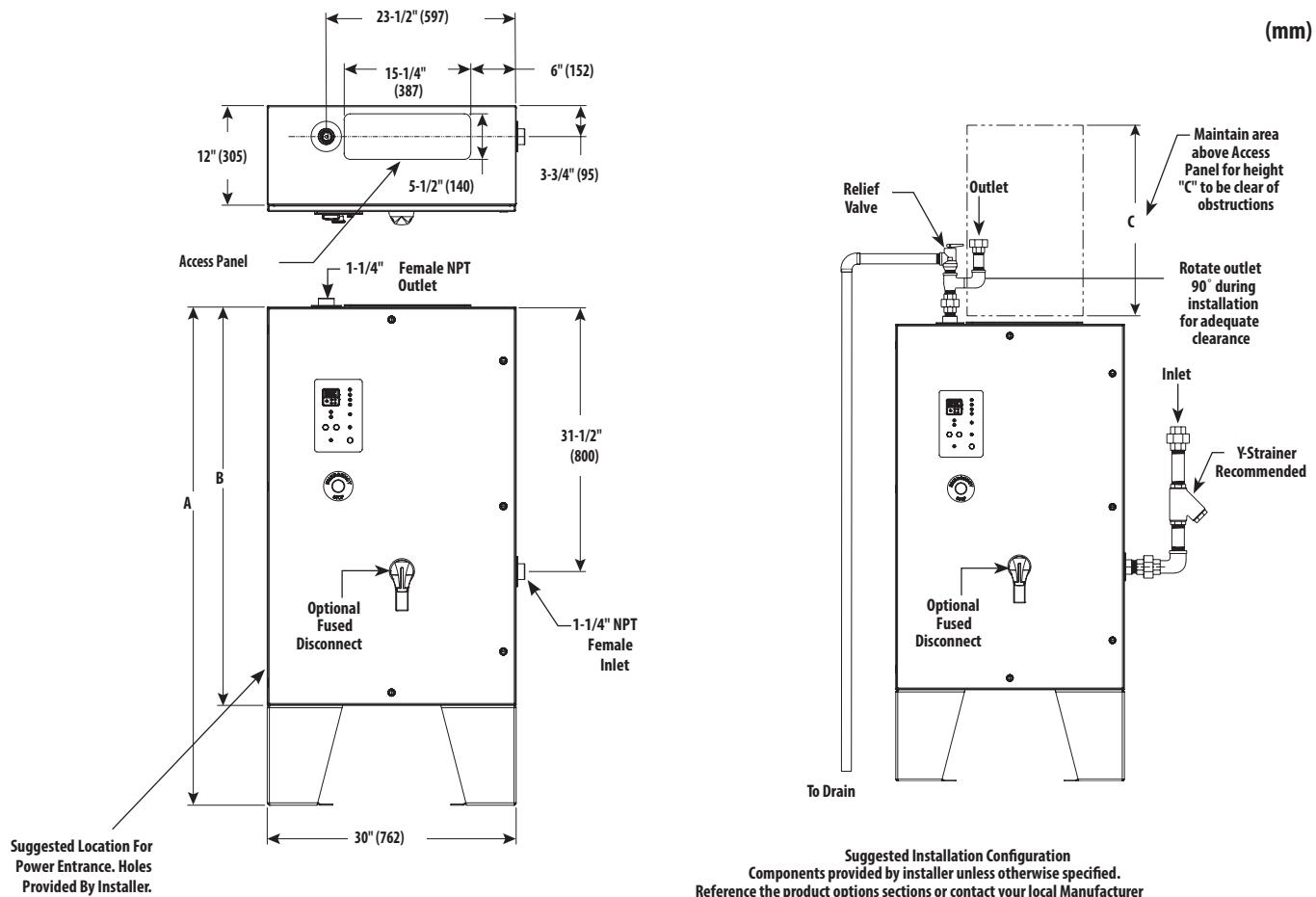
GPM	1.5	2	3	4	5	6	8	10	15	20	25	30	35	40	45	50
<b>36–63 kW PSI</b>	0.0	0.0	0.1	0.2	0.2	0.3	0.6	0.9	2.0	3.6	5.5	7.9	10.8	14.0	17.6	21.7
<b>72–144 kW PSI</b>	0.0	0.0	0.1	0.2	0.3	0.4	0.8	1.2	2.6	4.7	7.3	10.4	14.2	18.5	23.3	28.7
<b>LPM</b>	5.7	7.6	11.3	15.1	18.9	22.7	30.2	37.8	56.7	75.6	94.5	113.4	132.5	151.2	170.1	189
<b>36–63 kW BAR</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.5	0.7	1.0	1.2	1.5
<b>72–144 kW BAR</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.7	1.0	1.3	1.6	2.0

\*\* Standard Build Configuration

## N Series - Dimensions



Select product options shown.



	A	B	C
<b>36kW</b>	60"(1524)	48"(1219)	36"(914)
<b>54kW</b>	60"(1524)	48"(1219)	36"(914)
<b>63kW</b>	72"(1829)	60"(1524)	48"(1219)
<b>72kW</b>	60"(1524)	48"(1219)	36"(914)
<b>108kW</b>	60"(1524)	48"(1219)	36"(914)
<b>126kW</b>	72"(1829)	60"(1524)	48"(1219)
<b>144kW</b>	72"(1829)	60"(1524)	48"(1219)



# N Series

## Heavy Industrial Heaters

### ankless Electric Water Heating Solutions

## kW Calculator

N Series: 36, 54, 63, 72, 108, 126, 144 kW

ASME Certification Available



Sizing for the proper flow rate is important. If the temperature rise requirements exceed a single N Series model, consider using multiple N Series units. Please contact your Laars Representative for additional product information.

## How to Size a Heater.

1. Calculate temperature rise (also known as delta tee or  $\Delta T$ ).  
Setpoint temp \_\_\_\_\_ minus coldest incoming water temp \_\_\_\_\_ =  $\Delta T$        $\Delta T$  = \_\_\_\_\_
  2. Select kW required by using chart or formula below.  
Peak demand in GPM x  $\Delta T$  x 0.1465 = kW      kW = \_\_\_\_\_
  3. Confirm voltage and phase available on site.      Voltage & Phase \_\_\_\_\_

<input type="checkbox"/> <b>L</b> Brand	<input type="checkbox"/> <b>C</b>	<input type="checkbox"/> <b>T</b>	<input type="checkbox"/> <b>E</b>	<input type="checkbox"/> <b>N</b>	<b>Category</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Power</b>
1 L = Laars	2	3	4	5	<b>CTEN</b> = Commercial Tankless Electric N Series (formerly CNA)	6	7	8	<b>036</b> = 36kW <b>108</b> = 108kW <b>054</b> = 54kW <b>126</b> = 126kW <b>063</b> = 63kW <b>144</b> = 144kW <b>072</b> = 72kW

<input type="checkbox"/> <b>Voltage</b>	<b>Construction</b>	<b>Construction</b>
9 Three Phase S = 480 T = 600	10 <b>D</b> = NEMA 4 Standard <b>E</b> = NEMA 4X 304 SSTL <b>L</b> = NEMA 4 & EXP2CFPM Explosion Proof Cont. Flow Class 1 / Div 1 <b>P</b> = NEMA 4X 304 & EXP2CFPM	11 <b>X</b> = Standard <b>A</b> = ASME HLW <b>T</b> = TE - Teflon Coated HX <b>C</b> = ENHT Freeze Protect -20°F <b>D</b> = ENHT30 Freeze Protect -30°F <b>E</b> = ASME HLW & TE * <b>G</b> = ASME HLW & ENHT * <b>H</b> = ASME HLW & ENHT30 * <b>J</b> = ASME HLW & TE & ENHT * <b>K</b> = ASME HLW & TE & ENHT30 *

<input type="checkbox"/> <b>Control</b>	<b>F</b> = D1- 4-20mA Input <b>G</b> = DC- RS-485 Modbus RTU	*HLW available on 63kW and higher
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<input type="checkbox"/> <b>Electrical</b>	<b>Temperature Setpoints</b>	<b>Firmware</b>	<b>Language</b>
13 <b>X</b> = Standard <b>R</b> = RES - Remote Emergency Stop <b>J</b> = FDS & GF* <b>M</b> = FDS & GF & RES*  *Not available with 72kW 600V	14 <b>X</b> = Standard (Set up to 160°F) <b>4</b> = T200 High Temp	15 <b>X</b> = Standard	16 <b>      </b> = English (blank) <b>F</b> = French

<b>Installation Accessories</b>
<input type="checkbox"/> <b>BSPP</b> = Stainless steel thread adapter converts NPT to BSPP
<input type="checkbox"/> <b>NONE</b> = None

**PR** = Pressure and temperature relief valve  
 **PRS** = ASME pressure relief valve, stainless steel  
 **NONE** = None

**YS** = Y-Strainer  
 **YSS** = Y-Strainer, stainless steel  
 **NONE** = None

<b>Application Attributes (MANDATORY)</b>		
Coldest ground water temperature:	Maximum Flow:	Set point temperature:
Delta T Calculation: Set Point Temperature - Coldest Incoming Water Temperature = _____ (Maximum Delta T for Application)		

Laars Tankless Water Heaters are built to customer specification and are therefore non-cancelable, non-refundable and non-returnable.

Teflon is a registered trademark of E.I. du Pont de Nemours and Company

<b>Model Number Configuration</b>																																
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Customer Signoff \_\_\_\_\_