- 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 ≥ 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 380V, 400V, 415V, 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. The NEMA 4X enclosure can also be specified with 316 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 fittings, and fixtures.

ETL listed to UL499

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

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

Fused Disconnect
Internal fused disconnect interlocks with enclosure door when energized, prohibiting access to a live cabinet. Select the FDS option for an additional level of safety and convenience at the heater location.

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.

Ground Fault
Optional equipment protection ground fault senses leakage current to ground >1 Amp. In the event a fault is detected, this device will terminate the high voltage power supply to heating elements and disable operation of the unit. Fault status is communicated EXTERNALLY at the control interface. Personnel may also test the Ground Fault system and reset any nuisance trips without opening the cabinet.

Level Sensor
The level sensor (LS option) prevents accidental dry fire in the event there is no water in the heating vessel. Dry fire situations are most common upon start up or after routine service.

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**

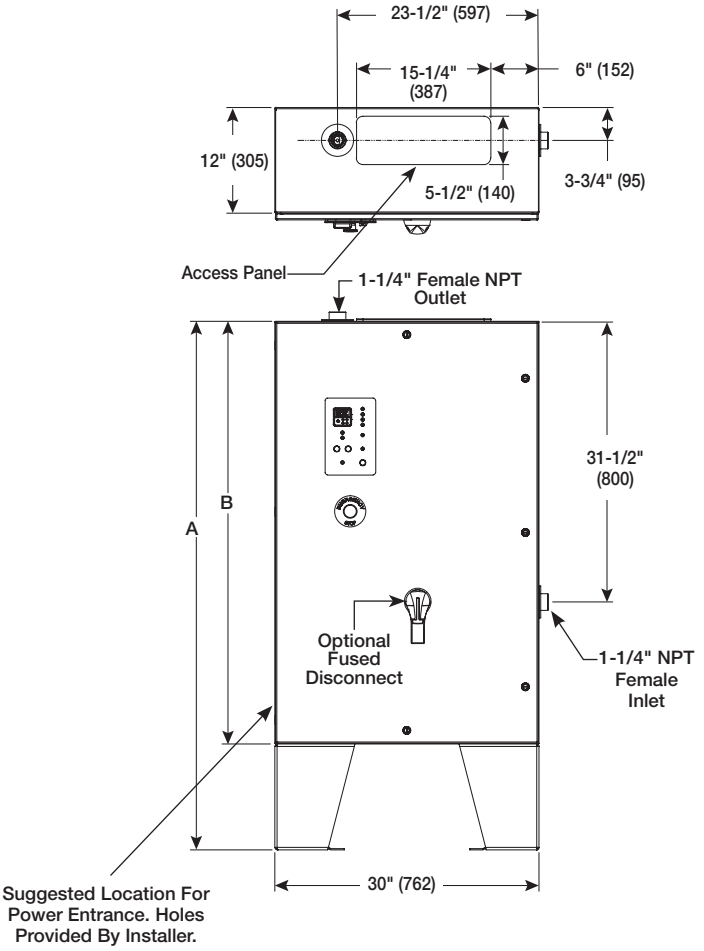
GPM	1.5	2	3	4	5	6	8	10	15	20	25	30	35	40	45	50
36–63 kW PSI	0.0	0.0	0.1	0.2	0.2	0.3	0.6	0.9	2.0	3.6	5.5	7.9	10.8	14.0	17.6	21.7
72–144 kW PSI	0.0	0.0	0.1	0.2	0.3	0.4	0.8	1.2	2.6	4.7	7.3	10.4	14.2	18.5	23.3	28.7
LPM	5.7	7.6	11.3	15.1	18.9	22.7	30.2	37.8	56.7	75.6	94.5	113.4	132.5	151.2	170.1	189
36–63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

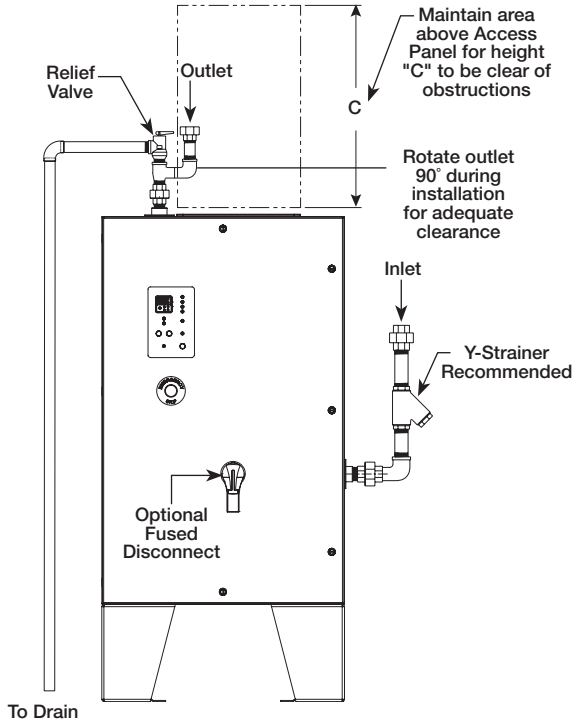
** Standard Build Configuration

N Series - Dimensions

Select product options shown. Other options available.

(mm)





Suggested Installation Configuration
Components provided by installer unless otherwise specified.
Reference the product options sections or contact your local Manufacturer Representative for product options.

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

kW Calculator

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

Temperature ΔF (°C)

Flow GPM	LPM	10° (6°)	15° (8°)	20° (11°)	25° (14°)	30° (17°)	35° (19°)	40° (22°)	45° (25°)	50° (28°)	55° (31°)	60° (33°)	65° (36°)	70° (39°)	75° (42°)	80° (44°)	85° (47°)	90° (50°)	95° (53°)	100° (56°)	105° (58°)	110° (61°)	115° (64°)	120° (67°)	125° (69°)	130° (72°)	135° (75°)	140° (78°)
1.5	5.7	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
2	7.6	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	54	54	54	54
3	11.3	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	54	54	54	54	54	54	54	54	63	63	63	63
4	15.1	36	36	36	36	36	36	36	36	36	36	36	54	54	54	54	54	54	54	63	63	72	72	72	108	108	108	108
5	18.9	36	36	36	36	36	36	36	36	54	54	54	54	54	54	63	63	72	72	108	108	108	108	108	108	108	108	108
6	22.7	36	36	36	36	36	36	36	54	54	54	54	63	63	72	72	108	108	108	108	108	108	108	108	126	126	126	126
7	26.5	36	36	36	36	36	36	54	54	54	63	63	72	72	108	108	108	108	108	108	108	126	126	126	144	144	144	144
8	30.2	36	36	36	36	36	54	54	54	63	72	72	108	108	108	108	108	108	126	126	126	144	144	144	-	-	-	-
9	34.0	36	36	36	36	54	54	54	63	72	108	108	108	108	108	108	126	126	126	144	144	-	-	-	-	-	-	-
10	37.8	36	36	36	54	54	54	63	72	108	108	108	108	108	126	126	126	144	144	-	-	-	-	-	-	-	-	-
12	45.4	36	36	36	54	54	63	72	108	108	108	108	126	126	144	144	-	-	-	-	-	-	-	-	-	-	-	-
15	56.7	36	36	54	63	72	108	108	108	126	126	144	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	75.6	36	54	63	108	108	108	126	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	94.5	54	63	108	108	126	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	113.4	54	72	108	126	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	132.3	54	108	108	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	151.2	63	108	126	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	170.1	72	108	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	189.0	108	126	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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 Delta-T (ΔT).
   Set point temp - coldest ground water temp = ΔT ΔT = _____
2. Select kW required by using chart or formula below.
   Peak demand in GPM x ΔT x .1465 = kW kW = _____
3. Confirm voltage and phase available on site. Voltage and Phase = _____
4. Confirm minimum flow. Minimum Flow = _____

LAARS Heating Systems Company
POWERED BY KELTECH

N Series (Formerly CNA Series)
Heavy Industrial Heaters
Tankless Electric Water Heating Solutions

Brand (1)
L = Laars

Category (2 3 4 5)
C T E N = Commercial Tankless Electric N Series (formerly CNA)

Power (6 7 8)
0 3 6 = 36kW
0 5 4 = 54kW
0 6 3 = 63kW
0 7 2 = 72kW
1 0 8 = 108kW
1 2 6 = 126kW
1 4 4 = 144kW

Voltage (9)
Three Phase
S = 480
T = 600
M = 380*
N = 400*
P = 415*
*Downrated from 480V

Construction (10)
D = NEMA 4 Standard
E = NEMA 4X 304 SSTL
F = NEMA 4X 316 SSTL
H = EXP2CFPM - Explosion Proof Cont. Flow Class 1 / Div 1
P = NEMA 4X 304 & EXP2CFPM
T = NEMA 4X 316 & EXP2CFPM

Control (12)
X = Standard
E = AL- Process Temp Alarm
F = D1- 4-20mA Input
G = DC- RS-485 Modbus RTU

Construction (11)
X = Standard
A = ASME HLW (includes LS)*
L = LS - Low Level Sensor
T = TE - Teflon Coated HX
F = TE2 - XF Coated HX*
C = ENHT Freeze Protect -20°F
D = ENHT30 Freeze Protect -30°F
E = ASME HLW & TE
G = ASME HLW & ENHT
H = ASME HLW & ENHT30
J = ASME HLW & TE & ENHT
K = ASME HLW & TE & ENHT30
M = LS & TE
N = LS & TE2
P = LS & ENHT
R = LS & ENHT30
S = LS & TE & ENHT
U = LS & TE & ENHT30
V = LS & TE2 & ENHT
W = LS & TE2 & ENHT30
*HLW is not available with TE2

Electrical (13)
X = Standard
F = FDS - Internal Fuse Disconnect*
G = GF - Ground Fault Package
R = RES - Remote Emergency Stop
J = FDS & GF*
K = FDS & RES*
L = GF & RES
M = FDS & GF & RES*
*Not available with 72kW 600V

Temperature Setpoints (14)
X = Standard (Set up to 160°F)
1 = T170 High Temp
2 = T180 High Temp
3 = T190 High Temp
4 = T200 High Temp

Firmware (15)
1 = Process Heat
2 = Residential
3 = Boosting
4 = Re-Circulation
5 = ICXXX Temp Lockout**
6 = Process Heat & ICXXX**
7 = Residential & ICXXX**
8 = Boosting & ICXXX**
9 = Re-Circulation & ICXXX**
**Specify optional lockout temperature: _____

Language (16)
__ = English (blank)
F = French

Installation Accessories

- ☐ **BSPP** = Stainless steel thread adapter converts NPT to BSPP
- ☐ **NONE** = 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

Application Attributes (MANDATORY)

Coldest ground water temperature:_____ Minimum Flow:_____ Maximum Flow:_____ Set point temperature:_____

Delta T Calculation: Set Point Temperature - Coldest Incoming Water Temperature = _____ (Minimum Delta T for Application)

Asset Tag

- ☐ **00** None
- ☐ **01** 1 Asset Tag_____
- ☐ **02** 2 Asset Tags_____
- ☐ **03** 3 Asset Tags_____
- ☐ **04** 4 Asset Tags_____
- ☐ **05** 5 Asset Tags_____

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

Model Number Configuration

L	C	T	E	N											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Customer Signoff_____

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