LAARS Heating Systems Company
POWERED BY KELTECH

S Series
Safety Shower Heaters
Tankless Electric Water Heating Solutions

- 36 - 144 kW (122,800 - 491,300 BTU/hr.)
- Certified Lead-Free Design
- New & Improved Pressure Drop Advantage
- 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
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- ASME and NB Certified Options available
- Freeze protection options available
- Temperature overshoot purge system
- Dual flow activation
- Variable temp heat exchanger
- Controller-locked temperature setting, output fixed at 80°F (27°C)
- Meets ANSI/ISEA Z358.1 standards

Standard Equipment

Tankless Water Heating Specifications

Laars Tankless Water Heaters Powered by Keltech™ provide warm water intended to supply safety fixtures. The heaters uniquely perform in applications with low line pressure, while still accommodating ANSI standard flow rates. Standard units: activation flow ≥1.5 gpm. The durable components withstand higher pressures which result in longer service life, while ensuring the delivery of precise output temperature. Durable components withstand power abnormalities found in industrial environments and ensure tepid water standards are never exceeded (100°F) with its three-tier anti-scald protection and hot water purge. S Series units are also suited to applications with 3 Phase Delta 480V or 600V, 50/60 Hz. The heat exchanger features o-ring seals that out last typical gasket construction. 1-1/4" NPT female inlet and outlet connections. Our tankless systems do not require the installation of an emergency thermostatic mixing valve.

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 S 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.



Dual Flow Activation

Laars safety shower heaters have a dual flow activation. The low flow activation is used with eyewashes, eye/face washes, and drench hoses. The high flow activation is for safety shower usage. This allows just the right capacity of heated water to be used for each application.

Independent Safeties

Each heater has three-tier anti-scald protection and hot water evacuation (overshoot purge protection). The controller alarm sends a signal to disconnect power to the elements if the temperature reaches 90°F (32°C). The internal thermostat with auto reset high limit switch ensures that when the temperature limit is reached (factory preset at 80°F/27°C), the unit will power down a bank of elements; when the temperature returns 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. An anti-scald feature comes standard on all S Series Safety Shower Heaters. This overshoot purge will automatically open and purge excess temperature water. This feature actively monitors temperature within the heater while operational. It also passively monitors water temperature while the heater is inactive. This is beneficial for outdoor installations where sun and weather can cause water temperature to exceed ANSI standards.
Temperature Safety Valves: Internal thermostat with auto reset high limit switch: 95°F (35°C) Surface mounted bi-metal thermostat with manual reset: 100°F (38°C)
Overshoot purge: 95°F (35°C)

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)

Compliant to NEC/NFPA 70 and Canadian Electrical Code C22.1

* 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.

- 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.

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.

Local adjustment of set-point per standard interface on the heater control display is permitted.

Alarm Selection
Two levels of building communication alarm options. The AL3 option provides dry contacts that open to signal flow >1.5 gpm has activated the heater. The AL3-SL option provides these dry contacts and additionally activates a local audible and visual alarm on the heater. Alarms activate at 1.5 gpm flow or greater.

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**

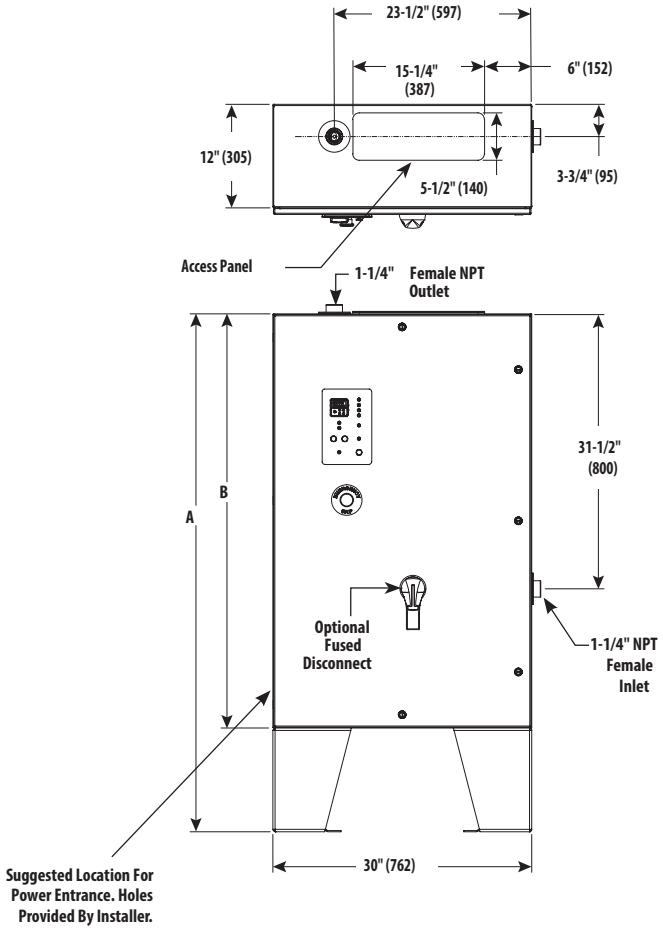
GPM	1.5	2	3	4	5	6	8	10	15	20	25	30	35	40	45	50
36–63 kW PSI	0.0	0.0	0.1	0.2	0.2	0.3	0.6	0.9	2.0	3.6	5.5	7.9	10.8	14.0	17.6	21.7
72–144 kW PSI	0.0	0.0	0.1	0.2	0.3	0.4	0.8	1.2	2.6	4.7	7.3	10.4	14.2	18.5	23.3	28.7
LPM	5.7	7.6	11.3	15.1	18.9	22.7	30.2	37.8	56.7	75.6	94.5	113.4	132.5	151.2	170.1	189
36–63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

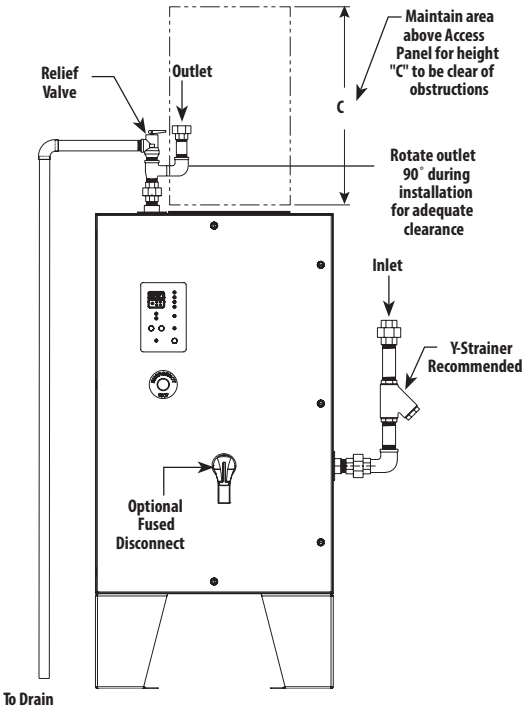
** Standard Build Configuration

S Series - Dimensions

☑ **Select product options shown.**

(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

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

Temperature Δ°F (°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 S Series model, consider using multiple S 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 ΔT).
   Setpoint temp _____ minus coldest incoming water temp _____ = ΔT ΔT = _____

2. Select kW required by using chart or formula below.
   Peak demand in GPM x ΔT x 0.1465 = kW kW = _____

3. Confirm voltage and phase available on site. Voltage & Phase _____

4. Confirm minimum flow. Minimum Flow _____

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S Series
Safety Shower Heaters
Tankless Electric Water Heating Solutions

1 Brand [L]
L = Laars

2 3 4 5 Category [C][T][E][S]
CTEN = Commercial Tankless Electric S Series

6 7 8 Power [ ][ ][ ]
036 = 36kW
054 = 54kW
063 = 63kW
072 = 72kW
108 = 108kW
126 = 126kW
144 = 144kW

9 Voltage [ ]
Three Phase
S = 480
T = 600

10 Construction [ ]
D = NEMA 4 Standard
E = NEMA 4X 304 SSTL
L = NEMA 4 & EXP2CFPM Explosion Proof Cont. Flow Class 1 / Div 1
P = NEMA 4X 304 & EXP2CFPM
G = NEMA 4 & EXP2LC Leakage Compensation
H = NEMA 4 & EXP2LCPM Leak Compensation Panel Mount
V = NEMA 4X 304 & EXP2LC Leakage Compensation
W = NEMA 4X 304 & EXP2LPM Leakage Compensation Panel Mount EXP2LCPM

11 Construction [ ]
X = Standard
A = ASME HLW (low level sensor included)*
C = ENHT Freeze Protect -20°F
D = ENHT30 Freeze Protect -30°F
G = ASME HLW & ENHT *
H = ASME HLW & ENHT30 *

*HLW available on 63kW and higher

12 Control [ ]
X = Standard
C = AL3 Dist Control Sys Link
D = AL3-SL Stack Light with Distributed Control Sys Link

13 Electrical [ ]
X = Standard
R = RES - Remote Emergency Stop
J = FDS & GF*
M = FDS & GF & RES*

*Not available with 72kW 600V

14 Temperature Setpoints [ ]
X = Standard

15 Firmware [ ]
X = Standard

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

Installation Accessories

☐ **BSPP** = Stainless steel thread adapter converts NPT to BSPP	☐ **PR** = Pressure and temperature relief valve	☐ **YS** = Y-Strainer
☐ **NONE** = None	☐ **PRS** = ASME pressure relief valve, stainless steel	☐ **YSS** = Y-Strainer, stainless steel
	☐ **NONE** = None	☐ **NONE** = None

Application Attributes (MANDATORY)

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

Model Number Configuration

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

Customer Signoff_____

Laars Heating Systems Company reserves the right to change specifications, components, features, or to discontinue products without notice.

LAARS Heating Systems Company

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