



## **Laars Tankless Electric Water Heaters, Powered by Keltech™**

### **N Series (Formerly CNA Series)**

#### **Guide Specification**

**Laars Tankless Electric Water Heaters Powered by Keltech™ Large Industrial Water Heaters** provide a practical solution to the requirement for providing a reliable supply of temperature-controlled hot water in a variety of workplace settings. Available as free-standing heaters, Laars Tankless Electric Water Heaters, Powered by Keltech™ Large Industrial Water Heaters range from 36 to 144 kW units. They feature automatic flow activation, Incoloy 800 sheathed low watt density heating elements, and a three-mode (PID) controller with dual digital display of set-point and output water temperature.

Laars Tankless Electric Water Heaters, Powered by Keltech™ large industrial water heaters allow water supply to quickly reach the required setpoint temperatures, up to **160 deg. F (71.1 Deg. C)** in as little as 20 to 30 seconds and provide a consistent flow of hot water – up to **50 GPM (189 l/m)** continuously.

Redundant Control and Safety Features: Every Laars large industrial water heater includes multiple safety features including internal fusing, digital microprocessor-based temperature control, an externally mounted emergency stop button, and splash proof NEMA 4 water tight enclosures. Safety only circuits monitor for over temperature conditions and ensure output temperature does not exceed maximum water heater allowable working water temperature.

Section 22 11 19 - DOMESTIC WATER PIPING SPECIALTIES (Thermostatic mixing valves)

**Section 22 33 13 - INSTANTANEOUS ELECTRIC DOMESTIC WATER HEATERS (Laars Tankless Electric Water Heaters, Powered by Keltech™)**

Section 22 42 16.11 - COMMERCIAL SINKS AND FAUCETS

Section 22 42 23 - COMMERCIAL SHOWERS AND SHOWER VALVES

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## **SECTION 22 33 13 – INSTANTANEOUS ELECTRIC DOMESTIC WATER HEATERS**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Tankless, electric large industrial water heaters and water heater accessories.

Specifier: If retaining optional "Related Sections" article, edit to include sections applicable to Project.

#### **1.2 RELATED SECTIONS**

- A. Division 22 Section, "General-Duty Valves for Plumbing Piping" for valves.
- B. Division 22 Section "Domestic Water Piping" for water piping.
- C. Division 22 Section "Domestic Water Piping Specialties" for vacuum breakers, water pressure-reducing valves, water-hammer arresters, and specialty valves.
- D. Division 26 Sections for electrical power and control wiring.

Specifier: If retaining optional "References" article, edit to include standards cited in edited Section.

#### **1.3 REFERENCES**

- A. General: Applicable edition of references cited in this Section is current edition published on date of issue of Project specifications, unless otherwise required by building code in force.
- B. American National Standards Institute (ANSI): [www.ansi.org](http://www.ansi.org):
  - 1. ANSI Z21.22 - Relief Valves for Hot Water Supply Systems
- C. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE): [www.ashrae.org](http://www.ashrae.org):
  - 1. ASHRAE/IESNA 90.1 - Energy Standard For Buildings Except Low-Rise Residential Buildings
- D. American Society of Mechanical Engineers (ASME): [www.asme.org](http://www.asme.org)

Specifier: Select subparagraph below based upon reference(s) retained under Quality Assurance Article.

- 1. ASME Boiler and Pressure Vessel Code, Section IV for "HLW" stamp and registered with National Board of Boilers and Pressure Vessel Inspectors for "NB" stamp
- E. American Society of Sanitary Engineering (ASSE): [www.asse-plumbing.org](http://www.asse-plumbing.org)
  - 1. ASSE 1003 - Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems
  - 2. ASSE 1010 - Performance Requirements for Water Hammer Arresters

- F. Canadian Standards Association/CSA Group (CAN/CSA): [www.csagroup.org/us/en/home](http://www.csagroup.org/us/en/home):
  - 1. CSA C22.2 No. 88 - Construction and Test of Industrial Heating Equipment
- G. National Electrical Manufacturers Association (NEMA): [www.nema.org](http://www.nema.org):
  - 1. NEMA Standards Publication 250 - "Enclosures for Electrical Equipment (1000 Volts Maximum)"
- H. National Fire Protection Association (NFPA) [www.nfpa.org](http://www.nfpa.org):
  - 1. NFPA 70 - National Electrical Code
  - 2. NFPA 496 - Standard For Purged and Pressurized Enclosures for Electrical Equipment
- I. NSF International (NSF): [www.nsf.org](http://www.nsf.org):
  - 1. NSF 61 - Drinking Water System Components – Health Effects
  - 2. NSF 372 - Drinking Water System Components - Lead Content
- J. Underwriters Laboratories (UL) [www.ul.com](http://www.ul.com):
  - 1. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations
  - 2. UL 499 - Standard for Electric Heating Appliances

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each product:
  - 1. Manufacturer's data sheets indicating unit performance and compliance with requirements.
  - 2. Include details of electrical and mechanical operating parts.
  - 3. Show mounting and securing requirements and utility connection requirements.

Specifier: Retain "LEED Submittals" Paragraph and corresponding "ASHRAE/IESNA Compliance" Paragraph under Quality Assurance Article below for LEED projects.

#### B. LEED Submittals

- 1. Product Data for Prerequisite EA 2 Minimum Energy Performance: Documentation indicating that units comply with applicable requirements in ASHRAE/IESNA 90.1, Section 7, "Service Water Heating."

#### 1.5 INFORMATION SUBMITTALS

Specifier: Retain paragraph below when Project requirements include compliance with Federal Buy American provisions.

- A. Buy American Act Certification: Submit documentation certifying that products comply with provisions of the Buy American Act 41 U.S.C 10a – 10d.
- B. Source quality-control test reports.

## 1.6 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

## 1.7 QUALITY ASSURANCE

Specifier: Retain "ASHRAE/IESNA Compliance" Paragraph for LEED projects and for other projects where compliance is required by authorities having jurisdiction.

- A. **ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.**
- B. Source Limitations: Obtain tankless electric water heaters through a single source from a single manufacturer.
- C. Electrical Components: Listed and labeled per NFPA 70, Article 100, by a testing agency acceptable to authority having jurisdiction.

Specifier: Retain "Boiler and Pressure Vessel requirements" option in the paragraph below based upon the following requirements:

HLW: When the heater has a heat input of 58.6 kW or more, or an output temperature of **210 deg. F (98.9 deg. C)**, or when authority having jurisdiction requires that water heater manufacturer complies with manufacture, inspection, and testing requirements in accordance with ASME Boiler and Pressure Vessel Code, Section IV.

- D. Boiler and Pressure Vessel Safety Requirements: Comply with ASME "Boiler and Pressure Vessel Code," Section IV for "HLW" stamp.
- E. Sanitation Standard: Comply with NSF 61 for fixture components in contact with potable water.
- F. Lead-Free Construction: Comply with NSF 372 for fixture components in contact with potable water.

Specifier: Retain the following reference when required.

## 1.8 WARRANTY

- A. Standard Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
  - 1. Standard Warranty Period: From Date of Substantial Completion:
    - a. Electrical Components: Two years
    - b. Heating Elements: Four years
    - c. Heat Exchanger Free From Leaks, eight years
  - 2. ASME Warranty Period: From Date of Substantial Completion:
    - a. Electrical Components: Two years

- b. Heating Elements: Five years
- c. Heat Exchanger Free From Leaks: Ten years

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Laars Tankless Electric Light Industrial Water Heaters, Powered by Keltech™, Rochester, NH. Phone: (603) 335-6300, Web site: [laars.com](http://laars.com)
- B. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.

### 2.2 TANKLESS ELECTRIC LARGE INDUSTRIAL WATER HEATERS

Specifier: The **Laars Tankless Electric, Powered by Keltech™, N Series (Formerly CNA Series)** includes automatic reset and manual reset controls to disable the water heater if the water temperature increases to **175 deg. F (79.5 deg. C)**.

- A. Tankless electric large industrial water heater, UL 499, sized for constant temperature duty to meet flow requirements and temperature setpoints up to **160 deg. F (71.1 deg. C)**- compliant fixtures, with liquid-cooled solid-state relays, flow activation, external emergency stop button, and anti-scald protection.
  - 1. Basis of Design Manufacturer/Model: **Laars, Powered by Keltech™, N Series (Formerly CNA Series) Large Industrial Water Heaters.**

Specifier: Select one of two "Enclosure" subparagraphs.

- 2. Enclosure: UL 50E [**0.078-inch/14-ga.- (1.99-mm-)** thick, NEMA 4] [**0.063-inch/16-ga.- (1.59-mm-)** thick stainless steel NEMA 4X].
- 3. Enclosure: UL 50E and NFPA 496 Explosion Proof, Class 1/Division 2: [**0.078-inch/14-ga.- (1.99-mm-)** thick, NEMA 4] [**0.063-inch/16-ga.- (1.59-mm-)** thick stainless steel NEMA 4X].
  - a. Water Heater Freeze Protection: [Not required] [to **-20 deg. F (-29 deg. C)**] [to **-30 deg. F (-35 deg. C)**].
  - b. Mounting: Floor mounted, free standing.

Specifier: Retain option for certification in "Heat Exchanger" Paragraph below when required. Laars Powered by Keltech™ N Series (Formerly CNA Series) units are the only tankless electric water heaters available with ASME and National Board certifications with the HLW stamp. Available for 63 kW and higher units.

- 4. Heat Exchanger: Copper tubing with brazed brass fittings and other NSF 61 barrier materials for potable water, without storage capacity [, ASME- and National Board-certified].

Specifier: Retain lining and coating options below as required for deionized water or corrosive liquid processing requirements. Xylan Fluoropolymeric Coating not available with ASME Heat Exchanger. Use PFA-Teflon-lined Coating option.

- a. PFA-Teflon-lined Coating: FDA approved for deionized water or mild corrosive fluid applications
  - b. Xylan Fluoropolymeric Coating: FDA approved for food contact or deionized water
5. High Temperature Package: [Temperature greater than 160 deg. F] [Temperature greater than 170 deg. F] [Temperature greater than 180 deg. F] [Not required].
  6. Connections: 1-1/4 inch NPT (DN 25) inlet, outlet.
  7. Pressure Rating: 150 psig (1035 kPa).
  8. Heating Element: Incoloy 800 sheathed low-watt density resistive element.
  9. Temperature Control: Microprocessor based PID logic and dual display of set-point and actual outlet water temperature.
  10. Safety Controls:
    - a. Internal thermostat with auto reset high- limit switch.
    - b. Surface mounted bi-metal thermostat with manual reset.
    - c. Door cutoff switch and emergency stop button.
    - d. Internal Fused Disconnect: [Required] [Not required].
    - e. Ground Fault Equipment Protection. For leakage to ground, greater than 1 amp, Door-mounted ground fault status light and reset: [Required] [Not required].
  11. Capacity:

Specifier: If temperature rise/flow rate data appear on Drawings, then select "As scheduled" option in two subparagraphs below. Otherwise, insert temperature rise and flow rate below from product data sheet. Temperature rise range available: 10 – 140 deg. F (6 – 78 deg C). Flow range available: 1.5 – 50 gpm (5.7 - 189 L/m).

- a. Temperature Rise at Flow Rate: [\_\_\_ deg F (\_\_\_ deg C) at \_\_\_ gpm (\_\_\_ L/m)] [As scheduled].
  - b. Adjustable Temperature Setpoint: [\_\_\_ deg F (\_\_\_ deg C)] [As scheduled].
12. Electrical Characteristics: [36] [54] [63] [72] [108] [126] [144] kW at [480VAC/3-phase/3-wire] [600VAC/3-phase/3-wire] [As scheduled].
  13. Facility Controls Integration:
    - a. 4-20 mA input
    - b. RS-485
    - c. Process Temp Alarm

## 2.3 WATER HEATER ACCESSORIES

- A. Provide tankless electric water heater system including the following system accessories:

Specifier: Retain accessories required for project from those in four paragraphs below; coordinate with contents of other Division 22 sections.

1. Pressure and Temperature Relief Valves: Pressure and Temperature Relief Valves: [Brass] [Stainless steel, ASME rated and stamped pressure relief valve]. Adjust to pressure setting less than water heater working-pressure rating.

- a. Pressure and Temperature Safety Relief Valve set to 80 psig (552 kPa).
- 2. Pressure-Reducing Valves: ASSE 1003.
- 3. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.
- 4. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.
- 5. Thread Adapters: NPT to BSPP, stainless steel.
- 6. Y-Strainer: [Lead Free Brass] [Stainless steel].

## 2.4 SOURCE QUALITY CONTROL

Specifier: Retain and edit following paragraph if ASME label is required.

- A. Factory Tests: Test and inspect domestic-water heaters according to ASME "Boiler and Pressure Vessel Code," Section [III] [IV]. Submit test reports.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Tankless, Electric, Domestic-Water Heater Mounting:
  - 1. Install water heaters in accordance with manufacturer's written instructions.
  - 2. Install water heaters level and plumb, according to layout drawings and referenced standards. Anchor to structure as recommended by manufacturer.
  - 3. Maintain manufacturer's recommended clearance and access dimensions.
- B. Install water supply piping to each water heater, and from heater to fixture requiring hot water supply connection.
  - 1. Install stop valves on water supply and outlet piping. Provide stop valve on each supply in readily-serviced location. Lock stop valve in OPEN position.
  - 2. Comply with Division 22 Section, General-Duty Valves for Plumbing Piping, for stop valve requirements.
- C. If shipped loose, install pressure and temperature safety relief valves on water heater. Manifold relief valve discharge as shown in manufacturer's written instructions.

Specifier: Select one of the two following paragraphs, as required by project conditions.

- A. Extend relief-valve outlet line, and discharge by positive air gap above closest floor drain.
- B. Install relief valve drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping.
- C. Run relief valve drain piping without creating tripping hazard.

Specifier: Retain accessories in following paragraph that are required for project; coordinate with contents of other Division 22 sections.

- D. Install [pressure-reducing valve with integral bypass relief valve in water heater cold water inlet piping] [and] [water hammer arrester in water-heater outlet piping], maximum outlet pressure [\_\_\_\_ psig (\_\_\_\_ kPa)] [as scheduled].

### 3.2 FIELD QUALITY CONTROL

- A. Do not energize water heater until hydrostatic testing of domestic water lines is complete. See Division 22 Section "Domestic Water Piping."
- B. Test and adjust installation.
  - 1. Set field-adjustable temperature set point of temperature-actuated controls. Adjust set point within allowable temperature range.
  - 2. Replace defective or malfunctioning controls and equipment.
- C. Clean unit surfaces, test fixtures, and leave in ready-to-use condition.

END OF SECTION