



Laars Tankless Electric Water Heaters, Powered by Keltech™

F Series (Formerly C2N Series)

Guide Specification

Laars Tankless Electric Water Heaters, Powered by Keltech™ Light Industrial Water Heaters are designed to accommodate most light industrial fluid heating applications including booster applications with incoming process temperatures up to **130 deg. F (54.4 deg. C)**, demand is 36kW-50kW and total flow is **<10 GPM up to 15 GPM (2.8 - 56.8 l/m)**. F-Series (Formerly C2N Series) units are 3 Phase Delta 480V or 600V. Standard units feature **≥ 0.75 GPM (2.8 l/m)** activation. Low flow activation options at **0.25 GPM (1.0 l/m)** and **0.50 GPM (1.9 l/m)** are available. NEMA 4X and explosion proof purge system options are available.

Available for wall- or floor- mounting, Laars Tankless Electric Water Heaters, Powered by Keltech™ Light Industrial Water Heaters range from 36 to 50 kW units. They feature shuttle type flow switches that activate a PID controller. Water heaters are equipped with 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™ Light 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 **15 GPM (56.8 l/m)** continuously.

Redundant Control and Safety Features: Every Laars Tankless Electric Water Heater, Powered by Keltech™ Light Industrial water heater includes multiple safety features including internal fusing, digital microprocessor-based temperature control, 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 light 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:
 - 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:
 - 1. ASHRAE/IESNA 90.1 - Energy Standard For Buildings Except Low-Rise Residential Buildings
- D. Canadian Standards Association/CSA Group (CAN/CSA): www.csagroup.org/us/en/home:
 - 1. CSA-C22.2 No. 88 - Construction and Test of Industrial Heating Equipment
- E. American Society of Sanitary Engineering (ASSE): 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. National Electrical Manufacturers Association (NEMA): www.nema.org:

1. NEMA Standards Publication 250 - "Enclosures for Electrical Equipment (1000 Volts Maximum)"
- G. National Fire Protection Association (NFPA) www.nfpa.org:
 1. NFPA 70 - National Electrical Code
 2. NFPA 496 - Standard For Purged and Pressurized Enclosures for Electrical Equipment
- H. NSF International (NSF): www.nsf.org:
 1. NSF 61 - Drinking Water System Components – Health Effects
 2. NSF 372 - Drinking Water System Components - Lead Content
- I. Underwriters Laboratories (UL) 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 paragraphs 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.
- C. Field 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.
- D. Sanitation Standard: Comply with NSF 61 for fixture components in contact with potable water.
- E. Lead-Free Construction: Comply with NSF 372 for fixture components in contact with potable water.

1.8 WARRANTY

- A. 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. 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.

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
 - 1. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.

2.2 TANKLESS ELECTRIC LIGHT INDUSTRIAL WATER HEATERS

Laars Tankless Electric, Powered by Keltech™, F Series (Formerly C2N Series) water heaters include 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 light 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)**, with PID Controller, fan-cooled solid-state relays, and flow activation.

1. Basis of Design Manufacturer/Model: **Laars, Powered by Keltech™, F Series (Formerly C2N Series) Light Industrial Heaters.**

Specifier: Select one of two "Enclosure" subparagraphs.

2. Enclosure: UL 50E, [0.063-inch/16-ga.- (1.59-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: [0.063-inch/16-ga.- (1.59-mm-) thick, NEMA 4] [0.063-inch/16-ga.- (1.59-mm-) thick stainless steel NEMA 4X].
 - a. Mounting: [Wall mounted] [Floor mounted with leg kit].
4. Heat Exchanger: Copper tubing with brazed brass fittings and large internal passageways for minimal pressure drop. Provide NSF 61 barrier materials for potable water, without storage capacity.

Specifier: Retain lining and coating options below as required for deionized water or corrosive liquid processing requirements.

- 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: [Insert temperature required between 160 and 190 deg. F] [Not required].
 6. Connections: 3/4 inch NPT (DN 19) inlet, outlet.
 7. Pressure Rating: 150 psig (1035 kPa).
 8. Flow Turn-On Point: [0.75 gpm (0.49 l/s)] [0.5 gpm (0.32 l/s)].
 9. Heating Element: Incoloy 800 sheathed low-watt density resistive element.
 10. Temperature Control: Microprocessor with PID logic and dual display of set-point and actual outlet water temperature.
 11. Safety Controls:
 - a. Internal thermostat with auto reset high- limit switch.
 - b. Surface mounted bi-metal thermostat with manual reset.
 - c. Internal Fused Disconnect: [Required] [Not required].
 - d. Ground Fault Equipment Protection. For leakage to ground, greater than 1 amp, Door-mounted ground fault status light and reset: [Required] [Not required].
 12. Capacity:

Specifier: If temperature rise/flow rate data appear on Drawings, then select "As scheduled" option. 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: 0.75-15 GPM (1.9 L/m – 57 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].
13. Electrical Characteristics: [36] [50] kW at [480VAC/3-phase/3-wire] [600VAC/3-phase/3-wire] [As scheduled].

Specifier: Retain following subparagraph that describes available option for the F Series (Formerly C2N Series) models if required for Project.

14. 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 subparagraphs 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].

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. Insert metal shims as required to level unit and anchor to structure as recommended by manufacturer.

Specifier: Retain subparagraph below for applications where seismic design of component fastening to structure is required by authorities having jurisdiction. Consult project structural engineer for performance requirements.

- a. Anchor unit in accordance with Project seismic design requirements.
- 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.

- D. Extend relief-valve outlet line, and discharge by positive air gap above closest floor drain.
- E. 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.
- F. 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.

- G. 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