



Keltech Pre-Assembled Freeze-Protected Safety Shower Heater Skid S19361F Series Guide Specification

Bradley's Keltech SNA Safety Shower Heaters provide ANSI Z358.1-compliant tepid water supplying safety fixtures. The heaters uniquely perform in applications with low line pressure, while still accommodating ANSI standard flow rates. The durable components withstand higher pressures which result in longer service life, while ensuring the delivery of precise output temperature. Keltech's durable components withstand power abnormalities found in industrial environments and ensure tepid water standards are never exceeded 100 deg F (37.8 deg C) with its three-tier anti-scald protection and hot water purge. SNA-Series units are suited to applications with 480V or 600V, 3-Phase, Delta-connected power is required.

The freeze-protected skid includes pre-piped assemblies, 1-1/4 inch (DN32) inlet, pre-piped pressure and temperature relief valve and piping connecting the heater to the safety shower and eye/face wash combination unit. The skid is 0.138 inch/10 ga. (3.5 mm) electro galvanized sheet steel frame, powder painted "safety yellow." Square molded Duragrate fiberglass 1 x 1-1/2 x 1-1/2 inch (25 X 38 X 38 mm) grating with grit top, covers the integrated shower pan. 3 inch (DN 80) PVC drain pipe included.

Keltech's 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. 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.

Each heater features a heavy duty, low watt density, Incoloy[®] 800 sheathed resistive element. The Keltech 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. The heat exchanger features O-ring seals that out last typical gasket construction. 1-1/4 inch NPT female inlet and outlet connections. Heater operating pressure range: 30 - 150 psig (207 - 1,035 kPa).

The SNA-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 (NFPA 70). Keltech protects each heating element with fusing.

Enclosures: The skid-mounted cabinet enclosure is NEMA 4 rated and made from #14 gauge 0.075 inch (1.9 mm) mild steel and powder coated with ANSI 61 gray, corrosion resistant paint. The optional NEMA 4X enclosures are corrosion resistant for harsher environments and made from #16 gauge 0.060 inch (1.6 mm) 304 stainless steel. The NEMA 4X enclosure can also be specified with 316 stainless steel. Additional service access panel located on top of cabinet enclosure.

Redundant Control and Safety Features: Heater has three-tier anti-scald protection and TepidGuard™ 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, 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.

TepidGuard™ is an anti-scald feature, standard on all SNA-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.

Keltech 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.

View Bradley's complete line of innovative Keltech tankless water heaters for ASME standard, continuous flow in industrial, healthcare, laboratory facilities, and specialty applications, at www.bradleycorp.com/tankless-water-heaters.

Contact Bradley Corporation, Menomonee Falls, WI 53051; Phone: 800-BRADLEY ((800) 272-3539).

Bradley eases the specifying process with a seasoned customer service staff and a range of helpful information tools on an advanced website. Bradley is the industry leader in the manufacture of premium quality commercial plumbing fixtures, valves, TMVs and washroom accessories that appear in the following CSI MasterFormat Sections:

Section 10 21 13 – TOILET COMPARTMENTS (Mills® Metal, Plastic-laminate, Phenolic, and Plastic units)
Section 10 28 13.13 – COMMERCIAL TOILET ACCESSORIES (Institutional and commercial accessories)
Section 10 28 13.14 – COMMERCIAL TOILET ACCESSORIES – Diplomat Series
Section 10 28 13.19 – HEALTHCARE TOILET ACCESSORIES (Patient care accessories)
Section 10 28 13.21 – WARM AIR DRYERS (Aerix® hand dryers)
Section 10 28 13.63 – DETENTION TOILET ACCESSORIES
Section 10 28 16 – BATH ACCESSORIES (Hospitality and commercial bath accessories)
Section 10 51 26 – PLASTIC LOCKERS (Lenox® Plastic Lockers)
Section 12 36 61 – SIMULATED STONE COUNTERTOPS (Terreon® and Terreon®RE countertops and integral sinks)
Section 22 11 19 – DOMESTIC WATER PIPING SPECIALTIES (Thermostatic mixing valves)
Section 22 33 13 – INSTANTANEOUS ELECTRIC DOMESTIC WATER HEATERS (Keltech tankless water heaters)
Section 22 42 16.01 – COMMERCIAL LAVATORIES AND FAUCETS (Express® and Frequency® Single and multi-station lavatories)
Section 22 42 16.02 – COMMERCIAL LAVATORIES AND FAUCETS (Advocate® lavatories)
Section 22 42 16.03 – COMMERCIAL LAVATORIES AND FAUCETS (Verge® lavatories)
Section 22 42 16.04 – COMMERCIAL LAVATORIES AND FAUCETS (OmniDecks™ lavatories)
Section 22 42 16.11 – COMMERCIAL SINKS AND FAUCETS
Section 22 42 23 – COMMERCIAL SHOWERS AND SHOWER VALVES
Section 22 42 33 – WASHFOUNTAINS (Sentry™, BradMate™, and Classic washfountains)
Section 22 43 00 – HEALTHCARE PLUMBING FIXTURES (Patient care lavatory units)
Section 22 46 00 – SECURITY PLUMBING FIXTURES

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SECTION 22 45 19 – SELF-CONTAINED EYEWASH EQUIPMENT, FREEZE-PROTECTED

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pre-assembled safety shower fixture mounted on skid with electric tankless safety shower 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 Z358.1 - American National Standard for Emergency Eyewash and Shower Equipment
 - 2. ANSI Z21.22 - Relief Valves for Hot Water Supply Systems
- C. American Society of Mechanical Engineers (ASME): www.asme.org
 - 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
- D. 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
- E. CSA Group
 - 1. CSA C22.1 - Canadian Electrical Code
 - 2. CSA C22.2 No. 88 - Construction and Test of Industrial Heating Equipment

- A. National Electrical Manufacturers Association (NEMA): www.nema.org
 - 1. NEMA Standards Publication 2501 - "Enclosures for Electrical Equipment (1000 Volts Maximum)"
- B. 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
- C. NSF International (NSF): www.nsf.org
 - 1. NSF 61 - Drinking Water System Components – Health Effects
 - 2. NSF 372 - Drinking Water System Components - Lead Content
- D. 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.
- B. Shop Drawings:
 - 1. Unit Layout: Show unit dimensions, dimensioned size and locations of utility and drain connections.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

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 MAINTENANCE SUBMITTALS

- A. Furnish indicated spare parts that are packaged with identifying labels listing associated products.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain pre-assembled safety shower heater skids through a single source from a single manufacturer.
- B. Electrical Components: Listed and labeled per NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- C. Safety Shower and Emergency Eyewash Standard: Comply with ANSI Z358.1.

Specifier: Retain paragraph below "Boiler and Pressure Vessel Safety Requirements" option based on project requirements:

HLW: When the heater has a heat input of 200,000 Btuh (58.6 kW) or more, or an output temperature of 210 deg F (99 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. Unit Construction: Comply with CSA C22.2 No. 88 for heater unit construction.
- F. Sanitation Standard: Comply with NSF 61 for fixture components in contact with potable water.
- G. Lead-Free Construction: Comply with NSF 372 for fixture components in contact with potable water.

1.9 WARRANTY

- A. 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.

Specifier: Select warranty period options in the following paragraphs based on whether the specified units are constructed to ASME Code standards.

- a. Electrical Components: Two years.
- b. Heating Elements: Four years.
- c. Heating Elements, ASME: Five years.
- d. Heat Exchanger: Eight years.
- e. Heat Exchanger, ASME: Ten years.
- f. All other components warranted for one year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to requirements, provide pre-assembled safety shower heater skids by Bradley Corporation, Menomonee Falls, WI 53051, (800) 272-3539; Email info@BradleyCorp.com; Website www.bradleycorp.com.

2.2 PRE-ASSEMBLED FREEZE PROTECTED SAFETY SHOWER SKIDS

Specifier: **Keltech S19361F**, SNA-Series water heaters include overshoot purge controls that automatically dump heated water to drain if the water temperature increases to 95 deg. F (35 deg. C).

The overshoot protection purge process ensures temperatures will never exceed "tepid" ANSI standards. This eliminates the necessity of tempering valves and scald guards required when using boiler heated water.

- A. Pre-assembled safety shower heater skid, including freeze protected safety fixture mounted on skid with electric tankless safety shower water heater system, UL 499, sized for stable, lower temperature duty to meet flow requirements and temperature requirements of ANSI Z358.1 - compliant safety shower fixtures, with liquid-cooled solid-state relays, flow activation, external emergency stop button, anti-scald protection, and overshoot protection purge function.

1. Basis of Design Manufacturer/Model: **Bradley Corporation, Keltech Model S19361F Pre-Assembled Freeze-Protected Safety Shower Heater Skid.**

Specifier: Retain NFPA 496 option in the following paragraph only when explosion proof option EXP2CFPM is required.

2. Enclosure: [NFPA 496,] UL 50E, [0.075-inch/14-ga.- (1.9-mm-) thick galvanized steel, NEMA 4] [0.064-inch/16-ga. (1.63-mm-) thick [304] [316] stainless steel, NEMA 4X].
- a. Freeze Protection: [-20 deg. F (-28 deg. C)] [-30 deg. F (-34 deg. C)].
- 1) Provide heater suitable to protect unit to [-20 deg. F (-28 deg. C)] [-30 deg. F (-34 deg. C)]. Power each level of protection with normal heater supply voltage.
 - 2) Do not power freeze protection from additional dedicated circuit to unit.
 - 3) Providee internally insulated [NEMA 4] [NEMA 4X] enclosure and thermostatically controlled forced air heater to maintain internal temperatures above freezing.
 - 4) Provide connection terminals for Digital Control System (DCS) monitoring.
 - 5) In event of power interruption or enclosure heater system failure, when internal enclosure temperatures reach 40 deg F (4.4 deg. C) or lower. Provide dry contact action to notify DCS that unit is unable to maintain freeze protection.
 - 6) Provide contact action to DCS on low temperature, without regard for state of power to unit.
- b. Explosion-Proof Class 1, Division 2, Groups A-D: [Required] [Not required].
- c. Mounting: Skid mounted with leg kit.

Specifier: Retain option for certification in "Heat Exchanger" Paragraph below when required. Keltech S19361F with SNA-Series units are the only electric tankless water heaters available with ASME and National Board certifications with the HLW stamp. Available for 200,000 Btuh (58 kW) and higher units.

3. Heat Exchanger: Copper tubing with brazed brass fittings and large internal passageways for minimal pressure drop. NSF 61 barrier materials for potable water, without storage capacity [ASME- and National Board- certified] Provide materials that are lead-free, and comply with NSF 372.
4. Connections: 1 1/4 inch NPT (DN 32) inlet, outlet, and purge.

Retain appropriate pressure rating from two subparagraphs below.

5. Pressure Rating: 30 - 150 psig (207 - 1035 kPa).
6. Pressure Rating, ASME-Rated Units: 30 - 160 psig (207 - 1103 kPa).
7. Heating Element: Incoloy[®] 800 sheathed low-watt density resistance heating system.
8. Temperature Control: Microprocessor based thermostat with PID controller and dual display of set-point and actual outlet water temperature.
9. Distributed Control System Link: [Required, with stack light] [Not required].
10. Safety Controls:
 - a. 95 deg. F (32 deg. C) high-temperature-limit alarm/cutoff with automatic reset.
 - b. 95 deg. F (35 deg. C) overshoot purge dumps hot water to drain.
 - c. 100 deg. F (38 deg. C) high temperature cutout with manual reset.
 - d. Pressure and Temperature Safety Relief Valve: 1 inch (DN 25), ASME rated and stamped. Range: 150 psig (1034 kPa).
 - e. Door cutoff switch and emergency stop button.

Specifier: Select requirement for fuse protection in following paragraph.

- f. Internal Fused Disconnect: [Required] [Not required].
 - 1) Provide fused disconnect that interlocks with enclosure door, to prevent opening enclosure while unit is energized.

Specifier: When required, retain the following paragraph describing optional ground fault protection.

- g. Ground Fault Protection: Provide ground fault system that senses leakage current to ground greater than 1 A. In event fault is detected, provide ground fault protection to deenergize high voltage power supply to heating elements and disable unit operation. Communicate ground fault status externally at control interface. Provide ground fault test and reset buttons on outside of cabinet door.
11. Configuration:

Specifier: Select safety fixture configuration in following paragraph.

- a. Eye/Face wash with plastic showerhead, [with] [without] bowl [and dust cover].
 - 1) Basis of Design Manufacturer/Model: **Bradley, Halo S19314FW**.

- b. Stainless steel eye/face wash and showerhead, [with] [without] bowl [and dust cover].

1) Basis of Design Manufacturer/Model: **Bradley, Halo S19314FSS.**

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. 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. Factory Temperature Setpoint: 80 deg. F (27 deg. C).

Specifier: Select power and voltage requirements in following paragraph.

13. Electrical Characteristics: [54] [63] [72] [108] [126] [144] kW at [480VAC/3-phase/3-wire] [600VAC/3-phase/3-wire] [As scheduled].

2.3 SHOWER HEATER SKID ACCESSORIES

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

- A. Stainless steel thread adapter to convert NPT to BSPP connections.
- B. Pressure-Reducing Valves: ASSE 1003, set at 25-psig- (172.5-kPa-) maximum outlet pressure.

Specifier: Retain stainless steel option in the following paragraph, when required.

- C. Y-Strainer: 1-1/4 inch (DN 32) [stainless steel] [Lead Free Brass].

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 IV. Submit test reports.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Electric, Tankless, 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 and over-temperature purge lines as shown in manufacturer's instructions.
 - D. Extend relief-valve/over-temperature purge outlet line, and discharge by positive air gap above closest floor drain.
 - E. Install relief valve/over-temperature purge 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/over-temperature purge 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 [thread adapters] [and] [strainers], 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. Replace defective or malfunctioning controls and equipment.
- C. Clean unit surfaces, test fixtures, and leave in ready-to-use condition.

END OF SECTION