C1N Series - Light Industrial Heaters

Tankless Water Heating Solutions

- 18-25 kW (61,4000 - 85,300 BTUs)
- Low flow activation options at 0.25 and 0.50 GPM (1.0 and 1.9 LPM)
- Certified Lead-Free Design
- Variable Temp Heat Exchanger
- Pressure Drop Advantage
- NEMA 4 enclosure standard
- 3/4" connections
- 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

Standard Equipment

Tankless Water Heating Specifications

Keltech, Inc. C1N-Series Tankless Water Heaters are designed to accommodate most light industrial fluid heating applications, where the demand is 18kW - 25kW and total flow is <10 GPM up to 15 GPM. Standard units feature ≥ .75 GPM activation. NEMA 4X and explosion proof purge system options available. C1N-Series units are 3 Phase Delta 480V or 600V, 50/60 Hz.

Construction

Temperature Controller

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.

Heating Element

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.

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 C1N-Series requires only one service feed per unit. Includes internal fusing as standard, which provides superior protection. Keltech protects each heating element with fusing.

Cabinet Enclosure

The standard wall cabinet enclosure is NEMA 4 rated and made from 16 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. Optional floor kit available (LK).

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

ETL listed to NFPA 496 (Requires EXP2 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.

P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

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.

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.

Explosion Proof Purge System

Keltech's EXP2 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, Keltech independently tests and 3rd party certifies all finished product with EXP2 to comply with NFPA 496.

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 Selections

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.

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

All internal fuses necessary for installation are included with the unit.

Capacity (kW)	Voltage	Maximum Amperage	Minimum AWG Wire Size
18	480	22	10
18	600	18	10
25	480	30	8
25	600	24	10

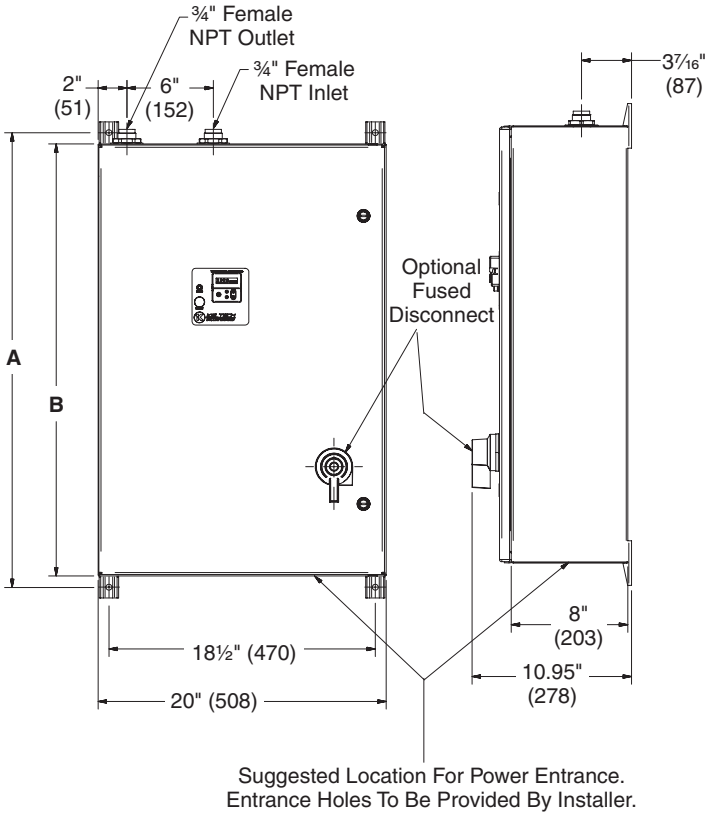
C1N Pressure Drop Advantage

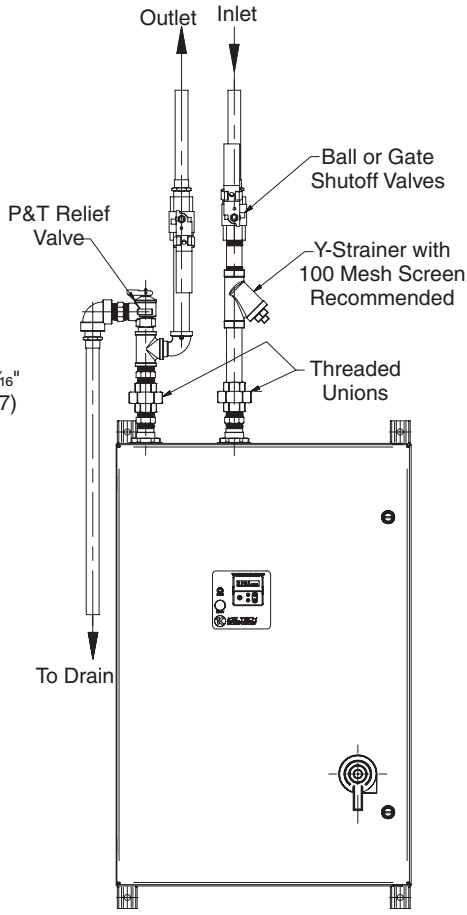
Pressure Drop									
GPM	1	2	3	4	5	6	8	10	15
PSI	0	1	2	3	4	5	7	10	15
L-MIN	3.8	7.6	11.3	15.1	18.9	22.7	30.2	37.8	56.8
BAR	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.7	1.0

P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

C1N Series - Dimensions (mm)

Select product options shown. Other options available.





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

kW	A	B
18	31-1/2" (800)	30" (762)
25	37-1/2" (953)	36" (914)

P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

kW Calculator

C1N Series (kW): 18, 25

Temperature Δ °F (°C)

Flow GPM	L-MIN	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°)
0.75	2.8	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1.0	3.8	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	25	25	25	25	25
1.5	5.7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	25	25	25	25	25	25	-	-	-	-	-	-
2	7.6	18	18	18	18	18	18	18	18	18	18	18	25	25	25	25	25	-	-	-	-	-	-	-	-	-	-	-
3	11.3	18	18	18	18	18	18	18	25	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	15.1	18	18	18	18	18	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	18.9	18	18	18	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	22.7	18	18	18	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	26.5	18	18	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	30.2	18	18	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	34.0	18	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	37.8	18	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	56.8	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sizing for the proper flow rate is important. If the temperature rise requirements exceed a single C1N model, consider using multiple C1N-Series units. Please contact your Keltech 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 = _____

P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

C1N Series - Light Industrial Heaters

Tankless Water Heating Solutions

Model

☐ **C1N** C1N-Series Light Industrial Heater

Standard Selections (Must select one from each category)

Kilowatts
☐ **18** 18 kilowatts
☐ **25** 25 kilowatts

AC Power Supply
☒ **3** Three Phase

Voltage
☐ **480** 480 Volts (standard)
☐ **600** 600 Volts (standard)
☐ **380** 380 Volts (down rated from 480V)
☐ **400** 400 Volts (down rated from 480V)
☐ **415** 415 Volts (down rated from 480V)

System Controller
☒ **D** Digital Control

Cabinet Enclosure
☐ **N4** NEMA-4 Enclosure (standard)
☐ **N4X** NEMA-4X Enclosure - Stainless Steel
☐ **N4X316** NEMA-4X Enclosure - 316 Stainless Steel

☑ **Heaters listed above can be down rated in 380, 400 and 415 volts. Contact your local Keltech Representative for power ratio and effective kW.**

Enhanced Performance Tuning

Please select your type of application. Keltech will precisely "tune" your heater specifically to your application for the highest level of performance at no additional charge.

☐ **Process Heating**
☐ **Potable**
☐ **Boosting**
☐ **Re-Circulating**
☐ **Sinks/Lavs**

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

☑ **Keltech Tankless Water Heaters are non-cancelable, non-refundable and non-returnable.**

Teflon is a registered trademark of E. I. du Pont de Nemours and Company
*LK option not available with EXP2 option.

Product Options (Must select one from each category)

☐	**D1**	4-20mA Input for Integration with Facility Controls
☐	**DC**	RS-485 Modbus RTU
☐	**AL**	Process Temperature Alarm
☐	**NONE**	None
☐	**EXP2**	Explosion Proof Class1/Division2
☐	**NONE**	None
☐	**FDS**	Internal Fused Disconnect
☐	**NONE**	None
☐	**GF**	Ground Fault Package
☐	**NONE**	None
☐	**L25**	Low flow .25 GPM Turn on Point
☐	**L5**	Low flow .5 GPM Turn on Point
☐	**NONE**	None
☐	**LK***	Leg Kit Converts Standard Wall-Mount to Floor-Mount
☐	**NONE**	None
☐	**T200**	High Temperature Package (Select for Temp Greater than 190°F)
☐	**T190**	High Temperature Package (Select for Temp Greater than 180°F)
☐	**T180**	High Temperature Package (Select for Temp Greater than 170°F)
☐	**T170**	High Temperature Package (Select for Temp Greater than 160°F)
☐	**NONE**	None
☐	**TE**	PFA Teflon® Coated Heat Exchanger with Bright Annealed Stainless Steel Elements, FDA Approved (Use for deionized water or mild corrosive fluid applications)
☐	**TE2**	Xylan Fluoropolymeric Coated Heat Exchanger with Bright Annealed Stainless Steel Elements, FDA Approved for Food Contact (Use in deionized water applications)
☐	**NONE**	None

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

Model Number Configuration

C1N_____/_____D-_____-_____-_____-_____

List applicable option codes alphabetically. Do not include Installation Accessories in configuration.

Customer Signoff_____

P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com