



A WATTS Brand

# CNA-Series - Large Industrial Heaters

## Tankless Water Heating Solutions

- 36 - 144 kW (122,800 - 491,300 BTUs)
- Certified lead-free design
- New & improved pressure drop advantage
- Variable temp heat exchanger
- NEMA 4 enclosure standard
- 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

### Standard Equipment

#### Tankless Water Heating Specifications

Bradley's CNA-Series Tankless Water Heaters **Powered by Keltech™** are designed to accommodate most heavy industrial fluid heating applications where demand is 36kW - 144kW and flow rates from 1.5 to 50 gpm are required. Standard units: activation flow  $\geq 1.5$  gpm. CNA-Series are designed for environments requiring precise temperatures to 160° as an alternative to boilers. CNA-Series units are suited to applications where 480V and 600V, 50/60 Hz 3-Phase Delta is required. The heat exchanger features O-ring seals that out last typical gasket construction. 1-1/4" NPT female inlet and outlet connections. NEMA 4X and explosion proof purge system options available.

### Construction

#### Temperature Controller

The 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 heater 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 CNA-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 by 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. The NEMA 4X enclosure can also be specified with 316 stainless steel.

#### 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.



### Product Compliance



#### 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 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. 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)



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### 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.

#### Freeze Protection

The standard ambient temperature is 33°F (0.6°C). For environments lower than 33°F, Bradley 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.

#### 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.

#### Level Sensor

The level sensor (LS option) prevents accidental dry fire in the event there is no water in the heating vessel. Dry fire situations are most common upon start up or after routine service.

#### Continuous Flow Explosion Proof Purge System

Bradley's 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, all finished product with EXP2 are independently tested and 3rd party certified to comply with NFPA 496 to comply with NFPA 496.

#### ASME Heat Exchanger

Bradley offers any product above 200,000 btu equivalent (58kw+) 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, stainless steel bulkheads and boiler drain valves, adding an extra level of quality and durability to Bradley's heaters.

Select the HLW-TE options for deionized or mild corrosive applications requiring a HLW (ASME) Pressure Vessel. The TE2 option, which provides a Xylan Fluoropolymeric Coating, is not available with an ASME heat exchanger.

#### 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 Selection

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.

#### 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.



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## Tankless Water Heating Solutions

### 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

### CNA-Series Pressure Drop Advantage

GPM	1.5	2	3	4	5	6	8	10	15	20	25	30	35	40	45	50
<b>36-63 kW PSI</b>	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
<b>72-144 kW PSI</b>	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
<b>L-MIN</b>	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
<b>36-63 kW BAR</b>	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
<b>72-144 kW BAR</b>	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



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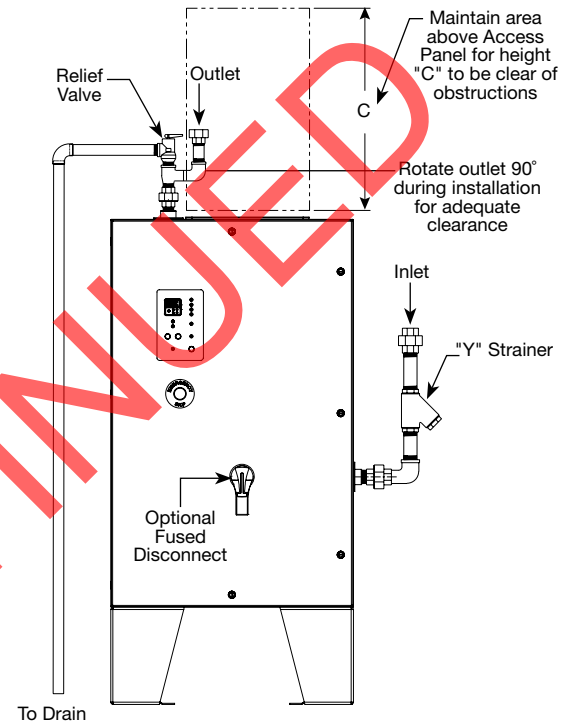
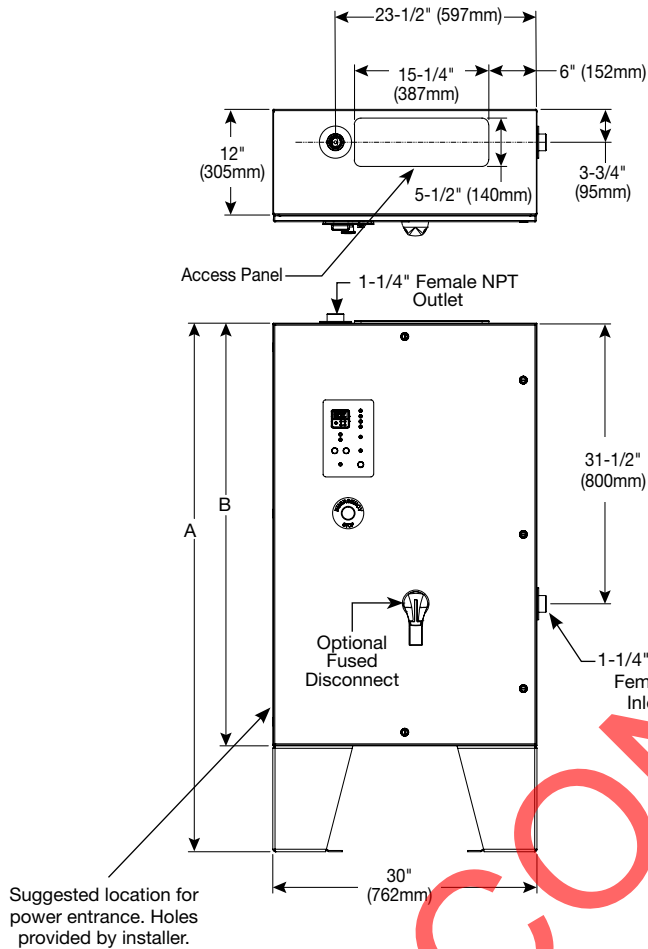
## Tankless Water Heating Solutions

### CNA-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.

	Dim. "A"	Dim. "B"	Dim. "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)



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### kW Calculator

CNA-Series (kW): 36, 54, 63, 72, 108, 126, 144

		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°)		
	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	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	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	54	63	63	63	63	
	4	15.1	36	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	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	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	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	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	108	126	126	126	144	144	-	-	-	-	-	-	-	
	10	37.8	36	36	36	54	54	54	63	72	108	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 CNA model, consider using multiple CNA-Series units. Please contact your Bradley Representative for additional product information.

### How to Size a Heater

- Calculate Delta-T ( $\Delta T$ ).  
Set point temp - coldest ground water temp =  $\Delta T$   $\Delta T$  = \_\_\_\_\_
- Select kW required by using chart or formula below.  
Peak demand in GPM x  $\Delta T$  x .1465 = kW kW = \_\_\_\_\_
- Confirm voltage and phase available on site. Voltage and Phase = \_\_\_\_\_
- Confirm minimum flow. Minimum Flow = \_\_\_\_\_



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## Tankless Water Heating Solutions

<b>Model</b> CNA CNA-Series - Large Industrial Heater			
<b>Standard Selections</b> (Must select one from each category)			
<b>Kilowatts</b>			
36	36 kilowatts	72	72 kilowatts
54	54 kilowatts	108	108 kilowatts
63	63 kilowatts	126	126 kilowatts
<b>AC Power Supply</b>			
3	Three Phase		
<b>Voltage</b>			
480	480 Volts	380	380 Volts (down rated from 480V)
600	600 Volts	400	400 Volts (down rated from 480V)
		415	415 Volts (down rated from 480V)
<b>System Controller</b>			
D	Digital Control		
<b>Cabinet Enclosure</b>			
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 Bradley Representative for power ratio and effective kW.

<b>Enhanced Performance Tuning</b>	
Please select your type of application. Bradley will precisely "tune" your heater specifically to your application for the highest level of performance at no additional charge.	
<b>Process Heating</b>	
<b>Potable</b>	
<b>Boosting</b>	
<b>Re-Circulating</b>	

<b>Asset Tag</b>	
00	None
01	1 Asset Tag
02	2 Asset Tags
03	3 Asset Tags
04	4 Asset Tags
05	5 Asset Tags

☒ Verify ASME Code applicability for all installations 58kw (200,000 btu) and higher.

Teflon is a registered trademark of E. I. du Pont de Nemours and Company

\* Not available with CNA-723/600D

\*\* TE2 not available with HLW.

<b>Installation Accessories</b>	
BSPP NONE	Stainless steel thread adapter converts NPT to BSPP None
PR PRS NONE	Pressure and temperature relief valve ASME pressure relief valve, stainless steel None
YS YSS NONE	Y-Strainer Y-Strainer, stainless steel None

<b>Product Options</b> (Must select one from each category)	
D1 DC AL NONE	4-20mA Input for Integration with Facility Controls RS-485 Modbus RTU Process Temperature Alarm None
ENHT ENHT30 NONE	Freeze Protection to -20°F Freeze Protection to -30°F None
EXP2CFPM NONE	Continuous Flow Explosion Proof Class 1/Division 2 None
FDS* NONE	Internal Fused Disconnect None
GF NONE	Ground Fault Package None
HLW NONE	ASME Heat Exchanger with Level Sensor (63kW and Higher Only) None
LS NONE	Level Sensor None
T200 T190 T180 T170 NONE	High Temperature Package (Select for Temp Greater than 190°F) High Temperature Package (Select for Temp Greater than 180°F) High Temperature Package (Select for Temp Greater than 170°F) High Temperature Package (Select for Temp Greater than 160°F) None
TE  TE2**  NONE	PFA Teflon® Coated Heat Exchanger with Bright Annealed Stainless Steel Elements, FDA Approved (Use for deionized water or mild corrosive fluid applications) Xylan Fluoropolymeric Coated Heat Exchanger with Bright Annealed Stainless Steel Elements, FDA Approved for Food Contact (Use in deionized water applications) None
RES NONE	Remote Emergency Stop None

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## Tankless Water Heating Solutions

### 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

CNA-	3 /	D -	-	-	-	-	-	-
	kW	Volts						
INSTL_ACCESSORY	-	-	-					

Customer Signoff \_\_\_\_\_

DISCONTINUED