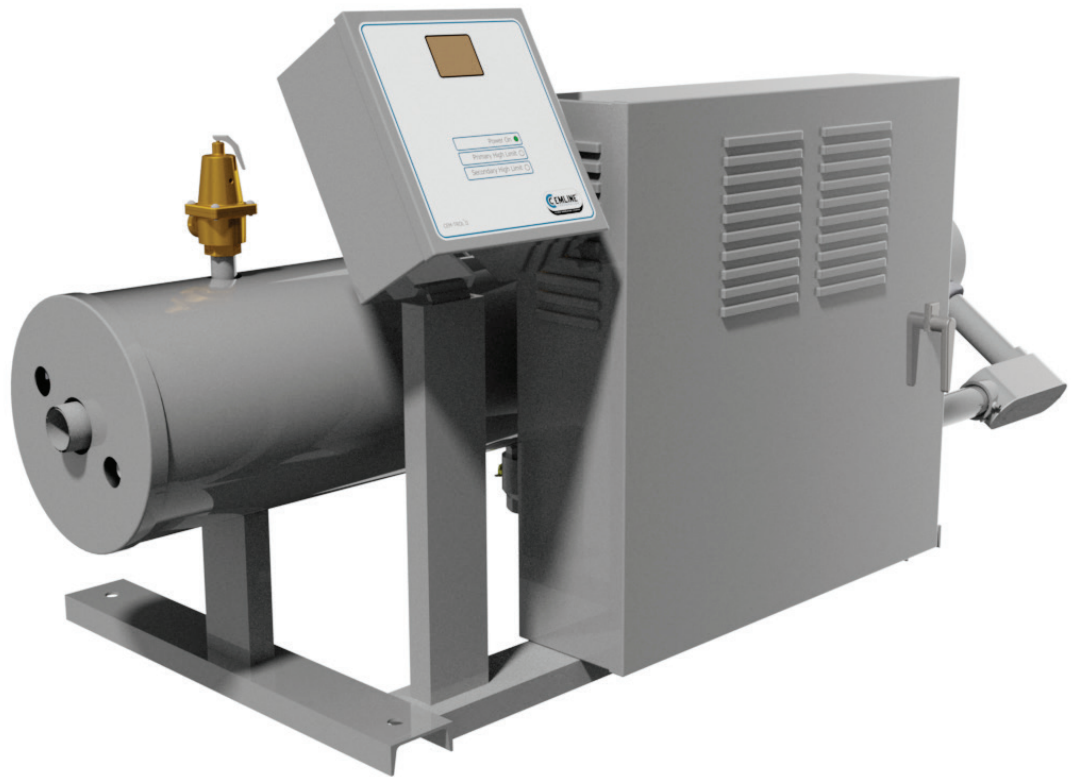
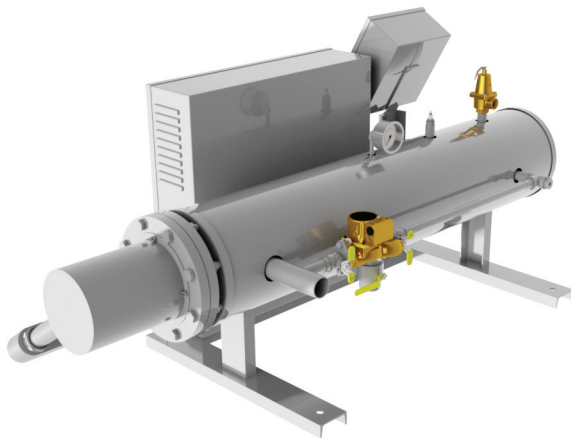


IEH Series



Instantaneous Commercial Electric Water Heaters *Immersion Flanged*



STONESTEEL is a registered trademark of Cemline Corporation

CEMLINE CORPORATION

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Cemline® IEH Series Instantaneous Electric Water Heaters Standard Equipment

Cemline IEH Series Electric Water Heaters are furnished as a complete factory package for one source responsibility. Installation requires only hot and cold water lines and power leads. We offer many optional extras for applications where such features are desired.

Standard IEH Package

Features

Tank—A.S.M.E. Code Constructed National Board Registered—U Stamp	A.S.M.E. Code stamping and registration offer the assurance of quality controlled construction.
Stainless Steel Tank	Virtually rustproof. Type 316-L Stainless. Five (5) year NON-PRORATED guarantee.
Stainless Steel Threaded Tank Connections	Maintains long tank life by protecting most vulnerable point of corrosion.
2" Foam insulation	Prevents heat loss to cut operation costs—meets or exceeds latest ASHRAE standards.
20 Gauge steel jacket with hammertone enamel-painted exterior	Protects insulation & provides neat finished appearance.
A.S.M.E. Relief Valves Pressure and Temperature	Safety feature against overheating or excess pressure.
Thermometer & Pressure Gauge	Easy to read dials to monitor operating temperature and pressure.
Immersion Flanged Element Incoloy/Copper Sheathed	Long life elements of incoloy or pure copper. Easily removable and replaceable in field with simple hand tools.
Copper Lined Flange	Economical, yet effective method of protecting water face of tube sheet. A 16 oz. copper sheet is bonded to steel tube sheet to assure a lifetime of rust free water.
Standard operating controls	All components necessary for safe-complete operation—all thermostats, high limit resets, contactors, transformer, fusing and low water cut off wired to a NEMA terminal box.
U.L. Listing	Unit meets testing and inspection requirements of Underwriters' Laboratories and is so labeled and listed.
Warranty	One year against defects in materials or workmanship.

Optional Extras Available:

- Circuit breaker with or without shunt trip
- Fused or non-fused disconnect
- Float type low water cut off
- Pilot lights
- Time clock
- Solid state step controller
- Internal recirculating pump
- Element watt density to suit customer request
- Safety door interlock
- Alarm bell
- Flow switch
- Outdoor sensor
- Load programmer—or —contacts for customer supplied load programmer
- Low water level cut off with manual reset
- High pressure cut off
- Ground fault detection
- NEMA IV panel enclosure
- 4" thick Fiberglass insulation

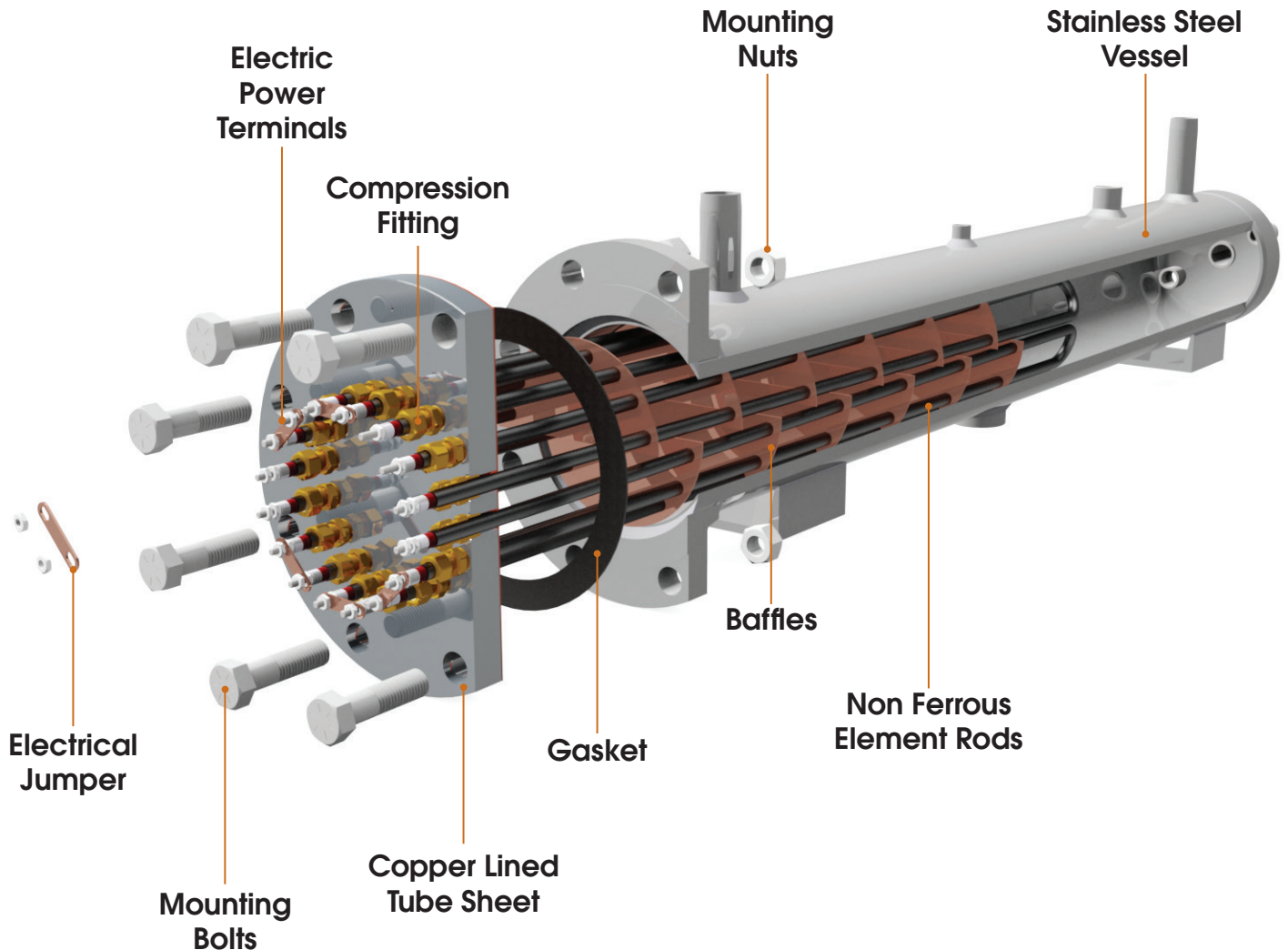
IEH Series Heating Element

Cemline IEH Series electric water heaters feature flanged immersion elements mounted in ANSI flanges in the vessel. This method of element mounting simplifies maintenance.

Detailed Cut-away of Flanged Immersion Element

Cemline IEH elements are mounted in a copper lined tube sheet using retaining nuts and compression ferrules. Individual element rods are grouped together as 3 phase deltas to achieve the required total kilowatt. The heating elements are incoloy or copper sheathed using a low heat concentration of 50 watts/sq in. Only non-ferrous materials are in contact with the heated water. The flanged immersion elements are

supplied with baffles to allow for even heat transfer and the prevention of localized hot spots on the element. The individual element rods can be easily replaced in the field after the electrical connections and retaining nuts are removed and replaced with a new element rod.



IEH Series Standard Equipment

Cemline IEH Series Electric Water Heaters are furnished with all accessories factory sized and mounted to insure the finest quality and most efficient package.

Tank

Cemline storage tanks are designed and constructed in accordance with Section IV of the A.S.M.E. Code and furnished with "U" stamp. All tanks are registered with the National Board of Boiler Pressure Vessel Inspectors. Vessels are normally built for 150 psig maximum working pressure, but can be furnished to a maximum working pressure of 160 psig.

Connections

Cemline STONESTEEL® tanks are manufactured with stainless steel threaded openings. Flanged openings are furnished with STONESTEEL® lined necks. This design insures that the water never contacts steel, and offers the owner the guarantee of exceptionally long tank life.

316L Vessel

Cemline has held the original patent for STONESTEEL® hydraulic cement lining since 1936. This proven design prevents rust and corrosion common to metal tanks. The STONESTEEL® lining is applied over wire mesh as a continuous arch against the metal wall and has the same thermal coefficient of expansion as the steel tank shell. This is an advantage in that even extreme and rapid temperature changes have no ill effect on STONESTEEL® lining. STONESTEEL® lining is suitable for all types of potable water.

Guarantee

Cemline 316L Stainless Steel tanks carry a five (5) year non-pro-rated guarantee, and an additional five (5) year pro-rated guarantee. During the five year period described in our guarantee form provided with these tank, should the owner experience rusty water or the Stainless Steel tank fail, factory representatives will repair or replace vessel at the place of installation.

Insulation

Cemline heaters are furnished with 2" foam insulation. This high quality insulation conforms to the latest ASHRAE standards for commercial water heaters, and has proven to be an extremely reliable means of minimizing heat loss.

Jacket

Cemline packaged units are neatly and attractively covered with a 20 gauge steel jacket over the fiberglass insulation. The jacket protects the insulation, and is professionally painted with superior quality enamel to allow the added advantage of an easy to maintain surface.

Base

Cemline horizontal heaters are mounted on structural support skids which are engineered to provide correct support for the heater as a permanent base.

Vertical heaters are supplied with leg stand supports with leveling bolts and couplings to receive pipe legs. This provides the option of mounting the unit directly on the floor or raising it with pipe legs to any desired height.

Control Circuit System

Cemline electric water heater control circuits are equipped with a line voltage to 120 volt isolation transformer to provide 120 volt control. This transformer is fused on the primary side and fused and grounded on the secondary side in accordance with A.S.M.E. Code, National Electric Code, and Underwriters' Laboratories.

High Limit Thermostats

Cemline electric water heaters are furnished with both an adjustable automatic reset type high limit and manual reset high limit thermostat with a manual reset button. These thermostats open the control circuit if the temperature of the tank exceeds the set point.

Integral Bronze Circulator

Cemline provides an integral bronze circulating pump to circulate water over the heating elements, thereby maximizing the heat transfer efficiency of the elements. Circulating the water across the element also helps reduce hotspots in elements for longer life of the elements.

IEH Series

Cemline IEH Series Electric Water Heaters are factory wired to conform to NEC Code, are U.L. listed, and are furnished as a complete factory package including necessary gauges and relief valves.

Electric Control System

Cemline elements are controlled by immersion thermostats adjustable to the desired temperatures and magnetic contactors. In our basic arrangement, the thermostat sensing bulbs are located at various levels in the tank. As hot water is drawn out of the top of the heater, the level of cold water rises, turning on one thermostat at a time, which in turn energizes the contactors and elements in sequence. When the hot water consumption decreases, hot water accumulates in the tank from the top downward and the elements in turn are de-energized. Progressive energizing and de-energizing of the heating elements in this manner balances the electric demand to hot water consumption. The element and heater load is normally divided into small increments which come on and go off in the manner described above. This means if a small amount of water is drawn from the tank only a small percentage of the total load will come on to recover it. If, however, a large demand is experienced, a greater percentage of the load will come on to recover this usage. This system is extremely reliable, simple and automatic.

Contactors

Cemline electric water heaters are equipped with magnetic contactors to close and open circuits as required for load control.

Fuses

Cemline IEH Series heaters utilize "Class J" type fuses. Each contactor line is protected by an individual fuse which is designed to interrupt power in the event of an overload condition.

Wiring

Cemline IEH Series electric water heaters are factory wired, utilizing heat resistant, color coded copper wire. All components are factory wired to a generously sized terminal strip for solderless connections. Heaters furnished with a circuit breaker or disconnect switch are factory wired to the load side of the breaker or the switch.

Low Water Cut-Off

Cemline electric units are furnished with electronic low water cut-off, wired to open the control circuit on a low water condition.

Electric Control Cabinet

Cemline electric elements and controls are mounted in a NEMA I enclosure with key lock door.

Relief Valves

Cemline IEH Series electric water heaters are provided with separate A.S.M.E. pressure and pressure-temperature relief valves. These valves are sized to relieve the total BTU input of the heating elements.

Thermometer and Pressure Gauge

Cemline electric heaters are furnished with a thermometer to monitor tank temperature and dial pressure gauge to monitor pressure within the vessel.

Final Assembly & Testing

Cemline packaged electric water heaters are thoroughly tested prior to shipment. All components and workmanship are guaranteed for a period of one year from date of start-up or eighteen months from the date of shipment.

U.L. Listing

Cemline electric water heaters are listed and labeled as required by Underwriters' Laboratories.

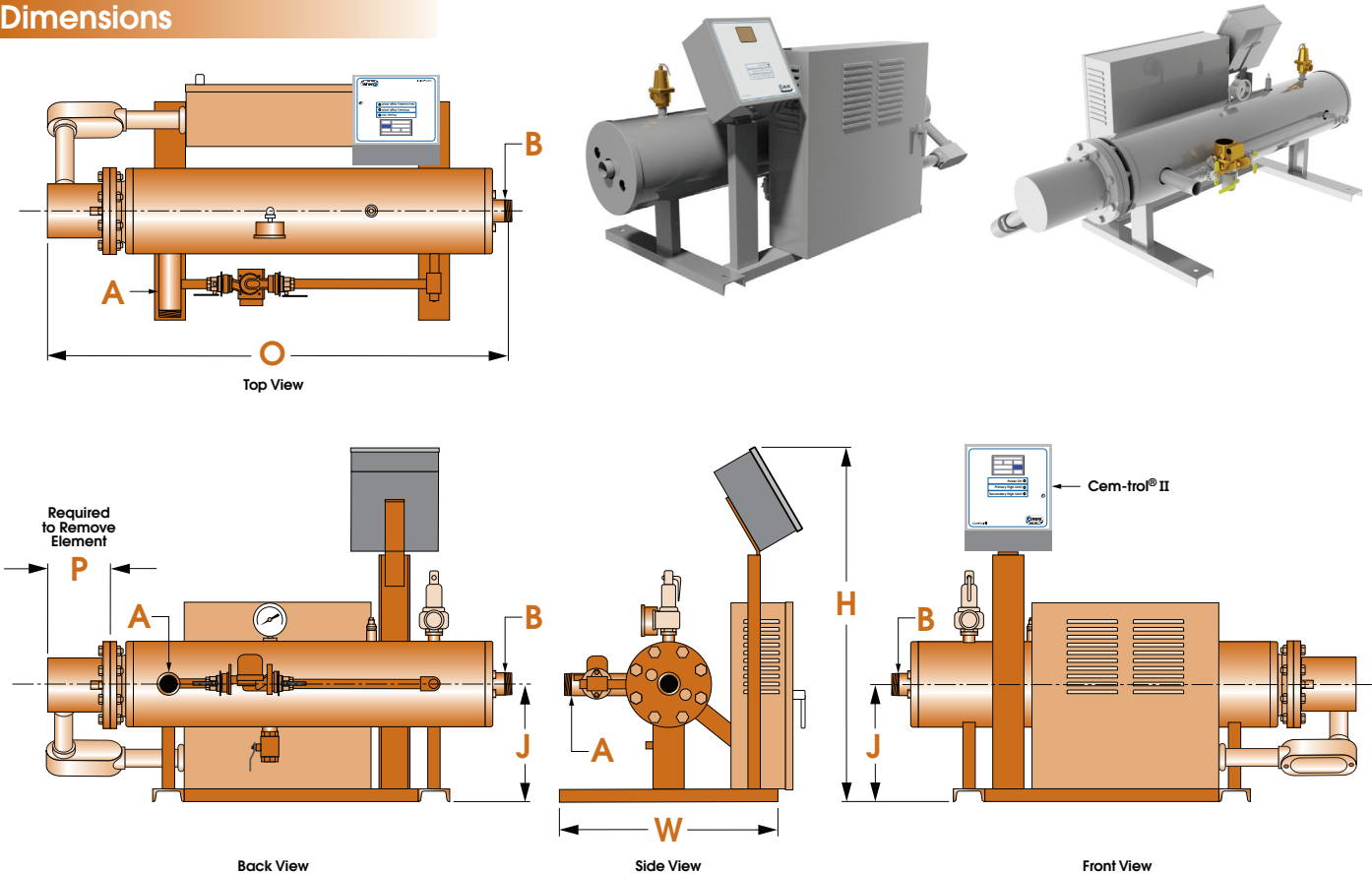
Cem-Trol® II

Cemline Cem-trol® II Solid State Water Heater Control Module combines all temperature control and automatic high limit functions for IEH Series Electric Water Heater. The controller features a PID control signal, LCD touch screen display, Modbus Interface, remote temperature read-out & setting, and remote on/off. The Cem-trol® II 0 - 10 VDC control signal is wired to a solid state step control board to modulate the steps of the water heater.

IEH Series Horizontal Storage Systems

Cemline IEH Series horizontal package heaters are normally furnished as shown below.

Dimensions



208 - 240 Volt

Gallon Capacity	Model No.	Tank Size D x L	W	H	O	P	J	A & B
6	H61EH	6" x 48"	28"	36"	62"	38"	15"	2"
8	H81EH	6" x 60"	28"	36"	75"	50"	15"	2"
14	H141EH	8" x 60"	30"	36"	75"	50"	16"	2"
22	H221EH	10" x 60"	34"	36"	75"	50"	17"	2"
31	H311EH	12" x 60"	36"	42"	77"	50"	18"	2"
37	H371EH	14" x 60"	36"	42"	78"	50"	19"	3"
49	H491EH	16" x 60"	40"	42"	80"	50"	20"	3"

415 - 480 Volt

Gallon Capacity	Model No.	Tank Size D x L	W	H	O	P	J	A & B
6	H61EH	6" x 48"	28"	36"	62"	38"	15"	2"
14	H141EH	8" x 60"	30"	36"	75"	50"	16"	2"
19	H191EH	8" x 84"	30"	36"	99"	72"	16"	2"
30	H301EH	10" x 84"	34"	36"	99"	72"	17"	3"
44	H441EH	12" x 84"	36"	42"	100"	72"	18"	3"
52	H521EH	14" x 84"	36"	42"	102"	72"	19"	3"

IEH Series Electric Recovery Section

The listing below is for those voltages and recoveries which are most widely used. Elements are available for other voltages and kilowatt inputs. Consult factory for further information.

Code Suffix — 208 Volts, 3 Phase - BY3 240 Volts, 3 Phase - B3							Code Suffix — 415 Volts, 3 Phase - CY3 480 Volts, 3 Phase - C3						
Model	Recovery 40°-140°F		KW Input	Steps	208 Volts 3 Phase	240 Volts 3 Phase	Model	Recovery 40°-140°F		KW Input	Steps	415 Volts 3 Phase	480 Volts 3 Phase
	GPH	GPM			Amps*	Amps*		GPH	GPM			Amps*	Amps*
H6IEH	49	.81	12	1	33	29	H6IEH	49	.81	12	1	17	14
H6IEH	74	1.23	18	1	50	43	H6IEH	74	1.23	18	1	25	22
H6IEH	98	1.63	24	2	67	58	H6IEH	98	1.63	24	2	33	29
H6IEH	123	2.05	30	2	83	72	H6IEH	123	2.05	30	2	42	36
H8IEH	148	2.47	36	2	100	87	H6IEH	148	2.47	36	2	50	43
H8IEH	185	3.08	45	3	125	108	H6IEH	185	3.08	45	3	63	54
H8IEH	221	3.68	54	3	150	130	H6IEH	221	3.68	54	3	75	65
H14IEH	246	4.1	60	4	167	145	H14IEH	246	4.1	60	4	84	72
H14IEH	295	4.92	72	4	200	174	H14IEH	295	4.92	72	4	100	87
H14IEH	369	6.15	90	5	250	217	H19IEH	394	5.57	96	4	134	116
H22IEH	443	7.38	108	6	300	260	H19IEH	492	8.2	120	4	167	145
H22IEH	517	8.62	126	7	350	303	H19IEH	590	9.83	144	4	201	173
H31IEH	590	9.83	144	8	400	347	H19IEH	738	12.3	180	5	251	217
H31IEH	738	12.3	180	10	500	434	H19IEH	886	14.77	216	6	301	260
H31IEH	886	14.77	216	12	600	520	H30IEH	1033	17.22	252	7	351	303
H37IEH	1033	17.22	252	14	700	607	H30IEH	1181	19.68	288	8	401	347
H37IEH	1181	19.68	288	16	800	694	H44IEH	1230	20.5	300	10	418	361
H49IEH	1255	20.92	306	17	850	737	H44IEH	1476	24.6	360	10	501	434
H49IEH	1476	24.6	360	20	1000	867	H44IEH	1771	29.52	432	12	602	520
							H52IEH	1919	31.98	468	13	652	564
							H52IEH	2214	36.9	540	15	752	650

* Amperes shown are full load resistance amps. Consult electric code for proper feeder and switch gear sizing. Recommended 90°C wire for connection to heater.

Note: Heaters will operate on 50 or 60 HZ. 240 volt, 1 phase available.

† Recovery is based upon 100°F temperature rise at a specified number of KW. For other temperature rises multiply recovery shown by factor from chart below.

Temperature Rise	70°	80°	90°	100°	110°	120°	130°	140°
Factor	1.43	1.25	1.11	1.00	.91	.83	.77	.71

Example:
60 KW will recover 246 GPH 40°-110° (70° rise)
multiply 246 x 1.43 = 351 GPH 40° - 110°

To Compute Maximum Flow (GPM) from KW:

$$GPM = \frac{KW * 6.824}{\Delta T}$$

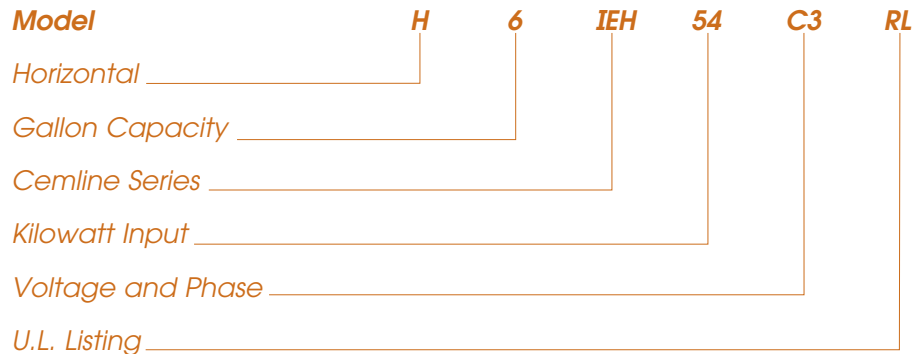
ΔT = Temperature Rise °F

IEH Water Heaters Sample Specifications



To specify a Cemline IEH Series Electric Water Heater choose the desired storage section in horizontal or vertical configuration. Select the recovery section in KW and add the voltage and phase suffix shown in recovery section. Final suffix "RL" is standard for U.L. Listing of Cemline heaters.

Example — To specify a 54 KW, 480 volt Electric Water Heater:



Electric Water Heater shall be Model _____ IEH _____ as manufactured by Cemline Corporation. Tank shall be constructed in accordance with the A.S.M.E. Code for _____ lbs. working pressure, registered with the National Board, certificate of inspection shall be furnished. Tank shall be made from 316-L Stainless Steel. All threaded openings shall be stainless steel, all flanged openings shall be properly sized. Tank shall have an actual capacity of _____ gallons and shall be _____ diameter by _____ long.

Electric Water Heater shall be insulated with 2" minimum foam insulation, protected by an enameled metal jacket with access panels to manhole and elements. Electric Water Heater shall be mounted horizontally on integral support skids.

Elements shall be immersion flange type. Total KW shall be _____. Elements shall be designed to operate on _____ volts, _____ phase, _____ cycle.

Elements shall be controlled by immersion thermostats and electrically held contactors. Elements and thermostats shall be arranged to bring load on in _____ steps. All element circuits shall be fused with Class J fuses.

Control circuit shall operate on 120 volts supplied by an integral transformer for the control circuit. Both high voltage and low voltage side of transformer shall be fused and the low voltage side grounded to the heater and jacket in accordance with A.S.M.E. Code.

IEH Electric Water Heaters have a Cem-Trol® II Digital Electronic Limit Control with LCD touch screen display. The A.S.M.E. code requires that water heaters utilizing boiler water as energy source have a high limit temperature control. Our limit controller is a solid state device with LCD readout of temperature, set point and differential and easily field-programmable. Cem-Trol® II can communicate with a building automation system with Modbus via a RS-485 connection.

Control circuit shall include one manual reset and one automatic reset high temperature thermostats with bulb located near top of tank and one electronic low water cut-off.

Elements, thermostats, contactors, transformers, low water cut-off, and high limit thermostats shall be factory wired to terminal strip.

Water Heater shall have A.S.M.E. pressure relief valve set at the certified working pressure of tank. Size shall be sufficient to relieve total BTU input of elements. Water Heater shall have A.S.M.E. temperature relief valve or valves set to relieve at 203°F. Size shall be sufficient to relieve total kilowatt input of elements.

Water Heater shall have a separate dial pressure gauge and temperature gauge in end of tank. Tank shall have an accessible drain.

Water Heater shall be U.L. Listed.



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