

EHB Series



STONESTEEL® Commercial Electric Water Heaters Individually Mounted Elements *Vertical or Horizontal*



STONESTEEL is a registered trademark of Cemline Corporation

CEMLINE CORPORATION

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Cemline® EHB Series Electric Water Heaters

Standard Equipment

Cemline EHB 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 EHB Package

Features

Storage tank—A.S.M.E. Code Constructed National Board Registered—HLW Stamp	A.S.M.E. Code stamping and registration offer the assurance of quality controlled construction.
STONESTEEL® Tank Lining	Five (5) year NON-PRORATED guarantee.
Stainless Steel Threaded Tank Connections	Maintains long tank life by protecting most vulnerable point of corrosion.
3" Fiberglass 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.
Individually Mounted Incoloy/Copper Sheathed Immersion Elements	Long life elements of incoloy or pure copper. Easily removable and replaceable in field with simple hand tools.
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.
UL 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
- BACnet communication
- 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
- Copper lining—Phenolic lining—solid stainless steel tanks

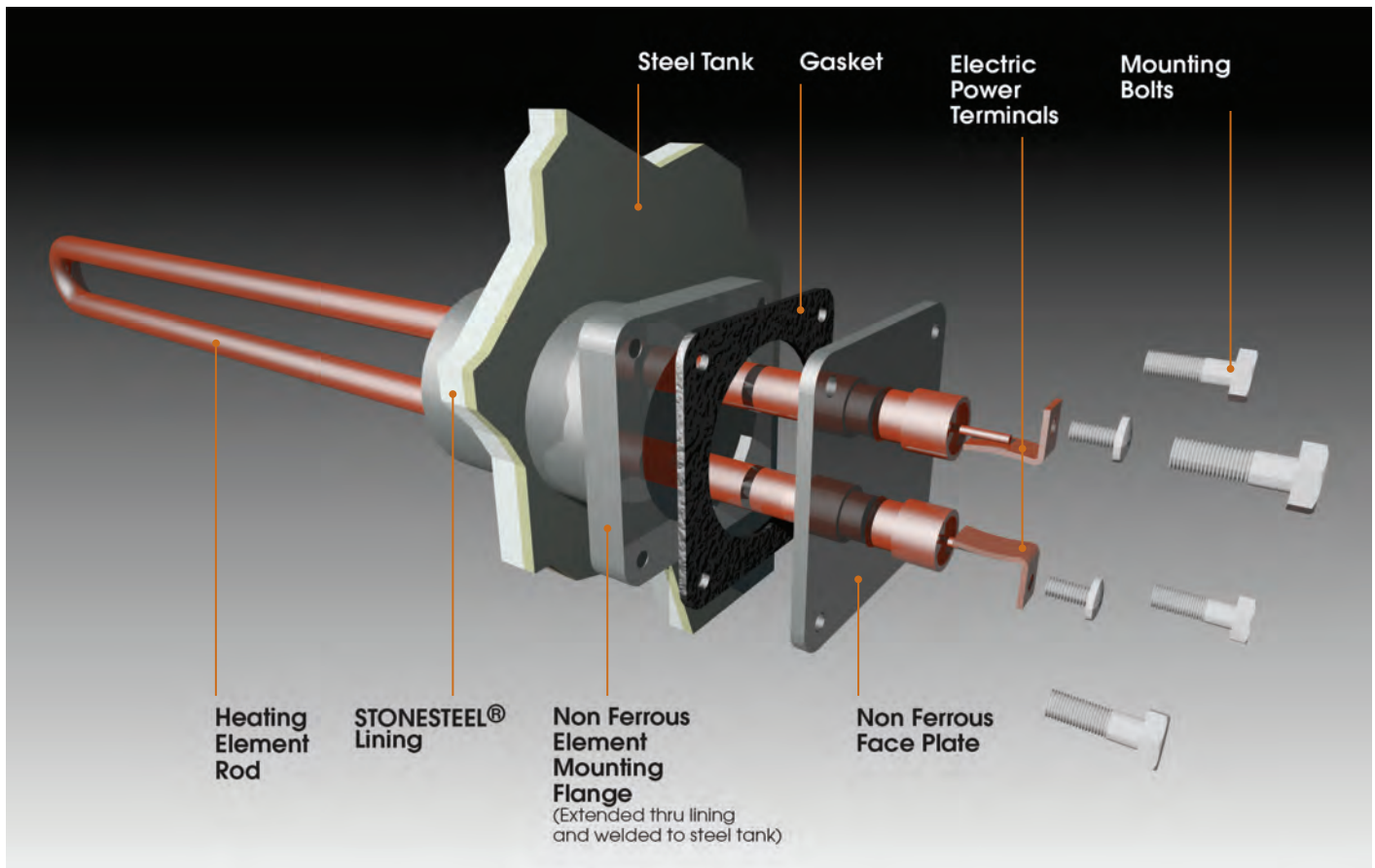
EHB Series Heating Element

Cemline EHB Series electric water heaters feature elements individually mounted in small copper flanges. This method of element mounting simplifies maintenance.

Detailed Cut-away of Element

Cemline EHB elements are individually mounted in small non-ferrous flanged openings. Any of the elements can be removed with the use of a 9/16" wrench and screwdriver. This simplified arrangement is preferred by maintenance personnel for ease in maintaining the water heater. The heating elements are incoloy or copper sheathed and

mounted in a non-ferrous flange which is securely bolted to the mounting flange, which mounts through the tank wall of the water heater. This mounting arrangement has been proven in thousands of heaters and is the simplest, yet most effective, method of heating element mounting devised.



EHB Series

Standard Equipment

Cemline EHB 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 form "HLW". 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.

Lining

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 STONESTEEL® lined 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 have the STONESTEEL® lining fail, factory representatives will repair or replace the lining at the place of installation.

Insulation

Cemline heaters are furnished with 3" thick fiberglass 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 I-Beam 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.

EHB Series

Cemline EHB 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 EHB 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 EHB 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 1 enclosure with key lock door.

Relief Valves

Cemline EHB 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.

UL Listing

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

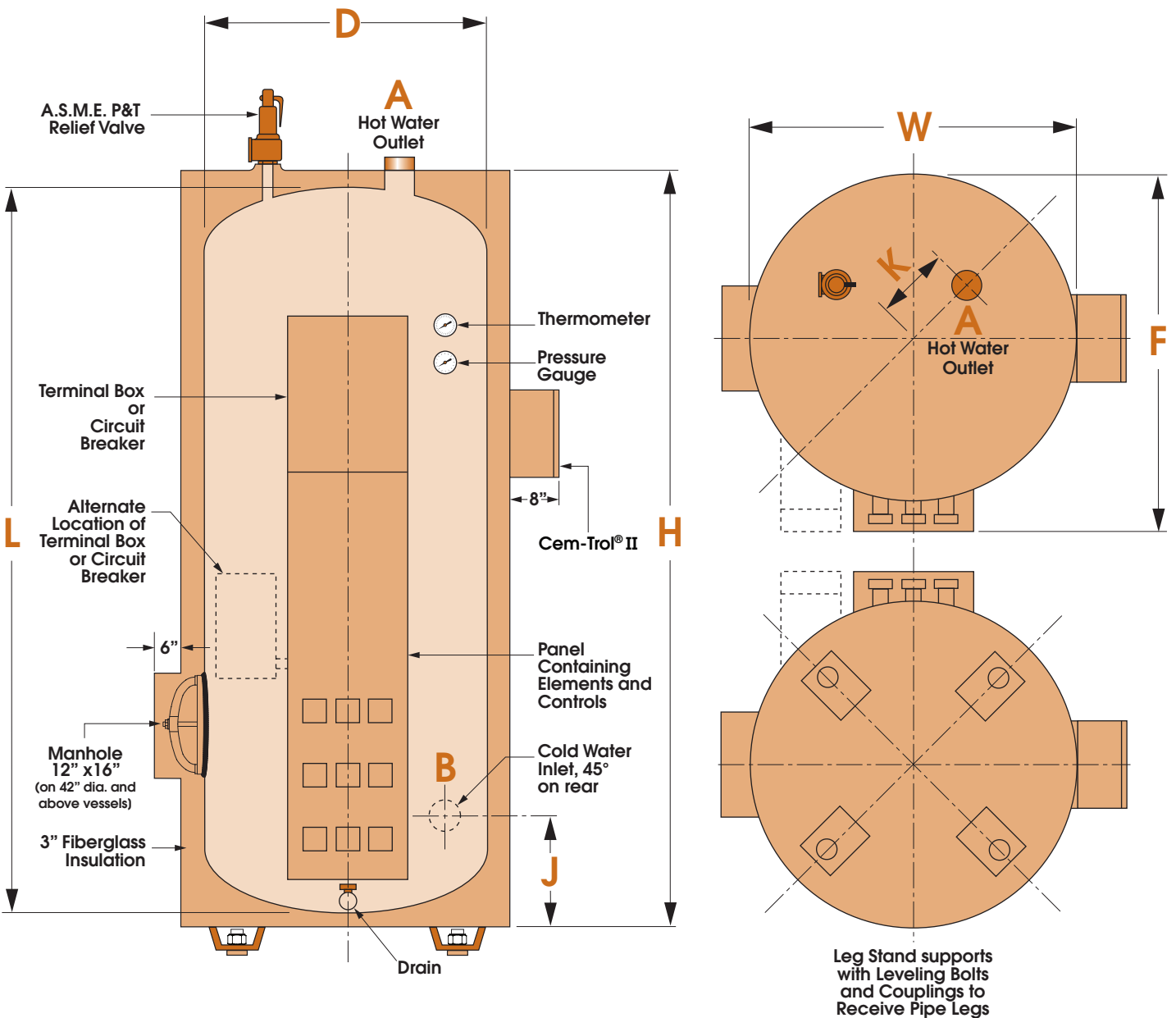
Cem-Trol® II

Cemline Cem-trol® II Solid State Water Heater Control Module combines all temperature control and automatic high limit functions for EHB 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.

EHB Series Vertical STONESTEEL® Storage Systems

Cemline EHB Series vertical package heaters are normally furnished as shown below.

Dimensions



EHB Series

The dimensions suggested below are well proportioned and suitable for most installations. When building space or other conditions demand, other sizes are readily available. Please consult factory.

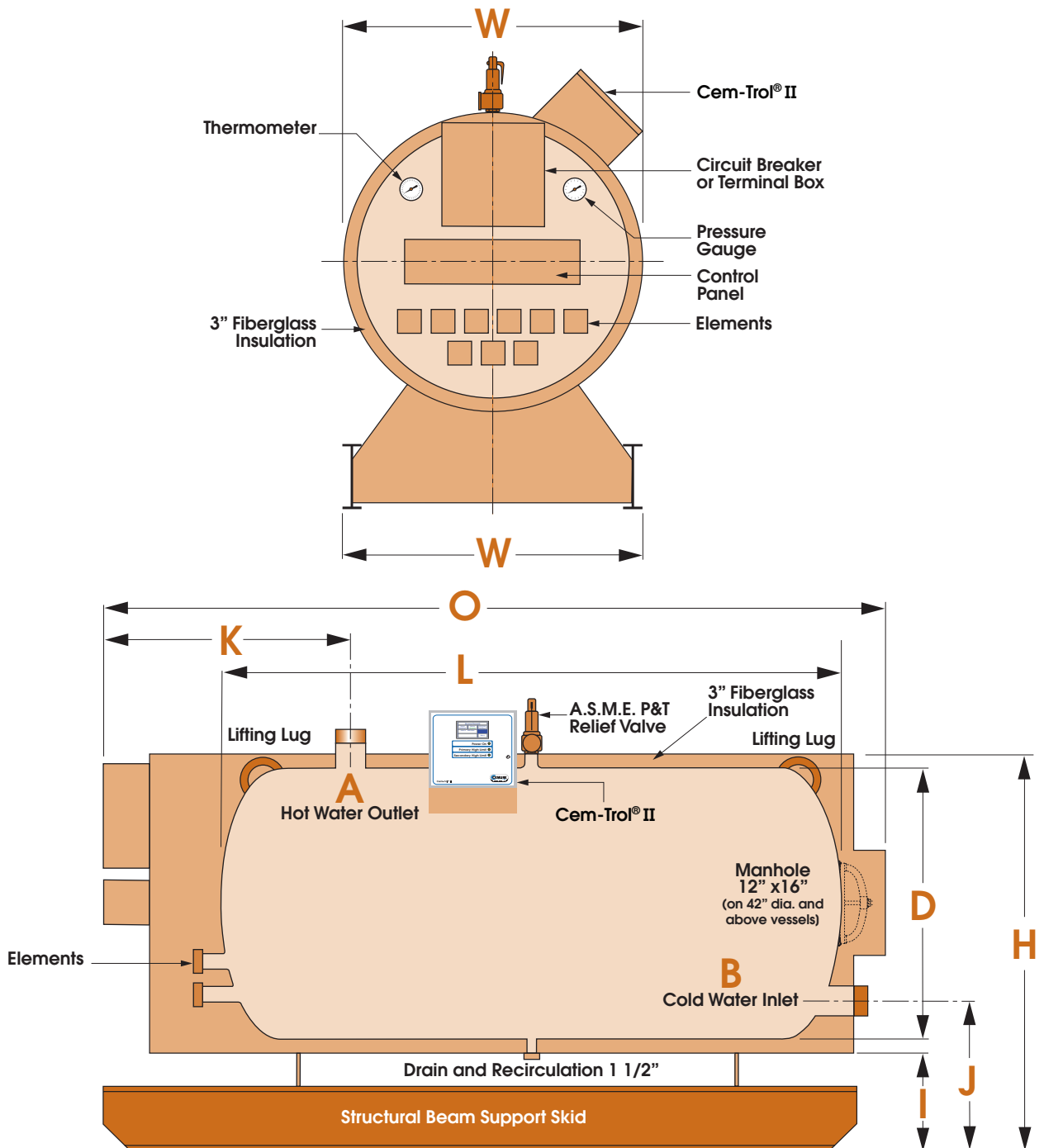
Gallon Capacity	Model No.	Tank Size D x L	W	H	F	J	K	A & B
40	V40EHB	16" x 63"	20"	66"	26"	9"	4"	3/4"
80	V80EHB	20" x 63"	24"	66"	30"	9"	6"	1"
120	V120EHB	24" x 63"	28"	66"	34"	13"	8"	1 1/4"
150	V150EHB	24" x 80"	28"	82"	34"	13"	8"	1 1/4"
170	V170EHB	30" x 67"	34"	70"	40"	17"	8"	1 1/2"
200	V200EHB	30" x 76"	34"	80"	40"	17"	8"	1 1/2"
250	V250EHB	30" x 84"	34"	88"	40"	17"	8"	1 1/2"
300	V300EHB	36" x 80"	40"	84"	46"	17"	8"	1 1/2"
400	V400EHB	36" x 96"	40"	100"	46"	17"	8"	1 1/2"
500	V500EHB	42" x 90"	46"	92"	52"	19"	10"	2"
1000	V1000EHB	60" x 96"	64"	100"	70"	21"	10"	2"

Gallon Capacity	Model No.	Tank Size D x L	W	H	F	J	K	A & B
570	V570EHB	42" x 108"	46"	112"	58"	19"	10"	1 1/2"
650	V650EHB	42" x 120"	46"	124"	58"	19"	10"	1 1/2"
700	V700EHB	42" x 132"	46"	136"	58"	19"	10"	1 1/2"
770	V770EHB	42" x 144"	46"	148"	58"	19"	10"	1 1/2"
560	V560EHB	48" x 84"	52"	88"	66"	19"	10"	2"
680	V680EHB	48" x 96"	52"	100"	66"	19"	10"	2"
730	V730EHB	48" x 108"	52"	112"	66"	19"	10"	2"
865	V865EHB	48" x 120"	52"	124"	66"	19"	10"	2"
915	V915EHB	48" x 132"	52"	136"	66"	19"	10"	2"
1010	V1010EHB	48" x 144"	52"	148"	66"	19"	10"	2"
670	V670EHB	54" x 84"	58"	88"	72"	19"	10"	2"
800	V800EHB	54" x 96"	58"	100"	72"	19"	10"	2"
880	V880EHB	54" x 108"	58"	112"	72"	19"	10"	2"
980	V980EHB	54" x 120"	58"	124"	72"	19"	10"	2"
1085	V1085EHB	54" x 132"	58"	136"	72"	19"	10"	2"
1190	V1190EHB	54" x 144"	58"	148"	72"	19"	10"	2"
850	V850EHB	60" x 84"	64"	88"	78"	21"	10"	2"
1000	V1000EHB	60" x 96"	64"	100"	78"	21"	10"	2"
1130	V1130EHB	60" x 108"	64"	112"	78"	21"	10"	2"
1300	V1300EHB	60" x 120"	64"	124"	78"	21"	10"	2"
1400	V1400EHB	60" x 132"	64"	136"	78"	21"	10"	2"
1600	V1600EHB	60" x 144"	64"	148"	78"	21"	10"	2"
1180	V1180EHB	72" x 84"	76"	88"	90"	23"	12"	2 1/2"
1380	V1380EHB	72" x 96"	76"	100"	90"	23"	12"	2 1/2"
1600	V1600EHB	72" x 108"	76"	112"	90"	23"	12"	2 1/2"
1980	V1980EHB	72" x 120"	76"	124"	90"	23"	12"	2 1/2"
2480	V2480EHB	72" x 144"	76"	148"	90"	23"	12"	2 1/2"
1620	V1620EHB	84" x 84"	88"	88"	102"	26"	12"	2 1/2"
1890	V1890EHB	84" x 96"	88"	100"	102"	26"	12"	2 1/2"
2160	V2160EHB	84" x 108"	88"	112"	102"	26"	12"	2 1/2"
2430	V2430EHB	84" x 120"	88"	124"	102"	26"	12"	2 1/2"
2700	V2700EHB	84" x 132"	88"	136"	102"	26"	12"	2 1/2"
2970	V2970EHB	84" x 144"	88"	148"	102"	26"	12"	2 1/2"
2120	V2120EHB	96" x 84"	100"	88"	114"	26"	12"	3"
2480	V2480EHB	96" x 96"	100"	100"	114"	26"	12"	3"
2840	V2840EHB	96" x 108"	100"	112"	114"	26"	12"	3"
3200	V3200EHB	96" x 120"	100"	124"	114"	26"	12"	3"
3560	V3560EHB	96" x 132"	100"	136"	114"	26"	12"	3"
3920	V3920EHB	96" x 144"	100"	148"	114"	26"	12"	3"

EHB Series Horizontal STONESTEEL® Storage Systems

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

Dimensions



EHB Series

The dimensions suggested below are well proportioned and suitable for most installations. When building space or other conditions demand, other sizes are readily available. Please consult factory.

Gallon Capacity	Model No.	Tank Size D x L	H	W	O	J	K	A & B	I
120	H120EHB	24" x 72"	46"	28"	90"	24"	40"	1 1/2"	18"
170	H170EHB	24" x 84"	46"	28"	102"	24"	40"	1 1/2"	18"
200	H200EHB	30" x 76"	49"	34"	94"	21"	40"	1 1/2"	15"
250	H250EHB	30" x 84"	49"	34"	102"	21"	40"	1 1/2"	15"
270	H270EHB	30" x 96"	49"	34"	114"	21"	40"	1 1/2"	15"
320	H320EHB	30" x 120"	49"	34"	138"	21"	40"	1 1/2"	15"
275	H275EHB	36" x 72"	52"	40"	90"	20"	40"	1 1/2"	12"
300	H300EHB	36" x 80"	52"	40"	98"	20"	40"	1 1/2"	12"
390	H390EHB	36" x 96"	52"	40"	114"	20"	40"	1 1/2"	12"
470	H470EHB	36" x 120"	52"	40"	138"	20"	40"	1 1/2"	12"
565	H565EHB	36" x 144"	52"	40"	162"	20"	40"	1 1/2"	12"
440	H440EHB	42" x 84"	58"	46"	102"	20"	40"	2"	12"
500	H500EHB	42" x 90"	58"	46"	108"	20"	40"	2"	12"
530	H530EHB	42" x 96"	58"	46"	114"	20"	40"	2"	12"
650	H650EHB	42" x 120"	58"	46"	138"	20"	40"	2"	12"
770	H770EHB	42" x 144"	58"	46"	162"	20"	40"	2"	12"
560	H560EHB	48" x 84"	64"	52"	102"	20"	40"	2"	12"
680	H680EHB	48" x 96"	64"	52"	114"	20"	40"	2"	12"
730	H730EHB	48" x 108"	64"	52"	126"	20"	40"	2"	12"
865	H865EHB	48" x 120"	64"	52"	138"	20"	40"	2"	12"
1010	H1010EHB	48" x 144"	64"	52"	162"	20"	40"	2"	12"
1080	H1080EHB	48" x 156"	64"	52"	174"	20"	40"	2"	12"
1170	H1170EHB	48" x 168"	64"	52"	186"	20"	40"	2"	12"
670	H670EHB	54" x 84"	70"	58"	102"	22"	40"	2"	12"
800	H800EHB	54" x 96"	70"	58"	114"	22"	40"	2"	12"
980	H980EHB	54" x 120"	70"	58"	138"	22"	40"	2"	12"
1190	H1190EHB	54" x 144"	70"	58"	162"	22"	40"	2"	12"
1390	H1390EHB	54" x 168"	70"	58"	186"	22"	40"	2"	12"
1000	H1000EHB	60" x 96"	76"	64"	114"	22"	40"	2"	12"
1300	H1300EHB	60" x 120"	76"	64"	138"	22"	40"	2"	12"
1600	H1600EHB	60" x 144"	76"	64"	162"	22"	40"	2"	12"
1900	H1900EHB	60" x 168"	76"	64"	186"	22"	40"	2"	12"
1380	H1380EHB	72" x 96"	88"	76"	114"	24"	40"	2 1/2"	12"
1980	H1980EHB	72" x 120"	88"	76"	138"	24"	40"	2 1/2"	12"
2400	H2400EHB	72" x 144"	88"	76"	162"	24"	40"	2 1/2"	12"
2580	H2580EHB	72" x 168"	88"	76"	186"	24"	40"	2 1/2"	12"
2780	H2780EHB	72" x 180"	88"	76"	198"	24"	40"	2 1/2"	12"
1890	H1890EHB	84" x 96"	98"	88"	114"	22"	40"	3"	10"
2430	H2430EHB	84" x 120"	98"	88"	138"	22"	40"	3"	10"
2970	H2970EHB	84" x 144"	98"	88"	162"	22"	40"	3"	10"
3500	H3500EHB	84" x 168"	98"	88"	186"	22"	40"	3"	10"
3780	H3780EHB	84" x 180"	98"	88"	198"	22"	40"	3"	10"
4040	H4040EHB	84" x 192"	98"	88"	210"	22"	40"	3"	10"
4320	H4320EHB	84" x 204"	98"	88"	222"	22"	40"	3"	10"
3200	H3200EHB	96" x 120"	110"	100"	138"	22"	40"	3"	10"
3920	H3920EHB	96" x 144"	110"	100"	162"	22"	40"	3"	10"
4640	H4640EHB	96" x 168"	110"	100"	186"	22"	40"	3"	10"
5000	H5000EHB	96" x 180"	110"	100"	198"	22"	40"	3"	10"
5360	H5360EHB	96" x 192"	110"	100"	210"	22"	40"	3"	10"
5720	H5720EHB	96" x 204"	110"	100"	222"	22"	40"	3"	10"
6080	H6080EHB	96" x 216"	110"	100"	234"	22"	40"	3"	10"

EHB 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 — BY3 208 Volts — 3 Phase				Code Suffix — B3 240 Volts — 3 Phase				Code Suffix — CY3 415 Volts — 3 Phase				Code Suffix — C3 480Volts — 3 Phase			
Recovery GPH 40°-140°F				Recovery GPH 40°-140°F				Recovery GPH 40°-140°F				Recovery GPH 40°-140°F			
KW	Steps	Amps*		KW	Steps	Amps*		KW	Steps	Amps*		KW	Steps	Amps*	
49	12	1	33	49	12	1	29	49	12	1	17	49	12	1	14
55	13.5	1	38	55	13.5	1	33	55	13.5	1	19	55	13.5	1	16
62	15	1	42	62	15	1	36	62	15	1	21	62	15	1	18
74	18	1	50	74	18	1	43	74	18	1	25	74	18	1	22
98	24	2	67	98	24	2	58	98	24	2	33	98	24	2	29
111	27	2	75	111	27	2	65	111	27	2	38	111	27	2	32
123	30	2	83	123	30	2	72	123	30	1	42	123	30	1	36
148	36	2	100	148	36	2	87	148	36	2	50	148	36	2	43
166	40.5	3	113	166	40.5	3	98	166	40.5	3	56	166	40.5	3	49
185	45	3	125	185	45	3	108	185	45	3	63	185	45	3	54
197	48	3	133	197	48	3	116	197	48	3	67	197	48	3	58
221	54	3	150	221	54	3	130	221	54	3	75	221	54	3	65
246	60	4	167	246	60	4	145	246	60	2	83	246	60	2	72
277	67.5	5	188	277	67.5	5	163	277	67.5	5	94	277	67.5	5	81
295	72	4	200	295	72	4	174	295	72	4	100	295	72	4	86
308	75	5	209	308	75	5	181	308	75	3	104	308	75	3	90
332	81	6	225	332	81	6	195	332	81	6	113	332	81	6	97
369	90	6	250	369	90	6	217	369	90	3	125	369	90	3	108
443	108	6	300	443	108	6	260	443	108	4	150	443	108	4	130
492	120	8	334	492	120	8	289	492	120	4	167	492	120	4	144
590	144	8	400	590	144	8	347	590	144	8	200	590	144	8	173
								615	150	5	209	615	150	5	180
								738	180	6	250	738	180	6	216
								861	210	7	292	861	210	7	252
								984	240	8	334	984	240	8	288

* 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.

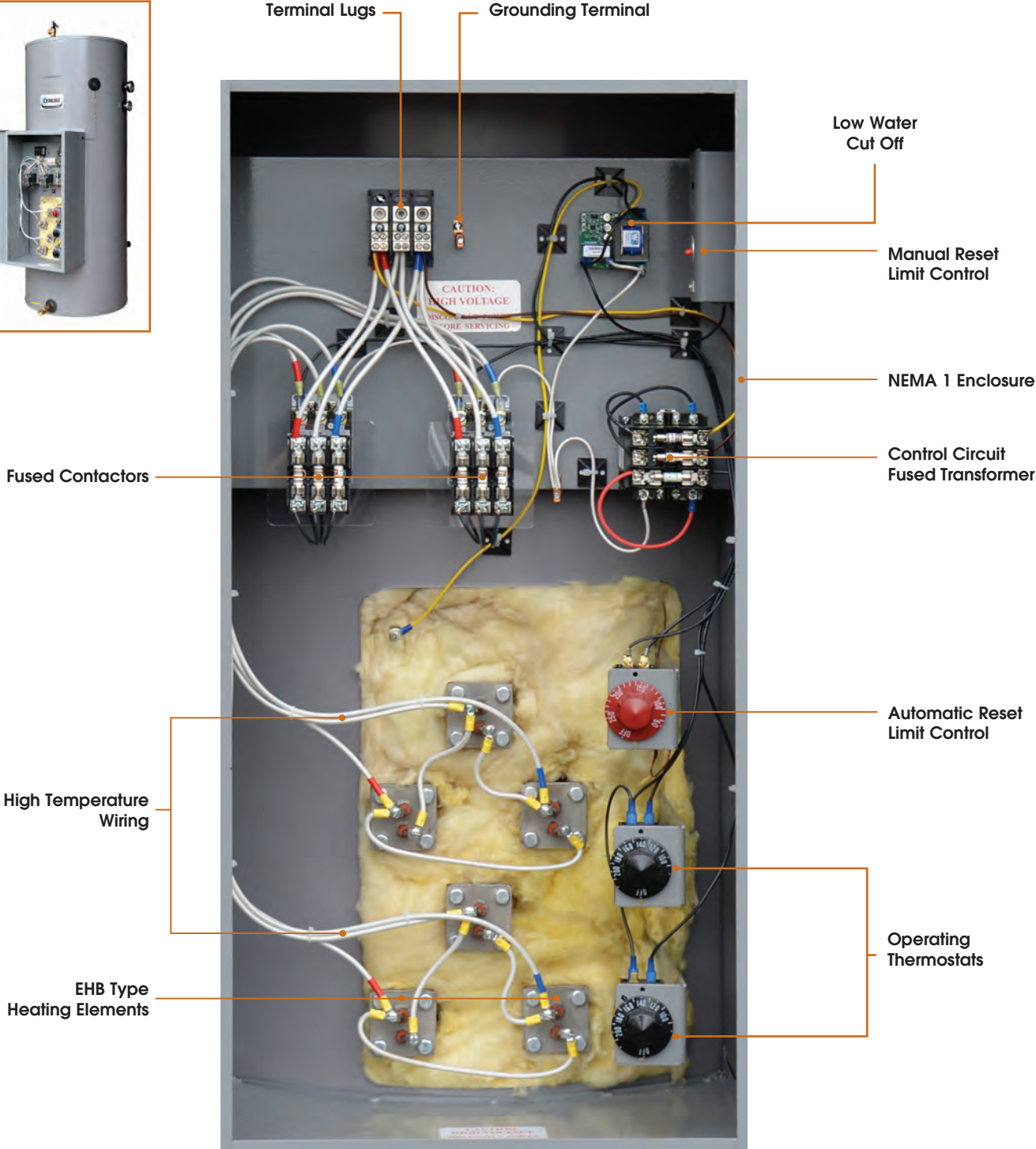
† Recovery is based upon 100°F temperature rise at a specified number of KW. For other temperature rises multiply recovery shown by factor from chart below.

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°

EHB Series Typical Control Panel

Simplified control panel means all components are readily accessible, a feature appreciated by operating and maintenance personnel. Contactors, step down transformer, thermostatic sensing devices, and elements in one self-contained panel. Separate terminal box with generously sized legs for power wiring.

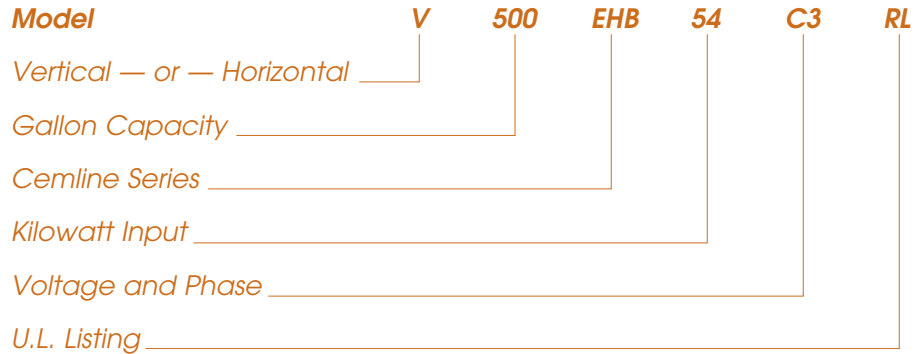


EHB Water Heaters Sample Specifications



To specify a Cemline EHB 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 vertical 500 gallon, 54 KW, 480 volt Electric Water Heater specify:



Electric Water Heater shall be Model _____ EHB _____ 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 have STONESTEEL® lining. All threaded openings shall be stainless steel, all flanged openings shall be properly sized and cement lined. Tank shall have an actual capacity of _____ gallons and shall be diameter _____ by _____ long.

Electric Water Heater shall be insulated with 3" minimum dense fiberglass, protected by an enameled metal jacket with access panels to manhole and elements. Electric Water Heater shall be mounted (horizontally on integral support skids), or (vertically with couplings to receive pipe legs).

Elements shall be individually flange mounted. 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.

EHB Electric Water Heaters have a Cem-Trol® IIDigital 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.

