

# Hubbell™

Marine Products Division

Model ME

## Shipboard Electric Water Heater

6-119 Gallon Capacity, Up To 12 KW, Single Phase

### Marine Approvals

- United States Coast Guard (USCG) conformance and American Bureau of Shipping (ABS) Type Approved
- USCG conformance and ABS Type Approval eliminates costly delays and uncertainties during ship inspection

### Heavy Duty Construction

- Hydrastone cement lining provides longer tank life
- Copper-silicon tappings cannot rust or corrode
- High impact composite jacket eliminates damage during installation and transit and cannot rust or corrode

### Mounting Systems

- Heavy-duty legs secure the tank to deck
- Removable side-sway bulkhead attachment points provide added mounting integrity
- The entire mounting system is integrally welded to tank for maximum stability and safety

### High Efficiency

- 2" thick polyurethane foam insulation reduces heat loss
- Built-in heat trap lowers operating costs

### Reliable

- Full five (5) year Non Pro-rated tank warranty is standard
- Full ten (10) year Non Pro-rated tank warranty can be specified for extended protection

## A Long Lasting, Trouble-Free Water Heater

The Hubbell Model ME water heater is specifically designed for marine use and is in USCG conformance and is ABS Type Approved. The entire water heater is securely fastened to the ship structure by utilizing deck and removable bulkhead mounting supports. This support system provides a secure and reliable water heater installation. To ensure tank longevity the Model ME water heater is constructed of steel and is internally lined with specially formulated hydrastone cement. The hydrastone cement lining, along with the solid copper-silicon threaded tank openings and a built in heat trap device all ensure a longer lasting, energy efficient water heater that is resistant to the highly corrosive effects of hot water.

When you specify and install a model ME, knowing that it is in conformance with USGC regulations and ABS Type Approved, you will have confidence that the ship owner will be provided with a long lasting, trouble-free source for hot water.

*The Model ME water heater is the perfect choice for your Marine application.*



**Hubbell™ The Electric Heater Company**

P.O. Box 288 ■ Stratford, CT 06615-0288

Phone: 203-378-2659 ■ FAX: 203-378-3593

E-mail: info@hubbellheaters.com ■ [www.hubbellheaters.com](http://www.hubbellheaters.com)

# Cement Lined Tanks Provide Longer Service Life

**Hubbell**<sup>TM</sup>

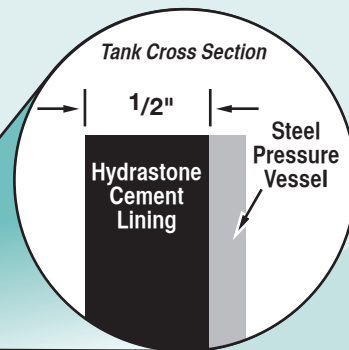
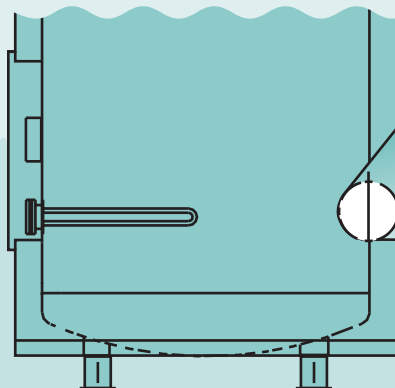
**Q**

**What is the most common reason why a water heater fails?**

**A**

Failure of a tank's protective lining allows water to come into direct contact with the steel tank causing it to corrode and leak.

Therefore, the type of protective lining is the single most important feature when determining the quality of any water heater. The ability of a lining to protect the steel tank is primarily based upon its thickness and complete coverage of all steel surfaces.



## **Threaded tapping material is critical for tank longevity.**

Glass lined tanks are constructed with regular steel tapings which are continuously attacked by corrosive hot water due to the lack of glass lining on the internal threads. The Hubbell Model ME water heater tank is constructed with solid non-ferrous copper-silicon tank tapings which are impervious to the corrosive effects of hot water.

The Hubbell Model ME is a longer lasting marine water heater based upon the construction features found in the Hydrastone cement lined storage tank. The result is that when you specify and install a Hubbell Model ME, you will have confidence in knowing that the owner will be provided with a trouble-free and long lasting marine water heater.

### **Thickness**

Each Hubbell Model ME storage tank is lined with a minimum of 1/2" thick Hydrastone cement to ensure protection of the steel tank.

### **Coverage**

The Hydrastone cement lining covers a guaranteed 100% of all interior tank surfaces and is free from imperfections. Full coverage is achieved by injecting the precise amount of Hydrastone cement into each tank and then centrifugally spinning it at 250 RPM to ensure complete and uniform coverage of the lining on all interior surfaces.

### **Corrosion Resistance**

Hydrastone cement is a specially formulated high density lining designed to provide maximum protection from the corrosive effects of hot water.

### **Reduced Operating Costs**

The Hubbell Model ME marine water heater significantly reduces the total ownership cost of a water heater due to the longer life and maintenance-free benefits derived from a Hydrastone cement lined tank. Longer tank life is directly attributable to the unmatched tank protection provided by the

Hydrastone cement lining and copper-silicon tapings. Additionally, the Model ME reduces operating expenses by eliminating the periodic inspection and replacement costs associated with maintaining a sacrificial anode in a glass lined tank.

## **Two common internal tank linings are Glass & Cement**

### **Glass Lining**

is approximately 5 mils (.005") thick & **does not cover** all internal surfaces. To compensate, all glass lined tanks require a sacrificial anode rod which must be periodically inspected and replaced.

### **Hydrastone Cement Lining**

is a minimum of 1/2" thick (100 times thicker than glass lining) and is guaranteed to uniformly cover 100% of all internal tank surfaces. The result is a significantly longer lasting tank which does not require a sacrificial anode.



## Model ME Water Heater Specifications

<b>Tank:</b>	Hydrastone Cement Lined Steel	<b>Thermostat Range</b>	
<b>Capacities:</b>	6 thru 119 Gallons	<b>Surface:</b>	110-170°F
<b>Orientation:</b>	Vertical	<b>Hi-Limit:</b>	190°F
<b>Voltages:</b>	120 thru 480 Volt	<b>Design WP:</b>	100 psi
<b>Phase:</b>	Single Phase	<b>Design TP:</b>	300 psi
<b>Inlet Size:</b>	3/4" Female NPT	<b>Elements:</b>	Copper Sheathed
<b>Outlet Size:</b>	3/4" Male NPT	<b>Insulation:</b>	2" Polyurethane Foam
<b>Drain Size:</b>	3/4" GHT Hose Connection	<b>Tank Warranty</b>	
<b>Relief Valve Size:</b>	3/4" Female NPT	<b>Standard:</b>	5 Year Non Pro-Rated
<b>Relief Valve Type:</b>	T&P, 210°F, 100 psi	<b>Optional:</b>	10 Year Non Pro-Rated
		<b>Electrical Warranty:</b>	1 Year
		<b>Jacket:</b>	High Impact Colorized Composite
		<b>Color:</b>	White and Black
		<b>Marine Classifications:</b>	ABS Type Approved

## General Specifications

### ■ Tank

The Hubbell tank is all welded heavy steel construction designed for 100 psi working pressure and tested to 300 psi. Each tank is centrifugally lined with 1/2" thick seamless high density Hydrastone cement with guaranteed 100% coverage of all steel surfaces. All tank openings are non-ferrous solid copper-silicon and are resistant to the corrosive effects of hot water.

### ■ Mounting System

Factory constructed heavy-duty leg supports are integrally welded to the tank for secure deck mounting. Removable side-sway bulkhead attachment points are provided for added mounting integrity. This mounting support system provides a stable water heater installation with improved safety compared to a typical water heater secured with a belly-band.

### ■ Plumbing

3/4" combination cold water inlet and drain, with non-corrosive strata flow diffuser which prevents incoming cold water from mixing too rapidly with the hot water in the tank and assures delivery of more hot water — not lukewarm water.

A 3/4" hot water outlet with a uniquely designed built-in heat trap prevents heated water from radiating through the piping during standby periods.

### ■ Electrical

Copper sheathed immersion heating elements with low watt density for prolonged life — up to 12 KW in 120, 208, 240, 277, 440 or 480 volt single phase (See chart for details). An adjustable surface thermostat operates in 110-170°F range.

Integral hi-limit with manual reset button for over-temperature protection is factory set at 190°F.

Upper and lower element configurations are factory wired for non-simultaneous operation.

### ■ Insulation

Highly efficient 2" thick polyurethane foam insulation exceeds the latest ASHRAE standards for energy efficiency and heat loss.

### ■ Jacket

The exterior protective jacket is constructed from high impact composite material which cannot rust or corrode and does not require painting.

## Optional Equipment

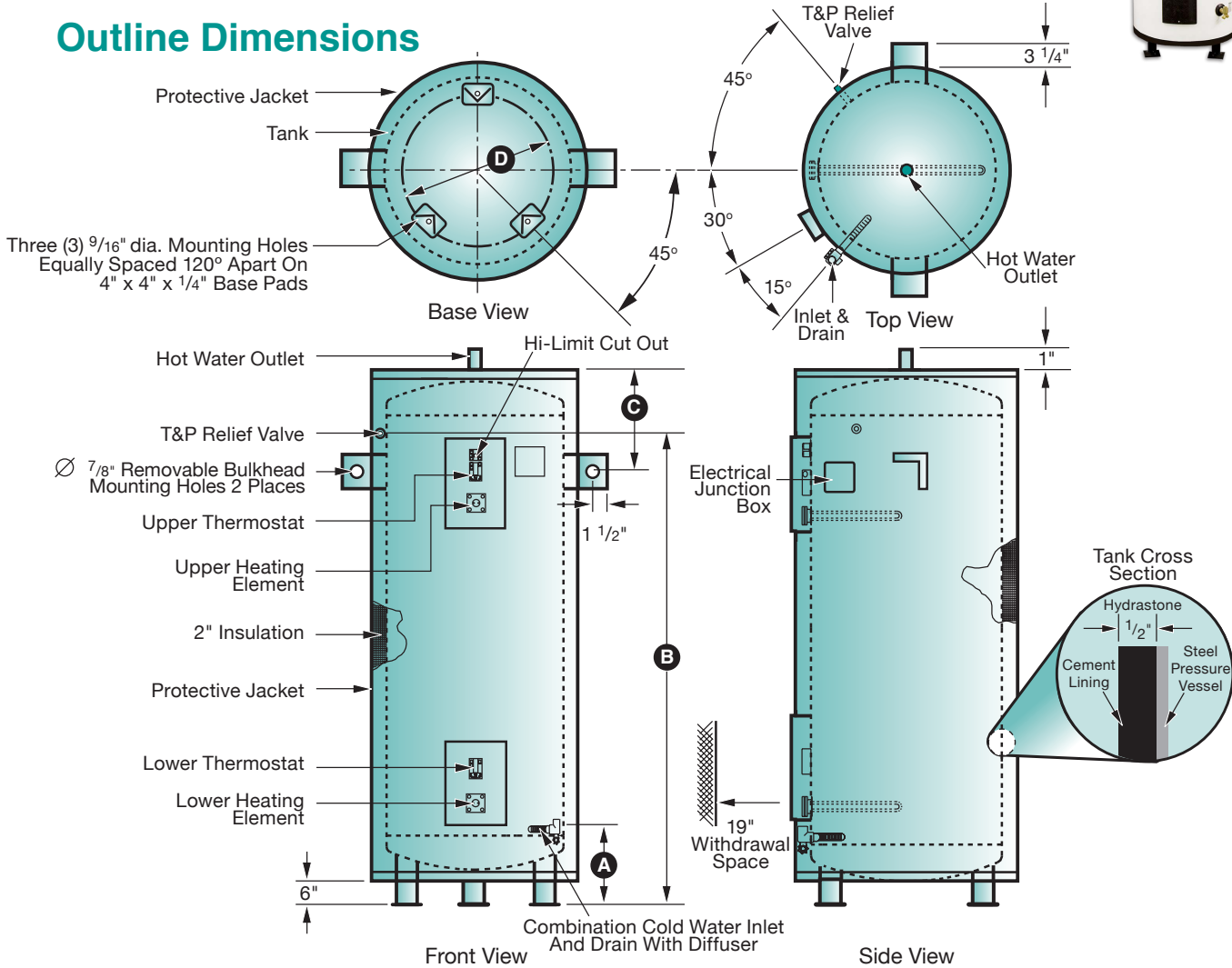
- 1. Immersion thermostat specify 100-180°F or 30-110 °F temperature range.
- 2. Immersion adjustable 100-240°F safety hi-limit cut out with manual reset.
- 3. Secondary heating capability provided by a factory installed heat exchanger constructed from single wall (Optional: double wall) copper fin tube.
- 4. Combination temperature and pressure gauge; 2 1/2" dial, 30-240°F, 0-200 psi — factory installed.
- 5. 1 1/2" Male NPT inlet and outlet water connections.
- 6. Solid Type 304 or 316L stainless steel, 90/10 copper nickel alloy tank for extended tank life.
- 7. Three phase open delta wiring (must be simultaneous operation).
- 8. Heating elements wired for simultaneous operation.
- 9. Full 10 Year Non Pro-Rated tank warranty.
- 10. Special construction including hazardous location, NEMA 4 and other features available. Please consult factory.
- 11. Alternate working pressure (Please Specify).

# Model ME

## Shipboard Electric Water Heater



### Outline Dimensions



### Dimensional Data

Storage Capacity (Gallons)	Base Model Number	Standard Configurations		Alternate Configurations		Dimensions (Inches)						Shipping Weight (lbs.)
		KW	Volts 1Φ	KW	Volts 1Φ	Overall Diameter	Overall Height	Deck to Inlet A	Deck to T&P B	Bulkhead Mounting Dimension C	Bolt Circle D	
6	ME06	1.5	120 or 240	1.5, 2, 3		15	17.5	5	12	None	None	100
10	ME10	1.5	120 or 240	1.5, 2, 3		20	27	13	21	None	13	140
20	ME20	1.5	120 or 240	4, 4.5		20	39	13	33	None	13	180
30	ME30	4.5	240		120	20	47.5	13	40	12	13	215
40	ME40	4.5	240		208	20	64.75	13	57	12	13	300
50	ME50	4.5	240		240	22.75	57	13	49	12	15	315
65	ME65	4.5	240	1.5, 2, 3, 4, 4.5, 5, 6	277	26	54	14	46	12	18	380
80	ME80	4.5	240		480	26	64	14	57	12	18	415
100	ME100	4.5	240			26	75.5	14	68	12	18	445
119	ME120	4.5	240			28	75.25	14	68	12	20	495
40	MEU40	4.5	240			26	39	13	30	None	18	305

- Notes:**
- 120 volt models are available in 1500, 2000, and 2500 Watts only.
  - The 6, 10, and 20 Gallon models are available in lower element design only. All other sizes have both upper and lower element banks of identical wattage and are wired for non-simultaneous operation.
  - For three phase open delta (unbalanced) wiring please contact factory for wattage availability.



### Formulas To Solve For:

#### Recovery

$$\text{GPH} \times \text{ } \times \text{ } \times 0.00244 = \text{KW}$$

$$\text{KW} \times 410 \div \text{GPH} = \text{ } \times \text{ } \Delta T$$

$$\text{KW} \times 410 \div \text{ } \times \text{ } \Delta T = \text{GPH}$$

Note: 1 KW will heat 4.1 GPH at a 100°F ΔT

#### Electrical

$$\frac{\text{KW} \times 1000}{\text{Volts}} = \text{Amps } 1 \Phi$$

#### Metric Conversion

$$\text{Liters} \times 0.2641 = \text{Gallons}$$

$$\text{Gallons} \times 3.79 = \text{Liters}$$

$$\text{Gallons} \times 0.003785 = \text{m}^3$$

$$\text{m}^3 \times 264.2 = \text{Gallons}$$

$$1^\circ\text{C } \Delta T = 1.8^\circ\text{F } \Delta T$$

$$^\circ\text{F} = (^\circ\text{C} \times 1.8) + 32$$

$$^\circ\text{C} = (^\circ\text{F} - 32) \times 0.556$$

$$\text{Watts/Sq.Cm.} \times 6.4 = \text{Watts/Sq.In.}$$

$$\text{Watts/Sq.In.} \times 0.155 = \text{Watts/Sq.Cm.}$$

$$\text{psi} \times 0.06896 = \text{Bar}$$

$$\text{Bar} \times 14.5 = \text{psi}$$

$$\text{psi} \times 6.86 = \text{kPa}$$

$$\text{kPa} \times 0.1456 = \text{psi}$$

$$\text{Kg/Cm}^2 \times 14.28 = \text{psi}$$

$$\text{psi} \times 0.07 = \text{Kg/Cm}^2$$

$$\text{Lbs} \times 0.4536 = \text{Kg}$$

$$\text{Kg} \times 2.2 = \text{Lbs}$$

### Model Number Designation



Step 1  
Model: ME

Step 2  
Storage Capacity:  
6-119 U.S. Gallons

Step 3  
Upper and Lower KW:  
1.5, 2, 3, 3.5, 4, 4.5, 5, 6  
(upper and lower KW must be the same)

Step 4  
Tank:  
SL = Hydrastone  
Cement lined tank  
SS = Solid  
stainless steel tank  
CN = Solid 90/10  
copper-nickel tank

Step 5  
Voltage / Phase / Hz:  
A = 120-1-60  
RS = 208-1-60  
S = 240-1-60  
W = 277-1-60  
T5S= 440-1-60  
T4S= 480-1-60  
R = 208-3-60 (open Delta)  
T = 240-3-60 (open Delta)  
T3 = 380-3-50/60 (open Delta)  
T5 = 440-3-60 (open Delta)  
T4 = 480-3-60 (open Delta)

Example: **ME80 - 4.5 - 4.5SLS**  
Model ME marine water heater with a storage capacity of 80 gallons with 4.5 KW upper and lower heating elements. Tank is cement lined and operates at 240 V, single phase, 60 Hz power.

#### Option Note

Any and all optional equipment for a water heater must be called out in the written specification. A model number in and of itself does not reflect any optional equipment selected.

(Manufacturer reserves the right to change specifications without notice)





## Model ME

# Master Specification

SHIP NAME \_\_\_\_\_

ENGINEER / NAVAL ARCHITECT \_\_\_\_\_

SHIPYARD \_\_\_\_\_

CONTRACTOR / SHIP CHANDLER \_\_\_\_\_

### General

Provide a quantity of \_\_\_\_\_ heavy-duty marine electric water heater(s) Model No. \_\_\_\_\_ as manufactured by HUBBELL Electric heater Co., Stratford CT. The entire water heater shall conform to USCG regulations per 46 CFR 53.01-10 and be ABS Type Approved for marine use. The water heater shall be constructed specifically for shipboard installation by utilizing deck and bulkhead mounting supports that are integrally welded to the pressure vessel. The water heater shall be complete with all operating controls requiring only plumbing and electrical service connections. The tank shall be all welded steel commercial construction designed for 100 psi working pressure and contain \_\_\_\_\_ gallons of storage. The tank shall be lined with seamless Hydrastone cement to a minimum thickness of 1/2" on 100% of all interior tank surfaces. (  **Optional Specification:** Tank to be fabricated from solid 90/10 Copper Nickel alloy or type 304 or 316L stainless steel. For this option no internal lining is required due to the non-ferrous materials used in construction of the pressure vessel. ) The tank shall not require any type of anodic protection. The tank shall be designed and fabricated with non-ferrous copper-silicon threaded tappings and non-ferrous inlet and outlet piping for maximum corrosion resistance. Steel tank tappings will not be acceptable. The entire tank shall be insulated with a minimum of 2" thick polyurethane foam insulation that exceeds the latest ASHRAE standard for stand-by heat loss. The complete heater shall be supplied with a high impact colorized composite protective jacket which cannot rust or corrode and does not require painting. The unit shall bear the ABS Type Approved mark certifying the entire water heater for marine use.

The cold water inlet shall be 3/4" Female NPT (  **Optional Specification:** 1 1/2" Male NPT ) and include a non-corrosive strata-flow diffuser, which prevents incoming cold water from mixing too rapidly with hot water in the tank. A 3/4" hose connection drain is supplied. The hot water outlet shall be 3/4" male NPT (  **Optional Specification:** 1 1/2" Male NPT ) and shall include a factory installed built-in heat trap to prevent water from radiating through the piping during stand-by periods. A separate 3/4" Female NPT tapping is to be provided for relief valve installation. An ASME rated automatic reseating combination temperature and pressure safety relief valve set at 100 psi and 210 °F shall be factory supplied.

### Electric

The heating elements shall be high quality copper sheath electric immersion type. The marine water heater shall be dual element design consisting of an upper and lower element rated at \_\_\_\_\_ watts each (Note: 6, 10, & 19 gallon models have single lower element only). Dual element water heaters are interlock wired for non-simultaneous element operation (  **Optional Specification:** elements to be wired for simultaneous operation. ) The heater shall be designed to operate at \_\_\_\_\_ volts, single phase. (  **Optional Specification:** wired for three phase open delta operation with elements operating simultaneously. )

In addition, the water heater shall be supplied with the following options:

- Option \_\_\_\_\_
- Option \_\_\_\_\_
- Option \_\_\_\_\_

The water heater manufacturer shall warranty all electrical components against defects in workmanship and material for a period of one (1) year from date of start-up and the pressure vessel for a full five (5) years Non Pro Rated (  **Optional Specification:** Full ten (10) years Non Pro-Rated Tank Warranty ) from date of start-up, provided that the unit is started within three (3) months of date of shipment and installed and operated within the scope of the tank design and operating capability. Each water heater shall be shipped with a complete set of installation and operating instructions including spare parts list and approved drawings.



*Committed to continuous improvements*

Continuing research results in product improvement; therefore these specifications are subject to change without notice. For the most updated information, consult the factory.



## Marine Products Division

The Electric Heater Company ■ P.O. Box 288 ■ Stratford, CT 06615-0288

Phone: 203-378-2659 ■ FAX: 203-378-3593 ■ info@hubbellheaters.com ■ www.hubbellheaters.com

Rev D