ASME Packaged Electric Water Heater

15 - 1600 KW - All Voltages & Phases, 80 - 5000 Gallon Capacity

Features

- **Reliable**
  - √ Only high grade materials used in construction to ensure long operating life
  - √ Hydrastone cement lining provides superior protection and tank longevity
  - √ Heavy duty construction withstands demanding commercial/industrial use
- **Packaged System**
  - √ Fully packaged water heater saves time and money during installation
  - √ All electrical operating controls are factory selected and wired to ensure reliable operation
- **Versatile**
  - √ Full range of styles, sizes, and optional features to meet your exact water heating needs
  - √ Highly efficient design lowers peak power demand and reduces operating costs

APPLICATIONS

- Schools
- Office Buildings
- Prisons
- Stadiums
- Hotels
- Industrial Facilities
- Nursing Homes
- Hospitals

NO GLASS LINING

Model SH - Vertical configuration

ASME H HLW

A Heavy Duty Storage Electric Water Heater

The Model SH and H is a fully packaged water heater designed to be a reliable and long lasting source for hot water. Each component is carefully selected to ensure performance in even the most demanding application. Whether you are heating potable water in a commercial building or heating process water in an industrial application you can select a Hubbell Model SH or H to do the job. When you specify and install a Hubbell SH or H model water heater you will have confidence in knowing that the owner will be provided with a quality product that is a long lasting and trouble free source for hot water.

Cement Lined Tanks Provide Longer Service Life

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.

Linings Available For A Steel Tank

1. Cement Lining

A specially formulated Hydrastone cement applied to a minimum of $^{5}/_{8}$" thickness on all surfaces. The cement lining covers 100% of all interior surfaces and is 125 times thicker than glass lining. Due to the thickness and guaranteed coverage of cement lining there is no need for a sacrificial anode. An extremely durable and long lasting lining suitable for hot and cold potable water storage in a variety of commercial and industrial applications.

2. Alternative Cement Formulations
To meet the specific requirements of DI Water, RO Water, extended service and/or high temperature applications, alternative formulations of cement are available. Please consult factory for assistance.

3. Phenolic Lining
An epoxy coating applied in 2 coats to a total of 10-12 mils DFT. Typically used in process applications using low conductivity DI, distilled, or food grade water.

4. Galvanizing
The steel pressure vessel is pickled and hot dipped in molten zinc to create a barrier which internally and externally protects a steel vessel for cold and hot water storage.

Unlined Tanks

An Unlined tank does not require a lining because the pressure vessel itself is constructed from material which is impervious to the corrosive effects of hot water. This type of tank will provide a significantly longer service life than all lined steel tanks, but is initially more costly.

1. 90/10 Copper-Nickel
A 90% Copper 10% Nickel alloy similar to copper-silicon, but with added strength and corrosion resistance. Typically used in applications with corrosive environments (salt water) or in critical commercial and industrial applications requiring long tank life.

2. Stainless Steel
Stainless steel (Specify: Type 304, 304L, 316, or 316L) is well suited for industrial and high purity applications requiring a corrosion resistant tank with minimal leaching of impurities into the water. Well suited for process, RO and DI water systems in the pharmaceutical, food and electronic industries.

NOTE: Unlined tanks do not require a Manway. Inspection openings will be provided as required.

SH and H Model Standard Equipment

Vessel Construction

1. All welded carbon steel vessel designed and built in strict accordance with the ASME Code Section IV and stamped, certified and registered with the National Board of Boiler and Pressure Vessel Inspectors
2. All internal tank surfaces are lined with a minimum of $^{5}/_{8}$" thick Hydrastone cement for superior protection and tank longevity
3. Designed for 125 psi working pressure and hydrostatically tested at 188 psi ($1^{1}/_{2}$ times the WP)

General

1. Heavy duty 2" thick fiberglass blanket insulation covers 100% of the pressure vessel for maximum operating efficiency and minimal standby heat loss
2. Heavy gauge galvanized steel protective jacket with both top and bottom heads keeps insulation in place and protected to ensure high efficiency during operation
3. Entire vessel is supported on heavy duty integrally welded steel supports for sturdy floor mounting
4. Full five (5) year Non Pro-Rated tank warranty and one (1) year electrical component warranty
5. Bronze ASME rated combination temperature and pressure safety relief valve set at the vessel working pressure and 210°F

Electrical Operating Controls

1. All electrical operating controls are factory sized, selected, wired, tested and mounted in a NEMA 1 enclosure to ensure safe and reliable operation
2. A power distribution block is supplied for single point electrical connection
3. Power fuses rated at a maximum of 60 Amps protect each heating element branch circuit per NEC and UL requirements. Each branch circuit has a maximum rating of 48 Amps
4. Heavy duty definite purpose magnetic contactor with integrally mounted power fuse block assembly switches power on/off to each branch circuit
5. Heavy duty removable flange type copper sheathed immersion heating element provides long service life
6. Fully adjustable thermostat maintains accurate water temperature and is sized by the factory to control the appropriate number of heating element circuits
7. A generously sized transformer provides fused 120V to the control circuit
8. A fully adjustable (100-240°F) safety hi-limit device with manual reset interrupts power to the control circuit in the event of over-temperature water in the storage tank
9. Safety door interlock mechanism interrupts power to the control circuit upon opening the electrical control panel
10. Louvers in the control panel as needed to allow for cooling of the electrical components to ensure maximum electrical component longevity

SH and H Model Optional Equipment

NOTE: Other optional features are available, please consult factory if required.

Vessel

- ☐ 1. **Alternate protective lining:** Phenolic epoxy resin, Flame spray copper, Hot dip galvanizing, other
- ☐ 2. **Alternate vessel construction:** Stainless Steel Type 304 or 316L, 90/10 Copper-Nickel, other
- ☐ 3. **Alternate working pressure:** Please specify
- ☐ 4. Tank designed, constructed and stamped to section VIII or Section I of the ASME Code

General

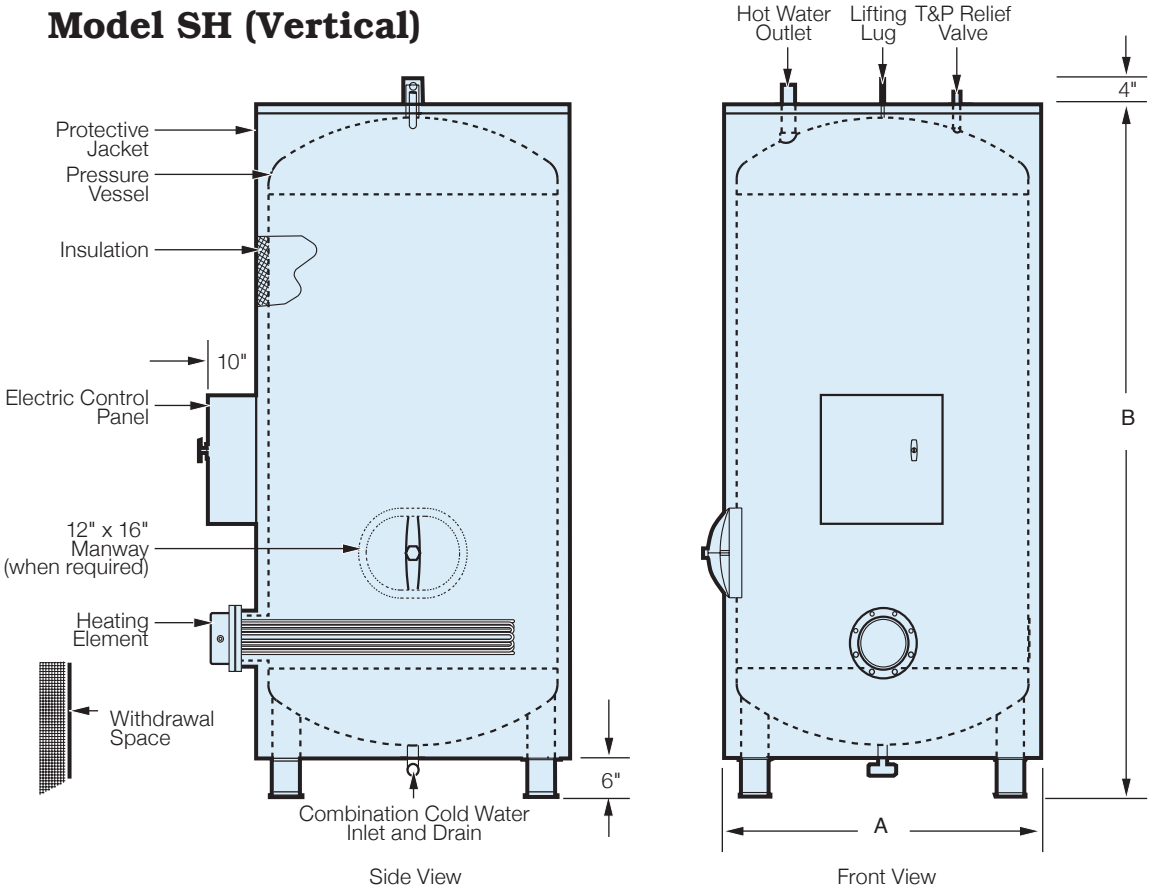
- ☐ 5. Skid mounting on heavy duty all welded I Beam
- ☐ 6. Type 304 stainless steel protective jacket, please specify if painted
- ☐ 7. Field removable (knocked-down) outer jacket
- ☐ 8. Alternate insulation system
- ☐ 9. Dual energy package provides operational flexibility for electric and (steam or boiler water) power
- ☐ 10. Manway 12" x 16" size
- ☐ 11. Inspection opening 3" NPT size

Electrical

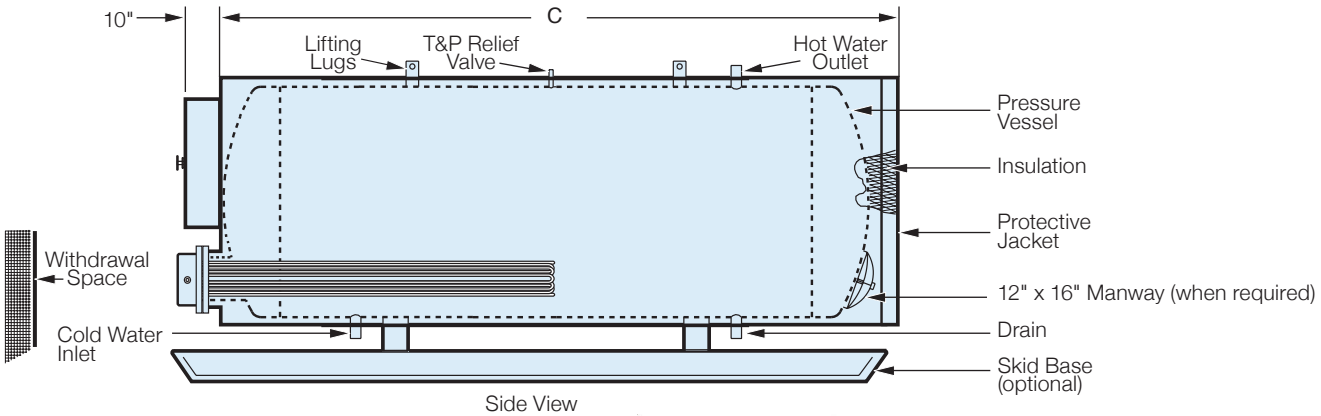
- ☐ 12. NEMA 4 weather resistant enclosure for outdoor/wet locations
- ☐ 13. Explosion resistant construction for hazardous locations
- ☐ 14. Built-in circuit breaker (with or without shunt trip) or a built-in non-fused On/Off disconnect switch
- ☐ 15. Alternate element sheath material (Please Specify: Incoloy, Stainless Steel, other)
- ☐ 16. Specialized heating element construction including: Special watt density rating, passivation, electropolishing, or any other feature required to meet the needs of your application
- ☐ 17. Factory installed low water cut out device to disengage electrically the heating element(s) in the event of insufficient water in the tank
- ☐ 18. Dial thermometer and pressure gauge factory installed in the tank
- ☐ 19. Intra-tank circulation pump package with On/Off switch to continuously circulate water within the tank and thereby reduce stratification. All bronze circulator pump is properly sized for the storage capacity
- ☐ 20. Status indicating lamp(s)
- ☐ 21. Audible alarm system
- ☐ 22. Digital display electronic temperature controller. Please specify with or without RS485 communication port for remote operation of the temperature controller
- ☐ 23. Building Automation System (BAS) package provides remote operating/alarm capability
- ☐ 24. Factory purchased mixing valve to supply high volume tepid water for safety shower systems. For details, please reference Hubbell Model EMV

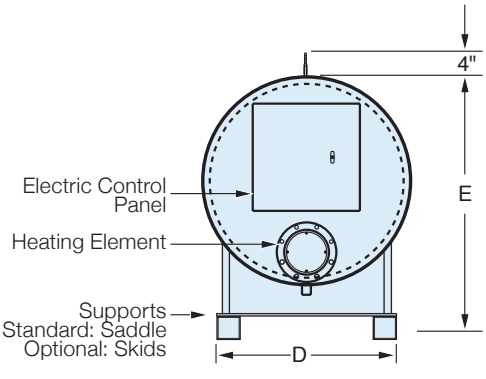
Outline Dimensions

Model SH (Vertical)



Model H (Horizontal)





Overall Dimensions, Models SH and H

Actual Storage Capacity (Gallons)	Overall Dimensions (Inches)					Storage Tank	Nominal Storage Capacity (Gallons)	Inlet Outlet Sizing (NPT)	Approx. Shipping Weight (Lbs.)
	Vertical		Horizontal						
	Diameter "A"	Height "B"	Length "C"	Width "D"	Height "E"	Diameter x Length			
80*	26	64	60	26	32	22 x 54	90	1½	700
120*	28	72	71	28	34	24 x 62	140	1½	900
150*	30	78	75	30	36	26 x 68	170	1½	1100
175	34	73	67	34	40	30 x 63	195	1½	1500
200	34	82	76	34	40	30 x 72	220	1½	1700
225	34	89	83	34	40	30 x 79	245	1½	1750
250	40	74	68	40	46	36 x 64	285	1½	1850
275	40	80	74	40	46	36 x 70	310	1½	2000
300	40	88	82	40	46	36 x 78	345	1½	2180
325	40	92	86	40	46	36 x 82	360	1½	2300
350	40	94	88	40	46	36 x 84	370	1½	2500
375	46	81	75	46	52	42 x 71	425	1½	2600
400	46	85	79	46	52	42 x 75	450	1½	2700
425	46	88	82	46	52	42 x 78	470	1½	2900
450	46	93	87	46	52	42 x 83	500	1½	3000
475	52	79	73	52	58	48 x 69	540	2	3100
500	52	82	76	52	58	48 x 72	565	2	3225
525	52	85	79	52	58	48 x 75	590	2	3350
550	52	89	83	52	58	48 x 79	620	2	3400
575	52	93	87	52	58	48 x 83	650	2	3500
600	52	95	89	52	58	48 x 85	665	2	3650
700	52	107	101	52	58	48 x 97	755	2	4000
800	52	119	113	52	58	48 x 109	850	2	4300
900	52	132	126	52	58	48 x 122	940	2	4800
1000	52	145	139	52	58	48 x 135	1060	2	5200
1250	58	149	143	58	64	54 x 139	1380	2	5600
1500	58	174	168	58	64	54 x 164	1625	2	6000
1750	64	168	162	64	70	60 x 158	1935	3	7400
2000	64	185	179	64	70	60 x 175	2145	3	8100
2500	76	169	163	76	82	72 x 159	2800	3	8200
3000	76	197	191	76	82	72 x 187	3300	3	8300
3500	88	174	168	88	94	84 x 164	3935	6 FLG.	8900
4000	88	195	189	88	94	84 x 185	4440	6 FLG.	9800
4500	N/A	N/A	178	94	100	96 x 160	5015	6 FLG.	10700
5000	N/A	N/A	200	94	100	96 x 175	5485	6 FLG.	11600

Note: All dimensions are approximate and subject to change. Please reference the submittal drawing for actual dimensions. The tank selections above are shown for convenience. A full selection of storage capacities are available by entering the desired capacity into the model number.

* 80, 120 and 150 gallon tanks do not come equipped with a manway. Please consult factory if desired on these sizes.

Recovery Ratings and Amperage at Selected KW

KW INPUT	BTU/HR RATING	Gallons Per Hour (GPH) Heated At Various Temperature Rises					Amperage Rating At Various Voltages				
		60°FΔ	80°FΔ	100°FΔ	120°FΔ	140°FΔ	208V3Φ	240V3Φ	380V3Φ	415V3Φ	480V3Φ
15	51,195	103	77	62	51	44	42	36	23	21	18
20	68,260	137	103	82	68	59	56	48	30	28	24
25	85,325	171	128	103	85	73	69	60	38	35	30
30	102,390	205	154	123	103	88	83	72	46	42	36
35	119,455	239	179	144	120	103	97	84	53	49	42
40	136,520	273	205	164	137	117	111	96	61	56	48
45	153,585	308	231	185	154	132	125	108	68	63	54
50	170,650	342	256	205	171	146	139	120	76	70	60
55	187,715	376	282	226	188	161	153	132	84	77	66
60	204,780	410	308	246	205	176	167	145	91	84	72
65	221,845	444	333	267	222	190	181	157	99	91	78
70	238,910	478	359	287	239	205	195	169	106	97	84
75	255,975	513	384	308	256	220	208	181	114	104	90
80	273,040	547	410	328	273	234	222	193	122	111	96
85	290,105	581	436	349	290	249	236	205	129	118	102
90	307,170	615	461	369	308	264	250	217	137	125	108
95	324,235	649	487	390	325	278	264	229	145	132	114
100	341,300	683	513	410	342	293	278	241	152	139	120
110	375,430	752	564	451	376	322	306	265	167	153	132
120	409,560	820	615	492	410	351	333	289	183	167	145
125	426,625	854	641	513	427	366	347	301	190	174	151
150	511,950	1025	769	615	513	439	417	361	228	209	181
175	597,275	1196	897	718	598	513	486	421	266	244	211
200	682,600	1367	1025	820	683	586	556	482	304	279	241
225	767,925	1538	1153	923	769	659	625	542	342	313	271
250	853,250	1708	1281	1025	854	732	695	602	380	348	301
275	938,575	1879	1409	1128	940	805	764	662	418	383	331
300	1,023,900	2050	1538	1230	1025	879	834	723	456	418	361
325	1,109,225	2221	1666	1333	1110	952	903	783	494	453	391
350	1,194,550	2392	1794	1435	1196	1025	973	843	532	487	421
375	1,279,875	2563	1922	1538	1281	1098	1042	903	570	522	452
400	1,365,200	2733	2050	1640	1367	1171	1112	963	608	557	482
450	1,535,850	3075	2306	1845	1538	1318	1251	1084	685	627	542
500	1,706,500	3417	2563	2050	1708	1464	1390	1204	761	696	602
1000	3,412,000	6833	5125	4100	3417	2929	2779	2408	1521	1393	1204
1200	4,094,400	8200	6150	4920	4100	3514	3335	2890	1825	1671	1445
1400	4,776,800	9567	7175	5740	4783	4100	3891	3372	2130	1950	1686
1600	5,459,200	10933	8200	6560	5467	4686	4446	3854	2434	2229	1927

Notes:

1. The KW selections above are shown for convenience. A full selection of KW ratings from 15 to 1600 KW is available by entering the desired KW into the model number.
2. For alternative voltages, including 220, 277, 440, 460, 575 and 600 volt please consult factory for full KW selection.

Electrical

$$\frac{\text{KW} \times 1000}{\text{Volts}} \div 1.73 = \text{Amps } 3\Phi$$

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

Example: 150 KW at 480V 3Φ

$$\frac{150 \times 1000}{480} \div 1.73 = 180 \text{ Total Amp Draw}$$

180 ÷ 48 Amps max circuit rating = 3.75

Round up the number of circuits to 4

NOTE:
Each branch circuit is rated at a maximum of 48 Amps and each circuit is typically operated as an independent temperature step.

Model SH and H Sizing Information

Step 1

Variables To Solve For:

Solve for the unknown using the formulas stated below.

1. **KW Requirement:**

_____ GPH x _____ °F ΔT x 0.00244 = _____ KW

2. **Temperature Rise:**

_____ KW x 410 ÷ _____ GPH = _____ °F ΔT

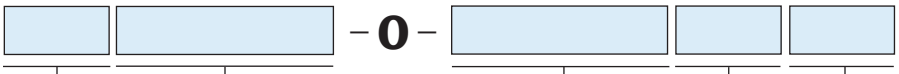
3. **Flow Rate:**

_____ KW x 410 ÷ _____ °F ΔT = _____ GPH

Metric Conversions

Liters x 0.2641 = Gallons	°F = (°C x 1.8) + 32	kPa x 0.1456 = psi
Gallons x 3.79 = Liters	°C = (°F - 32) x 0.556	Lbs x 0.4536 = Kg
Gallons x 0.003785 = m^3	psi x 0.06896 = Bar	Kg x 2.2 = Lbs
m^3 x 264.2 = Gallons	Bar x 14.5 = psi	Watts/Sq.Cm. x 6.4 = Watts/Sq.In.
1°C ΔT = 1.8°F ΔT	psi x 6.86 = kPa	Watts/Sq.In. x 0.155 = Watts/Sq.Cm.

Model SH and H Number Designation



Step 1
Model:
SH =
Vertical
H =
Horizontal

Step 2
Actual Storage Capacity:
80-5000 Gallons

Step 3
Lower KW:
5-1600 KW

Step 4
Vessel Type:
SL =
Cement Lined Steel
GL =
Phenolic Lined Steel
M =
Hot Dip Galvanized Steel
CN =
Solid 90/10 Copper-Nickel
SS =
Solid Stainless Steel
(specify Type 304 or 316L)

Step 5
Voltage/ Phase/Hz:
RS = 208-1-60
R = 208-3-60
S = 240-1-60
T = 240-3-60
W = 277-1-60
T3 = 380-3-50/60
T7 = 415-3-50/60
T5 = 440-3-60
T4 = 480-3-60
T6 = 600-3-60

Example: SH350-0-90SLT4

A vertical 350 gallon storage capacity water heater with a 90 KW heating element. Tank is cement lined. Power required is 480 VAC, 3 phase, 60 Hz.

Option Note

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

Master Specification: Model SH & H

JOB NAME _____ ENGINEER / ARCHITECT _____

REPRESENTATIVE _____ CONTRACTOR _____

General

Provide a quantity of _____ packaged type electric water heater(s) Model No. _____ as manufactured by HUBBELL The Electric Heater Co., Stratford, CT. The pressure vessel section, including the electrical control panel, shall be mounted on structural supports and be suitably insulated, jacketed, painted and provided with lifting lugs. The entire unit is to be packaged ready for plumbing and electrical service connections and shall bear the UL listing mark certifying the entire water heater.

Pressure Vessel

The pressure vessel shall be all welded construction and ASME Code Section IV stamped for a working pressure of 125 psi (☐ **Optional Specifications:** Select 100, 150, 160, _____ psi) and contain a minimum of _____ gallons of storage. The storage vessel shall be carbon steel and lined with seamless Hydrastone cement applied to a minimum thickness of $^{5}/_{8}$" on 100% of all interior tank surfaces (☐ **Optional Specifications:** Phenolic lined steel tank, Hot dipped galvanized steel tank, solid 90/10 copper-nickel tank, solid Type 304 or 316L stainless steel tank). The pressure vessel is to be completely covered with 2" thick energy conservation fiberglass blanket insulation (☐ **Optional Specification: Foam Insulation**) and enclosed in a heavy gauge galvanized steel metal jacket finished in gray hammertone enamel. The vessel shall be protected by an ASME approved automatic reseating combination temperature and pressure relief valve set at the tank working pressure and 210°F.

Recovery

The recovery section shall be rated at _____ KW which will heat _____ GPH of water at _____ °F rise (_____ °to _____ °F).

Electrical

The heater shall be designed to operate at _____ volts, _____ phase, _____ Hz, with a fused low voltage transformer providing 120 volt to all operating controls. The immersion heating element(s) shall be high quality copper sheathed (☐ **Optional Specifications:** Incoloy, Type 304 or 316 stainless steel Inconel) and sized to obtain the rated recovery. Each element circuit is to be independently operated through a definite purpose magnetic contactor having a resistive load rating equal to or exceeding the ampere rating of that particular circuit and shall be protected by individual power fuses rated at approximately 125% of the ampacity of the circuit. Multiple circuit elements shall be provided with a master terminal block for connecting of the incoming power feeds (☐ **Optional Specifications:** Built-in non-fused On/Off disconnect switch, Built-in circuit breaker with On/Off handle). A safety door interlock switch shall interrupt power to the control circuit when the control panel door is opened. The control thermostat shall be immersion type and shall be consistent with the recovery rate of the heating element as to the number of steps required. A hi-limit control with a manual reset button shall be factory installed to disconnect all ungrounded conductors to the heating element(s) in the event of an over-temperature condition in the storage section.

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

☐ **Option** _____

☐ **Option** _____

☐ **Option** _____

Warranty

Hubbell 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) 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 drawing.

ISO 9001:2008

Committed to continuous improvement...

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

Made in the U.S.A.

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info@hubbellheaters.com ■ ***www.hubbellheaters.com***