Hubbell™

MODEL ST

Packaged Steam Fired Water Heater

Utilizes Steam To Heat Domestic Water, Semi-Instantaneous or Storage Type Heaters

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**
  - √ Factory supplied with all steam controls saving time and money during installation
  - √ All steam operating controls are factory sized and selected to ensure reliable operation
- **Versatile**
  - √ Full range of styles, sizes, and optional features to meet your exact heating needs

Applications

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

NO GLASS LINING

Model STH
Storage Tank Type

The Model ST is a fully packaged steam fired storage water heater

ASME U

A Heavy Duty Steam Fired Storage Water Heater

The Model ST is a fully packaged steam fired 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 process water in an industrial application, you can select a Hubbell Model ST to do the job. When you specify and install a Hubbell ST 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 ⅝" 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 pressure vessel provides 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, 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.

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Model ST Storage Type Standard Equipment

Vessel Construction

1. All welded carbon steel vessel designed and built in strict accordance with the ASME Code Section VIII 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

Steam Operating Controls

1. Steam operating controls are factory selected, sized, piped and tested to ensure reliable operation
2. All steam components are factory plumbed with schedule 40 black iron pipe and ready for steam and condensate connections
3. High quality cast iron pilot operated steam control valve modulates the flow of steam through the heating coil to provide accurate water temperature control
4. Cast iron Y strainer with 20 Mesh screen protects the steam controls and coil from dirt and debris in the steam supply
5. Thermostatic drip trap removes condensate from the steam supply line
6. Heavy duty cast iron float and thermostatic main condensate trap for optimum efficiency
7. Brass vacuum breaker and dial steam pressure gauge

Steam Heating Coil

1. A high quality factory installed 2 pass U-Tube heating coil constructed from 18 gauge 3/4" O.D. single wall copper tubing designed for a maximum working pressure of 150 psi
2. All wetted parts are non-ferrous for maximum longevity
3. Heavy duty fabricated steel head with threaded NPT steam and condensate connections
4. Copper lined tube sheet
5. Please Reference HUBBELL brochure "Heating Coils" for detailed heating coil construction features

General

1. Heavy duty 3" thick fiberglass insulation covers 100% of the pressure vessel for maximum operating efficiency and minimal stand-by heat loss
2. Heavy gauge painted galvanized steel protective outer jacket
3. Heavy duty integrally welded steel supports for floor mounting
4. Full five (5) year Non Pro-Rated tank warranty and a one (1) year steam component warranty
5. ASME rated combination T&P relief valve set at the tank working pressure and 210°F

Model ST 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

Steam Heating Coil

- ☐ 4. Double wall tubing with a leak detection port
- ☐ 5. Alternate tubing material please specify: (Stainless Steel, 90/10 Copper-Nickel, Admiralty, Other)
- ☐ 6. Fabricated steam head constructed from: (Stainless Steel, Copper Alloy, Other)

General

- ☐ 7. Skid mounting on heavy duty all welded I Beam
- ☐ 8. Type 304 stainless steel protective jacket, please specify if painted
- ☐ 9. Manway 12" x 16" or Inspection Opening 3" NPT

Operating Controls

- ☐ 10. Steam controls can be factory selected and sized, but shipped loose for in the field installation by others
- ☐ 11. Various steam control valves are available to meet the specific needs of your application, please specify: Self-operated type, pneumatic operated, electronic operated, separate pressure reducing pilot type
- ☐ 12. Single solenoid safety system closes the steam supply to the control valve should the water temperature in the tank reach the hi-limit set point. Requires 120 volt 5 amp electrical service
- ☐ 13. A double solenoid safety system dumps over heated water in the storage tank to drain in addition to closing the steam supply to the control valve. Requires 120 volt 5 amp electrical service
- ☐ 14. Intra-tank circulation pump package continuously circulates water within the tank in order to reduce stratification. All bronze fractional HP pump
- ☐ 15. Anticipator control system forces incoming cold water over the control valve sensing bulb in order to begin heating water immediately
- ☐ 16. Dial water thermometer and pressure gauge factory installed in the tank
- ☐ 17. Factory wrapped and baffled steam coil with integral pump package

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Please note: *optional equipment may impact overall dimensions and weight. Please request submittal drawing from factory.*

Overall Dimensions, Models ST and STH

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	65	60	26	32	22 x 54	90	1.5	700
120*	28	75	68	28	34	24 x 64	140	1.5	900
150*	30	79	72	30	36	26 x 68	170	1.5	1100
175	36	73	67	36	44	30 x 63	195	1.5	1500
200	36	82	76	36	44	30 x 72	220	1.5	1700
225	36	89	83	36	44	30 x 79	245	1.5	1750
250	42	74	68	42	50	36 x 64	285	1.5	1850
275	42	80	74	42	50	36 x 70	310	1.5	2000
300	42	88	82	42	50	36 x 78	345	1.5	2180
325	42	92	86	42	50	36 x 82	360	1.5	2300
350	42	94	88	42	50	36 x 84	370	1.5	2500
375	48	81	75	48	56	42 x 71	425	1.5	2600
400	48	85	79	48	56	42 x 75	450	1.5	2700
425	48	88	82	48	56	42 x 78	470	1.5	2900
450	48	93	87	48	56	42 x 83	500	1.5	3000
475	54	79	73	54	62	48 x 69	540	2	3100
500	54	82	76	54	62	48 x 72	565	2	3225
525	54	85	79	54	62	48 x 75	590	2	3350
550	54	89	83	54	62	48 x 79	620	2	3400
575	54	93	87	54	62	48 x 83	650	2	3500
600	54	95	89	54	62	48 x 85	665	2	3650
700	54	107	101	54	62	48 x 97	755	2	4000
800	54	119	113	54	62	48 x 109	850	2	4300
900	54	132	126	54	62	48 x 122	940	2	4800
1000	54	145	139	54	62	48 x 135	1060	2	5200
1250	60	149	143	60	68	54 x 139	1380	2	5600
1500	60	174	168	60	68	54 x 164	1625	2	6000
1750	66	168	162	66	74	60 x 158	1935	3	7400
2000	66	185	179	66	74	60 x 175	2145	3	8100
2500	78	169	163	78	86	72 x 159	2800	3	8200
3000	78	197	191	78	86	72 x 187	3300	3	8300
3500	90	174	168	90	98	84 x 164	3935	6 FLG.	8900
4000	90	195	189	90	98	84 x 185	4440	6 FLG.	9800
4500	N/A	N/A	168	102	108	96 x 160	5015	6 FLG.	10700
5000	N/A	N/A	183	102	108	96 x 175	5485	6 FLG.	11600

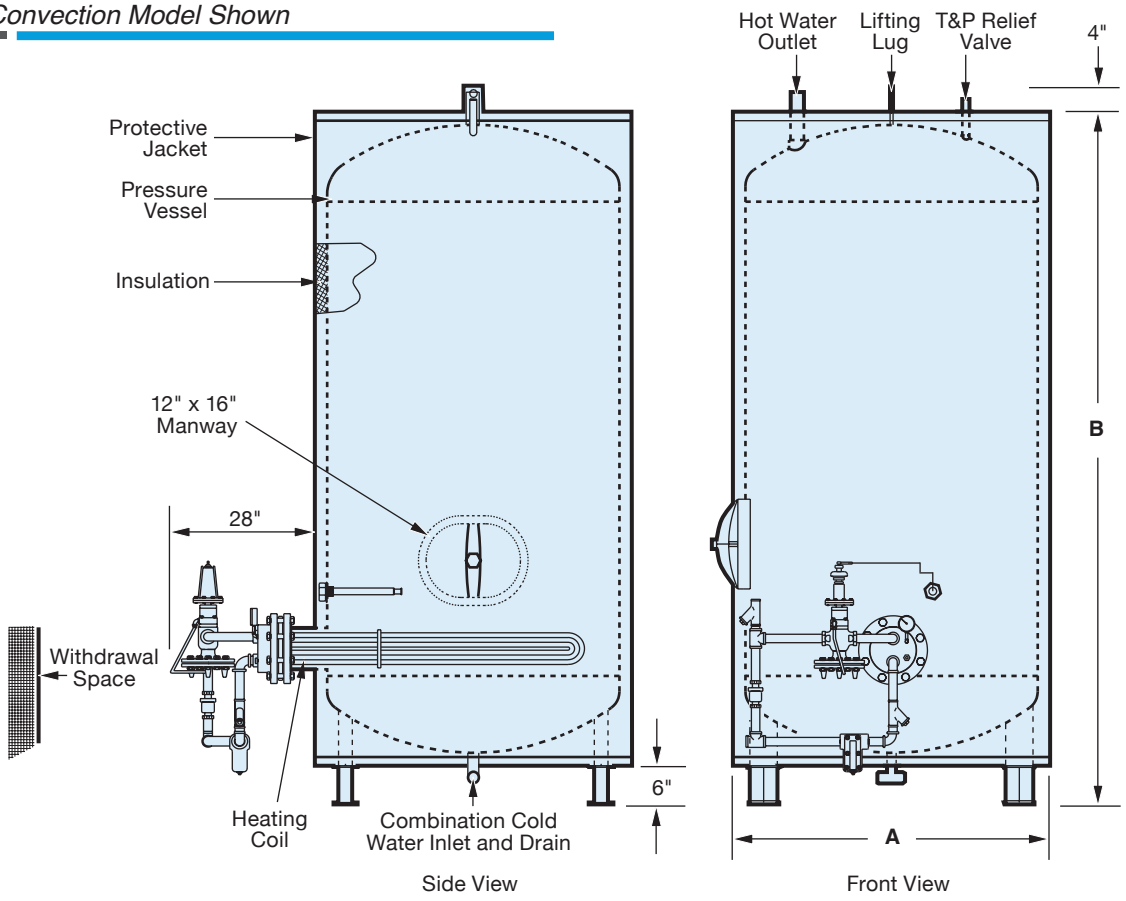
Note: All dimensions are approximate and subject to change. Please reference the submittal drawing for actual dimensions. The tank selections above are shown for convenience. A full selection of storage capacities is available by entering the desired capacity into the model number.

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

Outline Dimensions

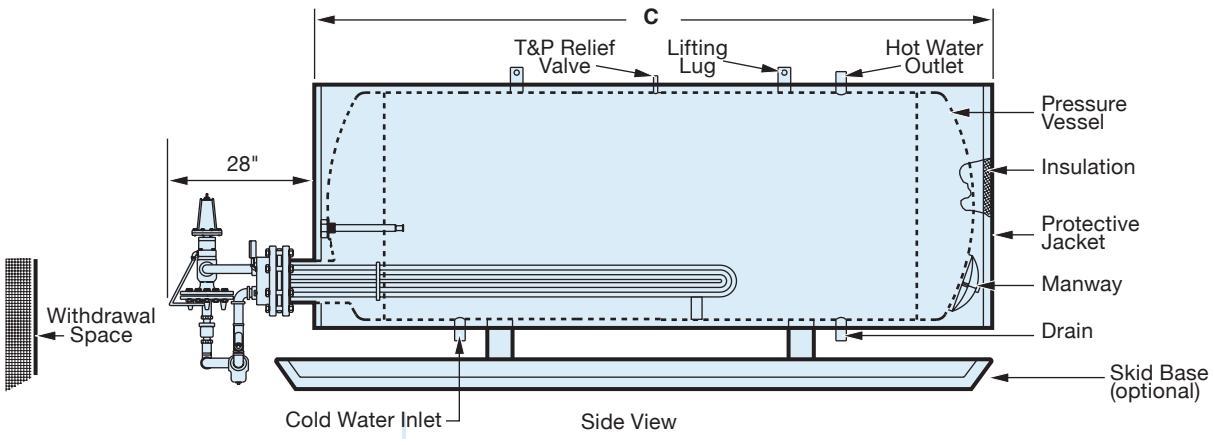
Model ST (Vertical)

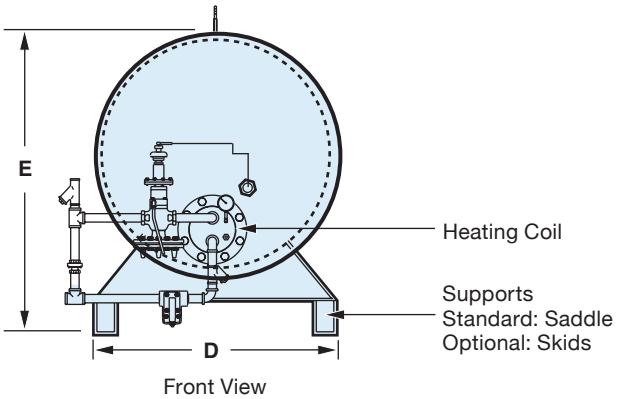
Convection Model Shown



Model STH (Horizontal)

Convection Model Shown





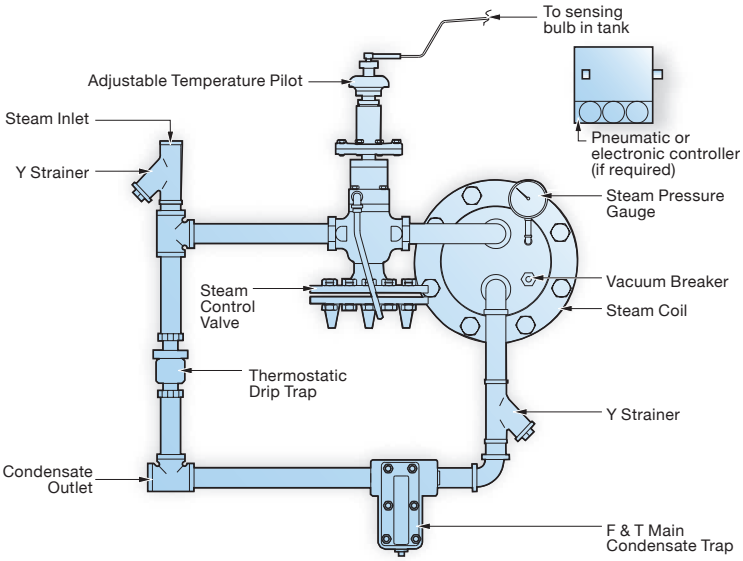
Steam Component General Configuration

The steam control valve maintains accurate water temperature in a steam fired water heater by regulating the flow of steam through the heating coil.

There are four types of steam control valves available for use on a steam fired storage water heater.

Self Operating

The valve design includes a bulb and capillary assembly charged with a thermally responsive vapor. The expansion/contraction of the vapor acts upon the valve bellows in order to control the flow of steam through the valve. No external power source is required for operation.



Pneumatically Operated

In this configuration the building air supply feeds a factory installed temperature controller which operates the steam control valve. The temperature controller sends a precise air signal to the steam control valve which adjusts the flow of steam into the heating coil. The temperature controller is fully adjustable from 50-250°F and requires 20 psi air at a maximum consumption of 0.5 SCFM.

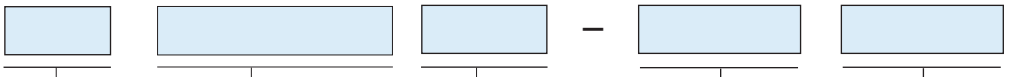
Pilot Operated

A pilot operated control valve is the most widely used type of valve for standard water heating applications. In this type of valve, a temperature pilot device utilizes steam to operate the main valve. No external power source is required other than steam. This is a highly dependable temperature control system which is suitable for most commercial and industrial applications. As an option, this valve may include a pressure reducing pilot which limits the steam pressure to a predetermined maximum.

Electronic Operated

This control valve is similar to a pneumatically operated system, except in this case the temperature controller is a PID digital display electronic temperature controller which outputs a 4-20mA signal to a compact motor mounted on the steam control valve in order to proportionally control the flow of steam to the heating coil. The temperature controller displays set point as well as actual water temperature and is available with an RS485 communications port for remote control.

Models ST and STH Number Designation



Step 1
Model:
ST= Vertical
STH = Horizontal

Step 2
Storage Capacity:
80-5000 Gallons

Step 3
Vessel Type:
SL = Cement Lined Steel
GL = Phenolic Lined Steel
M = Galvanized Steel
CN = Solid 90/10 Copper Nickel
SS = Solid Stainless Steel (specify Type 304 or 316L)

Step 4
Recovery Rating:
In GPH at 100°F ΔT

Step 5
Coil Type:
S = Single Wall
D = Double Wall

Example: ST600SL-1250

A vertically installed 600 gallon steam fired water heater with a cement lined steel storage tank rated to heat 1250 GPH at a 100°F temperature rise.

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 ST

JOB NAME _____ ENGINEER _____

REPRESENTATIVE _____ CONTRACTOR _____

GENERAL

Provide a quantity of _____ packaged type steam fired storage water heater(s) Model No. _____ as manufactured by HUBBELL Electric Heater Co., Stratford, CT. The pressure vessel 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 service connections.

PRESSURE VESSEL

The pressure vessel shall be all welded construction and ASME Code Section VIII stamped for a working pressure of 125 psi (☐ **Optional Specification:** _____ psi) and contain a minimum of _____ gallons of storage. The storage vessel shall be carbon steel and lined with seamless Hydrastone cement to a minimum thickness of 5⁄8" on 100% of all interior tank surfaces (☐ **Optional Specifications:** Phenolic lined steel tank, galvanized steel tank, solid Type 304 or 316L stainless steel tank, solid 90/10 Copper-nickel tank). The pressure vessel is to be insulated with 3" thick energy conservation fiberglass blanket 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.

HEATING SECTION

The heating coil shall be rated to heat _____ GPH from _____ °F to _____ °F when supplied with _____ PSI of steam to the control valve and consume _____ lbs/hour steam. The single wall (☐ **Optional Specification:** double wall) heating coil shall be constructed from 3⁄4" O.D. copper (☐ **Optional Specifications:** 90/10 Copper-nickel, admiralty, stainless steel) tubes with all non-ferrous wetted parts and fabricated steel head (☐ **Optional Specification:** Fabricated stainless steel head, fabricated copper-alloy head).

CONTROLS

The water heater shall (shall not) be supplied with steam operating controls. A cast iron pilot operated (☐ **Optional Specifications:** Pneumatic, self operating, electronic) type steam control valve shall regulate the flow of steam to the heating coil in order to control water temperature. A thermostatic drip trap, main F&T condensate trap, Y strainers, vacuum breaker and steam pressure gauge shall be factory sized and piped with the steam control valve.

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

☐ **Option** Domestic water dial temperature and pressure gauge shall be factory installed.

☐ **Option** The water heater shall be equipped with a factory packaged intra-tank circulator to constantly circulate water within the tank to reduce stratification.

☐ **Option** The heating coil shall be wrapped and baffled and piped with an integral pump package to force circulate water over the heating coil in order to reduce the coil size.

☐ **Option** Single solenoid safety system to close the steam supply to the heating coil should the water temperature in the tank reach the hi-limit set point. Requires 5 Amp, 120 Volt service.

☐ **Option** Double solenoid safety system dumps over heated water in the storage tank to drain in addition to closing the steam supply to the control valve. Requires 5 Amp, 120 Volt service.

WARRANTY

HUBBELL shall warranty all 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 a spare parts list and approved drawing.