

Thermodyne HX

Indirect-Fired, Semi-Instantaneous Steam & Boiler Water Heater

Compact Design

High Recovery

Energy Efficient

Copper Alloy Construction

Factory Packaged

ASME Constructed & Stamped

Integral Safety System



Thermodyne HX

The RECO USA Thermodyne HX series of semi-instantaneous water heaters is the choice where high recovery capacity is required and space is limited. Constructed of solid non-ferrous materials, the unit is engineered for exceptionally long life. Designed for continuous high peak loads, the HX systems are ideal for high demand applications such as hospitals or dormitories. Units are custom engineered using steam, boiler water or HTHW as the heating medium.

Thermodyne HX is supplied as a complete packaged system with components engineered to specific application requirements. The user simply needs to hook up water and utility connections in the field. RECO USA selects the correctly sized and matched components for optimal performance.

Semi-Instantaneous operation provides high output by channeling the incoming cold water directly over the tubes of the heat exchanger in a controlled manner maximizing the heat transfer rates when compared to conventional convection systems. Water is heated to the desired outlet temperature when it exits the Thermodyne HX outlet. By controlling the flow of water directly across the heat exchanger, velocity and pressure drops are controlled which increases heat transfer and inhibits scale formation. Quick response is achieved by locating the temperature sensing probe in the outlet flow of water exiting the system.

RECO USA Thermodyne HX systems are the perfect choice where high capacity is required and space is limited. The vertical configuration requires less than four square feet of floor space and the tube bundle can be removed downward from the bottom of the unit. No overhead space or extra clearances are required for service or maintenance. Horizontal configurations, with rack-mounted stands, are also available making the Thermodyne HX a perfect fit in any mechanical room.



Applications

Commercial Thermodyne HX capacity ranges are well suited for meeting the large hot water demands of hotels, apartment buildings, military barracks and hospitals. Typically utilized in facilities with a central energy source, the units are perfect choices for installation in smaller satellite equipment rooms. Units may be piped in parallel or series to provide additional capacity or emergency backup.

Institutional Thermodyne HX is widely used in facilities that exhibit high demand loads at varying intervals throughout the day. Dormitories, schools and correctional complexes exhibit strong sudden demands that are difficult for conventional convection heaters to sustain. Smaller units may be combined with storage tanks to ease the energy source requirements during minimal use periods.

Industrial Thermodyne HX is used for high demand process applications that require a continuous flow of hot water. Other uses such as equipment wash down and cafeteria needs are also served by this versatile system.

Construction RECO USA fabricates most units specifically to customer requirements. Stock systems are available for quick or emergency needs. All materials used in the construction of Thermodyne HX systems are CopperAlloy or 316 SS to assure long life and rust-free domestic water. Each unit is fabricated by skilled technicians certified to ASME Sect IX and inspected and stamped in accordance to ASME Sect VIII requirements. Working pressures up to 300 psig are available. The heat exchanger section is fabricated from copper, copper nickel single or double wall tubes as well as 316 SS for deionized water heating. Each heat transfer bundle is engineered to provide proper velocity and pressure drops while providing optimal heat transfer. The RECO USA Thermodyne HX will provide exceptional long life, dependability and ease of maintenance. Seismic rated construction is available to meet IBC and other codes.

Sizing

- 1) Determine the total fixture units for all fixtures in your project by using the Fixture/Unit Capacity Table below and the 400 Hotel Room example to the right.
- 2) Determine the demand GPM from the Hot Water Demand Curves shown below.
- 3) Select the proper size heater from the Steam to Water or Boiler Water to Water Selection Tables on the following pages. For HTHW sizing, contact your RECO USA representative.
- 4) Select the proper sized single wall heater to heat 103 GPM of water from 40°F to 140°F with steam in the tubes at 25 psig. From the Selection Table 2B, select a size 10024.

Example: 400 Room Hotel

Number of Fixtures	Type of Fixture	Fixture Unit	Demand Fixture Unit
400	Private Lavatory	0.75	300
20	Public Lavatory	1.0	200
40	Private Shower	1.5	60
370	Tub	1.5	556
20	Slop Sinks	2.5	50
Demand gpm from curve below: 103 gpm			Total Fixture Units: 986

Hot Water Demand Curves

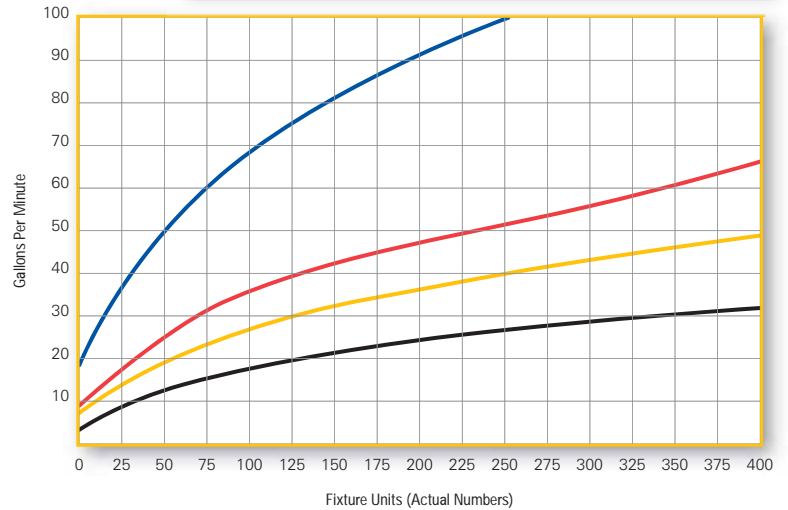
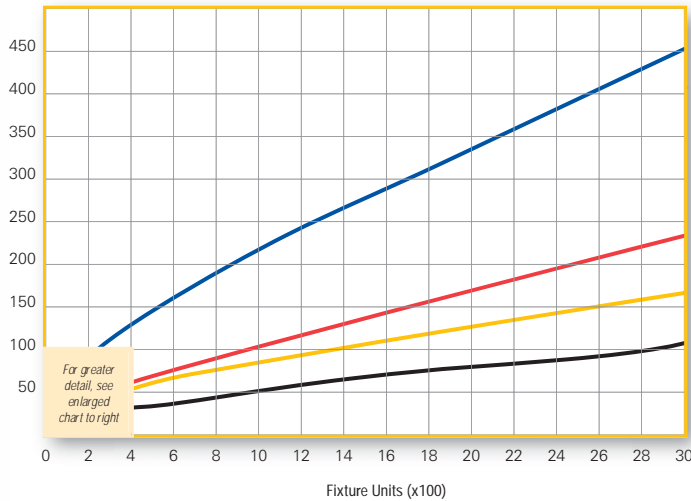


Table 1 — Fixture/Unit Capacities

Hot water demand per fixture unit, calculated at a final temperature of 140°F.

Fixture	Apartment House	Club	Gym	Hospital	Hotel	Industrial Plant	Office Building	School
Basin, Public Lavatory	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Basin, Public Lavatory	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Bathtubs	1.5	1.5		1.5	1.5			
Dishwashers	1.5							
Foot-Basins			1.2	1.2				
Kitchen Sink	0.75	1.5	1.5	3.0	1.5	3.0		2.5
Laundry, Stationary Tubs								2.0
Pantry Sink	1.5	2.5		2.5	2.5			2.5
Showers	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5
Slop Sink	1.5	1.5	1.5	2.5	2.5	2.5	2.5	2.5
Hydrotherapeutic Showers				8.0				
Hubbard Baths				4.0				
Leg Baths				3.0				
Arm Baths				4.0				
Sitz Baths				3.0				
Continuous-Flow Baths				4.0				
Circular Wash Sinks		2.5	2.0	2.5		4.0		2.5
Semicircular Wash Sinks		1.5	1.5	1.5		3.0		1.5

Select your Thermodyne HX Model

Use the listed tables and descriptions along with the following guide to identify the correct Thermodyne HX heating system to meet your exact needs. Note, the derived model number identifies selected features.

Model Selected: _____

STYLE	WORKING PRESSURE	TANK MATERIAL	COIL MODEL	TUBES	CONTROL	HEATING MEDIUM
HXV	150	C	12024	S	PN	S
HXV=Vertical HXH=Horizontal	125 Psig or 150 Psig	Copper Nickel=C Stainless Steel=S	Choose from Tables 2A - 5B to determine Heating Coil Model	Single Wall=S Double Wall=D (Copper is standard)	Electric=EL Pneumatic=PN Self Contained=SC	Steam=S Water=W

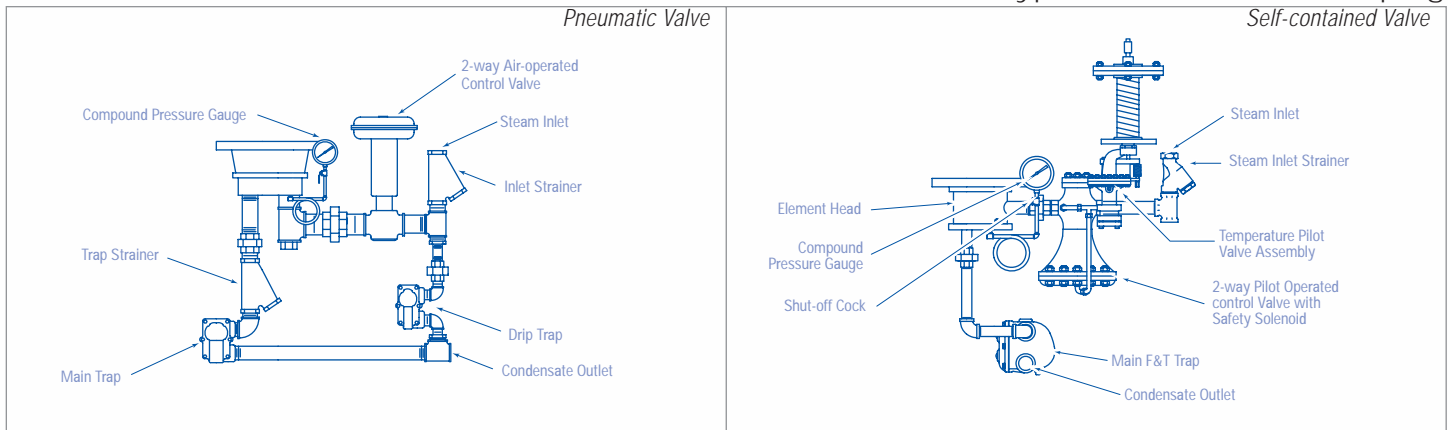
Example: Thermodyne HX model above is a copper-nickel construction, vertical unit with 150 psig working pressure. The 12024 model coil has single wall copper tubes and a pneumatic control system using steam as the heating medium.

Control Piping Diagrams

Typical Boiler Water Control Piping



Typical Steam Control Piping



Steam Selection Tables

Table 2A — Single Wall Steam Water Heater Sizing

							40 – 120°F
G.P.M.	5 / 2*	10 / 5*	15 / 10*	25 / 15*	50 / 25*	75 / 40*	B.T.U. / HR.
10	05030	05024	04036	04036	04030	04030	400,000
15	06024	05030	05030	05024	04036	04036	600,000
20	06024	06024	05030	05030	05030	04036	800,000
25	06024	06024	06024	06024	05030	05024	1,000,000
30	08024	06024	06024	06024	05030	05030	1,200,000
40	08024	08024	08024	06024	06024	05030	1,600,000
50	10024	08024	08024	08024	06024	06024	2,000,000
60	10024	10024	08024	08024	08024	06024	2,400,000
70	10024	10024	10024	08024	08024	06024	2,800,000
80	10024	10024	10024	10024	08024	08024	3,200,000
100	12024	12024	10024	10024	08024	08024	4,000,000
125	14024	12024	12024	10024	10024	08024	5,000,000
150	16024	14024	12024	12024	10024	10024	6,000,000
175	16024	16024	14024	12024	10024	10024	7,000,000

*Steam Pressure In Lines / Steam Pressure In Tubes

Table 2B — Single Wall Steam Water Heater Sizing

							40 – 140°F
G.P.M.	5 / 2*	10 / 5*	15 / 10*	25 / 15*	50 / 25*	75 / 40*	B.T.U. / HR.
10	05036	05036	05030	05030	05030	04036	500,000
15	06030	06024	05036	05036	05030	05030	750,000
20	06030	06030	06024	06024	05030	05030	1,000,000
25	08024	08024	06030	06024	05036	05030	1,250,000
30	08024	08024	08024	06030	06024	05036	1,500,000
40	10024	08024	08024	08024	06030	06024	2,000,000
50	10024	10024	08024	08024	08024	06030	2,500,000
60	10024	10024	10024	08024	08024	08024	3,000,000
70	12024	10024	10024	10024	08024	08024	3,500,000
80	12024	12024	10024	10024	08024	08024	4,000,000
100	14024	12024	12024	10024	10024	08024	5,000,000
125	16024	14024	12024	12024	10024	10024	6,250,000
150	—	16024	14024	12024	12024	10024	7,500,000
175	—	—	16024	14024	12024	10024	8,750,000

*Steam Pressure In Lines / Steam Pressure In Tubes

Steam Selection Tables (cont.)

Table 3A — Double Wall Steam Water Heater Sizing

40 – 120° F							
G.P.M.	5 / 2*	10 / 5*	15 / 10*	25 / 15*	50 / 25*	75 / 40*	B.T.U. / HR.
10	06030	06030	06030	05036	05036	05030	400,000
15	06036	06030	06030	06030	06030	05036	600,000
20	08024	06036	06030	06030	06030	06030	800,000
25	08030	08024	06036	06036	06030	06030	1,000,000
30	08030	08030	08024	06036	06030	06030	1,200,000
40	10024	08030	08030	08024	06036	06030	1,600,000
50	10024	10024	08030	08030	08024	06036	2,000,000
60	12024	10024	10024	08030	08030	08024	2,400,000
70	12024	12024	10024	10024	08030	08030	2,800,000
80	12024	12024	10024	10024	10024	08030	3,200,000
100	14024	12024	12024	12024	10024	08030	4,000,000
125	16024	16024	14024	12024	10030	10024	5,000,000
150	—	16030	14024	14024	12024	10030	6,000,000
175	—	—	16030	14030	12024	12024	7,000,000

*Steam Pressure In Lines / Steam Pressure In Tubes

Table 3B — Double Wall Steam Water Heater Sizing

40 – 140° F							
G.P.M.	5 / 2*	10 / 5*	15 / 10*	25 / 15*	50 / 25*	75 / 40*	B.T.U. / HR.
10	06036	06036	06036	06030	06030	06030	500,000
15	08030	08030	06036	06036	06030	06030	750,000
20	08030	08030	08030	06036	06036	06030	1,000,000
25	08036	08030	08030	08030	06036	06036	1,250,000
30	10030	08036	08030	08030	08030	06036	1,500,000
40	10030	10030	08036	08030	08030	08030	2,000,000
50	12024	10030	10030	10030	08030	08030	2,500,000
60	12030	12024	10030	10030	08036	08030	3,000,000
70	12030	12030	12024	10030	10030	08036	3,500,000
80	14030	12030	12030	12024	10030	08036	4,000,000
100	16024	16024	12030	12024	10030	10030	5,000,000
125	—	16024	16024	14024	12030	10030	6,250,000
150	—	—	16030	16030	12030	12030	7,500,000
175	—	—	—	16030	14030	12030	8,750,000

*Steam Pressure In Lines / Steam Pressure In Tubes

Boiler Selection Tables

Table 4A — Single Wall Boiler Water Heater Sizing

40 – 120 °F

G.P.M.	BOILER WATER 180 – 160 °F			BOILER WATER 200 – 180 °F			B.T.U. / HR.
	PASS	BW G.P.M.	MODEL	PASS	BW G.P.M.	MODEL	
10	2	41	06036	2	41	06024	400,000
15	2	61	06036	2	61	06030	600,000
20	2	82	08030	2	82	08024	800,000
25	2	102	08030	2	102	08024	1,000,000
30	2	123	08030	2	123	08024	1,200,000
40	2	164	10024	2	164	10024	1,600,000
50	2	205	10024	2	205	10024	2,000,000
60	2	246	12024	2	246	12024	2,400,000
70	2	287	12024	2	287	12024	2,800,000
80	2	327	12024	2	327	12024	3,200,000
100	2	409	14024	2	409	14024	4,000,000
125	2	512	16030	2	512	16030	5,000,000

Table 4B — Single Wall Boiler Water Heater Sizing

40 – 140 °F

G.P.M.	BOILER WATER 180 – 160 °F			BOILER WATER 200 – 180 °F			B.T.U. / HR.
	PASS	BW G.P.M.	MODEL	PASS	BW G.P.M.	MODEL	
10	2	51	08030	2	51	06030	500,000
15	2	76	08036	2	76	08024	750,000
20	2	102	08036	2	102	08030	1,000,000
25	2	128	10030	2	128	08030	1,250,000
30	2	153	10030	2	153	10024	1,500,000
40	2	204	10036	2	204	10024	2,000,000
50	2	255	12030	2	255	12024	2,500,000
60	2	306	12030	2	306	12024	3,000,000
70	2	357	12030	2	357	12024	3,500,000
80	2	409	14030	2	409	14024	4,000,000
100	2	511	16030	2	511	16030	5,000,000

Boiler Selection Tables (cont.)

40 – 120 °F

Table 5A — Double Wall Boiler Water Heater Sizing

G.P.M.	BOILER WATER 180 – 160 °F			BOILER WATER 200 – 180 °F			B.T.U. / HR.
	PASS	BW G.P.M.	MODEL	PASS	BW G.P.M.	MODEL	
10	2	41	08036	2	41	06036	400,000
15	2	61	08036	2	61	08030	600,000
20	2	82	10030	2	82	08030	800,000
25	2	102	10036	2	102	08036	1,000,000
30	2	123	10036	2	123	10030	1,200,000
40	2	164	10036	2	164	10030	1,600,000
50	2	205	12030	2	205	12024	2,000,000
60	2	246	12036	2	246	12030	2,400,000
70	2	287	12036	2	287	12030	2,800,000
80	2	327	14036	2	327	14030	3,200,000
100	2	409	16030	2	409	16024	4,000,000

40 – 140 °F

Table 5B — Double Wall Boiler Water Heater Sizing

G.P.M.	BOILER WATER 180 – 160 °F			BOILER WATER 200 – 180 °F			B.T.U. / HR.
	PASS	BW G.P.M.	MODEL	PASS	BW G.P.M.	MODEL	
10	2	51	1036	2	51	836	500,000
15	2	76	1230	2	76	1030	750,000
20	2	102	1236	2	102	1030	1,000,000
25	2	128	1236	2	128	1036	1,250,000
30	2	153	1436	2	153	1036	1,500,000
40	2	204	1436	2	204	1230	2,000,000
50	2	255	1636	2	255	1236	2,500,000
60	2	306	1636	2	306	1430	3,000,000
70	2	357	—	2	357	1436	3,500,000
80	2	409	—	2	409	1630	4,000,000

Vertical Configuration

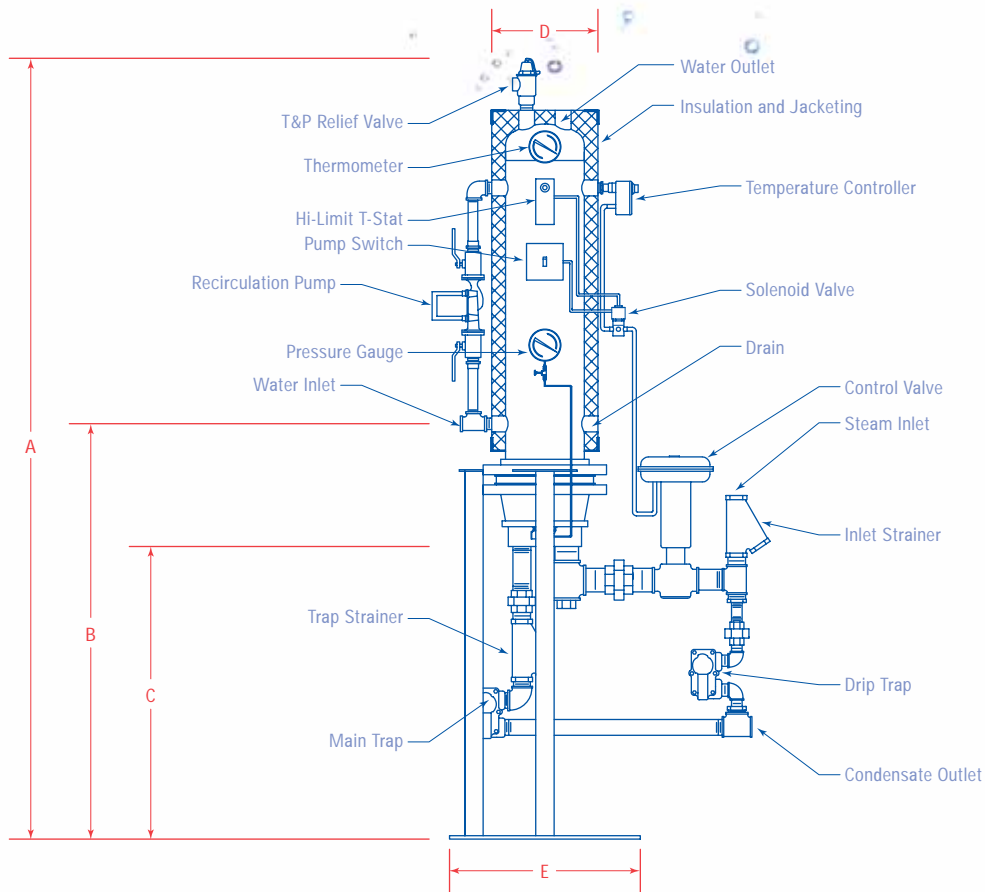


Table 6 — Vertical Tank Dimensions (in inches)

Additional sizes are available. Please contact your Sales Representative for information.

MODEL	Dimension A	Dimension B	Dimension C	Dimension D	Dimension E
HXV150C 04024	74.5	34	24	10.5	16.75
HXV150C 04030	86.5	40	30	10.5	16.75
HXV150C 04036	98.5	46	36	10.5	16.75
HXV150C 05024	75	34	23	11.625	17.75
HXV150C 05030	87	40	29	11.625	17.75
HXV150C 05036	99	46	35	11.625	17.75
HXV150C 06024	75.5	34	23	12.625	18.75
HXV150C 06030	87.5	40	29	12.625	18.75
HXV150C 06036	99.5	46	35	12.625	18.75
HXV150C 08024	76	35	22	14.625	21
HXV150C 08030	88	41	28	14.625	21
HXV150C 08036	100	47	34	14.625	21
HXV150C 10024	77	35	22	16.75	23
HXV150C 10030	89	41	28	16.75	23
HXV150C 10036	101	47	34	16.75	23
HXV150C 12024	78	36	21	18.75	25
HXV150C 12030	90	42	27	18.75	25
HXV150C 12036	102	48	33	18.75	25
HXV150C 14024	84	37	27	20	26.625
HXV150C 14030	96	43	33	20	26.625
HXV150C 14036	108	49	39	20	26.625
HXV150C 16024	87	37.5	27	22	31
HXV150C 16030	99	43.5	33	22	31
HXV150C 16036	111	49.5	39	22	31

Horizontal Configuration

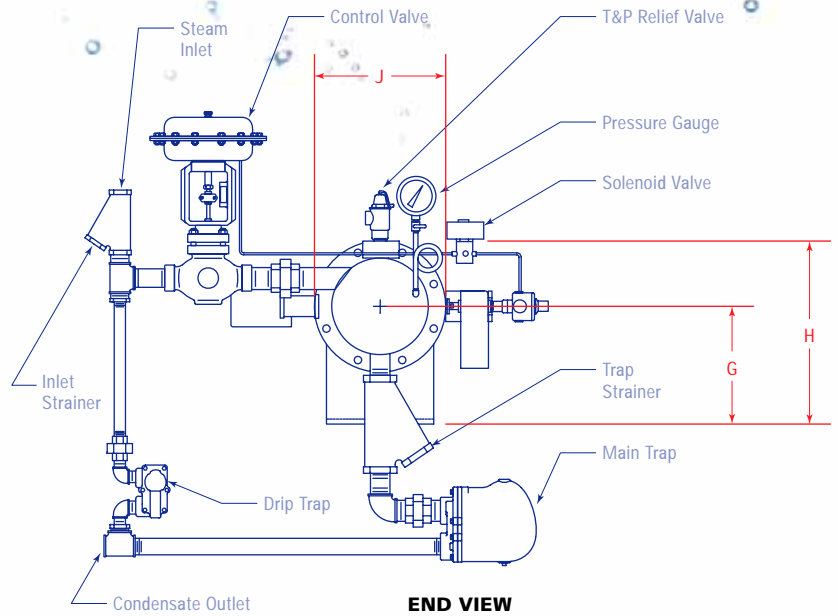
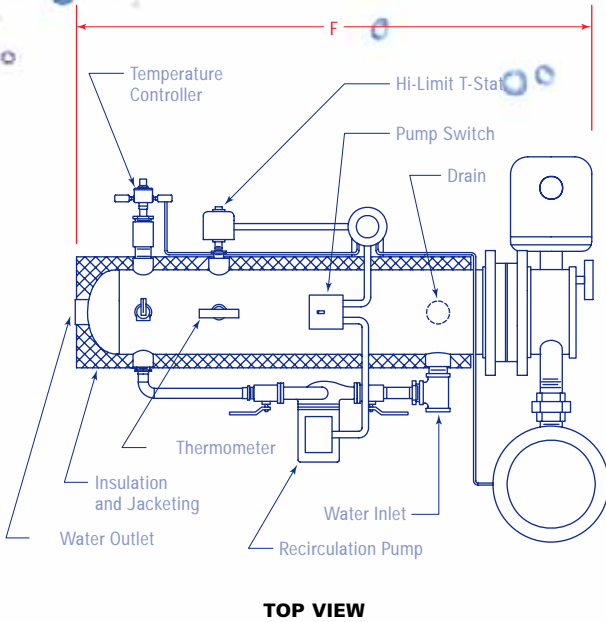


Table 7 — Horizontal Tank Dimensions (in inches)
 Additional sizes are available. Please contact your Sales Representative for information.

MODEL	Dimension F	Dimension G	Dimension H	Dimension J
HXV150C 04024	42	16.5	21.75	10.5
HXV150C 04030	48	16.5	21.75	10.5
HXV150C 04036	54	16.5	21.75	10.5
HXV150C 05024	43	17	22.875	11.625
HXV150C 05030	49	17	22.875	11.625
HXV150C 05036	55	17	22.875	11.625
HXV150C 06024	44	17.5	23.875	12.625
HXV150C 06030	50	17.5	23.875	12.625
HXV150C 06036	56	17.5	23.875	12.625
HXV150C 08024	46	18.75	26.125	14.625
HXV150C 08030	52	18.75	26.125	14.625
HXV150C 08036	58	18.75	26.125	14.625
HXV150C 10024	48	20	28.375	16.75
HXV150C 10030	54	20	28.375	16.75
HXV150C 10036	60	20	28.375	16.75
HXV150C 12024	50	21.5	31	19
HXV150C 12030	56	21.5	31	19
HXV150C 12036	62	21.5	31	19
HXV150C 14024	56	22.5	33	21
HXV150C 14030	62	22.5	33	21
HXV150C 14036	68	22.5	33	21
HXV150C 16024	60	23.75	35.5	23.5
HXV150C 16030	66	23.75	35.5	23.5
HXV150C 16036	72	23.75	35.5	23.5

Steam to Water

Furnish and install where indicated on the plans _____ factory packaged RECO USA Thermodyne HX semi instantaneous water heater, model _____. The shell section shall be constructed with solid 90/10 copper-nickel material. Copper lined or stainless steel will not be accepted. Vessel will be stamped for 150 PSI under Section VIII of the ASME Code. Manufacturer's data report and U-1 forms shall be furnished to the owner. No overhead clearance shall be required for servicing or removing the heating element. Each heater shall be designed to heat _____ G.P.M. of domestic water from _____ to _____ degrees F when supplied with _____ PSI steam to the control valve.

The heating element shall be fabricated with _____ (single or double) wall _____ (copper or 90/10 copper-nickel) tubes, non-ferrous baffles and a copper-lined tubesheet. The heater shall have its temperature control bulb located for direct sensing of water. Each heater shall be factory packaged with the following components:

- Vessel shall be solid copper nickel.
- Modulating steam control valve shall be _____ (Pneumatic, Electric or Self-Contained). Solenoid control valves will not be accepted.
- Main steam strainer & main F&T trap.
- Condensate strainer with drip trap and associated piping.
- All bronze integral circulating pump with copper piping and isolation valves.
- Direct mounted steam pressure and thermometer gauges.
- High limit _____ (single or double) safety system.
- ASME rated temperature and pressure relief valve.
- 3" insulation with an enamel finish metal jacket.
- Supports.

Water to Water

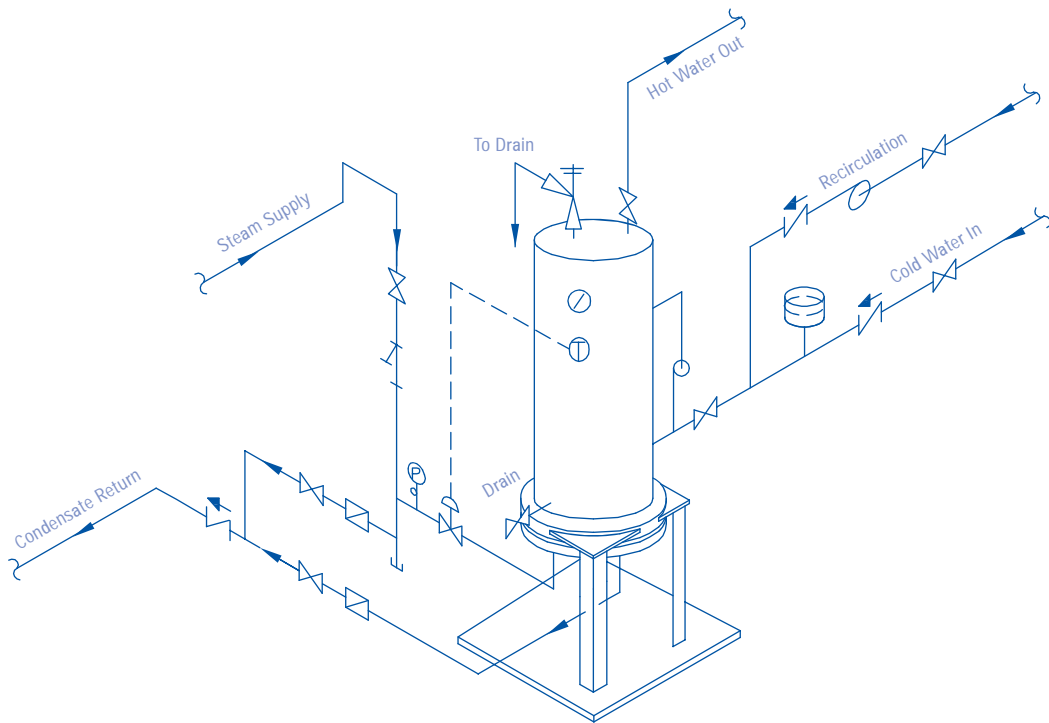
Furnish and install where indicated on the plans _____ factory packaged RECO USA Thermodyne HX semi instantaneous water heater, model _____. The shell section shall be constructed with solid 90/10 copper-nickel material. Copper lined or stainless steel will not be accepted. Vessel will be stamped for 150 PSI under Section VIII of the ASME Code. Manufacturer's data report and U-1 forms shall be furnish to the owner. No overhead clearance shall be required for servicing or removing the heating element. Each heater shall be designed to heat _____ G.P.M. of domestic water from _____ to _____ degrees F when supplied with _____ GPM of boiler water at _____ degrees F.

The heating element shall be fabricated with _____ (single or double) wall _____ (copper or 90/10 copper-nickel) tubes, non-ferrous baffles and a copper-lined tubesheet. The heater shall have its temperature control bulb located for direct sensing of water. Each heater shall be factory packaged with the following components:

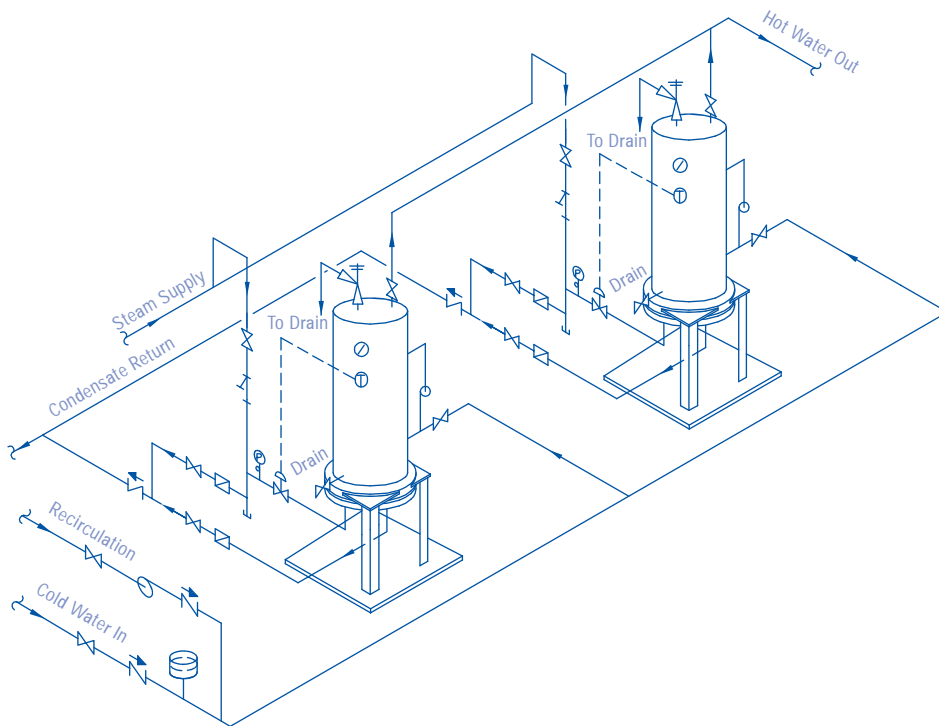
- Vessel shall be solid copper nickel.
- Modulating control valve shall be _____ (2-way or 3 way) _____ (Pneumatic or Electric). Solenoid control valves will not be accepted.
- All bronze integral circulating pump with copper piping and isolation valves.
- Direct mounted boiler water and thermometer gauges.
- High limit _____ (single or double) safety system.
- ASME rated temperature and pressure relief valve.
- 3" insulation with an enamel finish metal jacket.
- Supports.

Piping Layouts

Steam Water Heater Single Unit



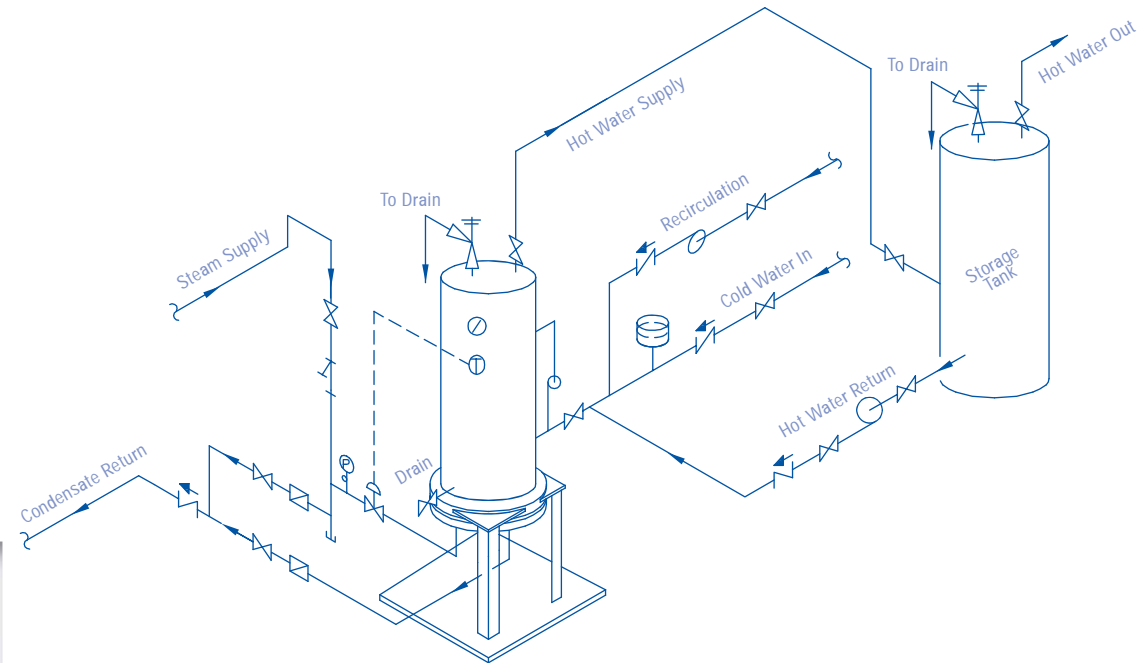
Steam Water Heater Dual Units



LEGEND

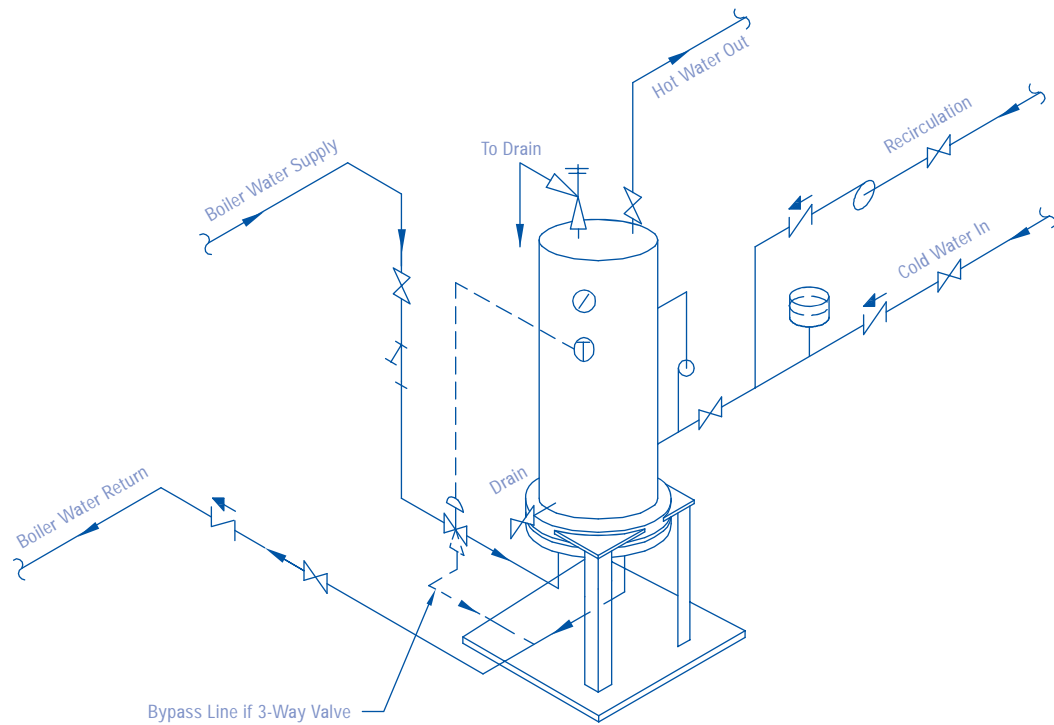


Steam Water Heater Single Unit with Storage Tank



- Strainer
- Stop Valve
- Check Valve
- Control Valve
- Relief Valve
- Thermal Element
- Pressure Gauge
- Temperature Gauge
- Steam Trap
- Circulator
- Expansion Tank

Boiler Water Heater Single Unit



Additional Products

- Storage Tanks
- Storage Heaters
- Air Receivers
- Expansion Tanks
- Hydro Pneumatic Tanks

- Fire Protection Tanks
- Flash tanks
- Blow Down Tanks
- Replacement Tube Bundles



RECO USA is a leading North American manufacturer of water heating and storage products for the commercial, institutional, and industrial markets. More than 90 years experience, unsurpassed quality control, and innovative technologies have resulted in products that exceed the toughest, day-to-day demands. RECO USA is headquartered in West Columbia, South Carolina, U.S.A. and its products are represented by an extensive team of factory-trained sales representatives throughout the United States and Canada.



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