

Tank Heating Units For Immersion Heating with Steam or Water

Standard Construction

- 20 ga Copper
- Cast Iron Head
- Carbon Steel Tube Sheet
- Carbon Steel Flange
- Brass Tube Supports

Optional Construction

- 90-10 Cupro Nickel
- Stainless Steel
- Double Wall Construction



You Must Know:

1. Heating Source (Steam or Water)
2. Temperature Rise Required
3. Recovery Required (In Gallons Per Hour)
4. Diameter (Vertical Tank) or Length (Horizontal Tank)

Standard Design Pressures

Tube Bundle Diameter	Design Pressure	Test Pressure
4"	150 PSI	300 PSI
6"	150 PSI	300 PSI
8"	150 PSI	300 PSI
10"	125 PSI	250 PSI
12"	125 PSI	250 PSI
14"	125 PSI	250 PSI

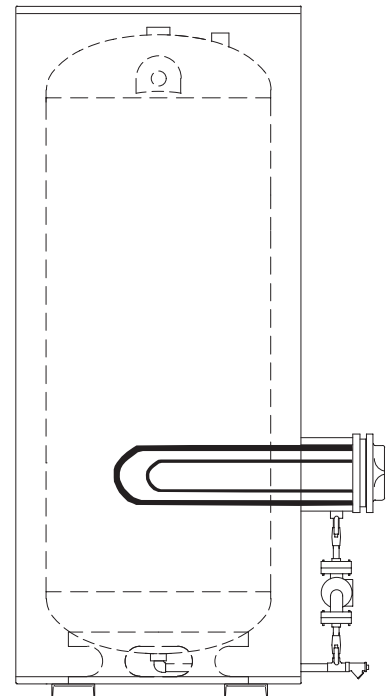
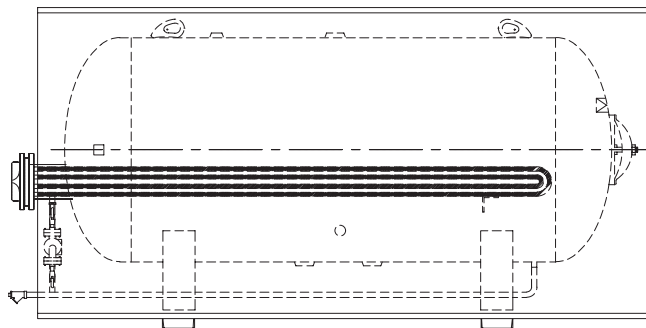
Max. Boiler Water Flow

Pumped circulation in LTW unit.

Heater Diameter	Boiler Water Flow
4"	27 GPM
6"	69 GPM
8"	135 GPM
10"	260 GPM
12"	375 GPM
14"	510 GPM

Typical Installations

Typical tube bundle installation for horizontal and vertical tube bundle configurations. For more information regarding standard Hot Water Generator construction consult factory.



Table

Tank Water Temp. Rise (°F) From To		Pumped Boiler Water Inlet Temperature (°F)				Steam Pressure at Heater (PSIG)									
		20°F ΔT			40°F ΔT	0	2	5	10	15	25	50	75	100	
100	100	2.33	2.87	3.10	3.36	3.12	3.80	4.12	4.24	4.50	4.78	5.25	5.95	6.88	7.70
	120	1.54	1.94	2.11	2.30	2.11	2.84	3.08	3.17	3.37	3.58	3.92	4.45	5.15	5.75
	40 140	1.00	1.20	1.50	1.64	1.49	2.28	2.40	2.48	2.73	2.91	3.25	3.90	4.32	4.55
	160	0.57	0.91	1.07	1.21	1.05	1.63	1.78	1.91	2.08	2.28	2.54	3.03	3.45	3.67
	180	---	0.55	0.70	0.85	0.68	1.19	1.30	1.47	1.75	1.82	2.05	2.54	2.84	3.06
200	---	---	---	0.52	---	0.75	0.87	1.09	1.30	1.39	1.61	2.05	2.35	2.56	
50	100	2.73	3.33	3.60	3.92	3.61	4.59	4.78	4.98	5.66	5.85	6.52	7.84	8.68	9.10
	120	1.67	2.12	2.34	2.55	2.36	3.27	3.41	3.55	4.03	4.17	4.65	5.58	6.18	6.50
	40 140	1.06	1.43	1.49	1.77	1.55	2.54	2.65	2.76	3.13	3.24	3.61	4.33	4.80	5.05
	160	0.57	0.95	1.11	1.26	1.10	1.82	1.98	2.04	2.31	2.42	2.74	3.34	3.76	3.92
	180	---	0.58	0.73	0.88	0.70	1.24	1.40	1.51	1.78	1.94	2.18	2.69	2.96	3.18
200	---	---	---	0.53	---	0.80	0.93	1.16	1.38	1.48	1.72	2.19	2.51	2.73	
60	100	3.26	4.00	4.38	4.74	4.33	5.78	5.98	6.22	7.07	7.30	8.15	9.80	10.85	11.40
	120	1.85	2.40	2.63	2.88	2.61	3.80	3.97	4.14	4.71	4.85	5.42	6.50	7.20	7.56
	40 140	1.13	1.54	1.74	1.93	1.71	2.84	2.96	3.08	3.50	3.62	4.03	4.83	5.35	5.62
	160	0.60	0.99	1.17	1.32	1.16	2.00	2.18	2.25	2.54	2.66	2.90	3.68	4.13	4.31
	180	---	0.56	0.76	0.91	0.72	1.29	1.51	1.62	1.88	1.99	2.35	2.85	3.13	3.50
200	---	---	---	0.54	---	0.85	1.00	1.24	1.48	1.58	1.84	2.35	2.68	2.93	

The above table is for selection of a single wall copper tube heat exchangers in a circulated tank.
For selecting a heat exchanger outside these design parameters, consult the factory.

Capacity Factor

The capacity factor is 1.00 for pumped boiler water entering at 180°F and heating tank water from 40°F to 140°F. To select a tank heater for other temperature combinations use the corresponding capacity factor from the Selection table. Divide the required tank water capacity in GPH by the capacity factor to determine the correct tank heater to select from the 180°F Pumped column on the Dimension and Sizes table. Choose a tank heater with a capacity equal to or greater than calculated.

Example: Select a tank heater to raise the temperature of 2,000 GPH from 40°F to 180°F with steam entering the tank heater at 50 psig.

- (A) Use a capacity factor of 2.54 from the Selection table.
- (B) Divide 2,000 by 2.54
 $2,000 \text{ GPH} \div 2.54 = 788 \text{ GPH}$
- (C) Under the 180°F Pumped column of the Dimension and Sizes table the first available tank heater that will meet the GPH requirements is LTS872. An alternate, shorter, tank heater that meets the GPH requirements is LTS1036.

Note: It is usually desirable to select a tank heater with a length that is at least ½ the length of the tank in which it is to be installed.

Boiler Water Minimum Pumping Rate

Boiler water minimum pumping rate is determined by multiplying the required water capacity in GPH by the required temperature rise (°F) and dividing by ΔT of the boiler water multiplied by 60 minutes/hour.

Example: Heating 2,000 GPH of tank water from 40°F to 160°F with boiler water entering at 200°F and exiting at 180°F requires a pump rate of 200 GPM.

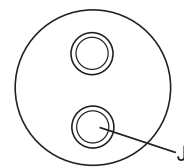
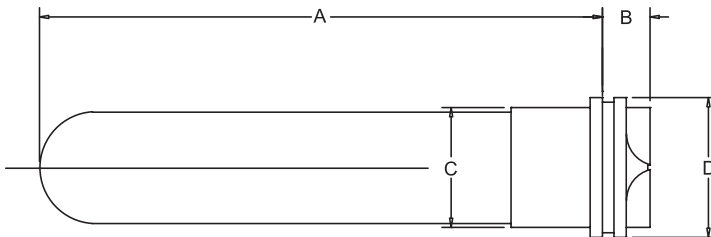
$$\frac{2,000 \text{ GPH} \times (160^\circ\text{F} - 40^\circ\text{F})}{60 \text{ Min/Hr.} \times (200^\circ\text{F} - 180^\circ\text{F})} = 200 \text{ GPM}$$

Dimensions

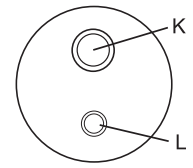
Model No. LTW or LTS	GPH for 40°F to 140°F w/ 180°F Pumped	A	B	C	D	J	K	L	Weight	Heating Surface Sq. Ft.
Four Inch Diameter										
412	32	12"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	29	1.5
418	48	18"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	30	2.3
424	64	24"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	32	3.1
430	80	30"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	33	3.9
436	96	36"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	35	4.7
448	128	48"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	38	6.2
460	158	60"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	41	7.8
472	186	72"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	44	9.4
484	232	84"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	47	10.9
496	280	96"	2-3/4"	4-1/2"	7-1/4"	1-1/4"	1-1/4"	3/4"	50	12.5
Six Inch Diameter										
612	77	11-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	51	3.5
618	108	17-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	56	5.4
624	138	23-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	61	7.6
630	170	29-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	66	9.4
636	198	35-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	71	11.5
648	262	47-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	81	15.3
660	324	59-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	91	19.3
672	384	71-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	101	23.1
684	450	83-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	111	27.1
696	510	95-1/4"	3-1/2"	6-3/4"	10-1/2"	2"	2"	1"	121	31.0
Eight Inch Diameter										
824	279	24"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	109	15.0
830	353	30"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	117	19.0
836	427	36"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	127	23.0
842	500	42"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	137	27.0
848	560	48"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	147	31.0
860	655	60"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	167	38.0
872	805	72"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	187	46.0
884	930	84"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	207	54.0
896	1070	96"	4-1/4"	8-3/4"	12-1/2"	3"	3"	1-1/4"	227	62.0
Ten Inch Diameter										
1030	690	30"	5"	10-3/4"	14-3/4"	4"	4"	2"	209	35.5
1036	820	36"	5"	10-3/4"	14-3/4"	4"	4"	2"	220	43.0
1042	966	42"	5"	10-3/4"	14-3/4"	4"	4"	2"	231	50.5
1048	1120	48"	5"	10-3/4"	14-3/4"	4"	4"	2"	242	58.0
1060	1398	60"	5"	10-3/4"	14-3/4"	4"	4"	2"	264	73.0
1072	1670	72"	5"	10-3/4"	14-3/4"	4"	4"	2"	286	88.0
1084	1910	84"	5"	10-3/4"	14-3/4"	4"	4"	2"	308	102.0
1096	2190	96"	5"	10-3/4"	14-3/4"	4"	4"	2"	330	117.0
10108	2460	108"	5"	10-3/4"	14-3/4"	4"	4"	2"	352	132.0

Dimensions (Continued)

Model No. LTW or LTS	GPH for 40°F to 140°F w/ 180°F Pumped	A	B	C	D	J	K	L	Weight	Heating
										Surface
Twelve Inch Diameter										
1236	1136	36"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	297	61.0
1242	1338	42"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	321	72.0
1248	1540	48"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	345	83.0
1254	1742	54"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	369	94.0
1260	1944	60"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	393	104.0
1272	2348	72"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	441	126.0
1284	2752	84"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	489	147.0
1296	3156	96"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	537	169.0
12108	3560	108"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	585	191.0
12120	3964	120"	5-3/4"	12-3/4"	16-3/4"	4"	4"	2"	633	212.0
Fourteen Inch Diameter										
1436	1535	36"	6-1/2"	14"	18"	6"	6"	3"	393	83.0
1442	1797	42"	6-1/2"	14"	18"	6"	6"	3"	423	98.0
1448	2060	48"	6-1/2"	14"	18"	6"	6"	3"	454	112.0
1454	2330	54"	6-1/2"	14"	18"	6"	6"	3"	484	127.0
1460	2605	60"	6-1/2"	14"	18"	6"	6"	3"	515	142.0
1472	3120	72"	6-1/2"	14"	18"	6"	6"	3"	576	171.0
1484	3670	84"	6-1/2"	14"	18"	6"	6"	3"	637	200.0
1496	4220	96"	6-1/2"	14"	18"	6"	6"	3"	689	230.0
14108	4750	108"	6-1/2"	14"	18"	6"	6"	3"	759	259.0
14120	5310	120"	6-1/2"	14"	18"	6"	6"	3"	820	289.0



LTW HEAD STYLE



LTS HEAD STYLE

For Ease In Ordering

Heat Source

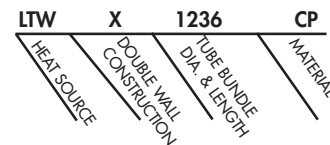
LTW - Water to Water
LTS - Steam to Water

Construction

X - Double Wall

Tube Material

CP - Copper
CN - Cupro Nickel
SS - Stainless Steel



This tube bundle utilizes water to water as a heat source, is 12" in diameter and 36" in length with double wall copper construction.



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