



CUSTOM-LINE SINGLE-WALL COPPER TUBE TANK HEATERS

STEAM AND HOT WATER HEATING COIL SELECTION

TABLE A
WATER HEATED -- GALLONS PER HOUR --

40° TO 140°F ALL RECOVERIES SHOWN ARE FOR 3/4" TUBES

Single wall copper tube tank heaters are designed for heating potable water with both steam or hot water.

DESIGN AND CONSTRUCTION FEATURES

Tank heating units are used for heating water and are specifically engineered for installation in water storage tanks. The heating medium may be either steam or hot water.

Heating units are manufactured from 3/4" OD 20 gauge seamless deoxidized drawn copper tubing, formed into "U" shapes with ends expanded into a steel or brass tube sheet. Where necessary, the assemblies are installed with tube bundle supports and with spacers to keep tubes in alignment. The collar is made from steel pipe. Heater heads are constructed of gray cast iron or optional methods, depending upon working pressure.

Other non-standard gauges, tubing sizes and materials are available; consult the factory.

EXPLANATION OF MODEL NUMBERS

Example: NS6-24

- NS = Steam, NW = water
- 6 = diameter of tube bundle in inches.
- 24 = length of tube bundle in inches.

SELECTION

For the best performance, tank heating units should extend into the tank as far as possible (minimum one half the tank diameter or length).

NOTE: The heat transfer rate can be drastically reduced in hard water areas with age and the build up of scale. Thus, consideration should be given to fouling factors and the square footage increased accordingly. In order to increase the fouling factor from 0.001 to 0.002 increase the square footage of heating surface by 20%.

NS COIL -- STEAM TO WATER					NW COIL -- WATER TO WATER									
Model Number Type NS	Sq. Ft. Surf.	Approx. Ship. Wt. (lbs.)	Using Steam As Heating Medium		Model Number Type NW	Sq.* Ft. Surf.	Approx. Ship. Wt. (lbs.)	Maximum		Using Forced Circulation of Boiler Water As Heating Medium				
			GPH@ 0 lbs.	GPH@ 10 lbs.				Flow Rate	Press Drop PSI	GPH Rec.@ 180°F	@'Min. BW Flow GPM	GPH Rec.@ 210°F	@'Min. BW Flow GPM	
NS 4-12	0.9	29	20	26										
NS 4-18	1.7	31	37	50	NW 4-18	1.0	31		0.90	10	1	19	2	
NS 4-24	2.5	32	55	73	NW 4-24	1.7	32		1.20	17	1	33	3	
NS 4-30	3.3	34	72	97	NW 4-30	2.7	34		1.50	27	2	52	4	
NS 4-36	4.1	35	90	120	NW 4-36	3.6	35		1.80	36	3	69	6	
NS 4-42	4.9	37	107	143	NW 4-42	4.6	37		2.10	46	4	89	7	
NS 4-48	5.7	38	125	167	NW 4-48	5.6	38	34	2.40	56	5	108	9	
NS 4-54	6.5	40	142	190	NW 4-54	6.5	40		2.70	65	5	125	10	
NS 4-60	7.3	41	160	214	NW 4-60	7.3	41		3.00	73	6	141	12	
NS 4-66	8.1	43	178	237	NW 4-66	8.1	43		3.30	81	7	156	13	
NS 4-72	8.9	44	195	260	NW 4-72	8.9	44		3.60	89	7	172	14	
NS 4-84	10.5	47	230	307	NW 4-84	10.5	47		4.20	105	9	202	17	
NS 4-96	12.1	50	265	354	NW 4-96	12.1	50		4.80	121	10	233	19	
NS 6-12	3.3	51	72	97										
NS 6-18	5.6	56	124	165	NW 6-18	3.1	56		0.90	31	3	60	5	
NS 6-24	8.0	61	175	234	NW 6-24	5.8	61		1.20	58	5	112	9	
NS 6-30	10.3	66	227	303	NW 6-30	8.5	66		1.50	85	7	164	4	
NS 6-36	12.7	71	278	372	NW 6-36	11.4	71		1.80	114	9	220	18	
NS 6-42	15.0	76	330	441	NW 6-42	14.2	76		2.10	142	12	274	23	
NS 6-48	17.4	81	381	509	NW 6-48	17.3	81	78	2.40	172	14	334	28	
NS 6-54	19.7	86	433	578	NW 6-54	19.7	86		2.70	197	16	381	32	
NS 6-60	22.1	91	484	647	NW 6-60	22.1	91		3.00	220	18	426	36	
NS 6-66	24.4	96	536	716	NW 6-66	24.4	96		3.30	244	20	471	39	
NS 6-72	26.8	101	587	784	NW 6-72	26.8	101		3.60	267	22	517	43	
NS 6-84	31.5	111	690	922	NW 6-84	31.5	111		4.20	314	26	607	51	
NS 6-96	36.2	121	793	1060	NW 6-96	36.2	121		4.80	361	30	698	58	
NS 8-18	11.2	97	247	329	NW 8-18	6.6	97		0.90	66	5	127	11	
NS 8-24	15.5	107	340	454	NW 8-24	11.0	107		1.20	110	9	212	18	
NS 8-30	19.7	117	433	578	NW 8-30	15.7	117		1.50	156	13	303	25	
NS 8-36	24.0	127	526	702	NW 8-36	20.7	127		1.80	206	17	399	33	
NS 8-42	28.2	137	619	827	NW 8-42	25.7	137		2.10	256	21	495	41	
NS 8-48	32.5	147	712	951	NW 8-48	31.9	147	175	2.40	318	26	615	51	
NS 8-54	36.7	157	806	1076	NW 8-54	36.7	157		2.70	366	31	709	59	
NS 8-60	41.0	167	899	1200	NW 8-60	41.0	167		3.00	409	34	790	66	
NS 8-66	45.2	177	992	1324	NW 8-66	45.2	177		3.30	451	38	872	73	
NS 8-72	49.5	187	1085	1449	NW 8-72	49.5	187		3.60	493	41	954	30	
NS 8-84	58.0	207	1271	1698	NW 8-84	58.0	207		4.20	578	48	1118	93	
NS 8-96	66.5	227	1458	1946	NW 8-96	66.5	227		4.80	663	55	1282	107	
NS 10-24	26	220	570	761	NW 10-24	20	220		1.20	202	17	391	33	
NS 10-30	34	231	734	981	NW 10-30	29	231		1.50	288	24	557	46	
NS 10-36	41	242	899	1200	NW 10-36	38	242		1.80	381	32	736	61	
NS 10-42	49	253	1063	1420	NW 10-42	48	253		2.10	473	39	916	76	
NS 10-48	56	264	1227	1639	NW 10-48	56	264		2.40	554	46	1072	89	
NS 10-54	64	275	1392	1859	NW 10-54	64	275		2.70	633	53	1224	102	
NS 10-60	71	286	1556	2078	NW 10-60	71	286	310	3.00	708	59	1369	114	
NS 10-66	79	297	1721	2298	NW 10-66	79	297		3.30	782	65	1513	126	
NS 10-72	86	308	1885	2517	NW 10-72	86	308		3.60	857	71	1658	138	
NS 10-84	101	330	2214	2956	NW 10-84	101	330		4.20	1007	84	1947	162	
NS 10-96	116	352	2543	3395	NW 10-96	116	352		4.80	1156	96	2236	186	
NS 10-108	131	374	2871	3834	NW 10-108	131	374		5.40	1305	109	2526	210	
NS 12-36	60	297	1315	1756	NW 12-36	56	297		1.80	554	46	1072	89	
NS 12-42	71	321	1556	2078	NW 12-42	69	321		2.10	689	57	1332	111	
NS 12-48	82	345	1797	2400	NW 12-48	83	345		2.40	823	69	1592	133	
NS 12-54	93	369	2038	2722	NW 12-54	93	369		2.70	927	77	1793	149	
NS 12-60	104	393	2280	3044	NW 12-60	104	393	310	3.00	1036	86	2005	167	
NS 12-66	115	417	2521	3366	NW 12-66	115	417		3.30	1146	96	2217	185	
NS 12-72	126	441	2762	3688	NW 12-72	126	441		3.60	1256	105	2429	202	
NS 12-84	148	489	3244	4332	NW 12-84	148	489		4.20	1475	123	2853	238	
NS 12-96	170	537	3726	4976	NW 12-96	170	537		4.80	1694	141	3277	273	
NS 12-108	192	585	4208	5620	NW 12-108	192	585		5.40	1913	159	3702	308	
NS 12-120	214	633	4691	6264	NW 12-120	214	633		6.00	2133	178	4126	344	

All recovery capacities (GPH) figures include a .001 fouling factor for average water conditions.

Hard water areas should consider an increase to this factor.

*Effective heating surface for water to water calculation (Actual NW heating surface is equal to NS heating surface).

+Minimum boiler water (b.w.) required.

TABLE B TANK COIL RECOVERY DATA (Various Temperature Rises)

TEMP. RISE	GALLONS PER HOURS/SQ.FT. OF HEATING SURFACE														
	FORCED BOILER WATER*		STEAM PRESSURE - POUNDS PER SQUARE INCH												
	Inlet	Outlet	180°F	210°F	0 lbs	2 lbs	5 lbs	10 lbs	15 lbs	20 lbs	30 lbs	40 lbs	50 lbs	75 lbs	100 lbs
40	80	38	63	72	77	83	91	98	104	116	126	133	151	166	
	100	23	39	44	48	52	57	62	66	73	80	85	97	106	
	120	15	26	31	33	36	40	43	46	52	57	60	69	77	
	140	10	19	22	24	26	29	32	34	39	43	46	53	58	
	160	6	14	16	17	19	22	25	26	30	33	36	42	46	
180	--	10	11	13	14	17	19	21	24	27	29	34	38		
50	80	48	81	93	99	107	118	128	136	151	164	174	198	217	
	100	26	45	52	55	60	66	72	77	86	94	100	114	125	
	120	16	29	34	36	40	44	48	52	58	63	68	78	86	
	140	11	20	24	26	28	32	35	37	42	46	50	57	64	
	160	7	14	17	18	21	23	26	28	32	36	38	45	50	
180	--	10	12	13	15	18	20	22	25	28	30	35	40		
60	80	65	112	135	145	156	172	187	198	221	241	256	291	320	
	100	31	54	63	67	73	81	88	94	105	115	122	139	154	
	120	18	33	38	41	45	50	55	59	66	72	77	89	98	
	140	11	22	26	28	31	35	38	41	46	51	55	63	70	
	160	7	15	18	20	22	25	28	30	35	38	41	48	54	
180	--	10	12	14	16	18	21	23	26	30	32	38	42		
70	100	39	69	80	86	94	104	114	122	137	149	159	182	201	
	120	20	38	44	47	52	58	64	68	77	85	91	104	116	
	140	12	24	28	31	34	38	42	45	52	57	61	71	79	
	160	7	16	19	21	23	27	30	32	37	41	45	52	58	
	180	--	11	13	14	17	19	22	24	28	31	34	40	45	
80	100	52	95	116	125	136	152	166	177	200	219	233	268	296	
	120	24	45	53	57	63	71	77	83	94	103	111	128	142	
	140	13	27	31	34	38	43	48	51	59	65	70	81	90	
	160	7	17	20	23	25	29	33	35	41	45	49	57	64	
	180	--	11	13	15	17	21	23	26	30	34	37	43	49	
90	120	30	57	68	73	81	91	100	108	122	134	144	167	185	
	140	15	30	36	40	44	50	55	60	69	76	82	95	106	
	160	8	19	22	25	28	32	36	39	45	51	55	64	72	
	180	--	12	14	16	19	22	25	28	32	36	40	47	53	
	100	120	39	78	97	105	116	132	145	156	178	196	211	244	272
140		17	36	43	47	53	60	67	72	83	92	99	116	130	
160		8	20	25	28	31	36	41	44	51	57	62	73	82	
180		--	12	15	17	20	24	27	30	35	40	43	52	58	

* Based on 20° F drop.

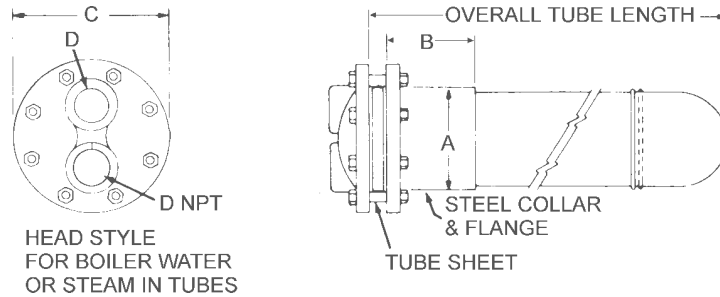


TABLE C DIMENSIONS

Technical Data							Dimensions in Inches				
Unit Dia.	Tubing	Material		Test Tube Sheet	Work Press. PSI	Max. Press. PSI	Oper. Temp. °F.	A	B	C	D
		Tube Supports	Heads								
4					225	150	375	4 1/2	6 1/8	9	1 1/4
6	3/4" O.D.	Steel	Cast Iron	Steel	225	150	375	6 5/8	6 1/8	11	2
8	Copper				225	150	375	8 5/8	8	13 1/2	3
10					225	150	375	10 3/4	8 1/4	16	4
12					225	150	375	12 3/4	10 1/4	19	4" Flange

HOW TO SIZE TABLE B

1. Locate temperature rise desired in left-hand column.
2. Move to the right, until you reach the column labeled with the appropriate heating medium. This figure represents the recovery capacity of one square foot of heating surface.
3. Divide the total GPH requirement of the installation by the recovery of 1 sq. ft. to determine the number of sq. ft. required.
4. Select the coil with adequate sq. ft. of heating surface from table A. In most cases, more than one coil will meet the system requirements. Maximum efficiency for hot water coils will normally be obtained when the coil extends into the tank as far as a possible (minimum of halfway required).

Consideration should be given to insure adequate condensate drainage for steam coils.

Vertical tank: Maximum coil length determined by tank diameter.

Horizontal tank: Maximum coil length determined by tank length.

NOTE: The heat transfer rate can be drastically reduced with age and build-up of scale. Thus, consideration should be given to fouling factors and the square footage increased accordingly, in hard water areas. The recovery capacity (GPH/sq. ft.) already includes a .001 fouling factor for average water conditions.

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