



SUBMITTAL SHEET

HOT WATER GENERATOR SYSTEMS

Job Name _____

State/Province _____ City _____

Engineer _____

Wholesaler _____

Mech. Contractor _____

Model No. _____

Gallon Capacity _____

Tube Bundle Size _____

Please Check One: Heat Source Steam or Boiler Water

GPH Recovery _____ @ _____ °F Rise

Notes _____

Standard Features:

- ASME Tank Construction
- Intra-Tank Circulation Pump
- Five-Year Limited Tank Warranty (See warranty for details)
- One-Year Limited Warranty on Tube Bundle (See warranty for details)
- Glass-Lined Tank
- Anode Rods (Magnesium)
- 125 PSI Working Pressure
- Ring Base (for vertical tanks)

Optional Equipment/Features:

- | | | |
|-----------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------|
| 150 PSI Working Pressure | Insulation & Jacket | Manual Reset High Limit w/ Solenoid Valve |
| Other Working Pressure (specify) _____ | Manhole | Vacuum Breaker |
| Vertical Orientation | Handhole | Cement-Lined Tank (Not available on 200 gallon and below) |
| Horizontal Orientation | Lifting Lugs | ASME T&P Relief Valve |
| Saddles (for horizontal tanks) | Seismic Bracing | |
| Tank Legs (for vertical tanks) | | |
| T&P Gauge | | |
| Bare (paint applied as rust inhibitor until tank can be field insulated per ASHRAE standards) | | |

Steam to Water Controls (includes):

- 2-Way Self Operated Temperature Regulator
- Isolation Valves
- Wye Strainers (inlet and outlet)
- Float & Trap Thermostatic Steam Trap

Water to Water Controls (includes):

- 2-Way Self Operated Temperature Regulator
- Isolation Valves
- Wye Strainers (inlet and outlet)
- Piping Bypass



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HOT WATER GENERATOR SYSTEMS

Tube Bundle Sizing Questions

(For units with a heating coil the below must be completed)

Tank Side:

Tank Capacity _____

Inlet Water Temp _____

Stored or Tank Set Point _____

Recovery Rate (GPH) _____

Design Pressure (125 PSI or 150 PSI) _____

Coil Material (if other than copper) _____

Double or Single Wall Coil _____

Coil Side Heating Source (Choose Steam or Boiler Water)

Steam:

Steam Pressure _____ Steam Available (lbs/h) _____

Steam Inlet Pressure _____

Steam Outlet Pressure _____

Boiler:

Boiler Water Entering Temp. _____

Boiler Water Leaving Temp. _____

Boiler Water Available (GPH) _____

STEAM / HOT WATER MODELS HWG

FEATURES

A. O. Smith hot water generators are available for operation with steam or boiler water as the energy source. They are completely assembled with components sized, piped and checked at the factory before shipment. Generators are available in space saving vertical or horizontal models.

CUSTOM UNIT AVAILABILITY

- Custom units built to order, with tank capacities up to 4,000 gallons, with special control trim, and with special heating units can be built to design specifications on special order basis. Standard units listed in this brochure cover most standard orders.

PERMAGLAS® GLASSLINING

- All internal surfaces exposed to water are glasslined per ASME HLW procedures, using an NSF-approved glasslining compound.
- Glass is highly resistant to effects of temperature, corrosion and electrolysis.
- Optional Cement or Epoxy lined tanks are available.

INSULATION AND JACKETING

- The HWG systems meet or exceed the thermal efficiency and or standby loss requirements of NRCAN and current edition ASHRAE/IESNA 90.1.

CODE LISTING

- The standard system will employ an ASME "HLW" code glasslined storage tank fitted with an ASME "U" code 3/4" diameter copper tube heat exchanger.

INTEGRAL PUMP

- The standard HWG system will employ a circulator pump. The standard heat exchanger sizing tables are also based on using integral circulators.

HWG OPTIONS (STEAM OR WATER BOILER UNITS)

- Low water cut-off, 12x16 vessel manway, 4x6 vessel hand hole.

STEAM UNITS

- Standard steam trim consists of temperature control valve, 1 steam trap on condensate line, inlet and auxiliary strainers.

OPTIONAL STEAM TRIM

- Includes electric operated valve.
- Pressure gauge with siphon, vacuum breaker and air vent.

BOILER UNITS

- Standard boiler water trim includes temperature control valve.

OPTIONAL BOILER TRIM

- Electric high limit safety system, three-way controls with bypass.
- ASME rating - standard HWG consists of ASME HLW Code storage tank rated 125 psi working pressure with U Code heat exchanger, temperature & pressure relief valve, temperature & pressure gauge in tank, drain valve and lifting lugs.
- Pressure gauge with siphon, vacuum breaker and air vent.
- Boiler water temperature gauge.

CATHODIC PROTECTION

- Standard HWG systems employing glass or optional epoxy lined tanks are fitted with anodes as corrosion protection.

LIMITED WARRANTY OUTLINES GLASS-LINED, CEMENT, EPOXY

- If the tank should leak any time during the first five years, under the terms of the warranty, A. O. Smith will repair or replace the tank.
- Installation, labour, handling and local delivery extra.
- The coil has a one year limited warranty.

NOTE: THIS OUTLINE IS NOT A WARRANTY.

For complete information, consult the written warranty or A. O. Smith.

HWG MODELS

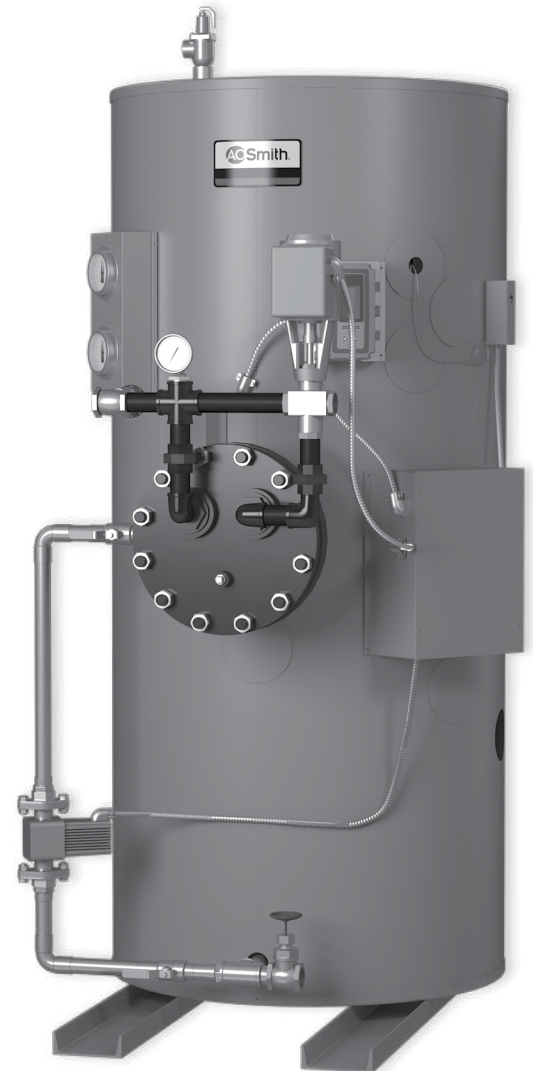


Image includes the optional electronic control package. Actual HWG appearance could vary.





Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

TO SPECIFY HWG SERIES PACKAGE WATER HEATER:

1. Calculate storage capacity in gallons required, and determine if vertical or horizontal installation applies.
2. Decide what type of heating medium will be used; steam or boiler water.
 - If STEAM - Determine pressure in coil.
 - If BOILER WATER - Determine available boiler water temperature.
3. From the recovery table, obtain the required GPH capacity and temperature rise. Selecting heating coil size.
4. Decide whether single or double wall coil is required.

EXAMPLE INSTALLATION REQUIREMENTS:

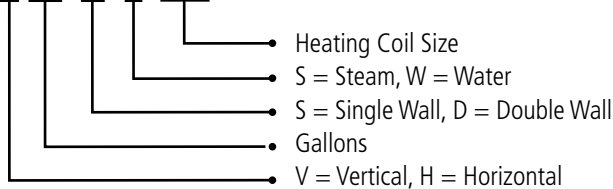
Vertical, 140 gallons, Steam @ 5 PSI, 80 GPH Recovery, 40 - 140°F temperature rise.

TO DETERMINE THE HWG SERIES MODEL:

Storage Tank 140 Gallons, Vertical
 Coil Size 418 (from RECOVERY CHART)

MODEL TO SPECIFY:

HWG - V 140 ES S 4-18



ESS = Single Wall Steam
 EDS = Double Wall Steam
 ESW = Single Wall Water
 EDW = Double Wall Water

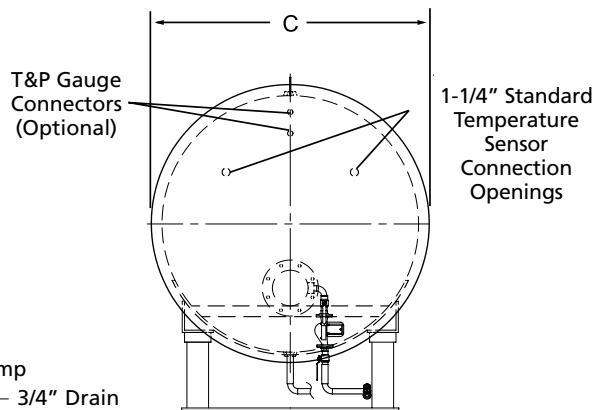
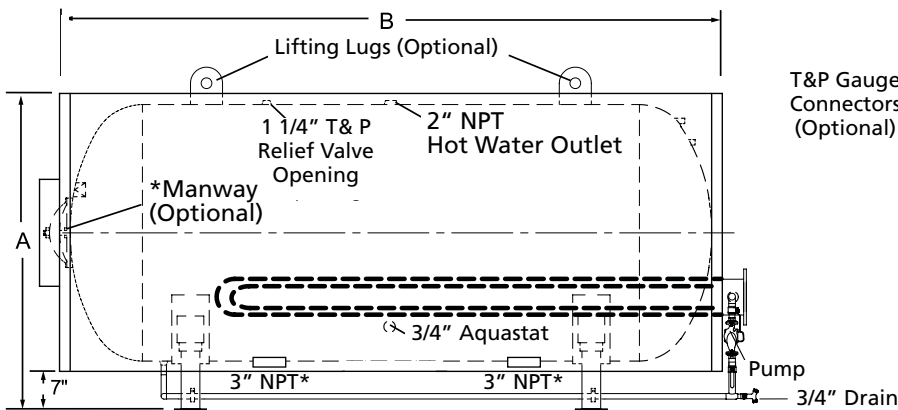
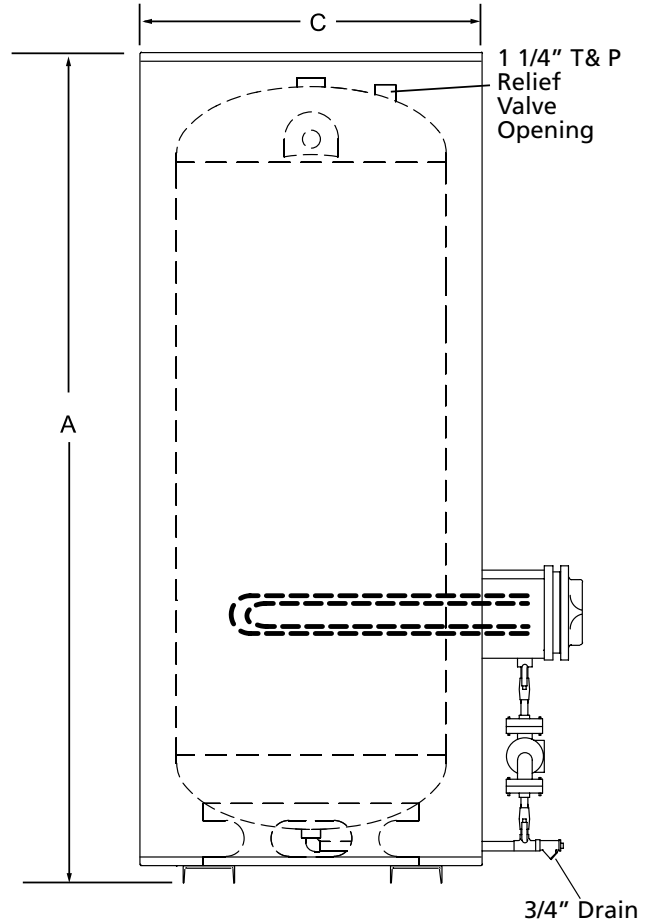
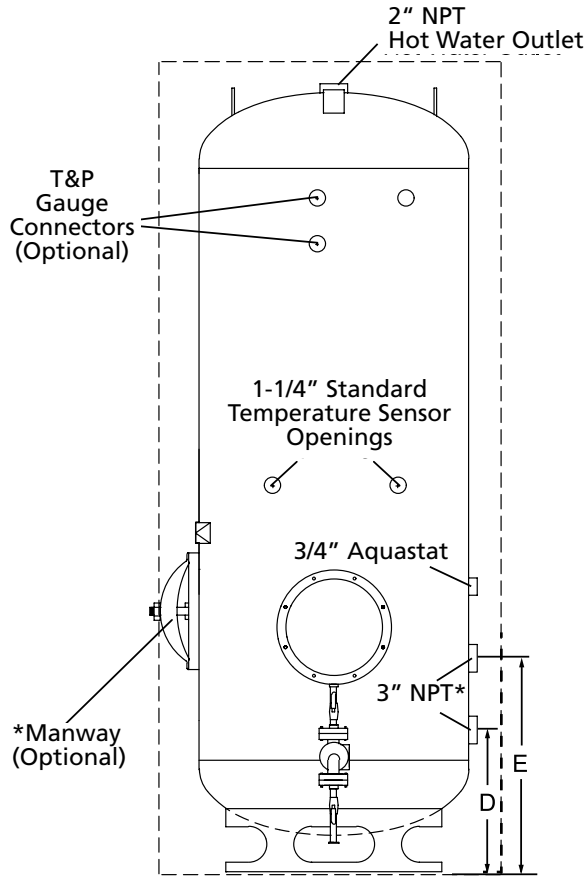
VERTICAL TANKS ROUND JACKETED

MODEL NUMBER	A IN (CM)	C IN (CM)	D IN (CM)	TANK CAPACITY USG (L)
HWGV-120A	63 (160)	28 (71)	10 (25)	120 (454)
HWGV-200A	77-1/4 (196)	32 (81)	11-1/4 (29)	200 (757)
HWGV-250A	91 (231)	34 (86)	18 (46)	257 (973)
HWGV-318A	80 (203)	40 (102)	19-1/2 (50)	318 (1,204)
HWGV-400A	80 (203)	46 (117)	21 (53)	432 (1,635)
HWGV-500A	92 (234)	46 (117)	21 (53)	504 (1,908)
HWGV-650A	92 (234)	52 (132)	23-1/2 (60)	650 (2,461)
HWGV-750A	104 (264)	52 (132)	23-1/2 (60)	752 (2,847)
HWGV-1000A	128 (325)	52 (132)	23-1/2 (60)	940 (3,558)

NOTE: Consult factory for design parameters outside this chart.

HORIZONTAL TANKS ROUND JACKETED

MODEL NUMBER	A IN (CM)	B IN (CM)	C IN (CM)	TANK CAPACITY USG (L)
HWGH-250A	41 (104)	87 (221)	34 (86)	250 (946)
HWGH-300A	47 (119)	76 (193)	40 (102)	300 (1,136)
HWGH-400A	53 (135)	76 (193)	46 (117)	400 (1,514)
HWGH-500A	53 (135)	88 (224)	46 (117)	500 (1,893)
HWGH-600A	59 (150)	88 (224)	52 (132)	600 (2,271)
HWGH-700A	59 (150)	100 (254)	52 (132)	700 (2,650)
HWGH-1000A	59 (150)	124 (315)	52 (132)	1000 (3,785)



*2" on 120; 2-1/2" on 200 Gal.



Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

BOILER WATER TABLE - RECOVERY SYSTEM

The listings are for boiler water temperatures and temperature rises that are most commonly used in the industry.

MODEL NUMBER	180°F BOILER WATER						200°F BOILER WATER						210°F BOILER WATER					
	GPH @ 40-120°F	GPM BW	GPH @ 40-140°F	GPM BW	GPH @ 40-160°F	GPM BW	GPH @ 40-120°F	GPM BW	GPH @ 40-140°F	GPM BW	GPH @ 40-160°F	GPM BW	GPH @ 40-120°F	GPM BW	GPH @ 40-140°F	GPM BW	GPH @ 40-160°F	GPM BW
FOUR INCH DIAMETERS																		
418	73	4	48	4	27	2	93	6	57	4	43	4	101	6	72	6	51	5
424	98	6	64	5	36	3	124	8	76	6	58	5	135	9	96	8	68	6
430	123	8	80	6	45	4	155	10	96	8	72	7	168	11	120	10	85	8
436	147	9	96	8	54	5	186	12	115	9	87	8	202	18	192	16	136	13
448	197	13	128	10	72	7	248	16	153	12	116	11	270	18	192	16	136	13
SIX INCH DIAMETERS																		
618	166	11	108	9	61	6	209	13	129	10	98	9	227	15	162	13	115	11
624	212	14	138	11	78	7	267	17	165	13	125	12	291	19	207	17	147	14
630	261	17	170	14	96	9	329	21	204	17	154	15	358	23	255	21	181	18
636	304	20	198	16	112	11	384	25	237	19	180	18	417	27	297	24	211	21
648	403	26	262	21	149	14	508	33	314	26	238	23	552	36	393	32	280	28
660	498	33	324	27	184	18	628	41	388	32	294	29	683	45	486	40	346	34
EIGHT INCH DIAMETERS																		
824	429	28	279	23	159	15	541	36	334	27	253	25	588	39	418	34	298	29
830	543	36	353	29	201	20	684	45	423	35	321	32	744	49	529	44	377	37
836	657	43	427	35	243	24	828	55	512	42	388	38	900	60	640	53	456	45
842	770	51	500	41	285	28	970	64	600	50	455	45	1055	70	750	62	535	53
848	862	57	560	46	319	31	1086	72	672	56	509	50	1181	78	840	70	599	59
860	1008	67	655	54	373	37	1270	84	786	65	596	59	1382	92	982	81	700	70
TEN INCH DIAMETERS																		
1030	1062	70	690	57	393	39	1338	89	828	69	627	62	1455	97	1035	86	738	73
1036	1262	84	820	68	467	46	1590	106	984	82	746	74	1730	115	1230	102	877	87
1042	1487	99	966	80	550	55	1874	124	1159	96	879	87	2038	135	1449	120	1033	103
1048	1724	114	1120	93	638	63	2172	144	1344	112	1019	101	2363	157	1680	140	1198	119
1060	2152	143	1398	116	796	79	2712	180	1677	139	1272	127	2949	196	2097	174	1495	149
1072	2571	171	1670	139	951	95	3239	215	2004	167	1519	151	3523	234	2505	208	1786	178
TWELVE INCH DIAMETERS																		
1236	1749	116	1136	94	647	64	2203	146	1363	113	1033	103	2396	159	1704	142	1215	121
1242	2060	137	1338	111	762	76	2595	173	1605	133	1217	121	2823	188	2007	167	1431	143
1248	2371	158	1540	128	877	87	2987	199	1848	154	1401	140	3249	216	2310	192	1647	164
1254	2682	178	1742	145	992	99	3379	225	2090	174	1585	158	3675	245	2613	217	1863	186
1260	2993	199	1944	162	1108	110	3771	251	2332	194	1769	176	4101	273	2916	243	2080	208
1272	3615	241	2348	195	1338	133	4555	303	2817	234	2136	213	4954	330	3522	293	2512	251
FOURTEEN INCH DIAMETERS																		
1436	2363	157	1535	127	874	87	2977	138	1842	153	1396	139	3238	215	2302	191	1642	164
1442	2767	184	1797	149	1024	102	3486	232	2156	179	1635	163	3791	252	2695	224	1922	192
1448	3172	211	2060	171	1174	117	3996	266	2472	206	1874	187	4346	289	3090	257	2204	220
1454	3588	239	2330	194	1328	132	4520	301	2796	233	2120	237	4916	327	3495	291	2493	249
1460	4011	267	2605	217	1484	148	5053	336	3126	260	2370	237	5496	366	3907	325	2787	278
1472	4804	320	3120	260	1778	177	6052	403	3744	312	2839	283	6583	438	4680	390	3338	333



Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

STEAM TABLE - RECOVERY SYSTEMS

The listings are for steam pressures and temperature rises that are most commonly used in the industry.

MODEL NUMBER	5 PSI STEAM						15 PSI STEAM					
	GPH @ 40-120°F	PPH STEAM	GPH @ 40-140°F	PPH STEAM	GPH @ 40-160°F	PPH STEAM	GPH @ 40-120°F	PPH STEAM	GPH @ 40-140°F	PPH STEAM	GPH @ 40-160°F	PPH STEAM
FOUR INCH DIAMETERS												
418	152	105	119	102	91	95	171	119	139	121	109	114
424	202	140	158	137	122	126	229	159	186	162	145	152
430	253	175	198	171	152	158	286	199	232	203	182	191
436	304	210	238	205	183	190	343	239	279	243	218	229
448	405	280	317	274	244	253	458	319	372	325	291	305
SIX INCH DIAMETERS												
618	342	236	267	231	206	213	386	269	314	274	246	257
624	437	302	342	295	263	273	494	344	401	350	314	329
630	538	372	421	364	324	336	608	424	494	431	387	405
636	627	433	491	424	378	391	708	494	576	502	451	472
648	830	573	649	561	500	518	937	655	762	665	597	625
660	1027	709	803	693	618	641	1159	809	942	822	738	773
EIGHT INCH DIAMETERS												
824	884	611	691	597	532	552	998	697	811	708	636	666
830	1119	773	875	756	674	698	1263	882	1027	896	804	842
836	1353	935	1058	914	815	845	1528	1067	1242	1084	973	1019
842	1585	1095	1240	1070	955	989	1790	1249	1455	1269	1140	1193
848	1775	1226	1388	1199	1069	1108	2004	1399	1629	1422	1276	1337
860	2076	1434	1624	1402	1251	1296	2344	1637	1906	1663	1493	
TEN INCH DIAMETERS												
1030	2187	1511	1711	1477	1317	1365	2470	1724	2007	1752	1573	1647
1036	2599	1795	2033	1756	1566	1623	2935	2049	2386	2082	1869	1957
1042	3062	2115	2395	2069	1845	1912	3458	2414	2811	2453	2202	2306
1048	3550	2453	2777	2398	2139	2217	4009	2799	3259	2844	2553	2674
1060	4431	3061	3467	2994	2670	2767	5004	3494	4068	3550	3187	3338
1072	5293	3657	4141	3576	3189	3305	5978	4174	4859	4241	3807	3987
TWELVE INCH DIAMETERS												
1236	3601	2488	2817	2433	2169	2248	4066	2839	3305	2884	2590	2712
1242	4241	2930	3318	2865	2555	2648	4790	3344	3893	3397	3050	3194
1248	4881	3372	3819	3298	2941	3048	5513	3849	4481	3910	3511	3677
1254	5522	3815	4320	3731	3327	3448	6236	4354	5069	4423	3971	4159
1260	6162	4257	4821	4163	3713	3848	6959	4858	5657	4936	4432	4641
1272	7443	5142	5823	5029	4484	4647	8405	5868	6832	5962	5353	5606
FOURTEEN INCH DIAMETERS												
1436	4865	3362	3806	3287	2931	3038	5495	3836	4466	3898	3499	3665
1442	5696	3935	4456	3848	3432	3557	6433	4491	5229	4563	4097	4290
1448	6530	4511	5108	4412	3934	4077	7374	5148	5994	5231	4696	4918
1454	7386	5103	5778	4990	4450	4612	8341	5823	6780	5917	5312	5563
1460	8257	5705	6460	5579	4975	5156	9325	6511	7580	6615	5939	6220
1472	9890	6833	7737	6682	5959	6176	11169	7798	9079	7923	7113	7449



Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

STEAM TABLE - RECOVERY SYSTEMS

The listings are for steam pressures and temperature rises that are most commonly used in the industry.

MODEL NUMBER	25 PSI STEAM						50 PSI STEAM					
	GPH @ 40-120°F	PPH STEAM	GPH @ 40-140°F	PPH STEAM	GPH @ 40-160°F	PPH STEAM	GPH @ 40-120°F	PPH STEAM	GPH @ 40-140°F	PPH STEAM	GPH @ 40-160°F	PPH STEAM
FOUR INCH DIAMETERS												
418	188	132	156	137	121	128	213	153	187	167	145	156
424	250	176	208	183	162	171	284	204	249	223	193	208
430	313	220	260	228	203	214	356	255	312	279	242	260
436	376	265	312	274	243	257	427	306	374	335	290	312
448	501	353	416	366	325	343	569	408	499	447	387	416
SIX INCH DIAMETERS												
618	423	298	351	309	274	289	480	344	421	377	327	351
624	540	381	448	394	350	370	614	440	538	482	418	449
630	666	666	552	486	431	456	756	542	663	594	515	553
636	776	546	643	566	502	531	881	631	772	691	599	645
648	1027	723	851	749	665	703	1165	835	1021	915	793	853
660	1270	894	1053	927	822	869	1441	1033	1263	1132	981	1055
EIGHT INCH DIAMETERS												
824	1093	770	906	798	708	748	1241	889	1088	974	845	908
830	1383	974	1147	1010	896	947	1570	1125	1376	1233	1069	1150
836	1673	1179	1387	1121	1084	1146	1900	1362	1665	1492	1293	1391
842	1960	1380	1625	1430	1270	1341	2225	1594	1950	1747	1515	1628
848	2195	1546	1820	1602	1422	1502	2492	1786	2184	1956	1696	1824
860	2567	1808	2128	1874	1663	1757	2914	2089	2554	2288	1984	2133
TEN INCH DIAMETERS												
1030	2704	1905	2242	1974	1752	1851	3070	2200	2691	2411	2090	2247
1036	3214	2264	2665	2346	2082	2200	3649	2615	3198	2865	2484	2671
1042	3786	2667	3139	2764	2453	2592	4298	3081	3767	3375	2926	3147
1048	4390	3092	3640	3205	2844	3005	4984	3572	4368	3913	3393	3648
1060	5480	3860	4543	4000	3550	3752	6221	4459	5452	4885	4235	4554
1072	6546	4611	5427	4779	4241	4482	7431	5327	6513	5835	5060	5440
TWELVE INCH DIAMETERS												
1236	4453	3136	3692	3250	2885	3048	5055	3623	4430	3969	3442	3700
1242	5244	3695	4348	3829	3398	3591	5954	4267	5218	4675	4054	4358
1248	6036	4252	5005	4407	3911	4133	6853	4912	6006	5381	4666	5017
1254	6828	4810	5661	4985	4424	4675	7751	5556	6793	6087	5278	5675
1260	7620	5368	6318	5563	4937	5217	8650	6200	7581	6793	5890	6333
1272	9204	6483	7631	6719	5963	6301	10448	7489	9157	8204	7114	7649
FOURTEEN INCH DIAMETERS												
1436	6017	4238	4988	4392	3898	4119	6830	4896	5956	5363	4651	5000
1442	7044	4962	5840	5142	4564	4822	7996	5731	7008	6279	5444	5854
1448	8075	5688	6695	5895	5232	5528	9167	6570	8034	7198	6241	6711
1454	9133	6434	7572	6667	5918	6253	10368	7432	9087	8141	7059	7590
1460	10211	7193	8466	7454	6616	6991	11592	8309	10159	9102	7893	8486
1472	12230	8615	10140	8928	7924	8373	13884	9951	12168	10902	9453	10164



Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

SUGGESTED SPECIFICATION - WATER TO WATER

The hot water heater generator package shall be A. O. Smith model no. HWG _____ (V) or (H), (ESW) or (EDW), with _____ heating coil. The jacketed, insulated storage tank shall be constructed and stamped according to ASME specifications for (125) psi working pressure. The unit shall be designed to recover _____ GPH for a temperature of _____ degrees F to _____ degrees F when supplied with _____ GPM boiler water entering temperature regulator at _____ degrees F. The heating coil shall be constructed and stamped according to section VIII of ASME code. The tube bundles shall be constructed of 3/4" O.D. 20 GA. deoxidized drawn copper tubing. The unit shall be controlled by one of three means: On-Off Valve _____, Three Way Modulating Valve _____. The unit will be completely factory assembled and furnished with the following standard components.

A storage tank _____" dia. x _____" long with _____ gallon capacity. Tank shall be insulated to meet the R12.5 minimum thermal insulation requirements of NRCan and current edition of ASHRAE/IESNA 90.1 Tank shall be jacketed with heavy gauge steel with a prepaint. Tank shall be built to ASME section IV lined. Heating coil built to Section VIII of ASME code. A temperature regulator to be self actuated, direct acting. A bronze integral circulator pump with copper soldered recirculation line and (2) bronze ball valves. A drain valve and assembly. Optional Jacket mounted temperature and pressure gauges, and a full length channel base and lifting lugs.

OPTIONAL EQUIPMENT IS AS FOLLOWS:

STORAGE TANK

Tank shall have 150 psi or 160 psi operating pressure, an ASME section VIII construction, a 4"x6" handhole, 12"x16" manhole, a cement or epoxy lining.

WATER TO WATER SECTION

Section shall have a self actuated or pneumatic operated temperature regulator and a bypass loop in boiler water line for temperature regulator isolation.



Commercial Packaged Hot Water Generating Systems - Steam / Hot Water

SUGGESTED SPECIFICATION - STEAM TO WATER

The hot water heater generator package shall be A. O. Smith model no. HWG _____ (V) or (H), (ESW), (EDW), (ESS) or (EDS) with _____ heating coil. The jacketed, insulated storage tank shall be constructed and stamped according to ASME specifications for (125) psi working pressure. The unit shall be designed to recover _____ GPH for a temperature rise of _____ degrees F to _____ degrees F when supplied with _____ psi steam to the temperature regulator. The heating coil shall be constructed and stamped according to section VIII of ASME code. The tube bundles shall be constructed of 3/4" O.D. 20 GA. deoxidized drawn copper tubing. The unit will be completely factory assembled and furnished with the following standard components.

A storage tank _____" dia. x _____" long with _____ gallon capacity. Tank shall be insulated to meet the R12.5 minimum thermal insulation requirements of NRCan and current edition of ASHRAE/IESNA 90.1. Tank shall be jacketed with heavy gauge steel with a prepaint. Tank shall be built to ASME section IV, glasslined. Heating coil built to Section VIII of ASME code. A temperature regulator to be self actuated, direct acting. Main Steam trap, main "Y" strainer and associated black steel pipe. A bronze integral circulator pump with copper soldered recirculation line and (2) bronze ball valves. A drain valve and assembly. Optional Jacket mounted temperature and pressure gauge. Full length channel base and lifting lugs. Air vent and vacuum breaker.

OPTIONAL EQUIPMENT IS AS FOLLOWS:

STORAGE TANK

Tank shall have 150 psi or 160 psi operating pressure, an ASME section VIII construction, a 4"x6" handhole, 12"x16" manhole, a cement or epoxy lining.

For Technical Information call 888-599-2837. A. O. Smith Enterprises Ltd. reserves the right to make product changes or improvements without prior notice.