Liquid-to-Water High Capacity Commercial Geothermal Heat Pumps

HW-800-HAC

Water Well, Groundloop or Wastewater Operation

Boreal
Energy Efficient Solutions

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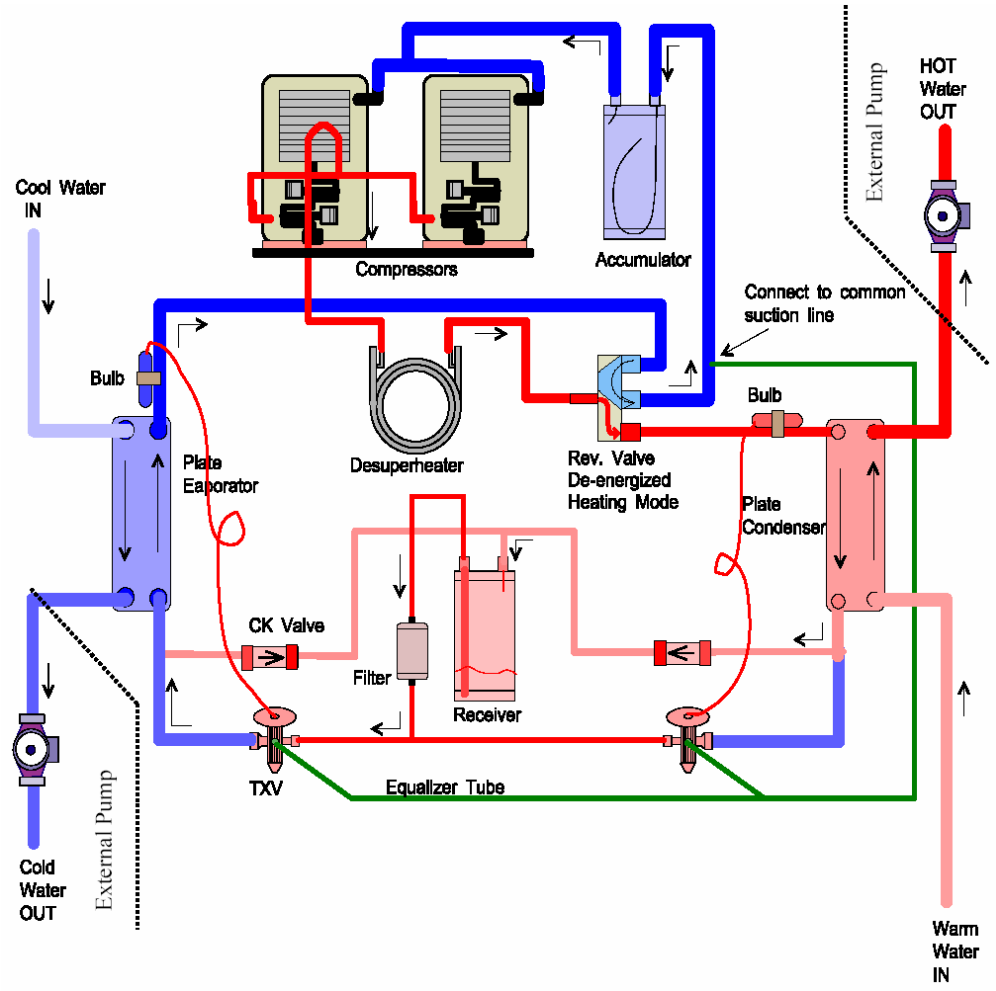
Standard Features

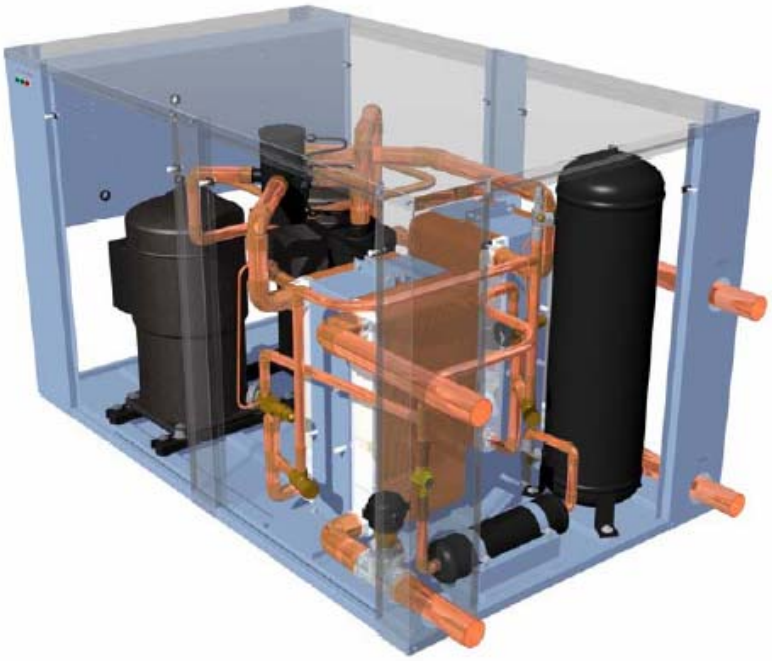
1. Heavy duty case constructed of 20 gauge 1mm satin galvanized panels with welded reinforcing channel stiffeners and corner posts.
2. Finished inside and out with an oven baked epoxy enamel.
3. Cabinet completely insulated with 1/2" to 1" acoustic insulation.
4. Four removable access doors for easy servicing.
5. Heavy duty heat pumps rated Copeland "Tandem" compressors with sump heater.
6. Oversized commercial duty compressor contactor rated for 2 million cycles.
7. Integrated heavy duty electrical box enclosure with removable cover.
8. Suction line accumulator & liquid line receiver.
9. High efficiency 316 SS brazed plate evaporator and condenser heat exchangers.
10. Flow proving switches standard.
11. Solid State Phase loss protector / anti short cycle timers.
12. Filter drier and sight glass standard equipment.
13. TXV with off cycle equalization port.
14. Compressor can be operated independently allowing up to three "stage" of capacity with 50% and full output or with 40%, 60% and full output.
15. Operational and lock-out indicator lights.
16. Optional dry contacts for remote alarms.
17. Low water flow cutoff safety (flow switch).
18. Low and high pressure / temperature refrigerant safety controls.
19. Suitable for wastewater, open well or closed loop applications.
20. Optional water valve for water well operation.
21. All water lines constructed of copper with optional PVC piping available for harsh environments.
22. CAN/CSA C22.2 NO 236-05 certified for electrical safety.
23. CSA for performance as per CSA 446 M-94 (equivalent to ARI 325 & 330-98).

Dual Scroll Compressors



Features HW-800-HAC Model

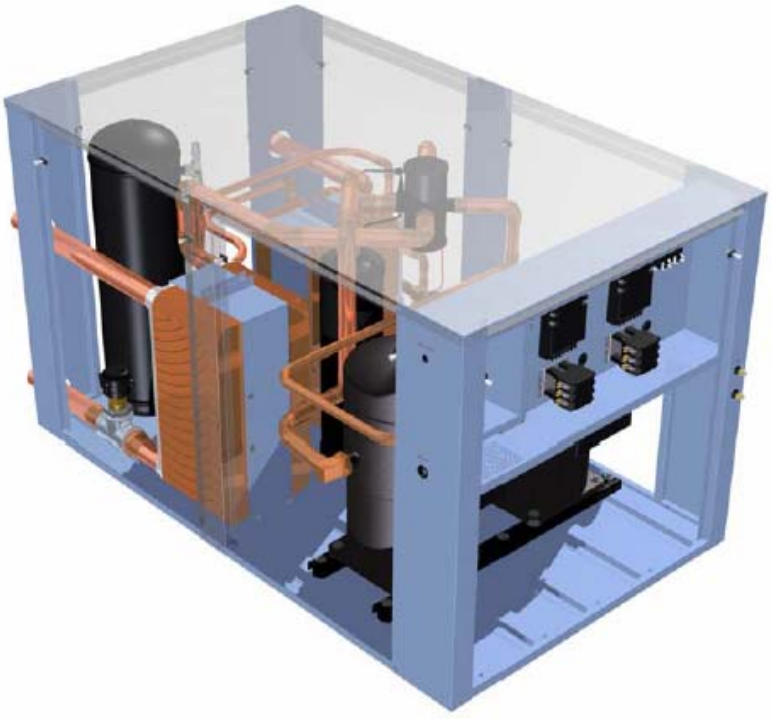
- Galvanized metal with baked enamel or epoxy based finish.
- Thermostatic expansion valves.
- High efficiency scroll compressors.
- High Efficiency brazed plate heat exchangers.



(Front) Plumbing side

- Liquid line filter drier.
- Sight glass.
- Liquid receiver.
- Insulated water coils.
- Suction accumulator.

- Baked enamel cabinet with satin galvanized panels.
- Components accessible from all four sides.
- Heavy duty electrical components.
- High & Low access ports.
- Remote reset lock-out relay system.



(Back) Electrical Box Side

- Acoustically insulated cabinet.
- Cabinet spot welded for superior strength.
- High efficiency scroll compressors.
- 1/2 or full out-put capacity.
- Low water Flow switch protection

Performance Charts

HW-800-HAC — Nominal 65 tons — Heating

Source Data						Power Consumption				Sink Data					
ELT °F	Evap. ° F	Flow Igpm	LLT °F	Temp. Diff °F	HAB (Btu's)	Watts	Amps	Output (Btu's)	KW OUT	COP	EWT ° F	Igpm	LWT ° F	Delta ° F	Cond. °F
°C	°C	L/min	°C	°C	tons			tons			°C	L/min	°C	°C	°C
27	15	162.0	22.7	4.29	417,136	56,484	82.7	609,916	178.7	3.16	105	162.0	111.3	6.3	120
-2.8	-9.4	732	-5.2	2.4	34.8			50.8			40.6	732	44.0	3.5	48.9
33	20	162.0	28.2	4.81	467,516	56,947	83.4	661,876	193.9	3.41	105	162.0	111.8	6.8	120
0.6	-6.7	732	-2.1	2.7	39.0			55.2			40.6	732	44.3	3.8	48.9
39	25	162.0	33.6	5.36	521,445	57,464	84.1	717,570	210.2	3.66	105	162.0	112.4	7.4	120
3.9	-3.9	732	0.9	3.0	43.5			59.8			40.6	732	44.7	4.1	48.9
45	30	162.0	39.0	5.96	579,229	58,005	84.8	777,201	227.7	3.93	105	162.0	113.0	8.0	120
7.2	-1.1	732	3.9	3.3	48.3			64.8			40.6	732	45.0	4.4	48.9
51	35	162.0	44.4	6.60	641,176	58,539	85.4	840,970	246.4	4.21	105	162.0	113.7	8.7	120
10.6	1.7	732	6.9	3.7	53.4			70.1			40.6	732	45.4	4.8	48.9
57	40	162.0	49.7	7.28	707,594	59,035	86.1	909,082	266.4	4.51	105	162.0	114.4	9.4	120
13.9	4.4	732	9.8	4.0	59.0			75.8			40.6	732	45.8	5.2	48.9
63	45	162.0	55.0	8.01	778,791	59,463	86.6	981,738	287.6	4.84	105	162.0	115.1	10.1	120
17.2	7.2	732	12.8	4.5	64.9			81.8			40.6	732	46.2	5.6	48.9
69	50	162.0	60.2	8.80	855,073	59,792	87.0	1,059,142	310.3	5.19	105	162.0	115.9	10.9	120
20.6	10.0	732	15.7	4.9	71.3			88.3			40.6	732	46.6	6.1	48.9

In accordance with ARI 325 and 330 standards & CAN/CSA C446-M94

Current in amps @ 460v—Multiply by 2.2 for 208v, by .8 for 575v

HW-800-HAC — Nominal 65 tons — Cooling

Source Data						Power Consumption				Sink Data					
ELT °F	Evap. °	Flow	LLT °F	Temp.	HAB	Watts	Amps	Output	KW	EER	EWT °	Igpm	LWT °	Delta °	Cond.
°C	°C	L/min	°C	°C	tons			tons			°C	L/min	°C	°C	°C
55	40	162.0	46.4	8.64	839,345	39,957	62.4	975,719	285.9	21.01	65	162.0	75.0	10.0	80
12.8	4.4	732	8.0	4.8	69.9			81.3			18.3	732	23.9	5.6	26.7
55	40	162.0	46.5	8.49	825,279	41,953	64.8	968,464	283.8	19.67	70	162.0	80.0	10.0	85
12.8	4.4	732	8.1	4.7	68.8			80.7			21.1	732	26.6	5.5	29.4
55	40	162.0	46.7	8.34	810,507	44,021	67.3	960,752	281.5	18.41	75	162.0	84.9	9.9	90
12.8	4.4	732	8.1	4.6	67.5			80.1			23.9	732	29.4	5.5	32.2
55	40	162.0	46.8	8.18	795,040	46,181	69.9	952,657	279.1	17.22	80	162.0	89.8	9.8	95
12.8	4.4	732	8.2	4.5	66.3			79.4			26.7	732	32.1	5.4	35.0
55	40	162.0	47.0	8.01	778,887	48,453	72.7	944,256	276.7	16.08	85	162.0	94.7	9.7	100
12.8	4.4	732	8.3	4.5	64.9			78.7			29.4	732	34.8	5.4	37.8
55	40	162.0	47.2	7.84	762,056	50,855	75.7	935,623	274.1	14.98	90	162.0	99.6	9.6	105
12.8	4.4	732	8.4	4.4	63.5			78.0			32.2	732	37.6	5.3	40.6
55	40	162.0	47.3	7.66	744,557	53,406	78.9	926,833	271.6	13.94	95	162.0	104.5	9.5	110
12.8	4.4	732	8.5	4.3	62.0			77.2			35.0	732	40.3	5.3	43.3
55	40	162.0	47.7	7.28	707,594	59,035	86.1	909,082	266.4	11.99	105	162.0	114.4	9.4	120
12.8	4.4	732	8.7	4.0	59.0			75.8			40.6	732	45.8	5.2	48.9

Current in amps @ 460v—Multiply by 2.2 for 208v, by .8 for 575v

Legend

ELT – entering liquid temperature
EWT – entering water temperature
EAT – entering air temperature
LWT – leaving water temperature
LAT – leaving air temperature
LLT – leaving liquid temperature
Evap. – the temperature on evaporator side when Freon is converted from a liquid to a vapor (gas)
Cond. – Freon temperature on condenser side
Flow IGPM – liquid flow in Imperial Gallons Per Minutes
IGPM – Imperial Gallons Per Minutes
Temp. diff. – Temperature difference in-between ELT and a LLT
Delta T. – Temperature difference in-between LWT and EWT
HAB – in heating mode: heat absorption capacity from the ground or water
– in cooling mode: heat absorption capacity from the inside air (total cooling load)
LSM – HAB, Lower Stage compressor Mode
Sensible - The interior heat gain (sensible) due to heat conduction, convection, and radiation from the exterior into the interior, and from occupants and appliances.
Latent – The latent load created by moisture in the air, including from outside air infiltration and that from indoor sources such as occupants, plants, cooking, showering, etc.
Comp. - Watts – compressor electricity consumption
Fan-Watts – blower motor electricity consumption
Watts – heat pumps electricity consumption
Amps – electrical current (back up excluded)
Output – heat pump capacity in Btu's & Ton's
KW OUT – heat pump capacity in kilowatts
COP – coefficient of performance
EER – energy efficiency ratio
CFM – air flow rate in cubic feet per meter