

Liquid-to-Water High Capacity Commercial Geothermal Heat Pumps

HW-600-HAC



Water Well, Groundloop or Wastewater Operation

Boreal
Energy Efficient Solutions

Boreal GEOTHERMAL Inc.

Tel : 514 – 886 – 0682

Email : info@boreal-geothermal.com

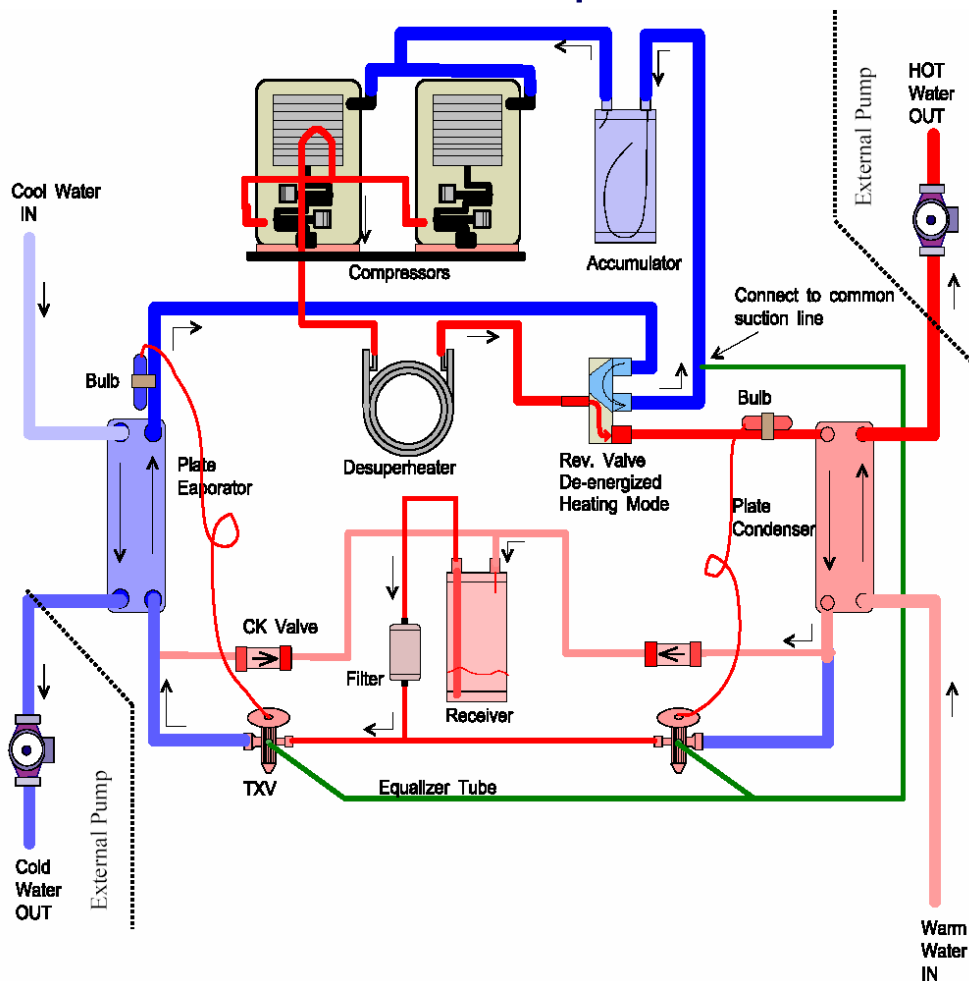
Fax : 514 – 221 – 3448

Web : www.boreal-geothermal.com

Standard Features

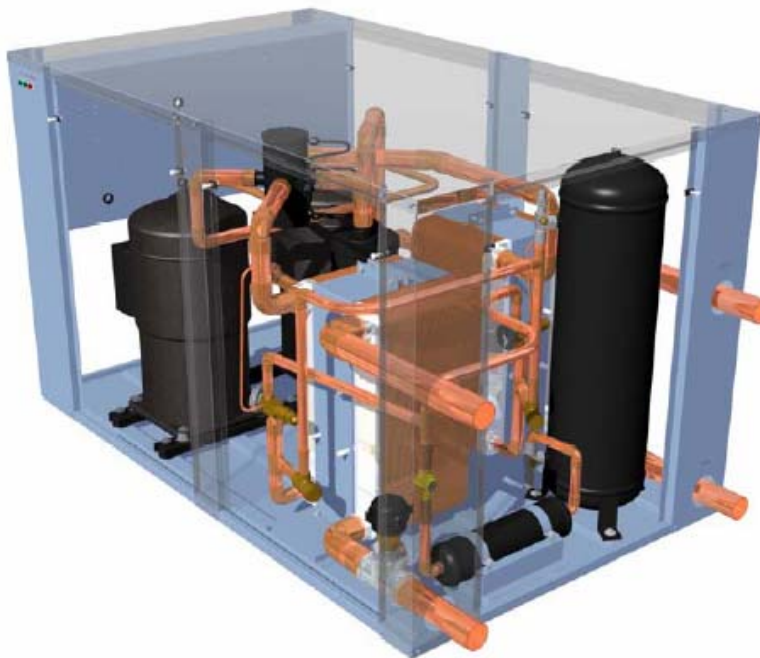
1. Heavy duty case constructed of 20 gauge 1mm satin galvanized panels with welded reinforcing channel stiffeners and corner posts.
2. Finished inside and out with an oven baked epoxy enamel.
3. Cabinet completely insulated with 1/2" to 1" acoustic insulation.
4. Four removable access doors for easy 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-600-HAC Model

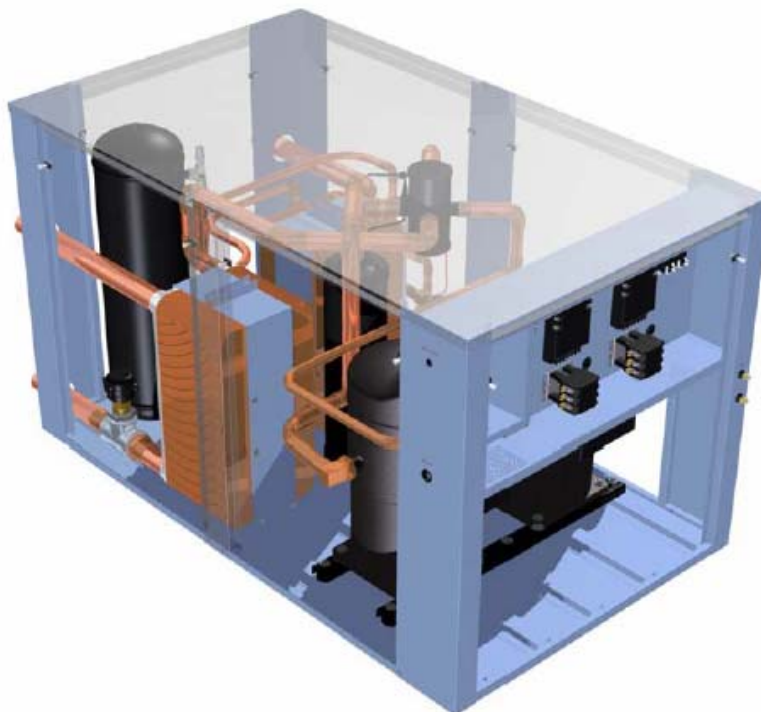
- Galvanized metal with baked enamel or epoxy based finish.
- Thermostatic expansion valves.
- High efficiency scroll compressors.
- High Efficiency brazed plate heat exchangers.



(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 output capacity.
- Low water Flow switch protection

Performance Charts

HW-600-HAC

Nominal 50 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	125.0	22.6	4.37	328,055	43,378	64.4	476,105	139.5	3.22	105	125.0	111.3	6.3	120
-2.8	-9.4	565	-5.2	2.4	27.3			39.7			40.6	565	44.1	3.5	48.9
33	20	125.0	28.1	4.88	366,340	43,864	65.0	516,050	151.2	3.45	105	125.0	111.9	6.9	120
0.6	-6.7	565	-2.2	2.7	30.5			43.0			40.6	565	44.4	3.8	48.9
39	25	125.0	33.6	5.44	407,919	44,274	65.5	559,026	163.8	3.70	105	125.0	112.5	7.5	120
3.9	-3.9	565	0.9	3.0	34.0			46.6			40.6	565	44.7	4.1	48.9
45	30	125.0	39.0	6.04	452,983	44,640	65.9	605,338	177.4	3.97	105	125.0	113.1	8.1	120
7.2	-1.1	565	3.9	3.4	37.7			50.4			40.6	565	45.0	4.5	48.9
51	35	125.0	44.3	6.69	501,725	44,994	66.4	655,288	192.0	4.27	105	125.0	113.7	8.7	120
10.6	1.7	565	6.8	3.7	41.8			54.6			40.6	565	45.4	4.9	48.9
57	40	125.0	49.6	7.39	554,337	45,369	66.8	709,180	207.8	4.58	105	125.0	114.5	9.5	120
13.9	4.4	565	9.8	4.1	46.2			59.1			40.6	565	45.8	5.3	48.9
63	45	125.0	54.9	8.15	611,010	45,797	67.3	767,315	224.8	4.91	105	125.0	115.2	10.2	120
17.2	7.2	565	12.7	4.5	50.9			63.9			40.6	565	46.2	5.7	48.9
69	50	125.0	60.0	8.96	671,938	46,311	68.0	829,998	243.2	5.25	105	125.0	116.1	11.1	120
20.6	10.0	565	15.6	5.0	56.0			69.2			40.6	565	46.7	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-600-HAC

Nominal 50 tons

Cooling

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	EER	EWT °F	Igpm	LWT °F	Delta °F	Cond. °F
°C	°C	L/min	°C	°C	tons			tons			°C	L/min	°C	°C	°C
52	40	125.0	43.1	8.92	668,712	31,991	50.7	777,896	227.9	20.90	65	125.0	75.4	10.4	80
11.1	4.4	565	6.2	5.0	55.7			64.8			18.3	565	24.1	5.8	26.7
52	40	125.0	43.3	8.74	655,519	33,161	51.9	768,699	225.2	19.77	70	125.0	80.2	10.2	85
11.1	4.4	565	6.3	4.9	54.6			64.1			21.1	565	26.8	5.7	29.4
52	40	125.0	43.4	8.56	641,894	34,469	53.4	759,537	222.5	18.62	75	125.0	85.1	10.1	90
11.1	4.4	565	6.4	4.8	53.5			63.3			23.9	565	29.5	5.6	32.2
52	40	125.0	43.6	8.37	627,895	35,917	55.1	750,478	219.9	17.48	80	125.0	90.0	10.0	95
11.1	4.4	565	6.5	4.7	52.3			62.5			26.7	565	32.2	5.6	35.0
52	40	125.0	43.8	8.18	613,580	37,507	57.0	741,593	217.3	16.36	85	125.0	94.9	9.9	100
11.1	4.4	565	6.6	4.5	51.1			61.8			29.4	565	34.9	5.5	37.8
52	40	125.0	44.0	7.99	599,009	39,245	59.1	732,952	214.8	15.26	90	125.0	99.8	9.8	105
11.1	4.4	565	6.7	4.4	49.9			61.1			32.2	565	37.7	5.4	40.6
52	40	125.0	44.2	7.79	584,239	41,132	61.5	724,622	212.3	14.20	95	125.0	104.7	9.7	110
11.1	4.4	565	6.8	4.3	48.7			60.4			35.0	565	40.4	5.4	43.3
52	40	125.0	44.6	7.39	554,337	45,369	66.8	709,180	207.8	12.22	105	125.0	114.5	9.5	120
11.1	4.4	565	7.0	4.1	46.2			59.1			40.6	565	45.8	5.3	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