

## GAHP A - Air Source LT Low Temperature

### Heating capacity (kW)

		Water delivery temperature							
		Heating					DHW		
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Outdoor temperature	-20 °C	30.3	28.2	26.1	24.1	21.2	12.8	11.9	8.2
	-19 °C	30.5	28.5	26.4	24.3	21.4	13.0	12.1	8.3
	-18 °C	30.8	28.7	26.6	24.6	21.7	13.2	12.3	8.4
	-17 °C	31.0	29.0	26.9	24.8	21.9	13.3	12.5	8.5
	-16 °C	31.3	29.2	27.1	25.1	22.2	13.5	12.6	8.6
	-15 °C	31.5	29.5	27.4	25.3	22.4	13.7	12.8	8.8
	-14 °C	32.0	30.0	27.9	25.8	22.9	14.0	13.2	9.0
	-13 °C	32.5	30.5	28.4	26.3	23.4	14.4	13.5	9.2
	-12 °C	33.0	31.0	28.9	26.8	23.9	14.7	13.9	9.5
	-11 °C	33.5	31.5	29.4	27.3	24.4	15.1	14.2	9.7
	-10 °C	34.0	32.0	29.9	27.8	24.9	15.5	14.6	9.9
	-9 °C	34.9	32.8	30.8	28.7	25.8	16.0	15.2	10.3
	-8 °C	35.7	33.7	31.6	29.5	26.6	16.6	15.7	10.7
	-7 °C	36.6	34.5	32.4	30.4	27.5	17.2	16.3	11.1
	-6 °C	37.1	35.2	33.0	30.8	28.1	17.6	16.6	11.3
	-5 °C	37.7	35.9	33.6	31.3	28.7	18.0	16.8	11.4
	-4 °C	38.2	36.7	34.2	31.8	29.3	18.4	17.1	11.6
	-3 °C	38.8	37.4	34.8	32.3	29.9	18.8	17.3	11.7
	-2 °C	39.3	38.1	35.4	32.8	30.5	19.1	17.6	11.9
	-1 °C	39.8	38.7	36.2	33.6	31.3	19.4	17.8	12.0
	0 °C	40.3	39.4	37.0	34.5	32.0	19.7	18.1	12.2
1 °C	40.8	40.1	37.7	35.4	32.8	19.9	18.4	12.4	
2 °C	41.3	40.8	38.5	36.3	33.6	20.2	18.7	12.6	
3 °C	41.4	40.8	38.7	36.6	34.0	20.6	19.1	12.8	
4 °C	41.5	40.9	38.9	37.0	34.3	21.0	19.5	13.1	
5 °C	41.5	41.0	39.1	37.3	34.6	21.4	19.9	13.4	
6 °C	41.6	41.0	39.3	37.7	34.9	21.8	20.3	13.6	
7 °C	41.7	41.1	39.6	38.0	35.3	22.2	20.8	13.9	
8 °C	41.7	41.2	39.8	38.4	35.8	22.7	21.0	14.1	
9 °C	41.8	41.2	40.0	38.8	36.2	23.2	21.3	14.2	
10 °C	41.8	41.3	40.3	39.2	36.7	23.6	21.6	14.4	
11 °C	41.9	41.4	40.5	39.6	37.2	24.1	21.9	14.6	
12 °C	41.9	41.5	40.7	39.9	37.6	24.5	22.2	14.7	
13 °C	42.0	41.6	41.0	40.3	38.1	25.0	22.4	14.9	
14 °C	42.0	41.7	41.2	40.7	38.6	25.5	22.7	15.0	
15 °C	42.1	41.8	41.4	41.1	39.1	25.9	23.0	15.2	

**Efficiency (GUE)**

		Water delivery temperature							
		Heating					DHW		
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Outdoor temperature	-20 °C	1.201	1.119	1.037	0.955	0.840	0.728	0.678	0.650
	-19 °C	1.211	1.129	1.047	0.965	0.850	0.738	0.688	0.659
	-18 °C	1.221	1.139	1.057	0.975	0.860	0.748	0.698	0.668
	-17 °C	1.231	1.149	1.067	0.985	0.870	0.758	0.708	0.677
	-16 °C	1.241	1.159	1.077	0.995	0.880	0.768	0.718	0.686
	-15 °C	1.251	1.169	1.087	1.005	0.890	0.778	0.728	0.695
	-14 °C	1.271	1.189	1.107	1.025	0.910	0.798	0.748	0.714
	-13 °C	1.291	1.209	1.127	1.045	0.930	0.818	0.768	0.733
	-12 °C	1.311	1.229	1.147	1.065	0.950	0.838	0.788	0.751
	-11 °C	1.331	1.249	1.167	1.085	0.970	0.858	0.808	0.770
	-10 °C	1.351	1.269	1.187	1.105	0.990	0.878	0.828	0.788
	-9 °C	1.385	1.303	1.220	1.138	1.023	0.911	0.862	0.819
	-8 °C	1.418	1.336	1.254	1.172	1.057	0.945	0.895	0.850
	-7 °C	1.452	1.369	1.287	1.205	1.090	0.978	0.928	0.881
	-6 °C	1.473	1.398	1.311	1.224	1.114	1.000	0.942	0.893
	-5 °C	1.495	1.426	1.335	1.243	1.138	1.022	0.956	0.905
	-4 °C	1.516	1.454	1.358	1.262	1.162	1.044	0.970	0.917
	-3 °C	1.538	1.483	1.382	1.281	1.186	1.066	0.983	0.930
	-2 °C	1.559	1.511	1.406	1.300	1.210	1.088	0.997	0.942
	-1 °C	1.579	1.538	1.436	1.334	1.241	1.102	1.013	0.956
	0 °C	1.599	1.564	1.467	1.369	1.272	1.117	1.029	0.969
	1 °C	1.620	1.591	1.498	1.404	1.303	1.131	1.045	0.983
	2 °C	1.641	1.619	1.529	1.440	1.335	1.146	1.060	0.997
	3 °C	1.643	1.621	1.537	1.453	1.348	1.169	1.084	1.018
	4 °C	1.645	1.623	1.545	1.467	1.360	1.193	1.108	1.039
	5 °C	1.648	1.625	1.553	1.481	1.373	1.217	1.132	1.060
	6 °C	1.650	1.627	1.561	1.495	1.386	1.240	1.155	1.081
	7 °C	1.653	1.629	1.570	1.510	1.400	1.264	1.179	1.102
8 °C	1.655	1.633	1.579	1.525	1.419	1.290	1.195	1.115	
9 °C	1.657	1.637	1.588	1.540	1.438	1.316	1.211	1.128	
10 °C	1.659	1.640	1.598	1.555	1.456	1.342	1.227	1.142	
11 °C	1.661	1.644	1.607	1.570	1.475	1.368	1.243	1.155	
12 °C	1.664	1.648	1.616	1.585	1.494	1.394	1.259	1.168	
13 °C	1.666	1.651	1.626	1.600	1.513	1.420	1.275	1.181	
14 °C	1.668	1.655	1.635	1.615	1.531	1.446	1.292	1.194	
15 °C	1.670	1.658	1.644	1.630	1.550	1.472	1.308	1.206	

**Gas input (kW - LHV)**

		Water delivery temperature							
		Heating					DHW		
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Outdoor temperature	-20 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-19 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-18 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-17 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-16 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-15 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-14 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-13 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-12 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-11 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-10 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-9 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-8 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-7 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-6 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-5 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-4 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-3 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-2 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	-1 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	0 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	1 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	2 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	3 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	4 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	5 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	6 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
	7 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6
8 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
9 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
10 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
11 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
12 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
13 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
14 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	
15 °C	25.2	25.2	25.2	25.2	25.2	17.6	17.6	12.6	

# GAHP GS - Ground Source HT High Temperature

## Heating capacity (kW)

		Water delivery temperature					
		Heating					DHW
		45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Water return temperature to evaporator	0 °C	39.0	37.6	35.6	33.5	31.4	13.6
	1 °C	39.2	37.9	35.9	33.9	31.7	13.7
	2 °C	39.4	38.2	36.2	34.2	32.0	13.7
	3 °C	39.6	38.5	36.5	34.5	32.3	13.8
	4 °C	39.8	38.7	36.8	34.9	32.6	13.8
	5 °C	40.0	39.0	37.1	35.2	32.9	13.9
	6 °C	40.2	39.2	37.4	35.6	33.4	14.2
	7 °C	40.4	39.4	37.6	36.0	33.8	14.5
	8 °C	40.6	39.6	37.9	36.4	34.3	14.8
	9 °C	40.8	39.8	38.1	36.8	34.8	15.2
	10 °C	40.9	40.0	38.4	37.1	35.2	15.5
	11 °C	41.1	40.2	38.6	37.5	35.6	15.8
	12 °C	41.3	40.4	38.9	37.9	36.0	15.9
	13 °C	41.5	40.6	39.1	38.3	36.4	15.9
	14 °C	41.7	40.8	39.4	38.6	36.8	16.0
	15 °C	41.7	40.9	39.6	39.0	37.1	16.0
	16 °C	41.8	41.1	39.9	39.2	37.5	16.1
	17 °C	41.9	41.3	40.1	39.4	37.9	16.3
	18 °C	41.9	41.4	40.4	39.6	38.3	16.4
19 °C	42.0	41.6	40.6	39.8	38.6	16.5	
20 °C	42.0	41.7	41.1	40.0	39.0	16.6	

## Efficiency (GUE)

		Water delivery temperature					
		Heating					DHW
		45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Water return temperature to evaporator	0 °C	1.549	1.493	1.412	1.330	1.247	1.080
	1 °C	1.557	1.504	1.424	1.343	1.259	1.084
	2 °C	1.565	1.515	1.437	1.357	1.271	1.088
	3 °C	1.573	1.526	1.449	1.371	1.282	1.092
	4 °C	1.581	1.538	1.461	1.385	1.294	1.096
	5 °C	1.589	1.549	1.474	1.399	1.306	1.100
	6 °C	1.596	1.556	1.483	1.414	1.324	1.126
	7 °C	1.603	1.564	1.493	1.429	1.343	1.152
	8 °C	1.611	1.571	1.503	1.444	1.361	1.178
	9 °C	1.618	1.579	1.513	1.459	1.380	1.204
	10 °C	1.625	1.587	1.523	1.474	1.399	1.230
	11 °C	1.632	1.594	1.533	1.489	1.414	1.255
	12 °C	1.639	1.602	1.543	1.504	1.429	1.259
	13 °C	1.646	1.610	1.553	1.519	1.444	1.263
	14 °C	1.653	1.617	1.563	1.534	1.459	1.267
	15 °C	1.656	1.625	1.573	1.549	1.474	1.271
	16 °C	1.659	1.631	1.583	1.556	1.489	1.280
	17 °C	1.661	1.637	1.593	1.564	1.504	1.290
	18 °C	1.664	1.644	1.603	1.572	1.519	1.299
19 °C	1.667	1.650	1.612	1.580	1.534	1.308	
20 °C	1.667	1.656	1.630	1.587	1.549	1.318	

### Heat recovered from cold sink - ground (kW)

		Water delivery temperature (hot side)					
		Cold sink					Cold sink*
		45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Water return temperature to evaporator	0 °C	13.2	12.1	10.0	8.3	7.0	2.0
	1 °C	13.7	12.7	10.8	9.2	7.8	2.0
	2 °C	14.2	13.3	11.7	10.0	8.6	2.0
	3 °C	14.7	13.9	12.4	10.8	9.4	2.0
	4 °C	15.1	14.4	13.1	11.5	10.1	2.0
	5 °C	15.5	14.9	13.8	12.2	10.8	2.0
	6 °C	15.9	15.3	14.4	12.9	11.4	2.1
	7 °C	16.2	15.7	14.9	13.5	12.0	2.2
	8 °C	16.5	16.1	15.4	14.0	12.6	2.2
	9 °C	16.8	16.4	15.8	14.5	13.1	2.3
	10 °C	17.0	16.7	16.2	15.0	13.6	2.4
	11 °C	17.2	16.9	16.5	15.4	14.0	2.4
	12 °C	17.4	17.1	16.8	15.8	14.4	2.4
	13 °C	17.5	17.3	17.0	16.1	14.8	2.4
	14 °C	17.6	17.4	17.2	16.4	15.2	2.4
	15 °C	17.6	17.5	17.3	16.6	15.4	2.4
	16 °C	17.6	17.5	17.3	16.8	15.7	2.4
17 °C	17.6	17.5	17.3	16.9	15.9	2.4	
18 °C	17.6	17.5	17.3	17.0	16.1	2.4	
19 °C	17.6	17.5	17.3	17.0	16.2	2.4	
20 °C	17.6	17.5	17.3	17.0	16.3	2.4	