

Submittal Data

GAHP Line W Series

Gas Fired Absorption Heat Pump

Heating and Cooling

GAHP is the acronym for Gas Absorption Heat Pump. The GAHP-W is a high efficiency water-cooled heat pump, utilizing a water-ammonia absorption cycle that is designed for indoor use. The GAHP-W is designed to recover thermal energy from external water sources (wells, aquifers, etc.). The thermal and chilling energy produced can also be

used simultaneously. The unit is able to heat water up to 149 °F and chill water down to 37.4 °F with a heating efficiency up to 139%. The cycle of the GAHP-W is driven by thermal energy provided by a gas burner. Therefore, the required electric energy is limited to feed the electronic control system and the pump motor. The GAHP-W is fed by

natural gas or LPG, and supplied with 208-230 V - 60 Hz SINGLE PHASE electrical power. The evacuation of combustion products takes place through an appropriate exhaust terminal, located on the side of the appliance, with outlet in a vertical position.



Operating mode

Three different consent management mode options may be selected from the unit's S60 electronic control board or the Optional Direct Digital Controller (DDC), with the control of the inlet or outlet water temperature. The three options are used to make the unit manage a specific operating request, through the assignment of a priority, which can be:

- HOT PRIORITY (satisfies the heating request);
- COLD PRIORITY (satisfies the chilling request);
- NO PRIORITY (satisfies the heating/chilling request).

This last option can only be programmed from the S60 electronic control board and only be used by the stand-alone board (no DDC installed).

The GAHP-W is equipped with the following devices:

- mild steel sealed circuit, externally coated with epoxy paint;
- pre-mixed multigas burner, multiple gas type with ignition and flame sensing device managed by an electronic control box;
- evaporator for chilled water: tube in shell type, made of titanium stainless steel,

externally insulated with polystyrene;

- condenser/absorber for heated water: tube in shell type, made of titanium, externally insulated with polystyrene.

Control and safety devices

The GAHP-W is controlled and monitored by the S60 control board through the peripheral W10 card. These cards and other components compose the control and safeties of the GAHP-W, as listed below:

- S60 Electronic Control Board with integrated

microprocessor, LCD display and encoder located inside the electric box; it is programmable and it controls and monitors the operation of the heat pump;

- water flow switches; located on the return chilled water lines; monitor both the hot and cold water flow and help prevent the freezing of the evaporator and the overheating of the condenser-absorber;
- sealed circuit high temperature limit; located on the external wall of the generator; helps prevent overheating of the generator;
- hot water high temperature

- limit switch; located on the outlet water line; prevents water circuit from overheating;
- differential air pressure switch; located inside the electric box; it helps manage the combustion system by monitoring the air flowing into the air-gas mixing chamber and stopping the burner if the air flow is too low;
- flue gas temperature limit switch; located inside the rear portion of the combustion chamber; helps prevent overheating of the generator;
- sealed circuit safety relief valve;
- safety by-pass valve; located inside the sealed system; prevents over pressurizing of the sealed system;
- antifreeze function for hydronic system; together with the flow switches, this electronic function programmed into the microprocessor, helps prevent the freezing of the two water heat exchangers;
- ignition control box; located inside the electric box; it manages the combustion system controlling the burner ignition, the gas valve, the air pressure switch, the air blower and the flame sensor;
- dual gas valve;
- temperature probes; located both on the sealed system and on the water lines; they monitor functional parameters of the unit.

PERFORMANCE RATINGS - HEATING ⁽¹⁾

		GAHP-W	
Heating capacity ⁽²⁾		BTU/h	132,400
Gas input		BTU/h	95,500
Ambient operating temperature	maximum	°F	113
	minimum	°F	10.4
Hot water temperature	maximum outlet (to hydronic system)	°F	149
	maximum inlet (to unit)	°F	113
Water flow	nominal	GPM	14.5
Internal pressure drop at nominal water flow		Feet of Head	12.7
		psi _g	5.5

PERFORMANCE RATINGS - COOLING ⁽¹⁾

Cooling capacity ⁽²⁾		BTU/h	54,600
Gas input		BTU/h	95,500
Chilled water temperature	minimum outlet (to hydronic system)	°F	37.4
	maximum inlet (to unit)	°F	113
Chilled water flow	nominal	GPM	12.3
Internal pressure drop at nominal water flow		Feet of Head	12.7
		psi _g	5.51

ELECTRICAL RATINGS ⁽¹⁾

Required voltage, 60 Hz, single phase ⁽³⁾		V	208-230
Operating consumption-chiller + heaters ⁽⁴⁾		kW	0.4
MCA (Minimum Circuit Ampacity)		A	4.5
MOP (Maximum Overcurrent Protection)		A	8.1

PHYSICAL DATA

Operating weight		pounds	630
Dimensions	width	inches	33 1/4
	length	inches	25 3/4
	height	inches	50 3/4

⁽¹⁾ All illustrations and specifications contained herein are based on the latest information available at the time of publication.

⁽²⁾ GAHP-W standard test conditions: W50/W122.

⁽³⁾ Units are factory-wired for 208-230 volts operation.

⁽⁴⁾ May vary by ± 10% as function of both power supply and electrical motor input tolerance.

Due to continuous product innovation and development, Robur reserves the right to change product specifications without prior notice.

HEATING MODE CAPACITY (BTU/h)

Chilled water inlet temperature	Hot water inlet temperature					
	77.0 °F	86.0 °F	95.0 °F	104.0 °F	113.0 °F	113.0 °F
	$\Delta\Delta T = 18\text{ °F}$					$\Delta\Delta T = 36\text{ °F}$
46.4 °F	142,400	140,000	136,000	129,000	121,500	117,700
50.0 °F	142,600	140,900	138,200	132,400	125,300	121,300
53.6 °F	142,600	141,400	139,600	134,900	128,800	124,800
59.0 °F	142,600	141,600	140,500	137,600	133,300	129,400
68.0 °F	142,600	141,600	140,700	139,500	137,700	134,700
77.0 °F	142,600	141,600	140,700	139,700	138,800	137,000
86.0 °F	142,600	141,600	140,700	139,700	138,800	137,200

ΔT is the difference between outlet and inlet temperature.

COOLING MODE CAPACITY (BTU/h)

Chilled water inlet temperature	Hot water inlet temperature					
	77.0 °F	86.0 °F	95.0 °F	104.0 °F	113.0 °F	113.0 °F
	$\Delta\Delta T = 18\text{ °F}$					$\Delta\Delta T = 36\text{ °F}$
46.4 °F	63,700	61,200	56,700	51,700	46,000	42,500
50.0 °F	64,100	62,200	58,900	54,800	49,900	46,000
53.6 °F	64,200	62,900	60,600	57,400	53,300	49,000
59.0 °F	64,300	63,600	62,400	60,400	57,100	52,900
68.0 °F	64,300	64,000	63,500	62,400	60,600	57,900
77.0 °F	64,300	64,000	63,500	62,400	61,600	60,100
86.0 °F	64,300	64,000	63,500	62,400	61,700	60,000

ΔT is the difference between outlet and inlet temperature.

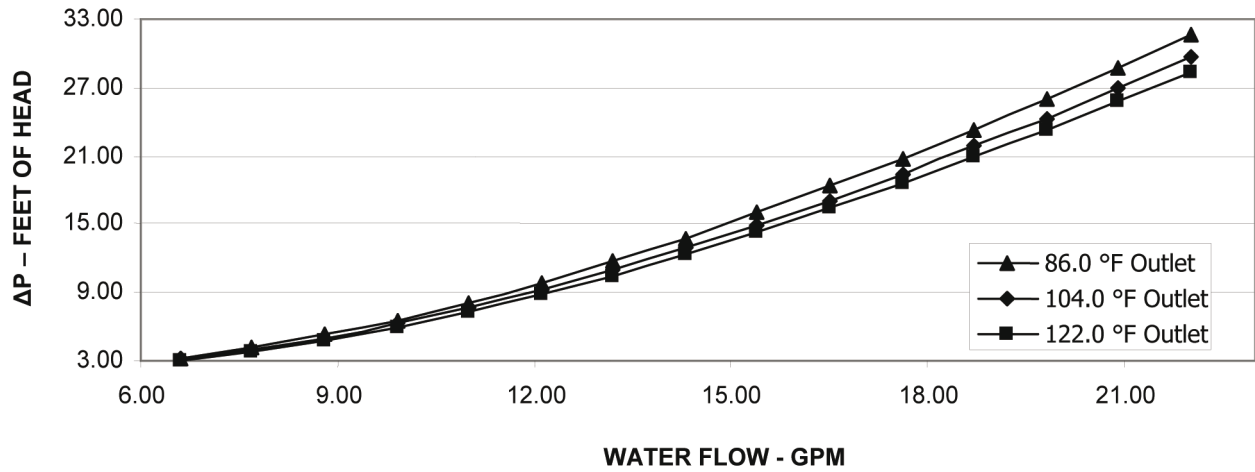
PRESSURE DROP - Heating mode

Hot water flow	Outlet water temperature		
	86.0 °F	104.0 °F	122.0 °F
GPM	$\Delta\Delta P$ (Feet of Head)		
6.60	3.29	3.14	2.91
7.71	4.17	3.98	3.71
8.81	5.28	5.02	4.70
9.91	6.60	6.25	5.89
11.01	8.12	7.67	7.25
12.11	9.83	9.25	8.79
13.21	11.72	11.00	10.47
14.31	13.77	12.90	12.31
15.41	15.97	14.94	14.27
16.51	18.30	17.11	16.36
17.61	20.76	19.41	18.56
18.71	23.32	21.81	20.86
19.81	25.98	24.32	23.25
20.91	28.73	26.92	25.71
22.01	31.55	29.60	28.24

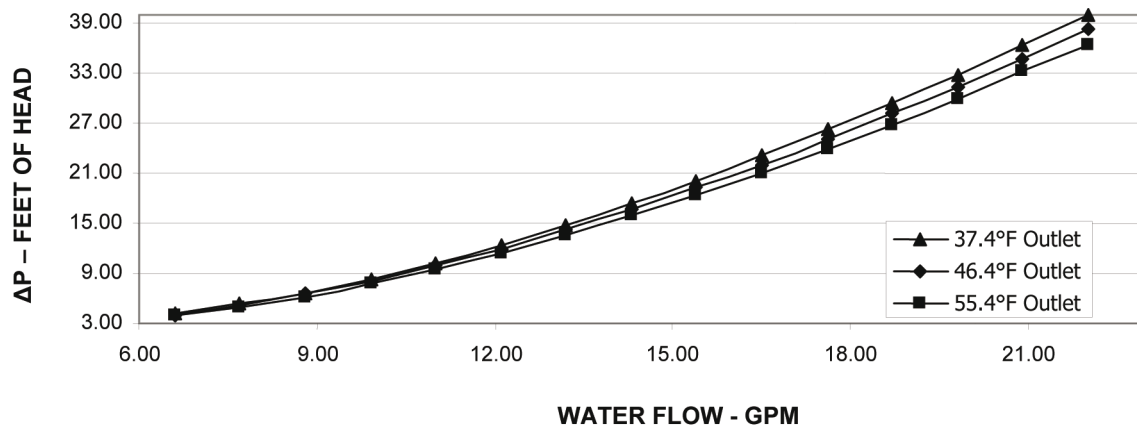
PRESSURE DROP - Cooling mode

Hot water flow	Outlet water temperature		
	37.4 °F	46.4 °F	55.4 °F
GPM	ΔP (Feet of Head)		
6.60	4.26	3.98	3.88
7.71	5.34	5.12	4.93
8.81	6.70	6.50	6.22
9.91	8.35	8.11	7.73
11.01	10.25	9.94	9.47
12.11	12.40	11.99	11.42
13.21	14.78	14.23	13.56
14.31	17.37	16.66	15.89
15.41	20.15	19.27	18.39
16.51	23.11	22.06	21.06
17.61	26.23	25.01	23.88
18.71	29.49	28.11	26.85
19.81	32.88	31.35	29.94
20.91	36.38	34.72	33.16
22.01	39.97	38.22	36.48

GAHP-W PRESSURE DROP – HEATING MODE



GAHP-W PRESSURE DROP – CHILLING MODE

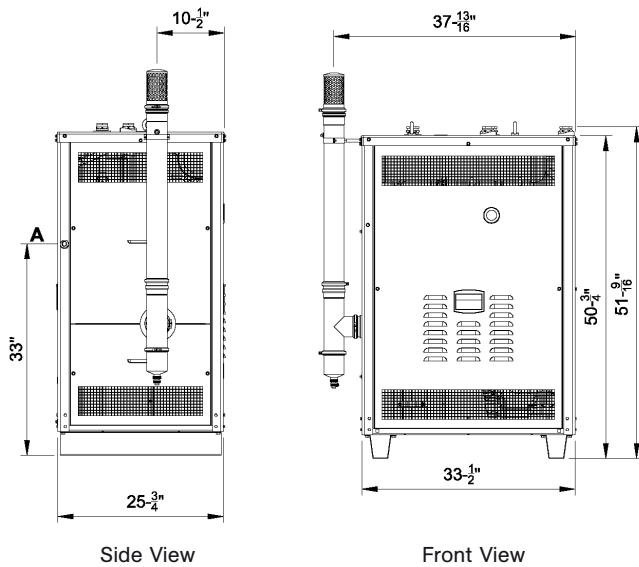


APPROXIMATE WATER FREEZING POINT TEMPERATURE

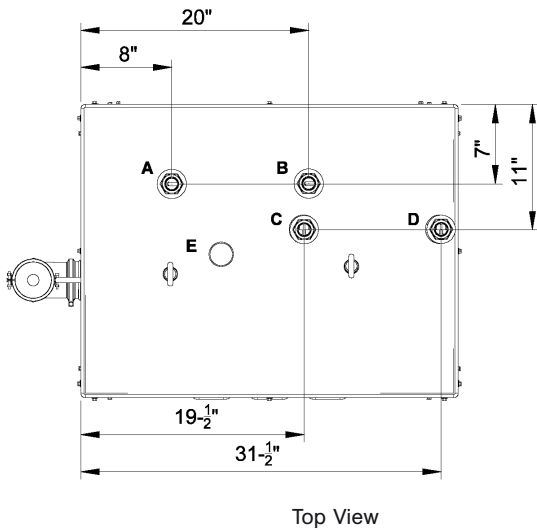
Percentage of monoethylene glycol	10	15	20	25	30	35	40
Water freezing point temperature (°F)	26.6	23.0	17.6	10.4	5.0	-4.0	-13.0
Percentage of increase in pressure drop	--	6	8	10	12	14	16
Loss of efficiency of unit	--	0.5	1	2	2.5	3	4

The numbers provided in this table are approximate and you must refer to the glycol manufacturer's instructions for additional instructions and amount of glycol required based on expected ambient conditions.

GAHP-W DIMENSIONS

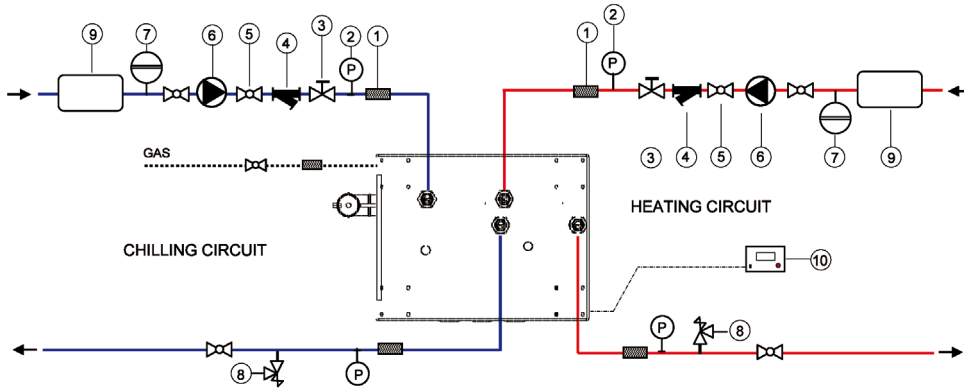


GAHP-W SERVICE PLATE DIMENSIONS



- A Chilled water inlet ø 1" FPT
- B Hot water inlet ø 1" FPT
- C Chilled water outlet ø 1" FPT
- D Hot water outlet ø 1" FPT
- E Discharge valve canalization plug

GAHP-W HYDRONIC SYSTEM: Typical Installation Arrangement (External Components not included with Robur Unit)



- | | |
|--------------------------------|------------------------------|
| 1 Antivibration flexible hoses | 6 Circulating water pump |
| 2 Pressure gauge | 7 Expansion tank |
| 3 Flow regulating valve | 8 Safety valve |
| 4 Water filter | 9 Water storage |
| 5 Shut-off valve | 10 DDC (optional from Robur) |

Clearances

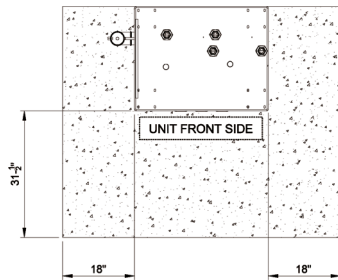
Position the appliance so that minimum clearances from combustible surfaces and constructions (walls and

other equipment) are maintained, as shown in the figure below. The appliance may be installed directly on wood

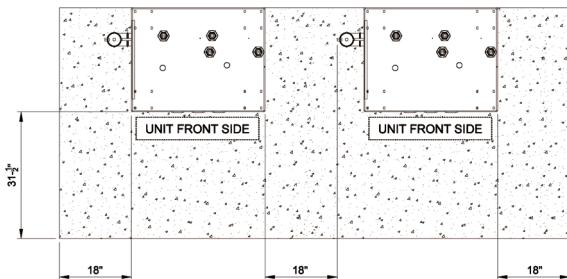
flooring. Minimum clearances are necessary for operating performance, and in order to be able to carry out

maintenance operations.

Observe all local and State codes.



Single unit



Multiple units