

Submittal Data

GAHP Line A Series

Gas Fired Absorption Heat Pump Heating

GAHP is the acronym for Gas Absorption Heat Pump. The GAHP-A is a high efficiency air source heat pump boiler, utilizing a water-ammonia absorption cycle that is designed for outdoor use.

The GAHP-A is able to heat water up to 140 °F, with

external ambient temperatures from -20 °F up to 113 °F.

The cycle of the GAHP-A is driven by thermal energy provided by a gas burner. Therefore, the required electric energy is limited to driving the fan and pump motors.

The GAHP-A 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 the outlet in a vertical position.



Operating mode

The appliance uses an absorption cycle to recover heat from the outside environment via the finned coil, which when combined with the heat produced by the combustion of natural/LPG gas, is transferred into the exchanger and then into the medium to be heated, ensuring efficiency of 129% (under nominal conditions).

The GAHP-A is equipped with the following devices:

- steel sealed circuit, externally coated with epoxy paint;

- premixed multigas burner with ignition and flame sensing device managed by the electronic control box;
- steel tube air heat exchanger with single-row coil and aluminum fins;
- titanium stainless steel tube bundle water heat exchanger, with external insulation;
- two-way automatic defrosting valve, controlled by the microprocessor, allows for fin coil defrosting.

Control and safety devices

The GAHP-A 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-A, 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;

- hot water flow switch; located on the return water line; monitors the hot water flow and helps prevent 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 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;
 - 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.
- The GAHP-A is especially suited for gas heating plants wanting to achieve higher overall operating performance. Total plant efficiency rises when one or more GAHP-A units are used in combination with standard boilers. When operating in a moderately cool climate, a plant with 25-30% of thermal load supplied by GAHP-A units (and the residual supplied by ordinary boilers) can reach a total efficiency up to 120-130%, with proportionally lower combustible consumption.

PERFORMANCE RATINGS ⁽¹⁾

		GAHP-A	
Heating capacity ⁽²⁾		BTU/h	123,500
Gas input		BTU/h	95,500
Ambient operating temperature	maximum	°F	113
	minimum	°F	-20
Hot water temperature	maximum outlet (to hydronic system)	°F	140
	maximum inlet (to unit)	°F	122
Water flow	nominal	GPM	13.6
	maximum	GPM	22
	minimum	GPM	6.2
Internal pressure drop at nominal hot water flow		Feet of Head	10.1
		psi _g	4.3

ELECTRICAL RATINGS ⁽¹⁾

Required voltage, 60 Hz, single phase ⁽³⁾	V	208 - 230
Operating consumption ⁽⁴⁾	kW	0.9
MCA (Minimum Circuit Ampacity)	A	8.0
MOP (Maximum Overcurrent Protection)	A	10.9

PHYSICAL DATA ⁽¹⁾

Operating weight	pounds	770	
Gas inlet connections	FPT	1/2"	
Dimensions	width	inches	33 1/2
	length	inches	48 1/2
	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⁾ Heating capacity at standard conditions of 44.6 °F ambient temperature. Hot water outlet temperature 122 °F, hot water inlet temperature 104 °F.

⁽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.

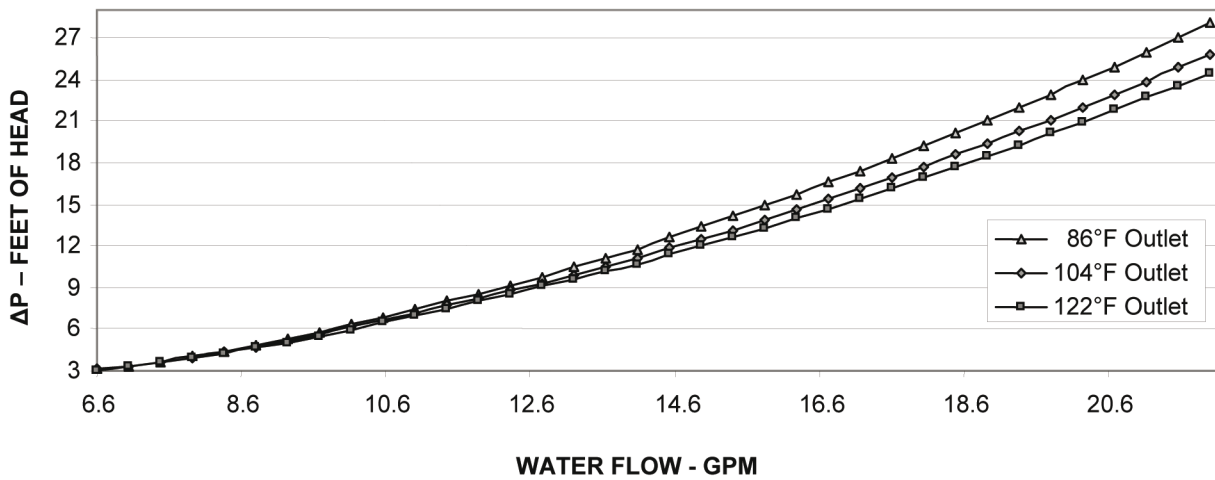
HEATING MODE CAPACITY (BTU/h)

External ambient operating temperature (dry bulb)	Outlet (to plant) hot water temperature			
	86 °F	113 °F	122 °F	140 °F
	$\Delta\Delta T = 18\text{ °F}$		$\Delta\Delta T = 27\text{ °F}$	
-20.0 °F	97,600	88,700	85,000	83,600
-13.0 °F	98,600	89,700	86,000	84,600
-4.0 °F	99,600	90,800	87,000	85,600
5.0 °F	102,000	93,500	90,100	88,400
14.0 °F	111,600	102,400	95,900	92,800
19.4 °F	117,000	108,200	100,000	96,200
35.6 °F	126,900	122,200	114,000	105,800
44.6 °F	132,400	130,700	123,500	115,300
50.0 °F	134,800	134,400	128,000	120,100
59.0 °F	136,500	136,500	132,000	123,500
68.0 °F	138,200	138,200	133,800	127,300
77.0 °F	139,200	139,200	134,800	128,000

Nominal value in bold type.

ΔT is the difference between outlet and inlet temperature.

GAHP-A PRESSURE DROP



PRESSURE DROP - Heating mode (ΔP condenser / absorber)

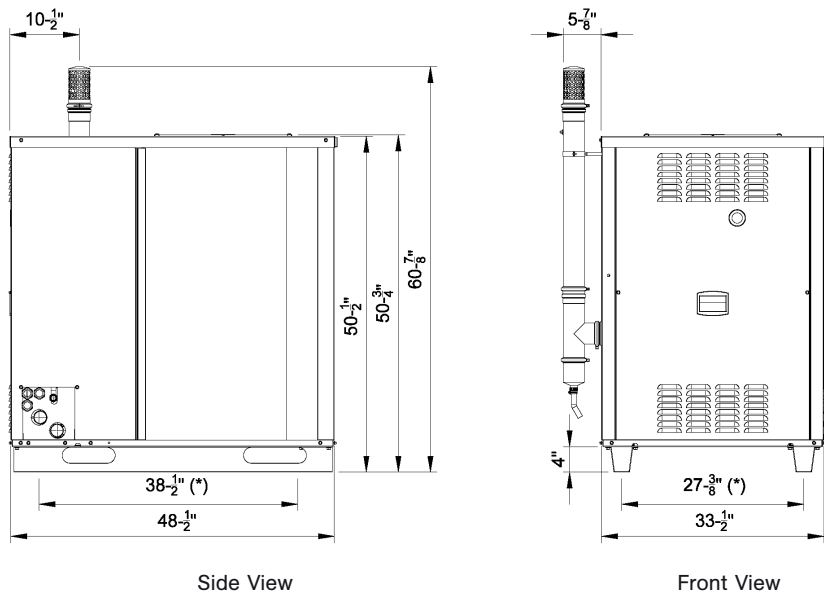
Hot water flow	Outlet water temperature		
	122.0 °F	104.0 °F	86.0 °F
GPM	$\Delta\Delta P$ (Feet of Head)		
6.60	3.05	3.08	3.15
7.04	3.30	3.32	3.35
7.48	3.58	3.62	3.65
7.93	3.89	3.98	4.05
8.37	4.25	4.35	4.42
8.81	4.64	4.76	4.86
9.25	5.05	5.19	5.28
9.69	5.50	5.66	5.77
10.13	5.96	6.18	6.29
10.57	6.45	6.66	6.83
11.01	6.95	7.16	7.39
11.45	7.47	7.68	7.97
11.89	7.99	8.21	8.57
12.33	8.52	8.76	9.18
12.77	9.06	9.32	9.80
13.21	9.59	9.90	10.43
13.65	10.12	10.50	11.07
14.09	10.64	11.11	11.72
14.53	11.36	11.81	12.60
14.97	11.98	12.48	13.35
15.41	12.63	13.17	14.12
15.85	13.29	13.87	14.91
16.29	13.97	14.60	15.72
16.73	14.67	15.35	16.55
17.17	15.39	16.11	17.40
17.61	16.13	16.90	18.27
18.05	16.88	17.70	19.16
18.49	17.65	18.53	20.07
18.93	18.44	19.37	21.00
19.37	19.25	20.23	21.94
19.81	20.08	21.11	22.91
20.25	20.92	22.01	23.90
20.69	21.78	22.93	24.90
21.13	22.66	23.87	25.93
21.57	23.56	24.82	26.97
22.01	24.48	25.80	28.03

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.

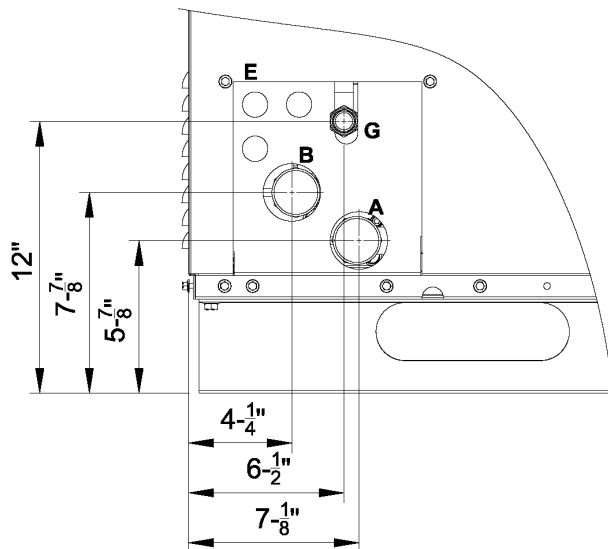
GAHP-A DIMENSIONS



Side View

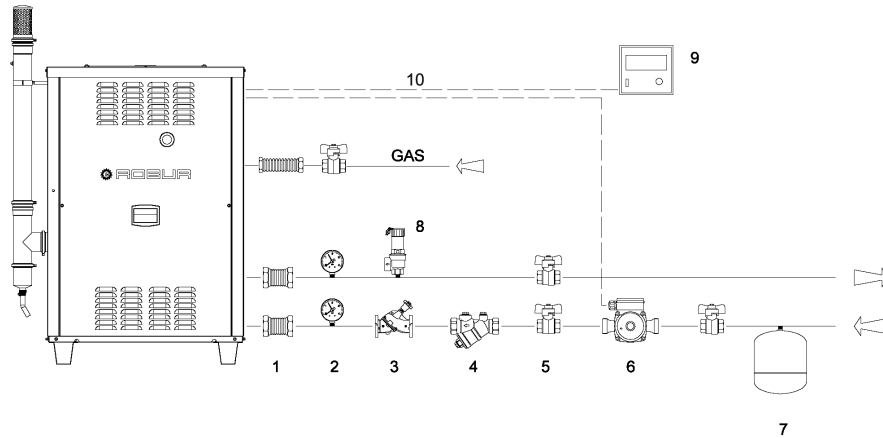
Front View

GAHP-A SERVICE PLATE DIMENSIONS



- A Water outlet (to water loop) ø 1" FPT
- B Water inlet (to unit) ø 1" FPT
- E Electrical knockouts ø 7/8" FPT
- G Gas connection ø 1/2" FPT

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



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

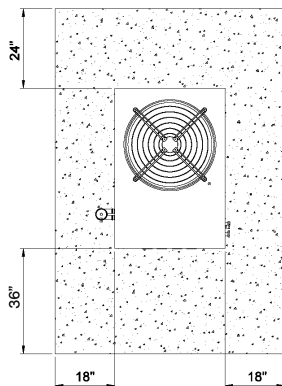
The appliance may be installed directly on wood flooring. Minimum clearances are

necessary for operating performance, and in order to be able to carry out maintenance operations and to ensure the correct airflow required for proper heat exchange with the finned coil. There must not be any obstructions or structural overhangs (roof edges, balconies) over the top of the unit. The re-circulation of

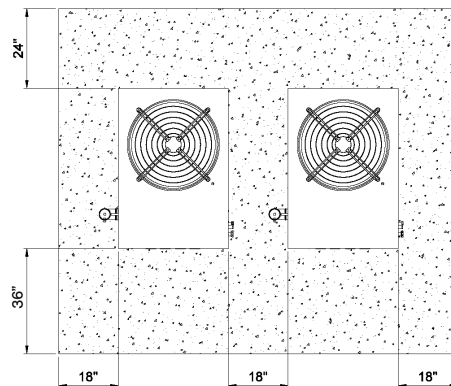
the air discharged from the condenser results in poor unit performance. When the unit is installed in close proximity to buildings, keep the unit away from the roof edge drip line. In no case should the unit be placed within 6 feet of any external air intakes of the building. For installations on balconies or roofs, the unit

must not be located within 8 feet from chimney flues, outlets and other such vents. It is important that the unit is located so that hot or contaminated air is not drawn into the air intakes of the unit.

Observe all local and State codes.



Single unit



Multiple units