

GAHP Line AR Series

Reversible Gas Fired Absorption Heat Pump

Heating and Cooling

Cooling and heating with a unique gas fired high efficiency unit.

Robur GAHP-AR is the first air-source water-ammonia absorption heat pump. By using natural gas as the primary energy source it supplies hot water up to 140 °F or chilled water down to 37.4 °F. The same unit is suitable for heating or cooling by reversing the absorption cycle, using the outside air for

heat rejection in cooling mode and as a heat source in heating mode. The gas efficiency at rated conditions is 126% in heating mode.

As a general efficiency feature, in moderate climate areas (about twice the heating load versus cooling load) the gas savings during the heating season can offset the gas consumption normally required

during the cooling season.

The AR series offers a wide variety of convenient applications, for instance: air conditioning systems for light commercial, industrial and residential use; single unit for both heating and cooling with low electrical power consumption; gas-based heating and cooling systems in order to achieve electrical peak shaving.



Use Heating and Cooling alternatively

Type Air to water

Heat transfer fluid Water

Heating capacity 120,400 BTU/h

Cooling capacity 57,700 BTU/h

Renewable energy percentage contributing to the total heat output 34

Heating efficiency 126%

Cooling efficiency 60%

Outlet water temperature 37.4 °F / 140 °F

Main applications High efficiency low temperature heating, air conditioning water system

Main advantage Savings up to 40% in operating costs in comparison with the best gas fired boilers, thanks to the energy recovered from a renewable source (air).

Additional advantages

- **Single Phase Power.**
- **One Single Unit and System**

with one single fuel supplies hot or chilled water.

- The prevailing use of gas **reduces the need of electric power by approximately 87%** in comparison with electric compression units (0.75 electrical kW for 120,400 BTU/h heating and 57,700 BTU/h cooling);
- **No need to increase electric power demand.**
- For application requiring standby power, the **electric generator size and electric output will be lower.**
- **High Reliability** due to few moving parts inside the unit.
- **Easy Maintenance**, similar to gas fired boilers.
- **No Water Consumption.** No need for cooling tower (no problems associated with legionella).
- **No use of Harmful Refrigerants.**
- **Outdoor Installation.**

Features

- **Patented reversible absorption cycle.**
- **Air source/cooled heat exchanger** with single row aluminium fin coil.
- **Evaporator/Condenser-Absorber** tube and shell tower geometry made of stainless steel.
- **Refrigerant accumulator** to optimize refrigerant volume inside the evaporator relative to operational conditions.
- **Axial fan** with thermally protected motor drive and safety protection grid.
- **Pre-mixed gas burner.** Stainless steel multiple gas type with ignitor and flame sensor device controlled by an electronic ignition box.
- **Microprocessor control.** Printed resin electronic circuit with LED display. Ensures optimum

operation of the absorption cooling process while allowing easy access of unit data for preventative maintenance and diagnostics.

- **Optional Direct Digital Controller (DDC).** A single device to fully manage and control Robur units.
- **Built-in safety and control devices**, comprised of water flow switch; sealed circuit safety valve and safety by-pass valve between high and low pressure side; generator high temperature limit switch with manual reset; antifreeze control system; redundant gas valve; microprocessor control with LED readout to assist with maintenance and service diagnostics; flue temperature limit switch with automatic reset to avoid overheating.

PERFORMANCE RATINGS - HEATING ⁽¹⁾

		GAHP-AR	
Heating capacity ⁽²⁾		BTU/h	120,400
Gas input		BTU/h	95,500
Ambient operating temperature	maximum	°F	95
	minimum	°F	-20
Hot water temperature	maximum outlet (to hydronic system)	°F	140
	maximum inlet (to unit)	°F	122
Hot water flow	nominal	GPM	13.4
Internal pressure drop at nominal hot water flow		Feet of Head	9.8
		psi _g	4.2

PERFORMANCE RATINGS - COOLING ⁽¹⁾

Cooling capacity ⁽³⁾		BTU/h	57,700
Gas input		BTU/h	95,500
Ambient operating temperature	maximum	°F	120
	minimum	°F	32
Chilled water temperature	minimum outlet (to hydronic system)	°F	37.4
	maximum inlet (to unit)	°F	113
Chilled water flow	nominal	GPM	12.8
Internal pressure drop at nominal chilled water flow		Feet of Head	10.5
		psi _g	4.5

ELECTRICAL RATINGS

Required voltage, 60 Hz, single phase ⁽⁴⁾	V	208 - 230
Operating consumption ⁽⁵⁾	kW	0.75

PHYSICAL DATA

Operating weight	pounds	838	
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.

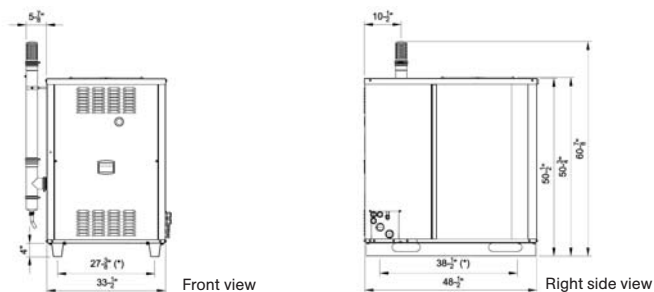
⁽³⁾ Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet

temperature 44.6 °F, chilled water inlet temperature 53.6 °F.

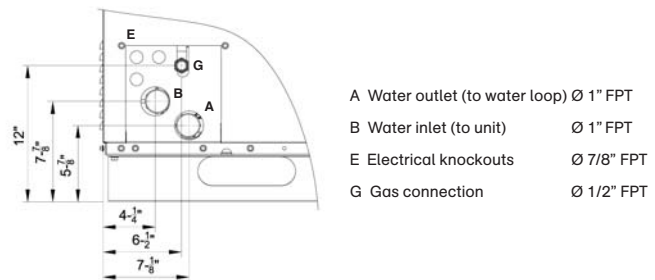
⁽⁴⁾ Units are factory-wired for 208-230 volts operation.

⁽⁵⁾ 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.**

GAHP-AR Dimensions

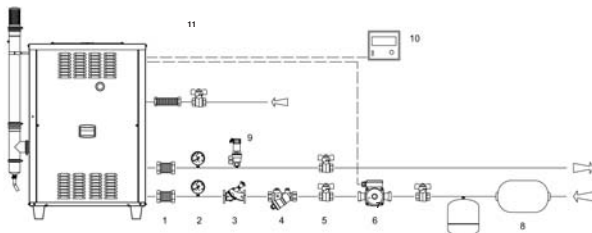


GAHP-AR Connection Panel



- 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-AR 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 Water storage
- 9 Safety valve
- 10 DDC (optional from Robur)
- 11 Can Bus cable (optional from Robur)