ROBUR
caring for the environment

Product Guide

Heating & Cooling Solutions

Natural Gas/Propane Gas (LPG)

Robur turns its passion to produce quality products
into innovative heating and cooling systems
that are especially designed and developed
to answer the specific needs of our customers.

Robur Vision

Robur is dedicated to dynamic progression
in research, development and promotion
of safe, environmentally-friendly, and energy-efficient products,
through the commitment and caring
of our employees and partners.

Robur Mission

Robur Corporation was founded in 1991 by the Robur Group, a leading Italian Manufacturer of advanced heating and cooling technologies sold throughout Europe since 1956. This bold step insured Robur of future growth opportunities in the North American market.
At our facility located in Evansville, IN (USA), Robur Corporation assembles and distributes high energy efficient and low environmental impact natural gas operated heating, air conditioning and refrigeration systems.
In addition to being the North American Service Center for all Robur products, the Evansville, IN location also services the spare parts needs of Servel and Arkla chillers.

Robur Values

Innovation

by researching and developing technologically advanced products and offering quality services directed towards total customer satisfaction.

Corporate Social Responsibility

by developing and manufacturing safe, environmentally friendly and energy-efficient products.

Human Resources

by involving all of its human resources, both inside and outside the company, in constant training and sharing of our vision, strategy and objectives.

Testimony

"Robur wants to be a workplace stimulated by Progress, sustained by Passion, enlivened by Humanity, guaranteed by Quality".

Recent Awards and Recognition

2001 - First company in Europe to obtain Vision 2000 certification in the heating and cooling sector.

2001 - First Prize National Quality Award in Italy.

2003 - Special Prize Winner of the "European Quality Award".

2004 - Benito Guerra, President of Robur, receives nomination as finalist in the "Quality of Life" category of Italian Businessman of the Year, promoted by Ernst & Young.

2005 - CSA and ASME certifications (renewal).

2006 - Two Honorable Mention Awards at AHR Expo co-sponsored by ASHRAE and ARI: the Reversible Gas Fired Absorption Heat Pump (GAHP-AR) in the "Heating" category and the Water Source Gas Fired Absorption Heat Pump (GAHP-W) for the "Green Building" category.

2007 - Listed on California's Building Energy Efficiency Standards by California Energy Commission (CEC).

2008 - CEC (California Energy Commission) approved Robur laboratories for testing in compliance with the requirements of the appliance efficiency regulation.

GAHP Line A Series
Air-to-Water
Gas Fired Absorption Heat Pump Heating

Heating with a unique gas fired high efficiency unit.

The Robur GAHP-A 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. It is suitable for heating systems where the highest gas efficiency appliance available is required. With a gas efficiency at rated conditions of 129%, this unit is suitable for raising the average efficiency of traditional heating systems when integrated with boilers. In temperate climate areas, where the heating load is twice the cooling load, operating with a Robur GAHP-A unit in conjunction with a standard heating unit will raise the average efficiency of the overall heating system approximately 112% to 122%.

Reasons for choosing Robur GAHP-A Heat Pumps.

- **High efficiency** up to 129% at nominal conditions.
- **Reduced electric consumption.** The GAHP-A gas fired unit draws less than 1 kW (SINGLE PHASE) to produce 123,500 BTU/h for the heating system.
- **Consistent operation with extreme outdoor temperatures.** Gas efficiency in heating mode around 100% even down to -20 °F.
- **Environmental awareness.** Low pollution emission and natural refrigerant fluids.
- **Defrosting mode.** The GAHP-A unit supplies over 50% of its nominal heating capacity with no need for additional primary energy input.
- **Maximum space utilization.** Robur units are installed outdoors and do not require any special indoor equipment room.
- **Complete flexibility, modularity for capacity control.** Multiple Robur units may be combined for greater capacity, modularity and redundancy.

PERFORMANCE RATINGS [1]

Heating capacity [2]		BTU/h	123,500
Gas input		BTU/h	95,500
Ambient operating temperature	max	°F	113
	min	°F	-20
Hot water temperature	max outlet (to hydronic system)	°F	140
	max inlet (to unit)	°F	122

ELECTRICAL RATINGS

Required voltage, 60 Hz, Single phase	V	208-230
Operating consumption [3]	kW	0.9

[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 of 122 °F, hot water inlet temperature 104 °F.

[3] 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 CAPACITY AT CONDITIONS DIFFERENT FROM NOMINAL (BTU/h)

External ambient operating temperat. (dry bulb)	Outlet (to hydronic system) hot water temperature			
	86 °F	113 °F	122 °F	140 °F
	DT=18 °F	DT=18 °F	DT=18 °F	DT=27 °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	108,400	95,900	92,800
19.4 °F	117,000	108,200	100,000	96,200
35.6 °F	126,000	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	135,500	132,000	123,500
68.0 °F	132,800	138,200	133,800	127,300
77.0 °F	139,200	139,200	134,800	128,000

Heating capacity nominal value in orange type.

DT is the difference between outlet and inlet temperature.

GAHP Line AR Series
Air-to-Water Reversible Gas Fired Absorption Heat Pump Heating and Cooling

Cooling and Heating alternatively with a unique gas fired high efficiency unit.

The Robur Reversible Heat Pump GAHP-AR is the first air-source water-ammonia absorption heat pump.

By using natural gas as the primary energy source it supplies chilled water down to 37.4 °F or hot water up to 140 °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 consumption savings during the heating season can offset the gas consumption normally required during the cooling season.

Reasons for choosing Robur GAHP-AR Heat Pumps.

- **High efficiency.** Heating gas efficiencies up to 126% are possible (at rated conditions).
- **Reduced electric consumption.** The GAHP-AR gas fired unit draws less than 1 kW (SINGLE PHASE) to produce 57,700 BTU/h in cooling mode and 120,400 BTU/h in heating mode.
- **Consistent operation with extreme outdoor temperatures.** Gas efficiency in heating mode around 100% even down to -20 °F. In cooling mode the GAHP-AR unit can produce chilled water at outdoor temperatures up to 120 °F.
- **Environmental awareness.** Low pollution emission and natural refrigerant fluids.
- **Defrosting mode.** The GAHP-AR unit supplies over 50% of its nominal heating capacity with no need for additional primary energy input.
- **Maximum space utilization.** Robur units are installed outdoors and do not require any special indoor equipment room.
- **A single unit.** Natural or Propane gas (LPG) fired for heating and cooling.

PERFORMANCE RATINGS - HEATING [1]			
Heating capacity [2]	nominal	BTU/h	120,400
Gas input	nominal	BTU/h	95,500
Ambient operating temperature	max	°F	95
	min	°F	-20
Hot water temperature	max outlet (to hydronic system)	°F	140
	max inlet (to unit)	°F	122
PERFORMANCES RATINGS - COOLING [1]			
Cooling capacity [3]		BTU/h	57,700
Gas input		BTU/h	95,500
Ambient operating temperature	max	°F	120
	min	°F	32
Chilled water temperature	min outlet (to hydronic system)	°F	37.4
	max inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase		V	208-230
Operating consumption [4]		kW	0.75

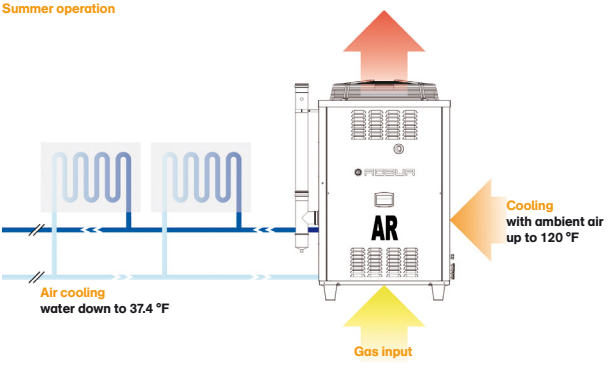
[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.

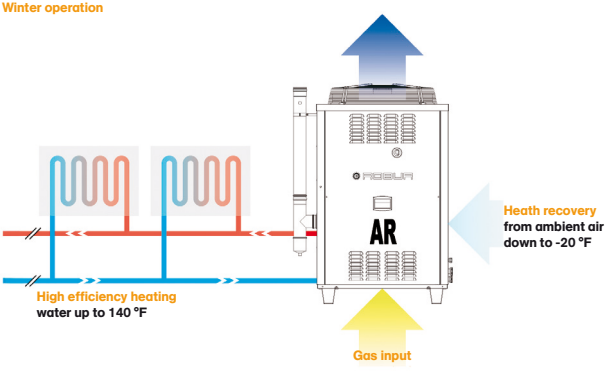
[2] Heating capacity at standard conditions of 44.6 °F ambient temperature.

[3] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature
45 °F, chilled water inlet temperature 55 °F.

[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.





GAHP Line RTAR Series

Air-to-Water Reversible Gas Fired Absorption Heat Pump Links Heating and Cooling

Cooling and Heating alternatively with a unique gas fired high efficiency system.

The Robur Reversible Heat Pump RTAR is a high efficiency link comprised of multiple air-source absorption heat pumps GAHP-AR.

By using natural gas as the primary energy source it supplies chilled water down to 37.4 °F or hot water up to 140 °F.

The same link 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 consumption savings during the heating season can offset the gas consumption normally required during the cooling season.

Reasons for choosing Robur RTAR Heat Pump Links.

- **Complete flexibility, modularity for capacity control:** 4 models from 240,800 to 602,000 Btu/h heating capacity and from approx. 10 to 25 Ton cooling capacity.
- **High efficiency.** Heating gas efficiencies up to 126%.
- **Reduced electric consumption.** The 600,000 Btu/h, 25 Ton RTAR Link draws less than 4 kW (SINGLE PHASE).
- **Consistent operation with extreme outdoor temperatures.** Gas efficiency in heating mode around 100% even down to -20 °F.
- **Environmental awareness.** Low pollution emission and natural refrigerant fluids.
- **Maximum space utilization.** Robur units are installed outdoors and do not require any special indoor equipment room.
- **Gas Configuration.** Natural or Propane gas (LPG) fired for heating and cooling.

Optional DDC

A single device to fully manage and control Robur units. Robur's Direct Digital Controller (DDC) allows total unit control, enhanced management and complete operation monitoring.

PERFORMANCE RATINGS - HEATING [1]		RTAR 120-240	RTAR 180-360
Heating capacity [2]	BTU/h	240,800	361,200
Gas input	BTU/h	191,000	286,500
PERFORMANCES RATINGS - COOLING [1]			
Cooling capacity [3]	BTU/h	115,400	173,100
Gas input	BTU/h	191,000	286,500
ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	
Operating consumption [4]	kW	1.50	2.25

PERFORMANCE RATINGS - HEATING [1]		RTAR 240-480	RTAR 300-600
Heating capacity [2]	BTU/h	481,600	602,000
Gas input	BTU/h	382,000	477,500
PERFORMANCES RATINGS - COOLING [1]			
Cooling capacity [3]	BTU/h	230,800	288,500
Gas input	BTU/h	382,000	477,500
ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	
Operating consumption [4]	kW	3.00	3.75

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

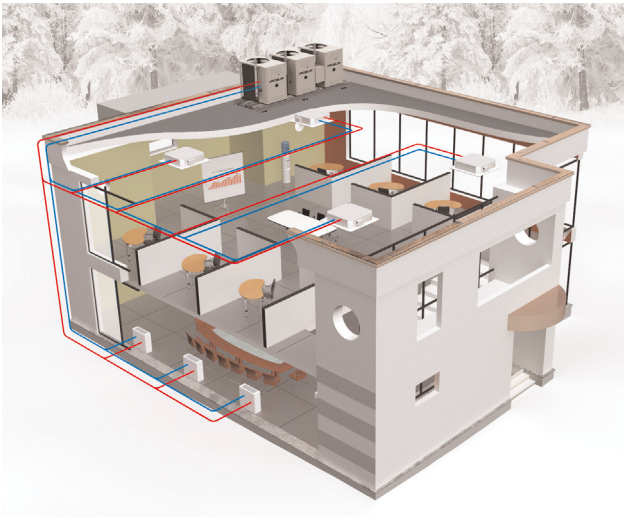
[2] Heating capacity at standard conditions of 44.6 °F ambient temperature.

[3] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.

[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.

RTAR: Light Commercial Application



GAHP Line W LB Series

Water-to-Water Ground Source Gas Fired Absorption Heat Pump Heating and Cooling

High efficiency with the Ground Source/Geothermal Heat Pump.

Robur GAHP-W LB is the only ground source heat pump operating on a gas fired water-ammonia absorption cycle which combines the advantages of ground source systems' heat recovery with the advantages of gas fired appliances. Foreseen for indoor installation, it is designed for heating/cooling applications, with heat recovery from closed loop (vertical/horizontal) or open loop ground source systems. Natural gas/LPG fired, GAHP-W LB supplies hot water up to 140 °F and chilled water down to 23 °F, recovering renewable energy from the ground with heating efficiency up to 125%. Units may be piped into modular configurations to satisfy greater cooling and heating requirements.

Reasons for choosing Robur GAHP-W LB Heat Pumps.

- **High efficiency** up to 125%, powered by the heat of gas combustion (natural or propane gas) and by recovering free renewable energy.
- **Reduced electric power consumption**. The Robur GAHP-W LB gas fired unit draws less than 0.5 kW (SINGLE PHASE).
- **Reduced dimensions of the ground-source exchanger**. In comparison with an electric heat pump, thanks to the absorption thermodynamic cycle, they are reduced up to approximately 40%.
- **Wide operational parameters**. Heating up to 140 °F and cooling down to 23 °F.
- **Indoor installation**.
- **Environmental awareness**. Low pollution emission and natural refrigerant fluids.

PERFORMANCE RATINGS - HEATING [1][2]			
Heating capacity	nominal	BTU/h	119,400
Gas input	nominal	BTU/h	95,500
Ambient operating temperature	max	°F	113
	min	°F	10.4
Hot water temperature	max outlet (to hydronic system)	°F	140
	max inlet (to unit)	°F	113
PERFORMANCES RATINGS - COOLING [1][2]			
Cooling capacity		BTU/h	46,100
Gas input		BTU/h	95,500
Chilled water temperature	min outlet (to hydronic system)	°F	23
	max inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase		V	208-230
Operating consumption [3]		kW	0.4

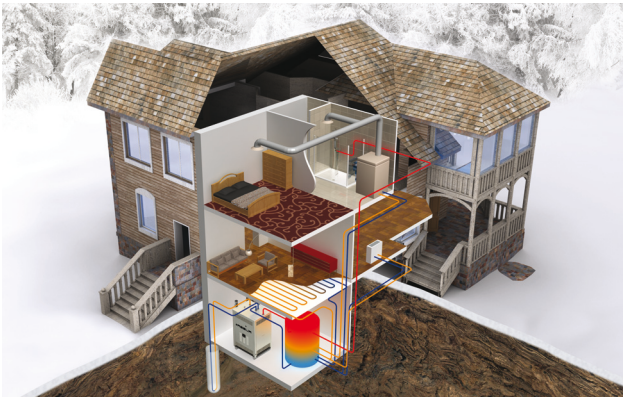
[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.

[2] GAHP-W LB standard test conditions: B32/W122.

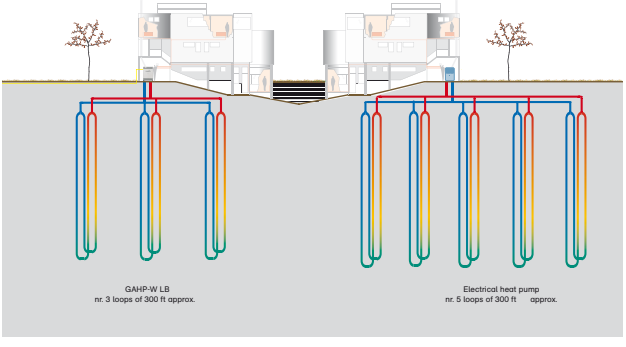
[3] May vary by ± 10% as function of both power supply and electrical motor input tolerance.

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

Ground source application



Ground source application: saving up to 40% of the total loop lenght



GAHP Line W Series
Water-to-Water
Gas Fired Absorption Heat Pump
Simultaneous Heating and Cooling

Simultaneous Heating and Cooling with the Gas Fired Absorption Heat Pump.

Robur GAHP-W is the only water source heat pump operating on a gas fired water-ammonia absorption cycle, which combines the advantages of water heat recovery with the advantages of gas fired appliances.

Foreseen for indoor installation, it is designed for heating/cooling applications, with contemporary pond/pool water heat exchange. Thermal energy can also be recovered from industrial processes (waste waters).

Natural Gas/LPG fired, Robur GAHP-W supplies hot water up to 149 °F and chilled water down to 37.4 °F, providing simultaneous heating and cooling with renewable energy recovery from the water with heating efficiency up to 139%.

Units may be piped into modular configurations to satisfy greater cooling and heating requirements.

Reasons for choosing Robur GAHP-W Heat Pumps.

- When both hot and chilled water are used, **no external exchange source** is needed.
- **High efficiency** up to 139%, powered by the heat of gas combustion (natural or propane gas) and by recovering free renewable energy.
- **Reduced electric power consumption.** The Robur GAHP-W gas fired unit draws less than 0.5 kW (SINGLE PHASE).
- **Wide operational parameters.** Heating up to 149 °F and cooling down to 37.4 °F.
- **Indoor installation**.
- **Environmental awareness.** Low pollution emission and natural refrigerant fluids.

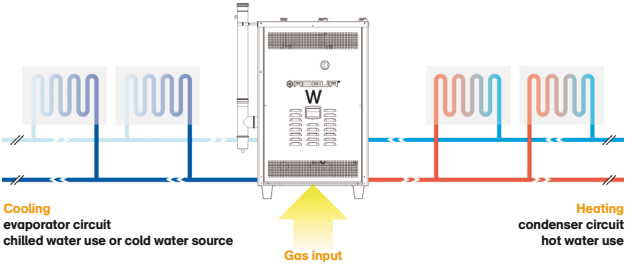
PERFORMANCE RATINGS - HEATING [1][2]			
Heating capacity	nominal	BTU/h	132,400
Gas input	nominal	BTU/h	95,500
Ambient operating temperature	max	°F	113
	min	°F	10.4
Hot water temperature	max outlet (to hydronic system)	°F	149
	max inlet (to unit)	°F	113
PERFORMANCES RATINGS - COOLING [1][2]			
Cooling capacity		BTU/h	54,600
Gas input		BTU/h	95,500
Chilled water temperature	min outlet (to hydronic system)	°F	37.4
	max inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage. 60 Hz, Single phase		V	208-230
Operating consumption [3]		kW	0.4

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

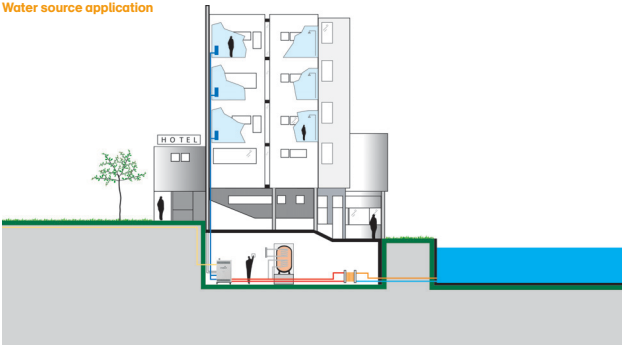
[2] GAHP-W standard test conditions: W50/W122.

[3] 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.



Water source application



GA Line ACF - RTCF Series

Gas Absorption Chillers and Chiller-Links Cooling

Natural Gas/LPG cooling: a perfect answer to every need.

Robur high efficiency chillers utilize a water-ammonia absorption cycle that is air-cooled and designed for outdoor installation.

Their primary energy source is natural or propane gas, resulting in minimal electrical service requirements.

With no engines or compressors and few moving parts in the sealed refrigeration cycle, Robur units are a reliable and durable source of chilled water.

These environmentally friendly, commercial grade chillers offer complete flexibility for residential and light commercial comfort air conditioning and industrial process cooling applications.

Reasons for choosing Robur Chillers.

- **Less electrical energy consumption.** Robur units reduce up to approximately 87% of the electrical energy consumption compared to traditional electric compressor driven systems.
- **Minimal operational costs.** Robur units use natural gas for air conditioning; only 94,900 BTU/h of natural gas and 0.75 kW of electrical energy (SINGLE PHASE) to produce 60,500 BTU/h of cooling output.
- **Performance is constant during the life span.** Robur units do not use a compressor and have only two mechanical parts in motion.
- **Complete flexibility, modularity for capacity control.** Using Robur RTCF links cooling capacities from 121,000 to 302,500 BTU/h can be obtained. Several links may be field connected together to obtain higher cooling capacities.
- **Maximum space utilization.** Robur units are installed outdoors and do not require any special indoor equipment room.

Optional DDC

A single device to fully manage and control Robur units. Robur's Direct Digital Controller (DDC) allows total unit control, enhanced management and complete operation monitoring.

PERFORMANCE RATINGS - COOLING [1]		ACF 60-00[4]
Cooling capacity [2]	BTU/h	60,500
Gas input	BTU/h	94,900
Ambient operating temperature min-max	°F	32/120
Chilled water temperature min outlet-max inlet	°F	37.4/113

ELECTRICAL RATINGS		
Required voltage, 60 Hz, Single phase	V	208-230
Operating consumption [3]	kW	0.75

PERFORMANCE RATINGS - COOLING [1]		RTCF 120-00[4]	RTCF 180-00[4]
Cooling capacity [2]	BTU/h	121,000	181,500
Gas input	BTU/h	189,800	284,700
Ambient operating temperature min-max	°F	32/120	32/120
Chilled water temperature min outlet-max inlet	°F	37.4/113	37.4/113

ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	208-230
Operating consumption [3]	kW	1.5	2.25

PERFORMANCE RATINGS - COOLING [1]		RTCF 240-00[4]	RTCF 300-00[4]
Cooling capacity [2]	BTU/h	242,000	302,500
Gas input	BTU/h	379,600	474,500
Ambient operating temperature min-max	°F	32/120	32/120
Chilled water temperature min outlet-max inlet	°F	37.4/113	37.4/113

ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	208-230
Operating consumption [3]	kW	3.00	3.75

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

[2] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.

[3] May vary by ± 10% as function of both power supply and electrical motor input tolerance.

[4] Also available in HR, TK, LB and HT versions and modular links; see page from 18 to 23.

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

GA Line HR Version
Gas Fired Absorption Chillers
Cooling with Heat Recovery

Cooling applications and Heat Recovery.

The GA line HR version chillers are engineered for air conditioning applications with heating request at the same time, such as hot domestic water or reheating in air handling units.

The heat recovery function does not interfere with normal chiller operation: when heat is not required, the unit operates as a chiller only.

The recuperator heat exchanger gives an output of 86,400 BTU/h at 122 °F and can deliver water at temperature up to approximately 176 °F.

Reasons for choosing Robur HR Chillers.

- **Free heating capacity** at high temperatures when the chiller is operating.
- **Less electrical energy consumption.** Robur units reduce up to approximately 87% of the electrical energy consumption compared to traditional electric compressor driven systems.
- **Minimal operational costs.** Robur units use natural gas for air conditioning; only 94,900 BTU/h of natural gas and 0.75 kW of electrical energy (SINGLE PHASE) to produce 60,500 BTU/h of cooling output with up to 86,400 BTU/h of free heating output.
- **Performance is constant during the life span.**
  Robur units do not use a compressor and have only two mechanical parts in motion.
- **Maximum space utilization.**
  Robur units are installed outdoors and do not require any special indoor equipment room.

PERFORMANCE RATINGS - COOLING WITH HEAT RECOVERY [1]		ACF60-00 HR
Cooling capacity (no recovery) [2]	BTU/h	60,500
Cooling capacity (with recovery) [3]	BTU/h	61,240
Heating capacity [4]	BTU/h	86,400
Gas input (HVV)	BTU/h	94,900
Ambient operating temperature min-max	°F	32/120
Chilled water temperature min outlet-max inlet	°F	37.4/113
Recovered hot water temperature max outlet	°F	176

ELECTRICAL RATINGS		
Required voltage, 60 Hz, Single phase	V	208-230
Operating consumption [5]	kW	0.75

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

[2] Cooling capacity at standard conditions (no recovery): ambient temperature 95 °F. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.

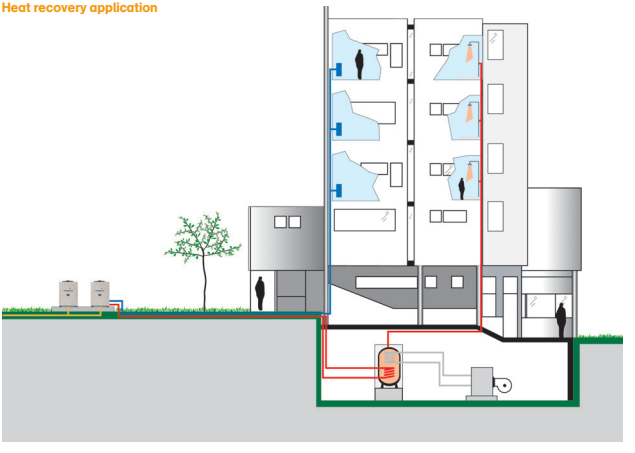
[3] Cooling capacity at standard conditions (with recovery): ambient temperature 95 °F. Chilled water outlet temperature 45 °F; heat recovery system water temperature - delivery 122 °F - return 104 °F.

[4] Cooling capacity at standard conditions (with recovery): ambient temperature 95 °F. Chilled water outlet temperature 45 °F; heat recovery system water temperature - delivery 122 °F - return 104 °F.

[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.

Heat recovery application



GA Line TK Version
Gas Absorption
Chillers and Chiller-Heaters
Process applications

Process Cooling Applications.

The GA line TK units have been designed and built for an extremely wide range of potential operating conditions:

- operating range - ambient air temperature: 10.4/120 °F;
- minimum outlet water temperature: 37.4 °F.

The units can also be supplied with an integrated heating module for the production of hot water and are available in several configurations from 60,500 to 302,500 BTU/h (cooling) and from 110,900 to 443,600 BTU/h (heating).

The manufacturing characteristics of these units are the same as those of the ACF60-00 units, but with some special features:

- refrigerant charge optimized for year-round operation;
- sealed circuit equipped with an Accumulator for greater average seasonal efficiency;
- upgraded hydraulic pump, to ensure maximum performance and reliability;
- microprocessor control parameters set for specific usage.

Reasons for choosing Robur TK Chillers.

- **Wide range of process applications.** In particular: manufacturing processes, where it is necessary to cool moulds, machines, tools and equipment; climate control throughout the year, for example for constant temperature rooms, computer rooms and laboratories; air-conditioning for areas with high heat gains during winter months.
- **Wide operational range of ambient air temperature:** 10.4 /120 °F.
- **Less electrical energy consumption.** Robur units reduce up to approximately 87% of the electrical energy consumption compared to traditional electric compressor driven systems.
- **Minimal operational costs.** Robur units use natural gas for air-conditioning; only 94,900 BTU/h of natural gas and 0.75 kW of electrical energy (SINGLE PHASE) to produce 60,500 BTU/h of cooling output.

Optional DDC

A single device to fully manage and control Robur units. Robur's Direct Digital Controller (DDC) allows total unit control, enhanced management and complete operation monitoring.

PERFORMANCE RATINGS - COOLING [1]		ACF60-00 TK
Cooling capacity [2]	BTU/h	60,500
Gas input	BTU/h	94,900
Ambient operating temperature min-max	°F	10.4/120
Chilled water temperature min outlet-max inlet	°F	37.4/113

ELECTRICAL RATINGS		
Required voltage, 60 Hz, Single phase	V	208-230
Operating consumption [4]	kW	0.75

PERFORMANCE RATINGS - COOLING [1]		AYF 60-119/2 TK	AYF 60-119/4 TK
Cooling capacity [2]	BTU/h	60,500	60,500
Gas input	BTU/h	94,900	94,900

PERFORMANCES RATINGS - HEATING [1]			
Heating capacity [3]	BTU/h	110,900	110,900
Gas input	BTU/h	129,000	129,000

ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	208-230
Operating consumption [4]	kW	0.75	0.83

AYFs TK are available in 2 or 4 pipe versions.

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

[2] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.

[3] Heating capacity at standard conditions: outlet water 176 °F, inlet water 151 °F.

[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.

GA line HT Version
Gas Fired Absorption Chillers and Chiller-Heaters Air Conditioning for High Ambient Areas

Comfort Conditioning for High Ambient areas.

The GA line HT version chillers are derived from the standard version and built for specific operation in high ambient air temperatures (higher than 103.5 °F).
They are ideal for residential, commercial and industrial environments in tropical geographic zones.

The HT units have been designed for use in extreme operating conditions:
- operational range: ambient air 32 °F to 131 °F;
- minimum outlet water temperature: 41 °F.

Available in multiple cooling and heating models from 58,400 to 292,000 BTU/h cooling and 110,900 to 443,600 BTU/h heating. Single phase electrical energy required.

PERFORMANCE RATINGS - COOLING [1]		ACF60-00 HT
Cooling capacity [2]	BTU/h	58,400
Gas input	BTU/h	94,900
Ambient operating temperature min-max	°F	32/131
Chilled water temperature min outlet-max inlet	°F	41/113
ELECTRICAL RATINGS		
Operating consumption (208-230 V, 60 Hz, Single phase) [3]	kW	0.75

		AYF	AYF
PERFORMANCE RATINGS - COOLING [1]		60-119/2 HT	60-119/4 HT
Cooling capacity [2]	BTU/h	58,400	58,400
Gas input	BTU/h	94,900	94,900
PERFORMANCES RATINGS - HEATING			
Heating capacity [3]	BTU/h	110,900	110,900
Gas input	BTU/h	129,000	129,000
ELECTRICAL RATINGS			
Operating consumption (208-230 V, 60 Hz, Single phase) [4]	kW	0.75	0.83

AYFs HT are available in 2 or 4 pipe versions.

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

GA Line LB Version
Gas Fired Absorption Chillers
Refrigeration

Refrigeration Applications.
The GA line LB chillers are units designed for medium temperature refrigeration applications.
For example: cooling for food conservation areas, rooms for processing foodstuffs, beverage coolers or laboratories.
In addition, LB chillers are capable of working with thermal (ice) storage systems during off-peak or on-peak hours to maximize building energy efficiency.

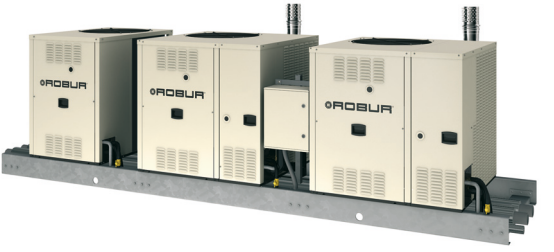
The LB units have been designed and built for use in specific operating conditions:
- operational range: ambient air 10.4 °F to 120 °F;
- minimum outlet water temperature: 14 °F.

Available in multiple chiller link configurations from 45,400 to 227,000 BTU/h.
Single phase electrical energy required.

PERFORMANCE RATINGS - COOLING [1]		ACF60-00 LB
Cooling capacity [2]	BTU/h	45,400
Gas input	BTU/h	94,900
Ambient operating temperature min-max	°F	10.4/120
Chilled water temperature min outlet-max inlet	°F	14/113

ELECTRICAL RATINGS		
Required voltage, 60 Hz, Single phase	V	208-230
Operating consumption [4]	kW	0.75

[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.
[2] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.
[3] Heating capacity at standard conditions: outlet water 176 °F - inlet water 151 °F (note for HT version - page 21).
[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.



GA Line AYF - RTYF Series
2 or 4 pipe Gas Absorption Chiller-Heaters and Chiller-Heater Links Cooling and Heating

Natural Gas/LPG cooling and heating: a perfect answer to every need.

Robur high efficiency chiller-heaters utilize an air-cooled water-ammonia absorption cycle, combined with a high efficiency low pressure boiler integrated into one single outdoor system.

Their primary energy source is natural or propane gas resulting in minimal electrical service requirements.

With no engines or mechanical compressors and few moving parts in the sealed refrigeration cycle, Robur units are a reliable and durable source of chilled and hot water.

These environmentally friendly, commercial grade chiller-heaters offer complete flexibility for residential and light commercial comfort cooling and heating: they are available in a four-pipe version for simultaneous production of hot and chilled water or in a two-pipe version for alternate production.

Maximum hot water supply temperature up to 185 °F;
chilled water supply temperature down to 37.4 °F.

Reasons for choosing Robur Chiller-Heaters.

- **Less electrical energy consumption.** Robur units reduce up to approx. 87% of the electrical energy consumption compared to electric compressor driven systems.
- **Complete service.** Heating, cooling and domestic hot water with just one unit.
- **Minimal operational costs.** Robur units use natural gas for air conditioning; only 94,900 BTU/h of natural gas and 0.75 kW of electrical energy (SINGLE PHASE), to produce 60,500 BTU/h of cooling output.
- **Complete flexibility, modularity.** Using Robur RTYF links, cooling capacities up to 242,000 BTU/h and heating capacities up to 443,600 BTU/h can be obtained. Several links may be field connected to obtain higher capacities.
- **Maximum space utilization.** Robur units are installed outdoors and do not require any special indoor equipment room.

Optional DDC

A single device to fully manage and control Robur units. Robur's Direct Digital Controller (DDC) allows total unit control, enhanced management and complete operation monitoring.

PERFORMANCE RATINGS - COOLING [1]		AYF 60-119/2 [5]	AYF 60-119/4 [5]
Cooling capacity [2]	BTU/h	60,500	60,500
Gas input	BTU/h	94,900	94,900
PERFORMANCES RATINGS - HEATING [1]			
Heating capacity [3]	BTU/h	110,900	110,900
Gas input	BTU/h	129,000	129,000
ELECTRICAL RATINGS			
Operating consumption (208-230 V, 60 Hz, Single phase) [4]	kW	0.75	0.826

PERFORMANCE RATINGS - COOLING [1]		RTYF 120-119/2/4 [5]	RTYF 120-238/2/4 [5]
Cooling capacity [2]	BTU/h	121,000	121,000
Gas input	BTU/h	189,800	189,800
PERFORMANCES RATINGS - HEATING [1]			
Heating capacity [3]	BTU/h	110,900	221,800
Gas input	BTU/h	129,000	258,000
ELECTRICAL RATINGS			
Operating consumption (208-230 V, 60 Hz, Single phase) [4]	kW	1.5	1.65

PERFORMANCE RATINGS - COOLING [1]		RTYF 180-238/2/4 [5]	RTYF 180-357/2/4 [5]
Cooling capacity [2]	BTU/h	181,500	181,500
Gas input	BTU/h	284,700	284,700
PERFORMANCES RATINGS - HEATING [1]			
Heating capacity [3]	BTU/h	221,800	332,700
Gas input	BTU/h	258,000	387,000
ELECTRICAL RATINGS			
Operating consumption (208-230 V, 60 Hz, Single phase) [4]	kW	2.4	2.47

PERFORMANCE RATINGS - COOLING [1]		RTYF 240-357/2/4 [5]	RTYF 240-476/2/4 [5]
Cooling capacity [2]	BTU/h	242,000	242,000
Gas input	BTU/h	379,600	379,600
PERFORMANCES RATINGS - HEATING [1]			
Heating capacity [3]	BTU/h	332,700	443,600
Gas input	BTU/h	387,000	516,000
ELECTRICAL RATINGS			
Operating consumption (208-230 V, 60 Hz, Single phase) [4]	kW	3.22	3.30

Additional models: RTYF 180-119, RTYF 240-119, RTYF 240-238.

All models are available in 2 or 4 pipe versions.

[1] All specifications contained herein are based on the latest information available at the time of publication.

[2] Cooling capacity at standard conditions of 95 °F ambient temperature. Chilled water outlet temperature 45 °F, chilled water inlet temperature 55 °F.

[3] Heating capacity at standard conditions: outlet water 176 °F, inlet water 151 °F.

[4] Shown consumption is the maximum for /2 units. May vary by ± 10% as function of both power supply and electrical motor input tolerance.

[5] Also available in TK and HT versions and modular links; see page 20 and 22.

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

Thermal Modules and Thermal-Links
Outdoor Modular Heaters
Heating

Thermal Modules for outdoor installation.

Robur AY00-119 Heater is designed for outdoor installation requiring no protection from adverse weather conditions.
An individual module offers a nominal heating output of 110,900 BTU/h with hot water supply temperature up to 185 °F.
Modular heater links mounted on steel rails are mechanically and electrically pre-assembled by Robur to operate as one integrated system.
Packages with up to five modules are available, offering heating output up to 554,500 BTU/h.

Reasons for choosing Robur Thermal Modules.

The use of AY heaters offers advantages from an energy and plant perspective:

- they do not require interior space as they are suitable for outdoor installation;
- nominal combustion efficiency of 86%;
- staging up/down of heating output to meet on-going requirements;
- flexible performance;
- single phase electrical energy required;
- no indoor flue expense.

PERFORMANCE RATINGS - HEATING [1]		AY00-119	AY00-238
Heating capacity [2]	BTU/h	110,900	221,800
Gas input	BTU/h	129,000	258,000
Nominal water flow	GPM	8.8	17.6
ELECTRICAL RATINGS			
Required voltage, 60 Hz, Single phase	V	208-230	208-230
Operating consumption [3]	kW	0.076	0.15

PERFORMANCE RATINGS - HEATING [1]		AY00-357	AY00-476	AY00-595
Heating capacity [2]	BTU/h	332,700	443,600	554,500
Gas input	BTU/h	387,000	516,000	645,000
Nominal water flow	GPM	26.4	35.2	44.0
ELECTRICAL RATINGS				
Required voltage, 60 Hz, Single phase	V	208-230	208-230	208-230
Operating consumption [3]	kW	0.23	0.30	0.38

[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.
[2] Characteristics under nominal conditions: outlet water 176 °F, inlet water 151 °F.
[3] ±10% tolerance to allow for different electrical voltage and power absorption of the motors.
Due to continuous product innovation and development, Robur reserves the right to change product specifications without prior notice.