ROBUR®

caring for the environment



The most efficient and easiest solution for heating with renewable energy

Absorption heat pumps and chillers
powered by natural gas and renewable energy

www.robur.com
export@robur.it

Always close to our Customers

Robur Pre-Sales Service
T +39 (0)35 888 111 presales@robur.it

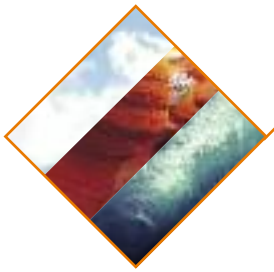
Robur Technical Support
T +39 (0)35 888 111 cst@robur.it

Due to continuous product innovation and development, Robur reserves the right to change the product specifications without prior notice.
For further reference please refer to www.robur.com.

SUMMARY



• Company, corporate values, awards and certifications p. 4



• Guidelines for choosing Robur solutions p. 6
• ErP label for your best choice p. 8



• Absorption technology efficiency evolution p. 10
• What is the Robur GAHP Gas Absorption Heat Pump powered by renewable energy p. 12
• Good reasons for choosing the Robur GAHP Gas Absorption Heat Pumps p. 13
• The value of experience: best applications p. 18



• Gas absorption heat pumps powered by renewable energy p. 26
• Gas absorption chillers also with heat recovery p. 44
• Gas condensing boiler for outdoor installation p. 52
• Complete systems with gas absorption heat pump powered by renewable energy p. 54
• Trivalent integrated outdoor packages p. 56
• Control systems p. 60
• Accessories and system components p. 62

ROBUR VALUES

Mission

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

Vision

Robur turns THE LOVE FOR BEAUTY AND WELL-MADE THINGS
into innovative heating and cooling systems
that are especially designed and developed
to answer the specific needs of Man

7 pillars

Sharing values
Training
Quality
Innovation
Service
Social responsibility
Testimony

The right choice can make the difference

A responsible purchase behaviour may have a great influence on our way of life.

Consider that a product consumes tons of oil during its whole life cycle, generating pollution that the forest cannot rebalance.
That's why, when choosing a product, we take a great responsibility.
Even the choice for the heating system may have a big impact.

To all who choose responsibly, Robur offers high efficiency heating systems with low environmental impact, and moreover concepts, data and facts to spread the culture of energy efficiency and environmental protection.

Benito Guerra - Robur Chairman



ROBUR AWARDS AND CERTIFICATIONS

1995	- ISO 9001 Certification
2000	- First Prize Italian Quality Award
2001	- Robur is the first ISO 9001:2000 (Vision 2000) certified company in Europe in HVAC sector
2003	- Special PrizeWinner of “European Quality Award” - Robur, with its reversible Gas Absorption Heat Pump (GAHP) won the Technological Innovation Award
2004	- Benito Guerra, chairman of Robur, received a nomination as finalist in the "Quality of life" category of the National Businessman of theYear Award, promoted by Ernst&Young
2005	- ISO 14001: 2004 Certification - CSA Certification (USA)
2006	- Honourable mention at AHR Expo Innovation Award sponsored by ASHRAE (American Society of Heating, Refrigerating and Air- Conditioning Engineers - USA)
2007	- Mentioned as best product category for GAHPs as part of the “Impresa Ambiente” Prize - Special mention in Enterprise Prize for Innovation promoted by Confindustria (Italian Industry Association)
2008	- ROBUR Test Laboratories accredited by California Energy Commission - CEC - GAHPs performances are tested by VDE and DVGW-Forschungsstelle
2009	- Special mention in the catagory Energy Efficiency Development Prize 2009 by the Foundation Sustainable Development and Ecomondo
2011	- It is supported by European Commission under the EU’s Seventh Framework Programme for Research and Technological Development
2012	- GAHPs are tested by Engler-Bunte-Insitut (EBI) of the Karlsruher Institut fuer Technologie (KIT)
2013	- GAHPs are tested by the Cetiat Laboratory in Lyon (EN ISO 17025)
2014	- The air-source GAHP has been presented at the European Parliament as one of the most innovative heating technologies during the Gas Week 2014
2016	- The GAHP is awarded as the Best Energy Efficient Product Award at SEAI 2016 in Dublin - The company Robur is awarded with the Positive Business Award by the Business School Palo Alto

GUIDELINES FOR CHOOSING ROBUR SOLUTIONS

SERVICE	ADVANTAGE		APPLICATION
HEATING AND DOMESTIC HOT WATER PRODUCTION	HIGH EFFICIENCY USING RENEWABLE ENERGY	RENEWABLE ENERGY: AIR-SOURCE The most cost-effective renewable energy	
		RENEWABLE ENERGY: GROUND-SOURCE Ideal under severe climate conditions	
		RENEWABLE ENERGY: WATER-SOURCE Ideal where the use of water-source renewable energy is required	
HEATING COOLING AND DOMESTIC HOT WATER PRODUCTION	HIGH EFFICIENCY USING RENEWABLE ENERGY	RENEWABLE ENERGY: AIR-SOURCE The most cost-effective renewable energy	
		RENEWABLE ENERGY: WATER-SOURCE Ideal where the use of water-source renewable energy is required	
COOLING	IDEAL WHERE ELECTRIC ENERGY SUPPLY IS LIMITED		
	IDEAL IN HOT CLIMATES UP TO 50 °C		
	FOR DOMESTIC HOT WATER PRODUCTION FOR FREE DURING COOLING MODE		
SPECIAL APPLICATIONS	SIMULTANEOUS USE OF HOT AND COLD WATER		
	PROCESS APPLICATION		
	REFRIGERATION		

ROBUR ICONS GUIDE



HEATING



COOLING



DHW PRODUCTION



DHW PRODUCTION WITH HEAT RECOVERY

ROBUR SOLUTION	P.	AVAILABLE ALSO AS
MODULATING AND CONDENSING ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **AIR-SOURCE RENEWABLE ENERGY** GAHP-A	26	- **OUTDOOR** (p. 26) or **INDOOR** (p. 30) installation; - pre-assembled units for higher capacity, combined with Robur chillers and/or boilers (from p. 28); - E³ A complete system (p. 54); - integrated outdoor package with condensing boiler Gitié AHAY (p. 56).
MODULATING AND CONDENSING ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **GROUND-SOURCE RENEWABLE ENERGY** GAHP-GS	38	- pre-assempbled units for higher capacity (p. 40); - E³ GS complete system (p. 54).
MODULATING AND CONDENSING ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **WATER-SOURCE RENEWABLE ENERGY** GAHP-WS	41	- pre-assempbled units for higher capacity (p. 43); - E³ WS complete system (p. 54).
REVERSIBLE ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **AIR-SOURCE RENEWABLE ENERGY** GAHP-AR	32	- pre-assembled units for higher capacity, combined with Robur chillers and/or boilers (from p. 34); - integrated outdoor package with condensing boiler Gitié ARAY (p. 56).
MODULATING AND CONDENSING ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **WATER-SOURCE RENEWABLE ENERGY** GAHP-WS	41	- pre-assembled units for higher capacity (p. 43).
GAS ABSORPTION **CHILLER** GA ACF	47	- pre-assembled units for higher capacity, combined with Robur heat pumps and/or boilers (p. 28-34-48); - integrated outdoor package with condensing boiler Gitié ACAY (p. 56).
GAS ABSORPTION **CHILLER** GA ACF HT	50	- pre-assembled units for higher capacity (p. 51).
GAS ABSORPTION **CHILLER-HEATER WITH HEAT RECOVERY** GA ACF HR	44	- pre-assembled units for higher capacity, combined with Robur heat pumps and/or boilers (p. 28-34-45).
MODULATING AND CONDENSING ABSORPTION **HEAT PUMP** POWERED BY NATURAL GAS + **WATER-SOURCE RENEWABLE ENERGY** GAHP-WS	41	- pre-assembled units for higher capacity (p. 54).
GAS ABSORPTION **CHILLER** GA ACF TK	50	- pre-assembled units for higher capacity (p. 51).
GAS ABSORPTION **CHILLER** GA ACF LB	50	- pre-assembled units for higher capacity (p. 51).

SIMULTANEOUS PRODUCTION OF HOT AND COLD WATER

PROCESS APPLICATION, REFRIGERATION AND COOLING IN HOT CLIMATES

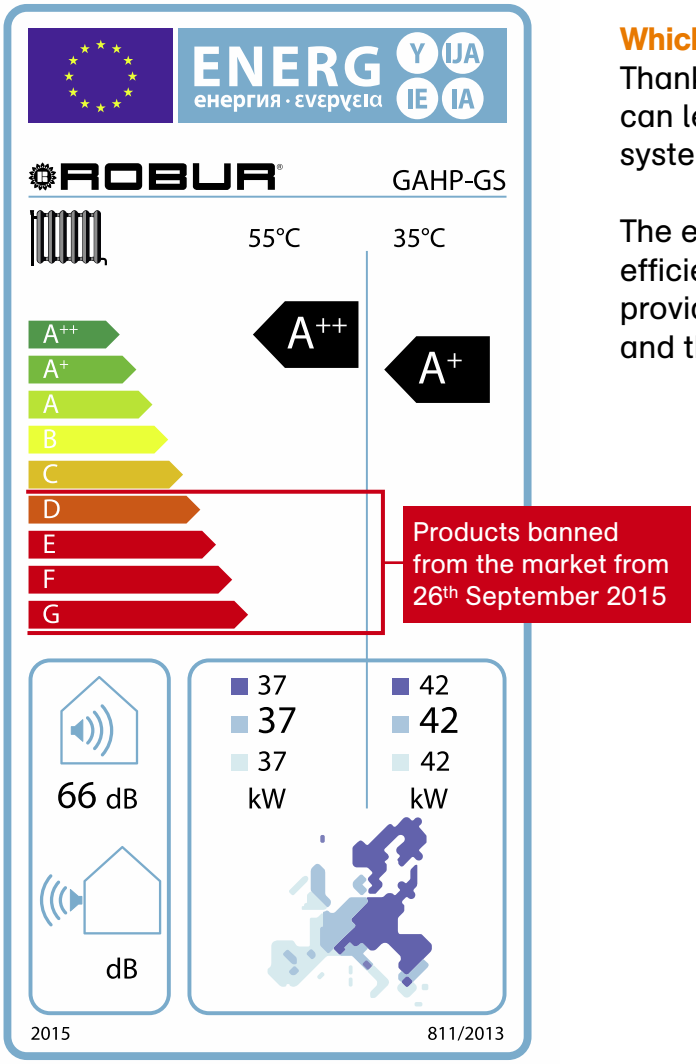
AIR-, GROUND-, WATER-SOURCE RENEWABLE ENERGY

EFFICIENCY AND ENERGY SAVING: ErP LABEL FOR YOUR BEST CHOICE

Robur researches, develops and manufactures high efficiency and sustainable heating solutions.

Robur is at the top of the ErP energy classification

What does ErP mean?
ErP - acronym for "Energy related Products" - refers to the European Directive to promote energy efficiency thus reducing energy consumption of heating and DHW-production appliances through eco-design.
The directive confirms the high standard of energy efficiency of Robur solutions.



Which are the advantages for the end user?
Thanks to the mandatory energy label, consumers can learn more about the features of the heating system and simply make their selection.

The energy label diplays a scale of energy efficiency running from A++ to G and also provides information on the heat output and the noise emissions.

ErP: Do you know that ...?
From 26th September 2015, heating and DHW production appliances of up to 70 kW output must be marked with a label showing their energy efficiency (delegated regulation EU N 811/2013 - Energy Label).

Robur heat pumps powered by natural gas and air-, ground- and water-source renewable energy **are in A++ energy class** even in applications with radiators for system retrofitting.





The Robur air-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class**(1) even in applications with radiators for system retrofitting.

(1) As per calculation methods of EN12309.

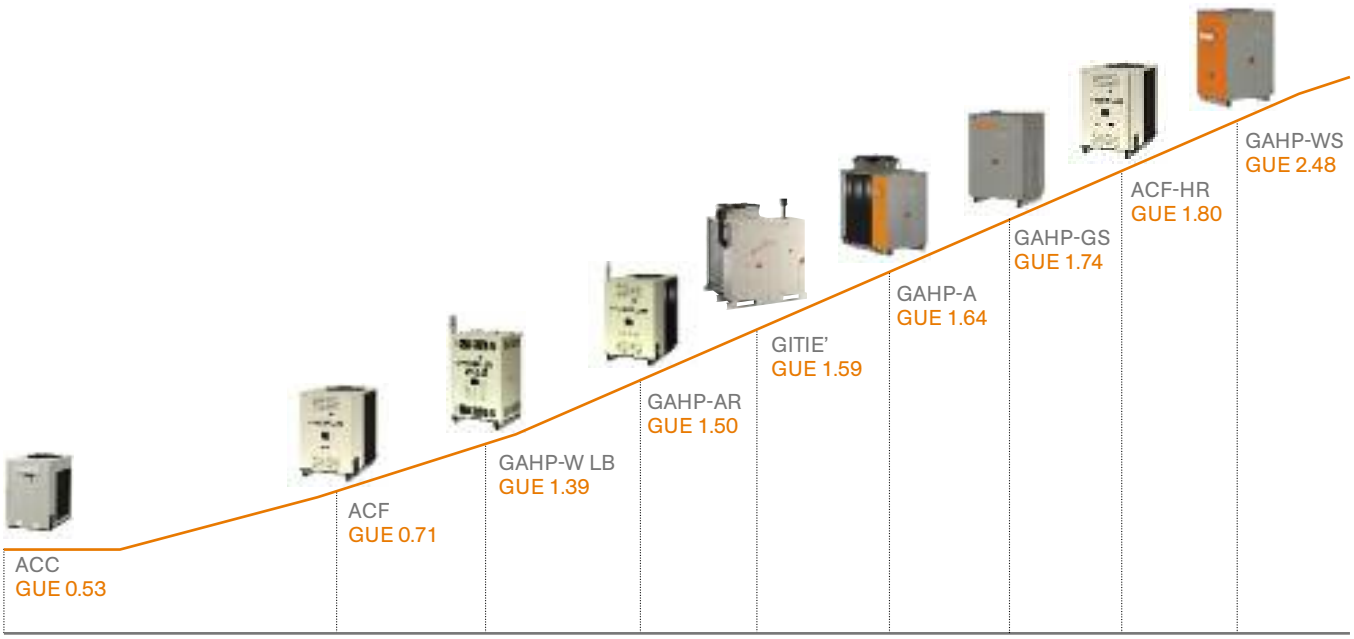
ErP: Do you know that ...?
From 26th September 2015 heating packages of up to 400 kW output are required to meet the minimum energy efficiency and maximum sound emission limits (regulation EU N 813/2013 - Ecodesign).



University Church of England Academy, UK

ABSORPTION TECHNOLOGY EFFICIENCY EVOLUTION

A key technology with a great potential for innovation



GUE - Gas Utilization Efficiency

1968 ACC Gas absorption chiller. ARKLA (Arkansas Louisiana Gas Co.) introduces the first water-ammonia absorption units, with 300,000 pieces sold between 1968 and 1991.

1991 Robur Corporation was established to acquire absorption technology from Dometic, a company of Electrolux Group.

1998 ACF The gas efficiency in absorption units was improved by 34%. Efficiency was becoming a crucial element.

2002 GAHP-W LB was introduced to the market: a worldwide innovation. This GAHP version has put Robur into the high efficiency heating market with an efficiency much higher than electric heat pumps and boilers.
GAHP-AR High efficiency gas absorption heat pump for alternative heating and cooling. The first reversible gas absorption heat pump in the world.

2004 GAHP-A High efficiency gas absorption heat pump for heating. Heating efficiency higher than condensing boilers. The most efficient product in gas heating sector worldwide.
ACF-HR The unit with heat recovery was developed and introduced to the market. The heat recovery for production of domestic hot water at temperature up to 85 °C makes the unit very competitive: the total efficiency of the unit is up to 180%.

2005 GAHP-GS Absorption heat pump powered by natural gas and ground-source renewable energy for high efficiency heating.
GAHP-WS Absorption heat pump powered by natural gas and water-source renewable energy for heating and cooling or the simultaneous production with overall efficency of 244%.

2008 GAHP-A, GAHP-GS and GAHP-WS Modulating and condensing gas absorption heat pumps.

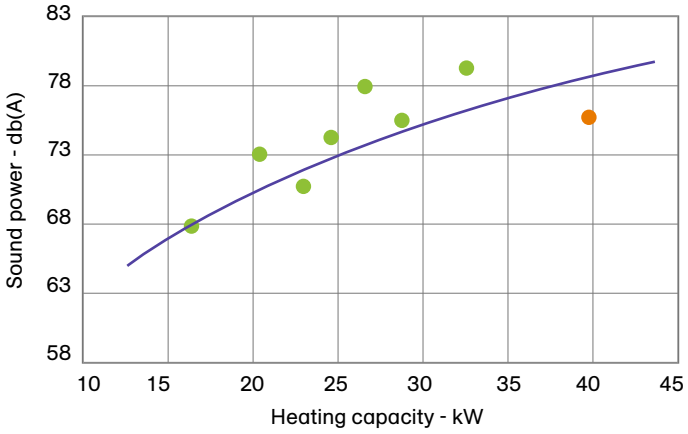
2014 Gitié Trivalent integrated outdoor package with absorption heat pump powered by natural gas and air-source renewable energy: integrated, pre-assembled and custom-made in the manufacturing plant, is a fully plug-'n-play system. This can facilitate correct installation, avoiding the complexity of the integration on field of solar thermal systems.

ROBUR CONTINUOUS IMPROVEMENT

Robur' continuous investment in R&D is one of the key factors for success

An example of continuous improvement of the absorption appliances is represented by sound power, which have been constantly reduced over years.

The chart below compares the sound power of Robur gas absorption heat pumps with the sound power of electric heat pumps manufactured by main competitors. The sound power of Robur GAHP is considerably lower than the limits imposed by Ecolabel and it is the same as the power of smaller (50% of heating capacity) electric heat pumps. Sound power is shown in the chart instead of sound pressure because this data allows a better evaluation of the noise impact of an installed unit.



- Robur gas absorption heat pump
- Electric heat pumps - by main competitors
- Highest range - Ecolabel

Source: Cetiat



Robur heat pumps and chillers are particularly quiet, enhancing the comfort

Palas Cerequio Resort in Vigna, Barolo wineyard
La Morra (Cuneo, Italy)

ABSORPTION HEAT PUMP POWERED BY NATURAL GAS AND RENEWABLE ENERGY (GAHP)

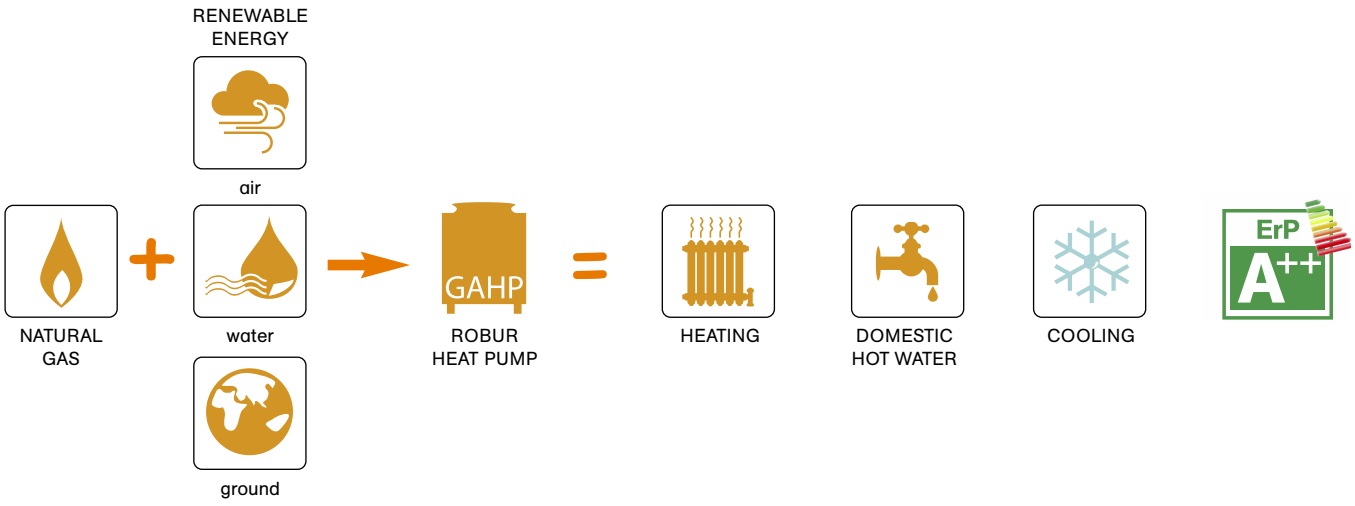
The perfect blend of the two most common heating technologies



ADVANTAGES - Condensing boiler
- Natural gas powered
- DHW supply
- Only 1/10 of electricity consumption in comparison to electric heat pumps

ADVANTAGES - Electric heat pump
- Use of renewable source energy with efficiency over 100%
- Cooling mode also available

Similarly to gas boilers, the gas absorption heat pump is a device able to supply high temperature hot water both for heating and for DHW production.
Similarly to electric heat pumps, gas absorption heat pump is able to recover renewable energy in the form of heat from air, water and ground sources, thus achieving efficiency rates up to 170%. Unlike electric heat pumps, gas absorption heat pumps do not use harmful refrigerants, have a negligible electrical consumption and can also provide cold water for summer cooling (reversible version).



6 GOOD REASONS

For choosing GAHP - Gas Absorption Heat Pump powered by renewable energy

1 EFFICIENCY

2 COST AND ENERGY SAVING

3 LOW ENVIRONMENTAL IMPACT

4 INCREASE IN PROPERTY VALUE

5 IDEAL INTEGRATION

6 ACKNOWLEDGEMENT OF THE TECHNOLOGY

1 GAHP HEAT PUMPS ARE EFFICIENT

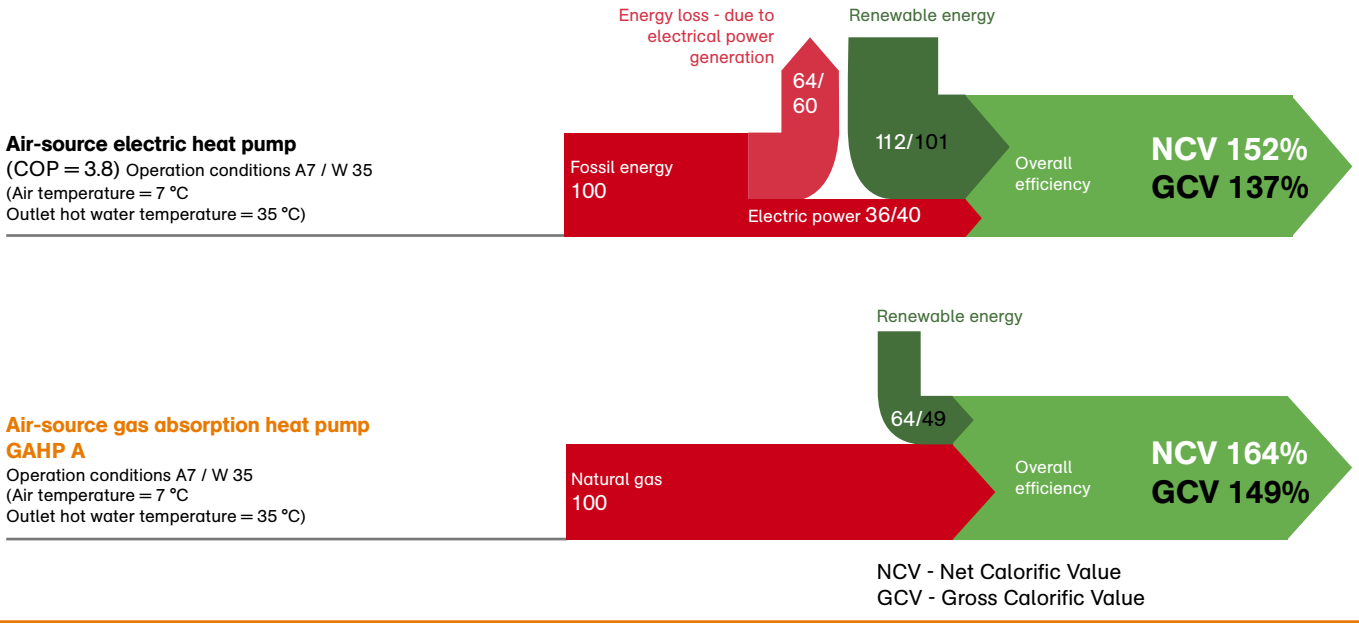
Efficiency and use of renewable energy

A heat pump is an appliance capable of exploiting the large amount of energy available in natural sources at a lower temperature and of tranferring it in the form of useful heat to a user at a higher temperature. Electric heat pumps work with a compressor powered by electricity. Absorption heat pumps are powered directly by natural gas or LPG with a negligible electric consumption.
The advantage is higher heating efficiency, due to the fact that main energy input (natural gas) is primary energy and not electricity, which is generated with low efficiencies (40% on average).

In Fig. A energy balances between electric heat pumps and Robur absorption heat pumps are shown. The energy balance based on the primary energy highlights the higher efficiency of Robur gas absorption heat pumps in comparison to the electric ones (COP of 3.8).

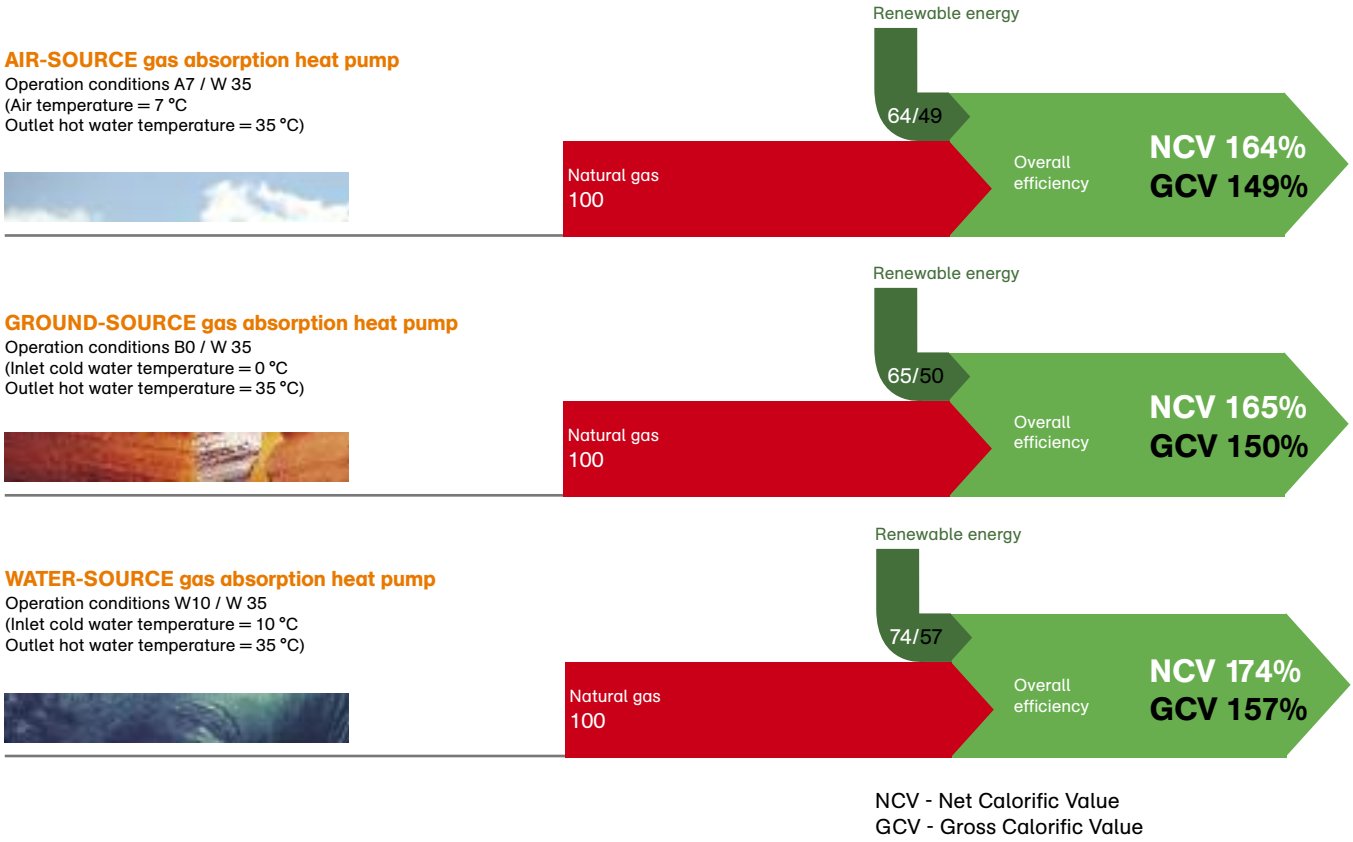
In Fig. B energy balances of Robur gas absorption heat pumps are shown for the 3 different types of renewable energy sources: air, water and ground.

Fig. A - Air-source absorption heat pump powered by natural gas and renewable energy GAHP vs. electric heat pump



NCV - Net Calorific Value
GCV - Gross Calorific Value

Fig. B - Efficiency and renewable energy utilization in GAHPs



NCV - Net Calorific Value
GCV - Gross Calorific Value

2 COST AND ENERGY SAVING

Robur Gas Absorption Heat Pump	Condensing boiler	Traditional boiler
Renewable energy: **AIR**	Renewable energy: **NO**	Renewable energy: **NO**
COST SAVING	**-35%**	**-50%**

As per calculation methods of:
- Winter season based on 1,800 hours
- Continental climate area
- Average temperature in winter: 6.7 °C (UNI 10349)
- Average seasonal outlet temperature: 50 °C

GAHP installation is cost competitive to other heating technologies.
Moreover, GAHP technology can cut running heating costs up to 50% every year.
It is eligible for subsidies all over Europe.

3 LOW ENVIRONMENTAL IMPACT

using natural gas + renewable energy

- Each Robur GAHP adds 1 kW of natural gas to 0.5 kW of renewable energy.
- Robur GAHPs are the best solution to the problem of global warming due to greenhouse gases, using a natural refrigerant with GWP (Global Warming Potential) = 0.
- According to a study by the Joint Research Centre (JRC - European Commission's in-house science service) Robur GAHP heating technology has the lowest environmental impact (NOx, PM, OCG, COx).

EVERY YEAR THE FIRST 10,000 ROBUR HEAT PUMPS INSTALLED ...

USE **109,452,345 kWh**
OF RENEWABLE ENERGY
(AIR-, GROUND- AND WATER SOURCE)

SAVE **16,938** TONS
OF OIL EQUIVALENT

EQUAL TO **20,842,033** M^3
OF NATURAL GAS

SAVE **42,000** TONS
OF CO_2 EMISSIONS

EQUAL TO THE EMISSION
BY **20,000** CARS

EQUAL TO **5,900,000**
NEW TREES

Discover more at: www.robur.com
(1) JRC - Development of European Ecolabel Criteria for Water based heaters (p. 98-103).

4 INCREASE IN PROPERTY VALUE

GAHPs are the most profitable investment to increase the value of the building.
Upgrading the heating system only and with a small investment per square meter, the building performance rating will increase. Thanks to their low carbon footprint, GAHPs are also compliant with key legislation and energy targets, such as BREEAM and LEED ratings without incurring high installation or operating costs.
Moreover, as the unit are designed for external installation, there is no requirement to use valuable space for plant rooms or bulky storage systems.



Pixel Building in Melbourne, AU
BREEAM and LEED assessments



Open University in Milton Keynes, UK
BREEAM assessment



Embassy Gardens in London, UK
BREEAM assessment

5 IDEAL INTEGRATION

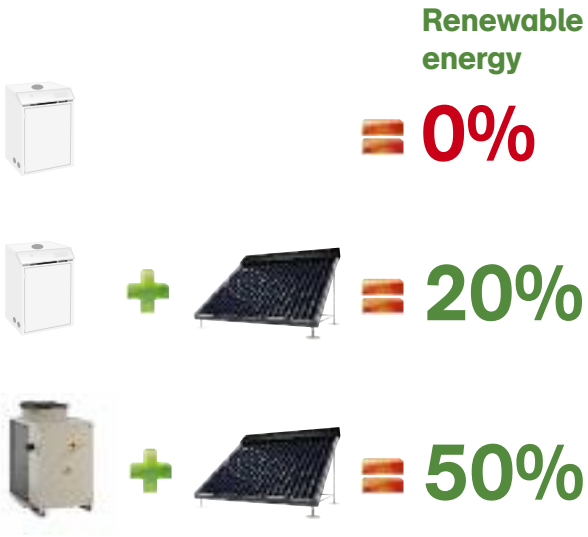
Ensuring energy and cost savings with low environmental impact, GAHPs are the best choice for integration into existing buldings.



GAHPs are the ideal integration with boilers. With heating efficiencies of 40% higher than the best condensing boilers, the system ensures remarkable savings on overall heating operational costs.

GAHPs are an excellent choice for integration with solar systems. Most solar systems require an auxiliary back-up heating source. For instance, boilers are used during periods when solar radiation is insufficient. The integration of GAHP with solar systems:

- provides the highest efficiency with the greatest use of renewable energy;
- reduces the overall investment cost of the application and its pay-back;
- overcomes architectural constraints in existing buildings, providing green energy even in cases where lack of spaces for solar panels does not allow the installation.



6 ACKNOWLEDGEMENT OF THE TECHNOLOGY

The GAHP Gas Absorption Heat Pump has been supported by European Commission under the EU's Seventh Framework Programme for Research and Technological Development.
Moreover it has been tested and certified by:



NY Department of sanitation, USA

Robur for the PUBLIC sector



Certosa di Pavia, Italy

Reversible absorption heat pumps powered by natural gas + air-source renewable energy **GAHP-AR**
Condensing boiler for outdoor installation **AY**
For high efficiency heating, domestic hot water production and cooling with low electric demand.





7 detention centres, Italy

Reversible absorption heat pumps powered by natural gas + air-source renewable energy **GAHP-AR**
Absorption heat pumps powered by natural gas + air-source renewable energy **GAHP-A**
For high efficiency heating, domestic hot water production and cooling with low electric demand.





MAS Museum Aan de Strom in Antwerp, Belgium

Absorption heat pumps powered by natural gas + water-source renewable energy **GAHP-WS**
Heating, cooling and domestic hot water production where the use of water-source renewable energy is required.





Technological Incubator in Slupsk, Poland

Reversible absorption heat pumps powered by natural gas + air-source renewable energy **GAHP-AR**
Absorption chiller-heaters with heat recovery **GA ACF HR**
Condensing boilers for outdoor installation **AY**
For high efficiency heating and cooling and free domestic hot water production with heat recovery.





Robur for the SCHOOL



Open University in Milton Keynes, United Kingdom

Absorption heat pumps powered by natural gas
+ ground-source renewable energy **GAHP-GS**

Robur ground-source heat pumps installed at Open University, the largest academic institution in the United Kingdom, contribute to the University's carbon reduction strategy, meeting BREEAM assessment.





Primary School in Plaidt, Germany

Absorption heat pumps powered by natural gas
+ ground-source renewable energy **GAHP-GS**

Data measured by E.ON Ruhrgas show an operating cost saving of 39% and a reduction of CO_2 emissions of 44% per year compared with the previous system made by two electric heat pumps.





Primary School in Sortland Arctic Polar Circle, Norway

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**

Robur air-source heat pumps ensure efficiency levels in excess of 145% even at -7°C, offering high performance in cold climates.





Università degli Studi del Sannio, Italy

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
Absorption chillers powered by natural gas **GA ACF**
For high efficiency heating and cooling
with low electric demand.





Robur for the INDUSTRY



Scania Service Facility in Oberschleißheim, Germany

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**
For high efficiency heating and domestic
hot water production.





AME Plus Automotive Industry in Gliwice, Poland

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
For high efficiency heating and cooling
with low electric demand.





simultaneous

SERO PumpSystems GmbH in Meckesheim, Germany

Absorption heat pumps powered by natural gas
+ water-source renewable energy **GAHP-WS**
High efficiency simultaneous
hot and cold water production.





Würth Italia in Neumarkt, Italy

Absorption chillers powered by natural gas **GA ACF**
Cooling with low electric energy consumption.





Boscolo Etoile Hotel and Culinary Academy in Tuscania, Italy

Robur for HO.RE.CA.



Holiday Inn Airport Hotel in Istanbul, Turkey

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
Absorption chiller-heaters with heat recovery **GA ACF HR**
For high efficiency heating and cooling and free domestic hot water production with heat recovery.





LO.AN Group 8 Facilities in Rome, Italy

Absorption chillers powered by natural gas **GA ACF**

For 10 years LO.AN Group has chosen Robur units for all its hotels in Rome.





simultaneous

Jardines de Nivaria Resort in Tenerife, Spain

Absorption heat pumps powered by natural gas
+ water-source renewable energy **GAHP-WS**
High efficiency simultaneous hot and cold water production.





Chateau Talbot banqueting in Saint-Julien-Beychevelle, France

Absorption chillers powered by natural gas **GA ACF**
Cooling with low electric energy consumption.





Robur for the RETAIL sector



Carrefour 24 points of sale, Italy

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**
For high efficiency heating and domestic
hot water production.
"Robur solutions installed guarantee remarkable cost saving compared with previous systems."
Alfio Fontana, Energy Manager Carrefour Italy





Brico Marché in Małopolska, Poland

Condensing boilers for outdoor installation **AY**
For heating.





Cisalfa Intersport in Saint-Christophe, Italy

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
For high efficiency heating and cooling
with low electric demand.





Mercedes Benz car dealer in Wielkopolska, Poland

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
Condensing boilers for outdoor installation **AY**

Robur heat pumps provide monitored efficiency of 149%.





Type-A building in Milan, A Gold KlimaHouse
top energy classification

Robur for the RESIDENTIAL sector



Multi Family House in Berlin, Germany

Absorption heat pumps powered by natural gas
+ ground-source renewable energy **GAHP-GS**
For high efficiency heating and domestic
hot water production in geothermal applications.





18th Century Historic Building in Pistoia, Italy

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**
Condensing boilers for outdoor installation **AY**
For high efficiency heating and domestic
hot water production.





Multi Family House in Verrières-le-Buisson, France

Absorption heat pumps powered by natural gas
+ ground-source renewable energy **GAHP-GS**

Robur solution provides monitored heating efficiency of 141%.





Multi Family House in Rome, Italy

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
Absorption chiller-heaters with heat recovery **GA ACF HR**
For high efficiency heating and cooling and domestic
hot water production with heat recovery.





Embassy Gardens multifunctional luxury building
in London, UK

Robur for ...



San Patrignano Rehab Centre in Rimini, Italy

Absorption heat pumps powered by natural gas
+ water-source renewable energy **GAHP-WS**
Absorption chiller-heaters with heat recovery **GA ACF HR**
Heating, cooling and domestic hot water production
also with heat recovery where the use
of water-source renewable energy is required.





Helipad Air Rescue, District Hospital in Bochnia, Poland

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**

Under severe winter climate conditions,
Robur solution prevents icing at the rooftop helipad.





Sky Line Swimming Pool in Cremona, Italy

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A and GAHP-AR**
For high efficiency heating, domestic
hot water production and cooling
with low electric demand.





Westerkerk Church in Amsterdam, Netherlands

Absorption heat pumps powered by natural gas
+ water-source renewable energy **GAHP-WS**

Robur solution fully conforms
architectural constraints in historical buildings.





Nursing Home in Kutna Hora, Czech Republic

Absorption heat pumps powered by natural gas
+ ground-source renewable energy **GAHP-GS**
For high efficiency heating and domestic hot water production in geothermal applications.





Golden Town Apple Products in Thornbury, Canada

Absorption chillers powered by natural gas **GA ACF**
Cooling with low electric energy consumption.





Masciarelli Wineyard and Cellar in San Martino sulla Marrucina, Italy

Absorption chillers powered by natural gas **GA ACF-LB**
Process refrigeration in systems requiring negative fluid temperatures.





Sixtus Italia Medical Warehouse in Prato, Italy

Reversible absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-AR**
Absorption chillers powered by natural gas **GA ACF**

"Food supplements and medical treatments should be stored properly. Also thanks to the Robur solution we can guarantee a higher standard quality of products." Mauro Marrucci, President Sixtus Italy





Lundegaarden Greenhouse in Odense, Denmark

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**
For high efficiency heating.





German Red Cross Family Care in Kölbingen, Germany

Absorption heat pumps powered by natural gas
+ air-source renewable energy **GAHP-A**
Condensing boilers for outdoor installation **AY**
For high efficiency heating and domestic hot water production.



For high efficiency heating and domestic hot water production.

Condensing and modulating absorption heat pump powered by natural gas + air-source renewable energy

GAHP-A

Advantages

- Up to 39% utilisation of air- source renewable energy. Designed to exceed peak efficiency (GUE - Gas Utilization Efficiency) of 164%(1). It ensures efficiency levels in excess of 154% even at -7 °C, so it is also used in especially cold climates. It thus avoids activating back-up systems (boilers and electrical heaters), reducing the seasonal performance coefficients and hence increase consumption.
- It is a super-efficient solution for domestic hot water production.
- It increases the total efficiency of the heating system when it is combined or integrated with boilers with a lower energy performance.
- It provides up to 40% of running cost savings if compared with the best condensing boilers.
- It enhances the energy qualification of buildings with the consequent increase in the value of the building.
- It is eligible for national and local incentive programs all over Europe.
- With a GAHP-A, every year 3.9 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 550 trees or those produced by 2 green cars; every year 1.7 Tons of Oil Equivalent are saved. Moreover, Robur GAHP-A uses natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

(1) Equivalent to COP 4.10 on energy conversion factor of 2.5.







ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com

Applications

- Ideal for heating and domestic hot water production for buildings with high gas/LPG consumption, either with low or high temperature systems.
- For outdoor installation.

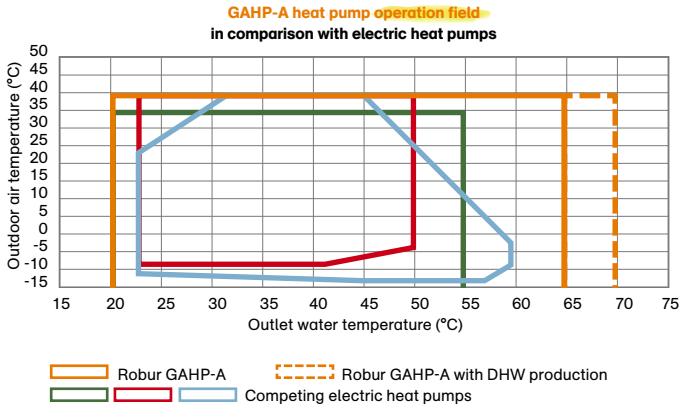
Versions

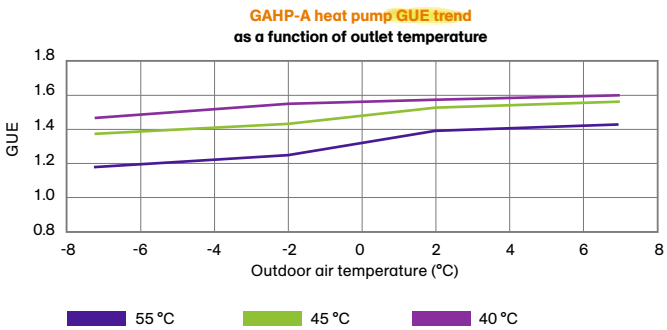
- Available in standard or low-noise version.
- Available also in:
  - pre-assembled units for higher capacity, combined with Robur chillers and/or boilers (from p. 28);
  - E³ A complete system (p. 54);
  - integrated outdoor package with condensing boiler Gitié AHAY (p. 56).





Examples of GAHP-A heat pump in residential and light-commercial applications.





HEATING OPERATION MODE [1]			GAHP-A outdoor unit
Energy class ErP (55 °C operation)			A+
Working point A7/W35	GUE gas utilization efficiency	%	164
	heating capacity	kW	41.3
Working point A7/W50	GUE gas utilization efficiency	%	152
	heating capacity	kW	38.3
Nominal water flow rate (ΔT = 10 °C)		m^3/h	3.0
Nominal water pressure loss (outlet water at 50 °C)		kPa	43
Maximum outlet water temperature heating/DHW		°C	65/70
Maximum inlet water temperature heating/DHW		°C	55/60
Outdoor temperature (dry bulb)	max	°C	40
	min	°C	-15 [2]
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.2
Gas consumption (actual)	natural gas G20 [3]	m^3/h	2.67
	LPG G30/G31 [4]	kg/h	1.99/1.96
ELECTRICAL CHARACTERISTICS			
Voltage			230V-50Hz
Nominal electrical power [5]	standard version	kW	0.84
	low noise version [6] - max/min speed fan	kW	0.77/0.50
INSTALLATION DETAILS			
Operational weight standard/low noise version		kg	390/400
Sound pressure Lp at 5 metres [7] Free field, at the front, direction factor 2	standard version	dB(A)	57.6
	low noise version [6] - max speed fan	dB(A)	52.0
	low noise version [6] - min speed fan [8]	dB(A)	49.0
Connections	water	" F	1 1/4
	gas	" F	3/4
	exhaust flue pipe	mm	80
Electrical degree of protection		IP	X5D
Standard version size [9]	width	mm	854
	depth	mm	1,260
	height	mm	1,445
Low-noise version size [9]	width	mm	854
	depth	mm	1,260
	height	mm	1,536

[1] As per calculation methods of EN12309.
[2] Available also for lower temperature.
[3] NCV 34.02 MJ/m^3 (9.45 kWh/m^3) at 15 °C- 1013 mbar.
[4] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[5] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[6] High efficiency modulating fan for lower noise emission.
[7] Lw sound power standard version dB(A) 79.6; max speed fan low-noise version dB(A) 74.0 and min speed fan dB(A) 71.0: sound power values measured according to EN ISO 9614.
[8] According to data by manufacturers.
[9] Size does not include exhaust flue pipe.

Heating solutions and DHW production

with high efficiency air-source heat pumps

Model	Units	Heating capacity heating/DHW kW	System GUE[1] %	Size w/d/h[2] mm	Weight kg
RTA [3]	2 A	82.60	164.3	2,314/1,245/1,400	888
	3 A	123.90	164.3	3,610/1,245/1,400	1,331
	4 A	165.20	164.3	4,936/1,245/1,400	1,774
	5 A	206.50	164.3	6,490/1,245/1,400	2,227

• Data refer to standard outdoor version, 2 pipes version and without circulators. Available with or without circulators, standard or low noise version. Please contact Robur Sales Network.

[1] Average efficiency on residential buildings; outlet water 35 °C.
[2] Size does not include exhaust flue pipe.
[3] Outdoor installation.

Solutions for heating and DHW production

with high efficiency air-source heat pumps + condensing boilers

Model	Units	Heating capacity heating/DHW kW	System GUE(1) %	Size w/d/h(2) mm	Weight kg
RTAY (3)	1 A + 2 AY	110.10	145.0	2,314/1,245/1,400	729
	2 A + 1 AY	117.00	163.4	3,382/1,245/1,400	891
	1 A + 3 AY	144.50	135.6	3,382/1,245/1,400	975
	2 A + 2 AY	151.40	157.6	3,382/1,245/1,400	1,069
	3 A + 1 AY	158.30	164.1	4,936/1,245/1,400	1,175
	1 A + 4 AY	178.90	129.8	3,382/1,245/1,400	1,351
	2 A + 3 AY	185.80	150.6	4,936/1,245/1,400	1,435
	3 A + 2 AY	192.70	161.8	4,936/1,245/1,400	1,530
	4 A + 1 AY	199.60	164.3	6,490/1,245/1,400	1,635
	2 A + 4 AY	220.20	144.5	4,936/1,245/1,400	1,745
	3 A + 3 AY	227.10	157.6	4,936/1,245/1,400	1,908
	4 A + 2 AY	234.00	163.4	6,490/1,245/1,400	1,993
	3 A + 4 AY	261.50	152.9	6,490/1,245/1,400	2,098
	4 A + 3 AY	268.40	161.0	6,490/1,245/1,400	2,218
	4 A + 4 AY	302.80	157.6	6,490/1,245/1,400	2,302

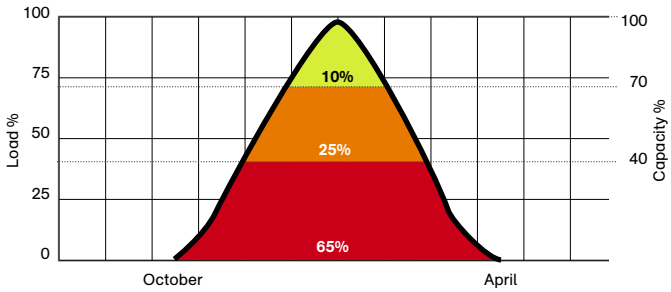
• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, standard or low noise version. Please contact Robur Sales Network.

(1) Average efficiency on residential buildings; outlet water 35 °C.
(2) Size does not include exhaust flue pipe.
(3) Outdoor installation.

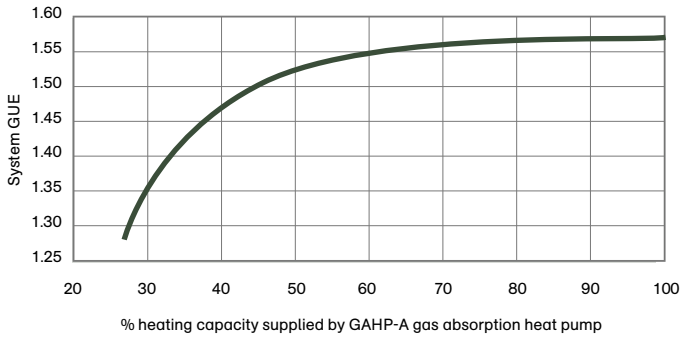
ErP A++

The Robur air-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class(1)** even in applications with radiators for system retrofitting.

(1) As per calculation methods of EN12309.



Energy supplied in winter season by an integrated system -composed by 1 heat pump, covering 40% of the overall heating capacity and 2 boilers, covering 60% of the overall heating capacity- is provided by the heat pump accounting for 65% and by the two boilers accounting for 35%.



The picture shows the increase in overall efficiency of an integrated heating system as a function of the percentage of the overall capacity covered by GAHP.

Energy supplied by second boiler = **10%**
Energy supplied by first boiler = **25%**
Energy supplied by heat pump = **65%**

For high efficiency heating and domestic hot water production.

Condensing and modulating absorption heat pump powered by natural gas + air-source renewable energy

GAHP-A INDOOR

Advantages

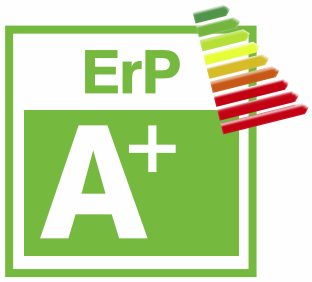
- It can be installed in the existing plant room and can facilitate correct installation, thanks to the ductwork mounted on the unit.
- It exceeds peak efficiency (GUE - Gas Utilization Efficiency) of 164%(1) thanks to the use of air-source renewable energy. It ensures high efficiency levels also at low temperature, thus avoiding activating back-up systems (boiler and electrical heaters) reducing the seasonal performance coefficients and hence increase consumption.
- It is a super-efficient solution for domestic hot water production.
- It provides up to 40% of running cost savings if compared with the best condensing boilers.
- It represents the most profitable investment to increase the value of the building and its energy performance rating.
- It is eligible for national and local incentive programs all over Europe.
- With a GAHP-A Indoor, every year 3.9 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 550 trees or those produced by 2 green cars. Every year 1.7 Tons of Oil Equivalent are saved in comparison with a boiler.

Moreover, Robur GAHP-A Indoor uses natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

Versions

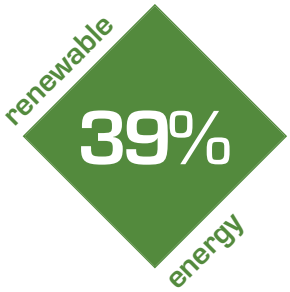
- Ideal for heating and domestic hot water production in buildings with high gas/LPG consumption.
- Suitable with raditors, floor systems and fan coils.
- For indoor installation.

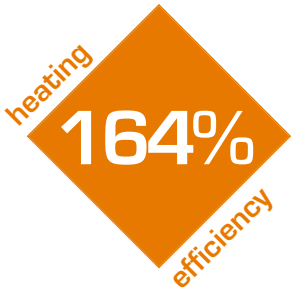
(1) Equivalent to COP 4.10 on energy conversion factor of 2.5.





THE IDEAL SOLUTION USING RENEWABLE ENERGY FOR THE PLANT ROOM







ELIGIBLE

for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com





Examples of GAHP-A Indoor application in the plant room.

			GAHP-A INDOOR
HEATING OPERATION MODE [1]			
Energy class ErP (55 °C operation)			**A+**
Working point A7/W35	GUE gas utilization efficiency	%	164
	heating capacity	kW	41.3
Working point A7/W50	GUE gas utilization efficiency	%	152
	heating capacity	kW	38.3
Nominal water flow rate (ΔT = 10 °C)		m^3/h	3,0
Nominal water pressure loss (outlet water at 50 °C)		kPa	43
Maximum outlet water temperature heating/DHW		°C	65/70
Maximum inlet water temperature heating/DHW		°C	55/60
Outdoor temperature (dry bulb)	max	°C	40
	min	°C	-15 [2]
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.2
Gas consumption (actual)	natural gas G20 [3]	m^3/h	2.67
	LPG G30/G31 [4]	kg/h	1.99/1.96
ELECTRICAL CHARACTERISTICS			
Voltage			230V–50Hz
Nominal electrical power [5][6]	max speed fan	kW	0.87
	min speed fan	kW	0.50
INSTALLATION DETAILS			
Operational weight		kg	405
Sound pressure Lp at 5 metres [6][7] Free field, at the front, direction factor 2	max speed fan	dB(A)	52.0
	min speed fan [8]	dB(A)	49.0
Connections	water	" F	1 1/4
	gas	" F	3/4
	exhaust flue pipe	mm	80
Size [9]	width	mm	848
	depth	mm	1,258
	height	mm	1,587

[1] As per calculation methods of EN12309.
[2] Available also for lower temperature.
[3] NCV 34.02MJ/m^3 (9.45 kWh/m^3) at 15 °C- 1013 mbar.
[4] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[5] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[6] High efficiency modulating fan for lower noise emission.
[7] Lw sound power max speed fan low-noise version dB(A) 74.0 and min speed fan dB(A) 71.0. Sound power values measured according to EN ISO 9614.
[8] According to data by manufacturers.
[9] Size does not include exhaust flue pipe.

For high efficiency heating and cooling using natural gas with low electric demand.

Reversible absorption heat pump powered by natural gas + air-source renewable energy

GAHP-AR

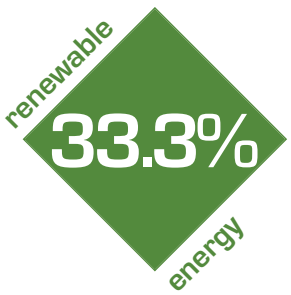
Advantages

- Up to 33.3% utilisation of air- source renewable energy. Designed to exceed peak efficiencies (GUE - Gas Utilization Efficiency) of 150%(1). Ensures efficiency levels in excess of 130% even at -7 °C. No back-up systems are required.
- It provides up to 30% of running cost savings if compared with the best condensing boilers.
- It enhances the energy qualification of buildings with the consequent increase in the value of the building.
- It reduces electricity requirements up to 86% compared to traditional electrical systems, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- With a GAHP-AR, every year 3.6 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 508 trees or those produced by 2 green cars; every year 1.6 Tons of Oil Equivalent are saved. Moreover, Robur GAHP-AR uses natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

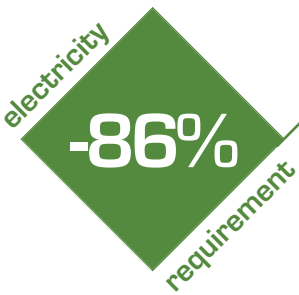
(1) Equivalent to COP 3.75 on energy conversion factor of 2.5.











ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com

Applications

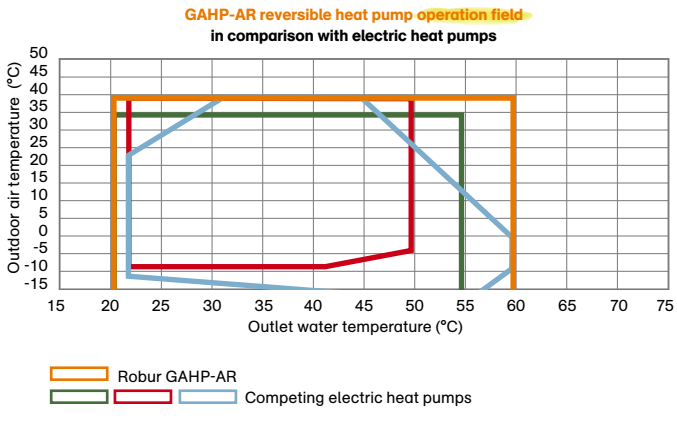
- Ideal for heating and DHW in buildings with high natural gas/LPG consumption where availability of electric power is limited.
- For outdoor installation.

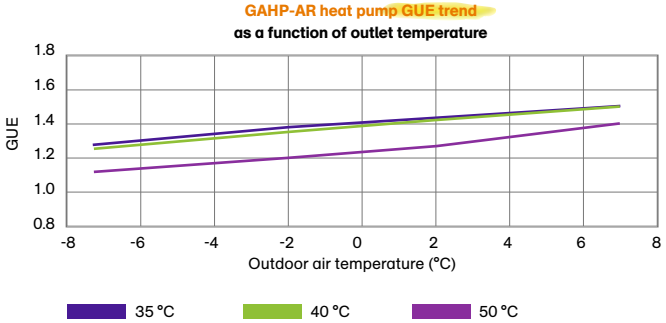
Versions

- Available also in standard and low noise version.
- Available also in:
  - pre-assembled units for higher capacity, combined with Robur chillers and/or boilers (from p. 34);
  - integrated outdoor package with condensing boiler Gitié ARAY (p. 56).



Example of GAHP-AR applications in winter and summer operation with radiant panels, fan coils and indirect production of DHW.





			GAHP-AR
HEATING OPERATION MODE (1)			
Energy class ErP (55 °C operation)			**A+**
Working point A7/W35	GUE (gas utilization efficiency)	%	150
	heating capacity	kW	37.8
Working point A7/W50	GUE (gas utilization efficiency)	%	140
	heating capacity	kW	35.3
Nominal water flow rate (ΔT = 10 °C)		m³/h	3.04
Nominal water pressure loss (outlet water at 50 °C)		kPa	29
Maximum outlet water temperature (ΔT = 10 °C)		°C	60
Inlet water temperature max/min		°C	50/20
Ambient operating temperature (dry bulb) max/min		°C	35/-20 (2)
COOLING OPERATION MODE (1)			
Working point A35/W7	GUE (gas utilization efficiency)	%	67
	cooling capacity	kW	16.9
Nominal water flow rate (ΔT = 5 °C)		m³/h	2.9
Nominal water capacity pressure loss (outlet water at 7 °C)		kPa	31
Minimum outlet water temperature		°C	3
Inlet water temperature max/min		°C	45/8
Ambient operating temperature (dry bulb) max/min		°C	45/0
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.2
Gas consumption (actual)	natural gas G20 (3)	m³/h	2.67
	LPG G30/G31(4)	kg/h	1.96
ELECTRICAL CHARACTERISTICS			
Voltage			230 V – 50 Hz
Nominal electrical power (5)	standard/low noise version	kW	0.84/0.87
INSTALLATION DATA			
Operational Weight	standard/low noise version	kg	380/390
Sound power Lp (6) Free field, at the front, direction factor 2	standard version	dB(A)	57.6
	low noise version	dB(A)	53.0
Connections	water	" F	1 1/4
	gas	" F	3/4
	flue exhaust pipe	mm	80
Electrical degree of protection		IP	X5D
Size (7)	width	mm	850
	depth	mm	1,230
	height standard/low noise version	mm	1,445/1,545

(1) As per calculation methods of EN12309.
(2) Available also for lower temperature.
(3) NCV 34.02 MJ/m³ (9.45 kWh/m³) at 15 °C - 1013 mbar.
(4) NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
(5) ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
(6) Lw sound power standard version dB(A) 79.6; low-noise version dB(A) 75.0. Sound power values measured according to EN ISO 9614.
(7) Size does not include exhaust flue pipe.

Solutions for heating and/or cooling

with high efficiency air-source reversible heat pumps, also combined with gas absorption chillers

Model	Units	Heating capacity kW	Cooling capacity kW	System GUE(1) %	Size w/d/h(2) mm	Weight kg
RTAR	2 AR	75.60	33.80	146.8	2,314/1,245/1,400	886
	3 AR	113.40	50.70	146.8	3,610/1,245/1,400	1,328
	4 AR	151.20	67.60	146.8	4,936/1,245/1,400	1,770
	5 AR	189.00	84.50	146.8	6,490/1,245/1,400	2,222
RTCR	1 AR +1 ACF	37.80	34.62	146.8	2,314/1,245/1,400	854
	1 AR + 2 ACF	37.80	52.34	146.8	3,610/1,245/1,400	1,264
	1 AR + 3 ACF	37.80	70.06	146.8	4,936/1,245/1,400	1,674
	1 AR + 4 ACF	37.80	87.78	146.8	6,490/1,245/1,400	2,094
	2 AR + 1 ACF	75.60	51.52	146.8	3,610/1,245/1,400	1,296
	2 AR + 2 ACF	75.60	69.24	146.8	4,936/1,245/1,400	1,706
	2 AR + 3 ACF	75.60	86.96	146.8	6,490/1,245/1,400	2,126
	3 AR + 1 ACF	113.40	68.42	146.8	4,936/1,245/1,400	1,738
	3 AR + 2 ACF	113.40	86.14	146.8	6,490/1,245/1,400	2,158
	4 AR + 1 ACF	151.20	85.32	146.8	6,490/1,245/1,400	2,190

• Data refer to standard version, 2 pipes version and without circulators. Available with or without circulators, standard or low noise version. Please contact Robur Sales Network.

(1) Average efficiency on residential buildings; with outlet water 60 °C with climate curve.
(2) Size does not include exhaust flue pipe.

Solutions for heating, cooling with heat recovery and DHW production all over year

with reversible air-source heat pumps
+ chillers with heat recovery and condensing boilers for integration

Model	Units	Heating capacity heating/DHW kW	Cooling capacity kW	Heating capacity recovered up to(1) kW	System GUE(2) %	Size w/d/h(3) mm	Weight kg
RTRH	1 AR + 1 ACF-HR + 1 AY	72.20	34.83	32.00	142.9	3,382/1,245/1,400	1,067
	1 AR + 2 ACF-HR + 1 AY	72.20	52.76	64.00	142.9	4,936/1,245/1,400	1,527
	1 AR + 3 ACF-HR + 1 AY	72.20	70.69	96.00	142.9	6,490/1,245/1,400	1,989
	1 AR + 1 ACF-HR + 2 AY	106.60	34.83	32.00	133.6	3,382/1,245/1,400	1,173
	1 AR + 2 ACF-HR + 2 AY	106.60	52.76	64.00	133.6	4,936/1,245/1,400	1,632
	1 AR + 3 ACF-HR + 2 AY	106.60	70.69	96.00	133.6	6,490/1,245/1,400	2,094
	2 AR + 1 ACF-HR + 1 AY	110.00	51.73	32.00	146.3	4,936/1,245/1,400	1,527
	2 AR + 2 ACF-HR + 2 AY	110.00	69.66	64.00	146.3	6,490/1,245/1,400	1,989
	1 AR + 1 ACF-HR + 3 AY	141.00	34.83	32.00	126.9	4,936/1,245/1,400	1,349
	1 AR + 2 ACF-HR + 3 AY	141.00	52.76	64.00	126.9	4,936/1,245/1,400	1,742
	1 AR + 3 ACF-HR + 3 AY	141.00	70.69	96.00	126.9	6,490/1,245/1,400	2,214
	2 AR + 1 ACF-HR + 2 AY	144.40	51.73	32.00	142.9	4,936/1,245/1,400	1,632
	2 AR + 2 ACF-HR + 2 AY	144.40	69.66	64.00	142.9	6,490/1,245/1,400	2,094
	3 AR + 1 ACF-HR + 1 AY	147.80	68.63	32.00	146.7	4,936/1,245/1,400	1,989
	1 AR + 1 ACF-HR + 4 AY	175.40	34.83	32.00	122.4	4,936/1,245/1,400	1,433
	1 AR + 2 ACF-HR + 4 AY	175.40	52.76	64.00	122.4	6,490/1,245/1,400	1,905
	1 AR + 3 ACF-HR + 4 AY	175.40	70.69	96.00	122.4	4,936/1,245/1,400	2,298
	2 AR + 1 ACF-HR + 3 AY	178.80	51.73	32.00	138.1	4,936/1,245/1,400	1,742
	2 AR + 2 ACF-HR + 3 AY	178.80	69.66	64.00	138.1	6,490/1,245/1,400	2,214
	3 AR + 1 ACF-HR + 2 AY	182.20	68.63	32.00	145.7	6,490/1,245/1,400	2,094
	2 AR + 1 ACF-HR + 4 AY	213.20	51.73	32.00	133.6	6,490/1,245/1,400	1,905
	2 AR + 2 ACF-HR + 4 AY	213.20	69.66	64.00	133.6	6,490/1,245/1,400	2,298
	3 AR + 1 ACF-HR + 3 AY	216.60	68.63	32.00	142.9	6,490/1,245/1,400	2,214
	3 AR + 1 ACF-HR + 4 AY	251.00	68.63	32.00	139.6	6,490/1,245/1,400	2,298

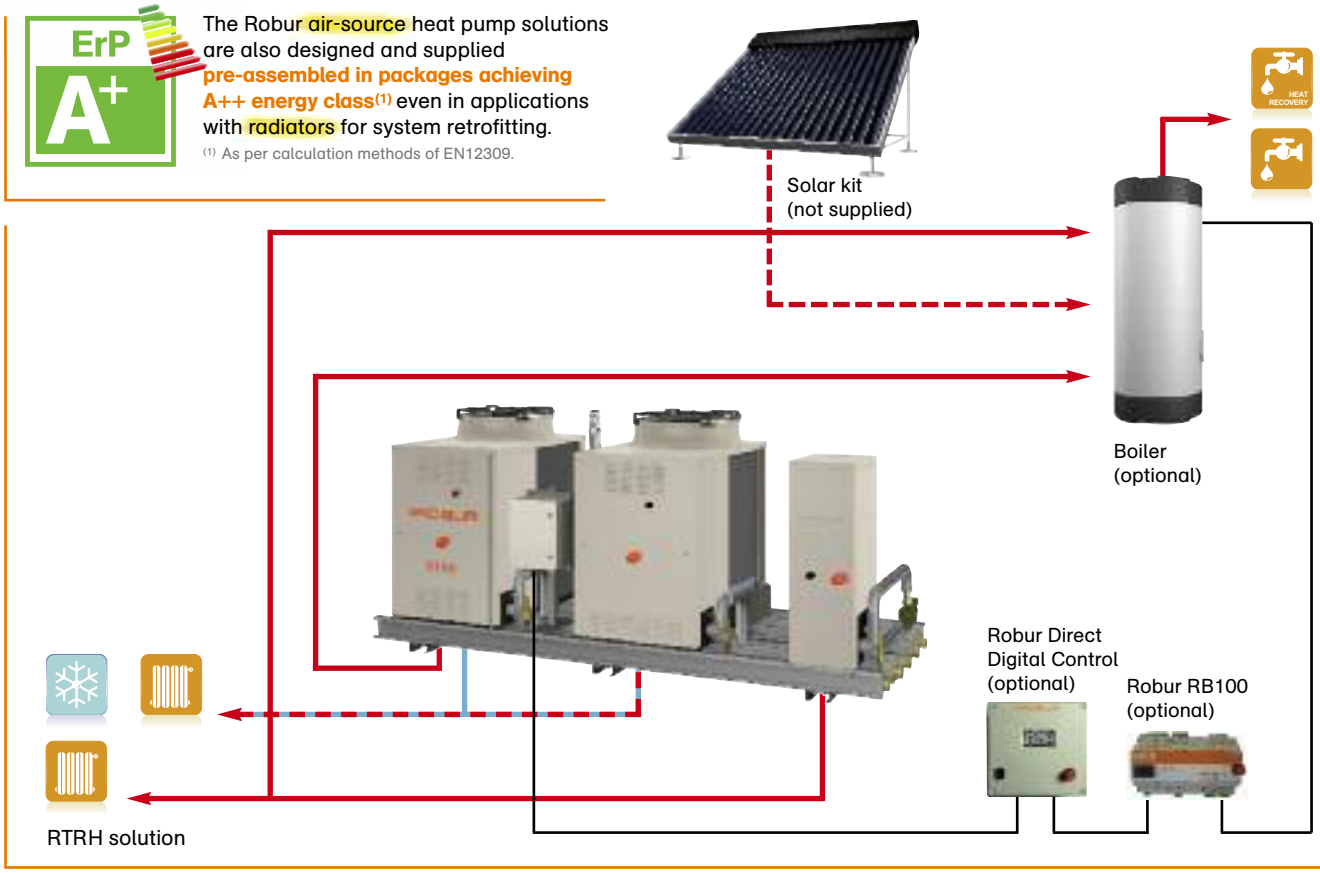
• Data refer to standard version, 6 pipes version and without circulators. Available with or without circulators. Please contact Robur Sales Network.

(1) For further data, please refer to Planning Manual
(2) Average efficiency on residential buildings; with outlet water 60 °C with climate curve.
(3) Size does not include exhaust flue pipe.

ErP A+

The Robur air-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class(1)** even in applications with radiators for system retrofitting.

(1) As per calculation methods of EN12309.



Solutions for heating, cooling and DHW production

with reversible air-source heat pumps + condensing boilers for integration also combined with gas absorption chillers

Model	Units	Heating capacity heating/DHW kW	Cooling capacity kW	System GUE[1]%	Size w/d/h[2] mm	Weight kg
RTYR	2 AR + 1 AY	110.00	33.80	146.3	3,382/1,245/1,400	1,067
	1 AR + 3 AY	141.00	16.90	126.9	3,382/1,245/1,400	890
	2 AR + 2 AY	144.40	33.80	142.9	3,382/1,245/1,400	1,173
	3 AR + 1 AY	147.80	50.70	146.7	4,936/1,245/1,400	1,527
	1 AR + 4 AY	175.40	16.90	122.4	3,382/1,245/1,400	974
	2 AR + 3 AY	178.80	33.80	138.1	4,936/1,245/1,400	1,349
	3 AR + 2 AY	182.20	50.70	145.7	4,936/1,245/1,400	1,632
	4 AR + 1 AY	185.60	67.60	146.8	6,490/1,245/1,400	1,989
	2 AR + 4 AY	213.20	33.80	133.6	4,936/1,245/1,400	1,433
	3 AR + 3 AY	216.60	50.70	142.9	4,936/1,245/1,400	1,742
	4 AR + 2 AY	220.00	67.60	146.3	6,490/1,245/1,400	2,094
	3 AR + 4 AY	251.00	50.70	139.6	6,490/1,245/1,400	1,905
	4 AR + 3 AY	254.40	67.60	145.0	6,490/1,245/1,400	2,214
	4 AR + 4 AY	288.80	67.60	142.9	6,490/1,245/1,400	2,298
RTRC	1 AR + 1 ACF + 1 AY	72.20	34.62	142.9	3,382/1,245/1,400	1,035
	1 AR + 2 ACF + 1 AY	72.20	52.34	142.9	4,936/1,245/1,400	1,463
	1 AR + 3 ACF + 1 AY	72.20	70.06	142.9	6,490/1,245/1,400	1,893
	1 AR + 1 ACF + 2 AY	106.60	34.62	133.6	3,382/1,245/1,400	1,141
	1 AR + 2 ACF + 2 AY	106.60	52.34	133.6	4,936/1,245/1,400	1,568
	1 AR + 3 ACF + 2 AY	106.60	70.06	133.6	6,490/1,245/1,400	1,998
	2 AR + 1 ACF + 1 AY	110.00	51.52	146.3	4,936/1,245/1,400	1,495
	2 AR + 2 ACF + 1 AY	110.00	69.24	146.3	6,490/1,245/1,400	1,925
	1 AR + 1 ACF + 3 AY	141.00	34.62	126.9	4,936/1,245/1,400	1,317
	1 AR + 2 ACF + 3 AY	141.00	52.34	126.9	4,936/1,245/1,400	1,678
	1 AR + 3 ACF + 3 AY	141.00	70.06	126.9	6,490/1,245/1,400	2,118
	2 AR + 1 ACF + 2 AY	144.40	51.52	142.9	4,936/1,245/1,400	1,600
	2 AR + 2 ACF + 2 AY	144.40	69.24	142.9	6,490/1,245/1,400	2,030
	3 AR + 1 ACF + 1 AY	147.80	68.42	146.7	6,490/1,245/1,400	1,957
	1 AR + 1 ACF + 4 AY	175.40	34.62	122.4	4,936/1,245/1,400	1,401
	1 AR + 2 ACF + 4 AY	175.40	52.34	122.4	6,490/1,245/1,400	1,841
	1 AR + 3 ACF + 4 AY	175.40	70.06	122.4	6,490/1,245/1,400	2,202
	2 AR + 1 ACF + 3 AY	178.80	51.52	138.1	4,936/1,245/1,400	1,710
	2 AR + 2 ACF + 3 AY	178.80	69.24	138.1	6,490/1,245/1,400	2,150
	3 AR + 1 ACF + 2 AY	182.20	68.42	145.7	6,490/1,245/1,400	2,062
	2 AR + 1 ACF + 4 AY	213.20	51.52	133.6	6,490/1,245/1,400	1,873
	2 AR + 2 ACF + 4 AY	213.20	69.24	133.6	6,490/1,245/1,400	2,234
	3 AR + 1 ACF + 3 AY	216.60	68.42	142.9	6,490/1,245/1,400	2,182
	3 AR + 1 ACF + 4 AY	251.00	68.42	139.6	6,490/1,245/1,400	2,266

• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, standard or low noise version, 2 or 4 pipes. Please contact Robur Sales Network.

[1] Average efficiency on residential buildings; outlet water 60 °C with climate curve.
[2] Size does not include exhaust flue pipe.

Solutions for heating, cooling and DHW production in cooling operation with heat recovery

with reversible air-source heat pumps + chillers with heat recovery

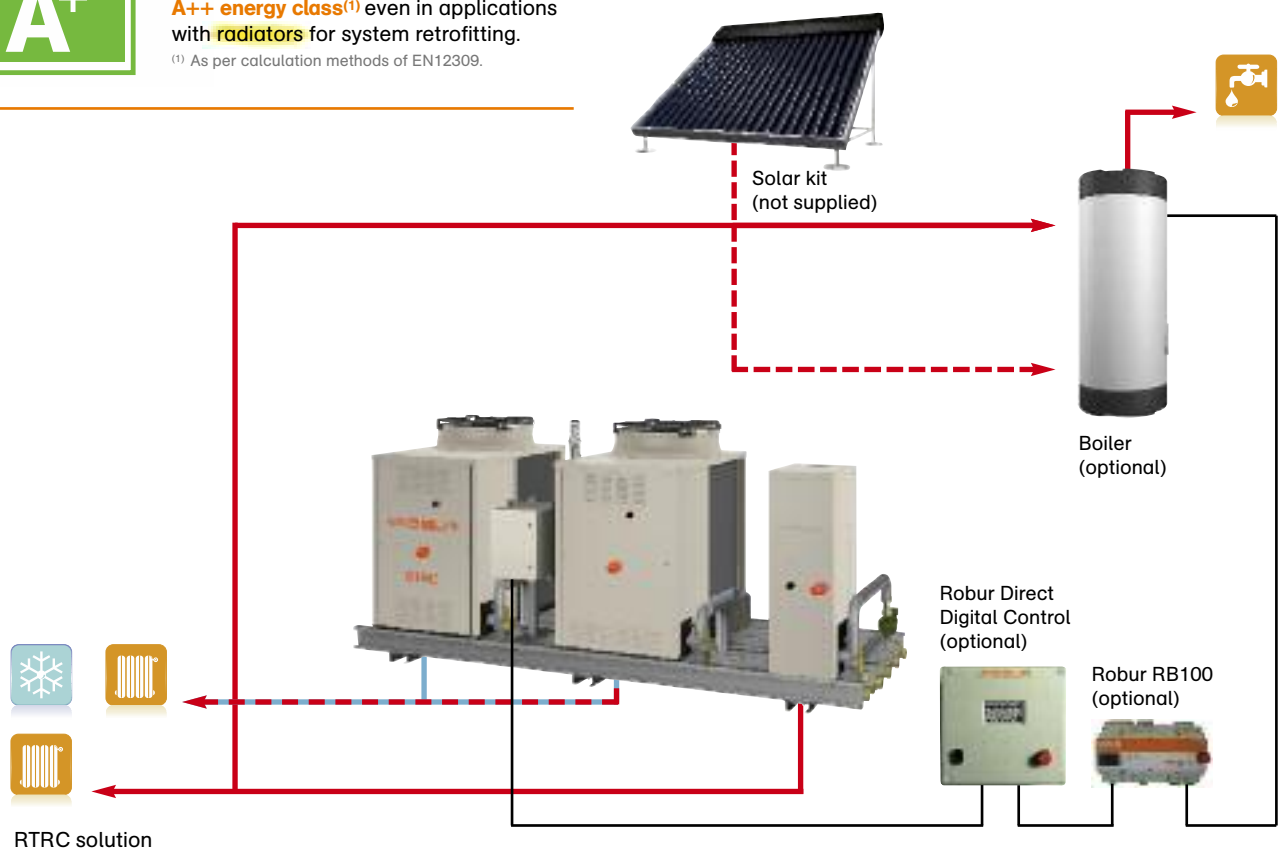
Model	Units	Heating capacity heating/DHW kW	Cooling capacity kW	Heating capacity recovered up to[1] kW	System GUE[2]%	Size w/d/h[3] mm	Weight kg
RTAH	1 AR + 1 ACF-HR	37.80	34.83	32.00	146.8	2,314/1,245/1,400	906
	1 AR + 2 ACF-HR	37.80	52.76	64.00	146.8	3,610/1,245/1,400	1,358
	1 AR + 3 ACF-HR	37.80	70.69	96.00	146.8	4,936/1,245/1,400	1,810
	1 AR + 4 ACF-HR	37.80	88.62	128.00	146.8	6,490/1,245/1,400	2,272
	2 AR + 1 ACF-HR	75.60	51.73	32.00	146.8	3,382/1,245/1,400	1,358
	2 AR + 2 ACF-HR	75.60	69.66	64.00	146.8	4,936/1,245/1,400	1,810
	2 AR + 3 ACF-HR	75.60	87.59	96.00	146.8	6,490/1,245/1,400	2,272
	3 AR + 1 ACF-HR	113.,40	68.63	32.00	146.8	3,610/1,245/1,400	1,810
	3 AR + 2 ACF-HR	113.40	86.56	64.00	146.8	4,936/1,245/1,400	2,272
	4 AR + 1 ACF-HR	151.20	85.53	32.00	146.8	6,490/1,245/1,400	2,272

• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, standard or low noise version. Please contact Robur Sales Network.
[1] For further data, please refer to Planning Manual.

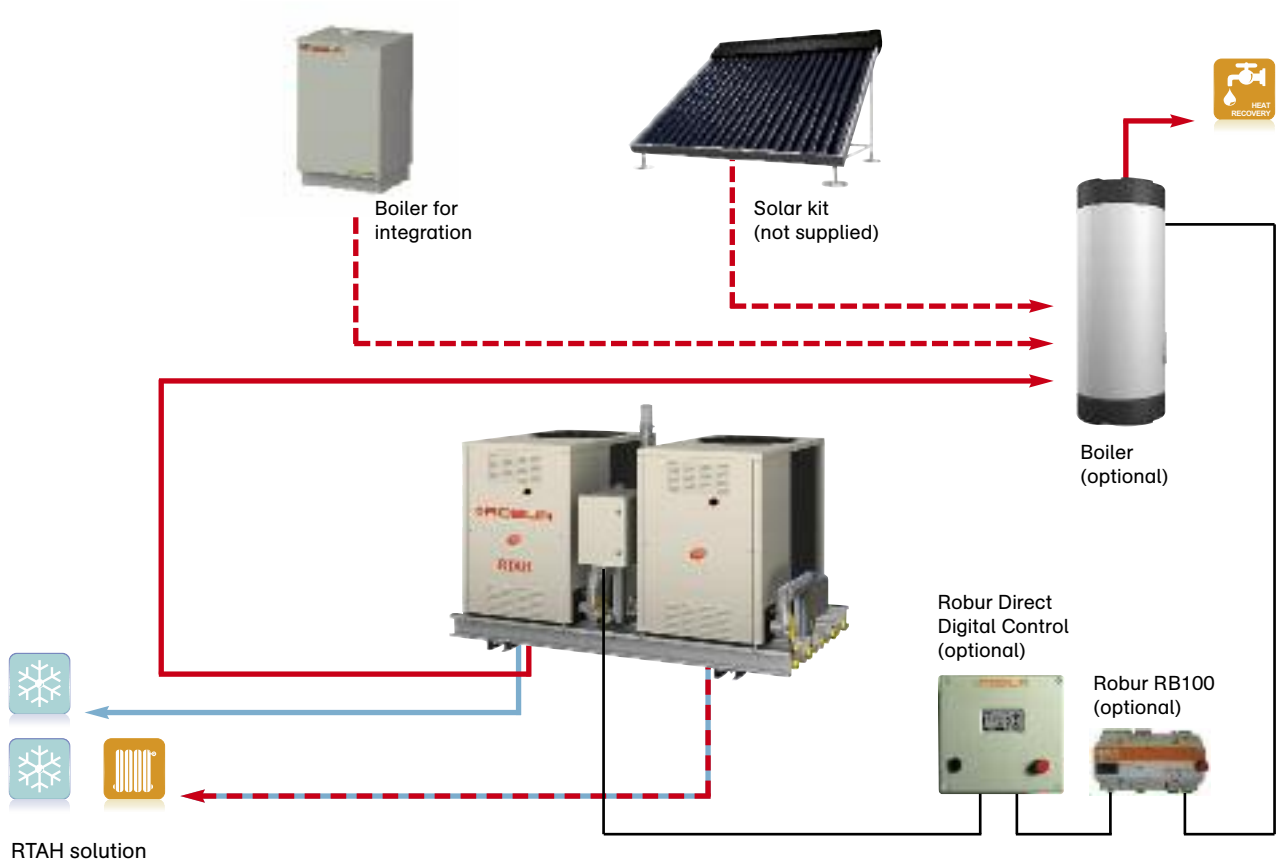
[2] Average efficiency on residential buildings; outlet water 60 °C with climate curve.
[3] Size does not include exhaust flue pipe.

The Robur air-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class**[1] even in applications with radiators for system retrofitting.

[1] As per calculation methods of EN12309.



RTRC solution



RTAH solution

For high efficiency heating and domestic hot water production in geothermal applications.

Condensing and modulating absorption heat pump powered by natural gas + ground-source renewable energy

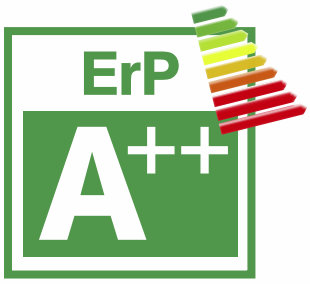
GAHP-GS

Advantages

- Up to 39.4% utilisation of ground-source renewable energy. Designed to exceed peak efficiency (GUE - Gas Utilization Efficiency) of 165%(1).
- Reduction in investment costs for geothermal loops can be higher than 50% in comparison to electric heat pumps.
- It is a super-efficient solution for domestic hot water production.
- It provides up to 40% of running cost savings if compared with the best condensing boilers.
- It represents the most profitable investment to increase the value of the building and its energy performance rating.
- It reduces electricity requirements compared to traditional electrical systems, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- With a GAHP-GS, every year 4.0 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 570 trees or those produced by 2 green cars; every year 1.8 Tons of Oil Equivalent are saved. Moreover, Robur GAHP-GS uses natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

(1) Equivalent to COP 4.13 on energy conversion factor of 2.5.







renewable **39.4%** energy

heating **165%** efficiency

geothermal **-50%** loops cost

ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com

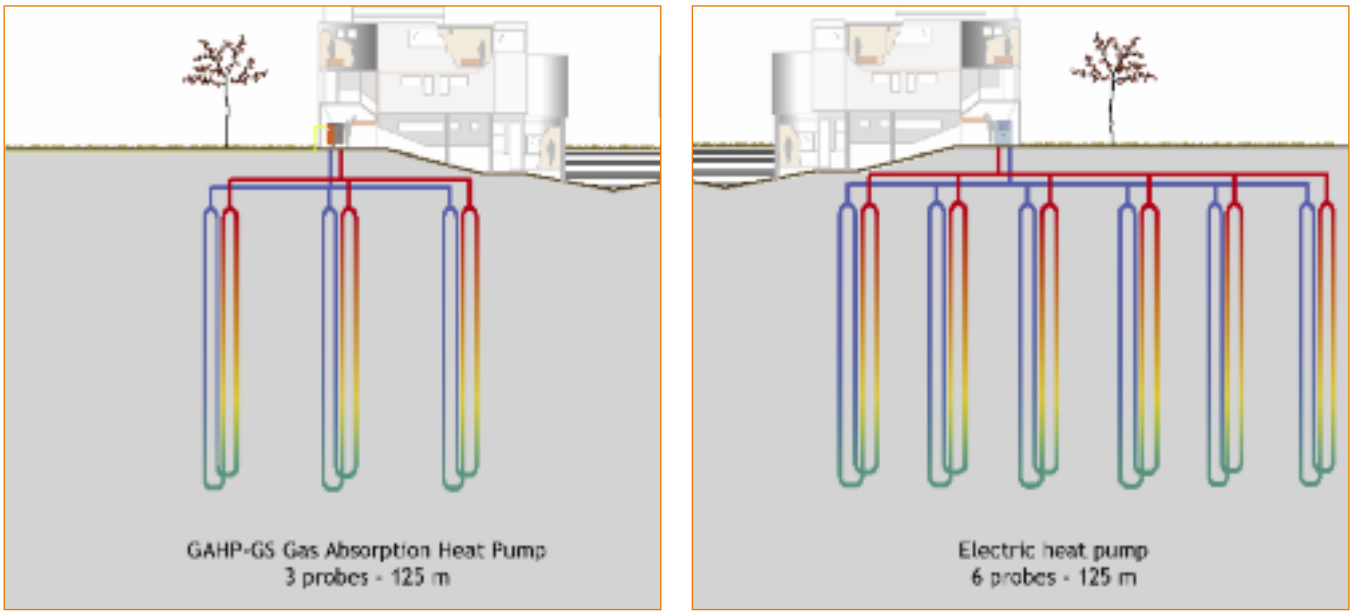
Applications

- Ideal for heating and DHW in buildings with high natural gas/LPG consumption.
- Ability to supply cooling as free-cooling mode (unit off) or in geothermal applications with active cooling (unit on).
- For indoor and outdoor installation.

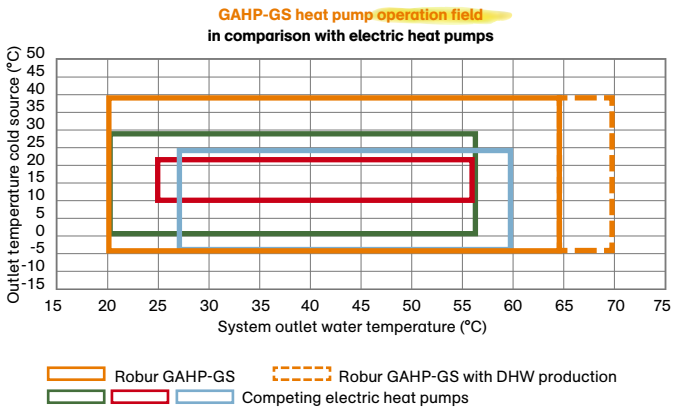
Versions

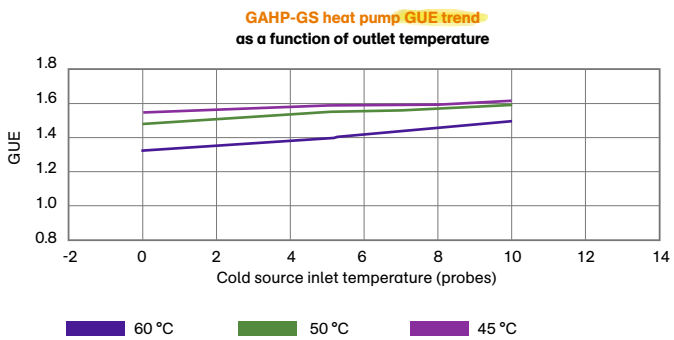
- Available also in:
  - pre-assembled units for higher capacity (p. 40);
  - E³ GS complete system (p. 54).

With GAHP-GS absorption heat pump **reduction in investment costs for geothermal loops can be higher than 50%** in comparison with electric heat pumps.



Example of geothermal heating system of 40 kW.
The length of the loops depends on the type of soil and operating conditions.





			GAHP-GS
HEATING OPERATION MODE [1]			
Energy class ErP (55 °C operation)			A++
Working point B0/W35	GUE (gas utilization efficiency)	%	165
	heating capacity	kW	41.6
	capacity recovered from renewable source	kW	16,4
Working point B0/W50	GUE (gas utilization efficiency)	%	149
	heating capacity	kW	37.6
	capacity recovered from renewable source	kW	12,1
Nominal water flow rate (ΔT = 10 °C)		m^3/h	3.17
Nominal water pressure loss (outlet water at 50 °C)		kPa	49
Maximum outlet water temperature for heating/DHW		°C	65/70
Maximum inlet water temperature for heating/DHW		°C	55/60
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.2
Gas consumption (actual)	natural gas G20 [2]	m^3/h	2.67
	LPG G31/G30 [3]	kg/h	1.99/1.96
ELECTRICAL CHARACTERISTICS			
Voltage			230 V – 50 Hz
Nominal electrical power [4]		kW	0.41
INSTALLATION DETAILS			
Operational Weight		kg	300
Sound pressure Lp at 5 metres [5] - Free field, at the front, direction factor 2		dB(A)	44.1
Connections	water	" F	1 1/4
	gas	" F	3/4
	flue exhaust pipe	mm	80
Electrical degree of protection		IP	X5D
Size [6]	width	mm	848
	depth	mm	690
	height	mm	1,278

[1] As per calculation methods of EN12309.
[2] NCV 34.02 MJ/m^3 (9.45 kWh/m^3) at 15 °C - 1013 mbar.
[3] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[4] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[5] Lw sound power standard version dB(A) 66.1. Sound power values measured according to EN ISO 9614.
[6] Size does not include exhaust flue pipe.
Note: The capacity recovered is considered as the capacity available for cooling. For any further information, please refer to design manual.

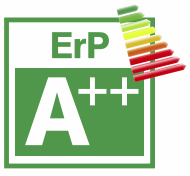
Solutions for heating and DHW production

with high efficiency ground source heat pumps

Model	Units	Heating capacity kW	Capacity recovered by RES kW	System GUE[1] %	Size w/d/h[2] mm	Weight kg
RTGS	2 GS	83.20	32.80	165.1	2,314/1,245/1,400	768
	3 GS	124.80	49.20	165.1	3,610/1,245/1,400	1,151
	4 GS	166.40	65.60	165.1	4,936/1,245/1,400	1,534
	5 GS	208.00	82.00	165.1	6,490/1,245/1,400	1,927

• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, for outdoor or indoor installation. Please contact Robur Sales Network.

[1] Average efficiency with outlet water 35 °C and geothermal loops 0 °C.
[2] Size does not include exhaust flue pipe.



The Robur ground-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class[1]** even in applications with radiators for system retrofitting.

[1] As per calculation methods of EN12309.

simultaneous

High efficiency simultaneous hot and cold water production.
Heating, cooling and domestic hot water production
where the use of water-source renewable energy is required.

Modulating and condensing absorption heat pump powered by natural gas + water-source renewable energy

GAHP-WS

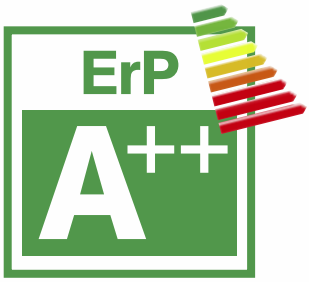
Advantages

- In case of simultaneous hot and cold water production, it exceeds overall efficiency (GUE - Gas Utilization Efficiency) of 248%(1). External sources are not required, thus reducing system and management costs.
- Up to 42.6% utilisation of water-source renewable energy, exceeding heating efficiency (GUE - Gas Utilization Efficiency) values of 174%(2).
- It is a super-efficient solution for domestic hot water production.
- It provides up to 40% of running cost savings if compared with the best condensing boilers.
- It represents the most profitable investment to increase the value of the building and its energy performance rating.
- It reduces electricity requirements compared to traditional electrical systems, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- With a GAHP-WS, every year 5.5 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 792 trees or those produced by 3 green cars; every year 2.4 Tons of Oil Equivalent are saved. Moreover, Robur GAHP-WS uses natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

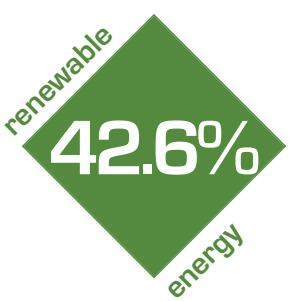
Versions

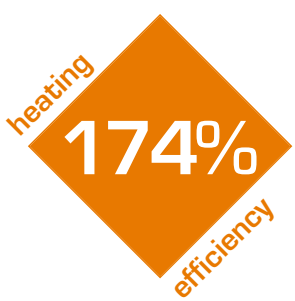
- For indoor and outdoor installation.
- Available also in:
  - pre-assembled units for higher capacity (p. 43);
  - E^3 WS complete system (p. 56).

(1) Equivalent to COP 6.20 on energy conversion factor of 2.5.
(2) Equivalent to COP 4.35 on energy conversion factor of 2.5.











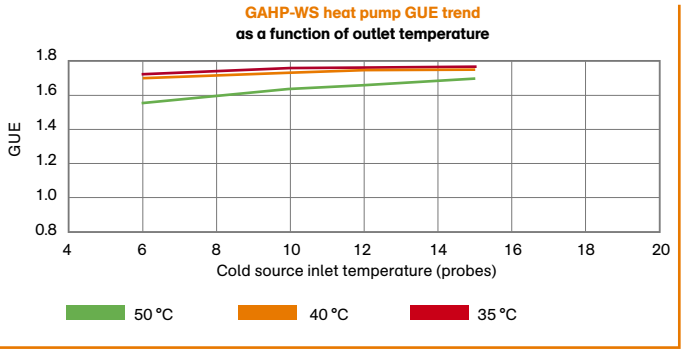
ELIGIBLE
for national and local incentive programs all over Europe

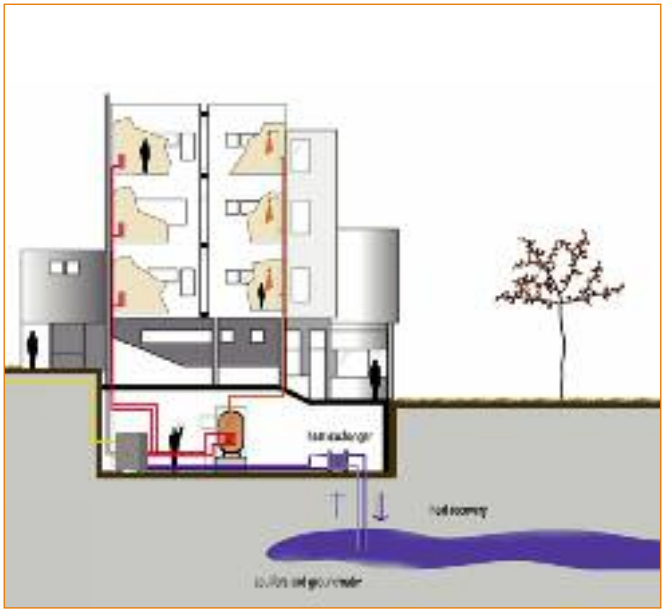
Please also refer to planning manual. Pdf download at www.robur.com

Heating and cooling and DHW production

Applications

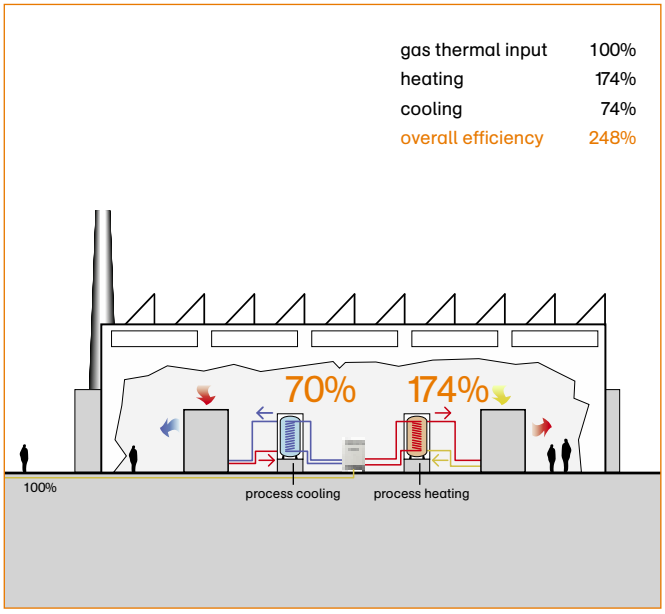
- Ideal for heating and DHW production. Preheating of DHW in summer in cooling operation (i.e. swimming pools).





Simultaneous production of hot and cold water

simultaneous



Applications

- Simultaneous production of heating and cooling capacity, with overall efficency (GUE - Gas Utilization Efficiency) of 248%, recovering energy from renewable energy sources.
- Systems that simultaneously require heating and cooling (hospitals, manufacturing process or liquid-ring-based air conditioning systems).

			GAHP-WS
HEATING OPERATION MODE [1]			
Energy class ErP (55 °C operation)			**A++**
Working point W10/W35	GUE (gas utilization efficiency)	%	174
	heating capacity	kW	43.9
	capacity recovered from renewable source	kW	18.7
Working point W10/W50	GUE (gas utilization efficiency)	%	165
	heating capacity	kW	41.6
	capacity recovered from renewable source	kW	16.6
Nominal water flow rate ($\Delta T = 10$ °C)		m^3/h	3.57
Nominal water pressure loss (outlet water at 50 °C)		kPa	57
Maximum outlet water temperature for heating/DHW		°C	65/70
Maximum inlet water temperature for heating/DHW		°C	55/60
COOLING OPERATION MODE			
Working point W12/W35	cooling capacity	kW	18.7
	supplied capacity - condenser	kW	43.9
Working point W12/W50	cooling capacity	kW	16.8
	supplied capacity - condenser	kW	42.0
OPERATION WITH SIMULTANEOUS USE			
Working point W10/W35 - Overall efficiency		%	248
Working point W10/W50 - Overall efficiency		%	231
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.2
Gas consumption (actual)	natural gas G20 [2]	m^3/h	2.67
	LPG G30/G31 [3]	kg/h	1.99/1.96
ELECTRICAL CHARACTERISTICS			
Voltage			230 V – 50 Hz
Nominal electrical power [4]		kW	0.41
INSTALLATION DETAILS			
Operational weight		kg	300
Sound pressure Lp at 5 metres [5] - Free field, at the front, direction factor 2		dB(A)	44.1
Connections	water	" F	1 1/4
	gas	" F	3/4
	flue exhaust pipe	mm	80
Electrical degree of protection		IP	X5D
Size [6]	width	mm	848
	depth	mm	690
	height	mm	1,278

[1] As per calculation methods of EN12309.
[2] NCV 34.02 MJ/m³ (9.45 kWh/m³) at 15 °C - 1013 mbar.
[3] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[4] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[5] Lw sound power standard version dB(A) 66.1. Sound power values measured according to EN ISO 9614.
[6] Size does not include exhaust flue pipe.
Note: The capacity recovered is considered as the capacity available for cooling. For any further information, please refer to design manual.

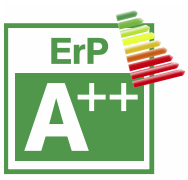
Solutions for simultaneous hot and cold water for heating, cooling and DHW production

with high efficiency water-source heat pumps

Model	Units	Heating capacity heating/DHW kW	Capacity recovered by renewable energy kW	System GUE[1]%	Size w/d/h[2] mm	Weight kg
RTWS	2 WS	87.80	35.20	174.3	2,314/1,245/1,400	768
	3 WS	131.70	52.80	174.3	3,610/1,245/1,400	1,151
	4 WS	175.60	70.40	174.3	4,936/1,245/1,400	1,534
	5 WS	219.50	88.00	174.3	6,490/1,245/1,400	1,927

- Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, for outdoor or indoor installation. Please contact Robur Sales Network.

[1] Average efficiency with outlet water 35 °C with climate curve, evaporator water 10 °C.
[2] Size does not include exhaust flue pipe.



The Robur water-source heat pump solutions are also designed and supplied **pre-assembled in packages achieving A++ energy class[1]** even in applications with radiators for system retrofitting.

[1] As per calculation methods of EN12309.

Cooling and simultaneous domestic hot water production for free up to 75 °C thanks to heat recovery.

Absorption chiller-heater powered by natural gas with heat recovery

GA ACF-HR

Advantages

- For 1 kW of natural gas equivalent used, every unit adds 0.8 kW of renewable energy available 24-hours-a-day for domestic hot water production, with peak efficiency of 180%.
- Saving up to 86% of electric energy consumption compared with a traditional electrical system, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- Use of natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

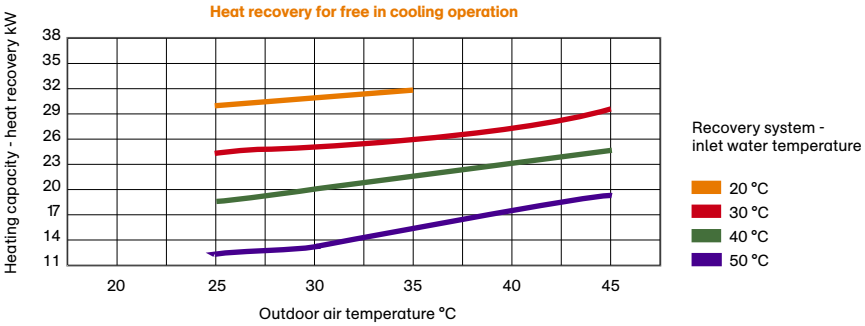
Applications

- Ideal for hotel, sport and wellness facilities.
- Ideal for post-heating circuits with air handling unit.
- Outdoor installation.

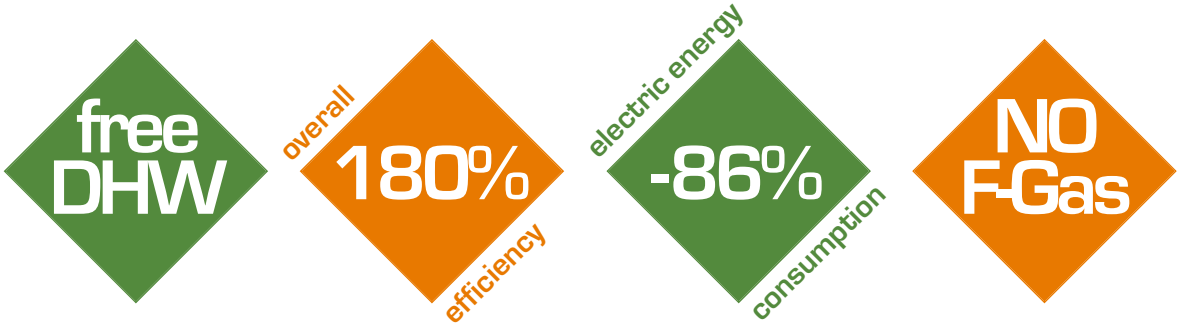
Versions

- Available in standard or low noise version.
- Available also in pre-assembled units for higher capacity, combined with Robur heat pumps and/or boilers (p. 28-34-45).





Cold water temperature at 7.2 °C and recovery system flow rate at 1,000 l/h.



Please also refer to planning manual. Pdf download at www.robur.com

			GA ACF HR
COOLING OPERATION MODE [1]			
Working point A35/W7	GUE (gas utilization efficiency)	%	71
	cooling capacity with heat recovery	kW	17.72
Nominal water flow rate ($\Delta T = 5.5$ °C)		m^3/h	2.77
Nominal water capacity pressure loss		kPa	29
Minimum outlet water temperature		°C	3
Inlet water temperature	max	°C	45
	min	°C	6
Ambient operating temperature	max	°C	45
	min	°C	0
HEAT RECOVERY SYSTEM CHARACTERISTICS			
Heating capacity with heat recovery for free in cooling operation		kW	up to 32
Nominal water flow rate		l/h	up to 2,500
Hot water inlet temperature	max	°C	75
	min	°C	10
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.0
Gas consumption (actual)	natural gas G20 [2]	m^3/h	2.65
	LPG G30/G31 [3]	kg/h	1.94
ELECTRICAL CHARACTERISTICS			
Voltage			230 V – 50 Hz
Nominal electrical power [4][5]	standard version	kW	0.82
	low noise version	kW	0.87
INSTALLATION DETAILS			
Operational weight	standard version	kg	390
	low noise version	kg	390
Sound pressure Lp at 5 metres [6] Free field, at the front, direction factor 2	standard version	dB(A)	57.6
	low noise version	dB(A)	53.0
Connections	water	" F	1 1/4
	gas	" F	3/4
Electrical degree of protection		IP	X5D
Standard version size	width	mm	850
	depth	mm	1,230
	standard version height	mm	1,445
	low noise version height	mm	1,545

[1] As per calculation methods of EN12309.
[2] NCV 34.02 MJ/m^3 (9.45 kWh/m^3) at 15 °C - 1013 mbar.
[3] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[4] Data measured at +30 °C outdoor temperature.
[5] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[6] Lw sound power standard version dB(A) 79.6 and low noise version dB(A) 75.0. Sound power values measured according to EN ISO 9614.
Note: For multiple units, please contact the Robur sales network. For any further information about heat recovery systems, please see planning manual.

Solutions for cooling and free DHW production

with chiller-heaters with heat recovery

Model	Units	Cooling capacity kW	Heating capacity with heat recovery up to[1] kW	Size w/d/h mm	Weight kg
RTCF HR	2 ACF HR	35.86	64.00	2,314/1,245/1,400	916
	3 ACF HR	53.79	96.00	3,610/1,245/1,400	1,373
	4 ACF HR	71.72	128.00	4,936/1,245/1,400	1,830
	5 ACF HR	89.65	160.00	6,490/1,245/1,400	2,297

• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, in standard or low noise version. Please contact Robur Sales Network.

[1] For further information regarding heating capacity of the recovery system under different operating conditions, please refer to planning manual.

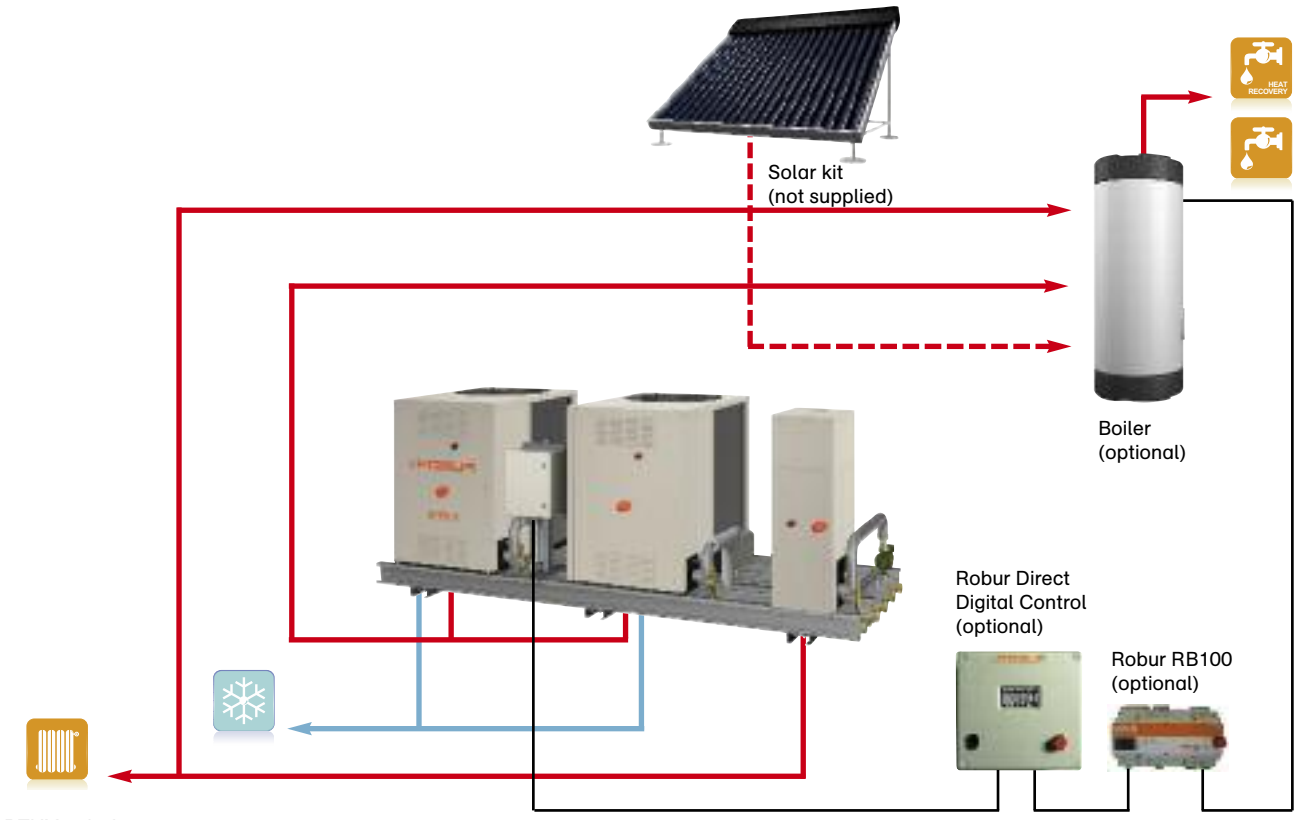
Solutions for heating and cooling with DHW production all over the year, for free in cooling mode

with chiller-heaters with heat recovery + condensing boilers

Model	Units	Heating capacity heating/DHW kW	Cooling capacity kW	Heating capacity with heat recovery up to(1) kW	Size w/d/h mm(2)	Weight kg
RTHY	1 ACF-HR + 1 AY	34.40	17.93	32.00	2,314/1,245/1,400	628
	1 ACF-HR + 2 AY	68.80	17.93	32.00	2,314/1,245/1,400	733
	1 ACF-HR + 3 AY	103.20	17.93	32.00	3,382/1,245/1,400	895
	1 ACF-HR + 4 AY	137.60	17.93	32.00	3,382/1,245/1,400	979
	2 ACF-HR + 1 AY	34.40	35.86	64.00	3,382/1,245/1,400	1,077
	2 ACF-HR + 2 AY	68.80	35.86	64.00	3,382/1,245/1,400	1,183
	2 ACF-HR + 3 AY	103.20	35.86	64.00	4,936/1,245/1,400	1,359
	2 ACF-HR + 4 AY	137.60	35.86	64.00	4,936/1,245/1,400	1,443
	3 ACF-HR + 1 AY	34.40	53.79	96.00	4,936/1,245/1,400	1,542
	3 ACF-HR + 2 AY	68.80	53.79	96.00	4,936/1,245/1,400	1,647
	3 ACF-HR + 3 AY	103.20	53.79	96.00	4,936/1,245/1,400	1,757
	3 ACF-HR + 4 AY	137.60	53.79	96.00	6,490/1,245/1,400	1,920
	4 ACF-HR + 1 AY	34.40	71.72	128.00	6,490/1,245/1,400	2,009
	4 ACF-HR + 2 AY	68.80	71.72	128.00	6,490/1,245/1,400	2,114
	4 ACF-HR + 3 AY	103.20	71.72	128.00	6,490/1,245/1,400	2,234
	4 ACF-HR + 4 AY	137.60	71.72	128.00	6,490/1,245/1,400	2,318

• Data refer to standard version, 6 pipes version and without circulators. Available with or without circulators, in standard or low noise versions, 4 or 6 pipes. Please contact Robur Sales Network.

(1) For further information regarding heating capacity of the recovery system under different operating conditions, please refer to planning manual.
(2) Size does not include exhaust flue pipe.



RTHY solution

Cooling with low electric energy consumption.

Absorption chiller powered by natural gas

GA ACF

Advantages

- Saving up to 86% of electricity compared with a traditional electric system, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- Use of natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).
- Independent and modular, it ensures continuity of service for cooling only as and when needed. Thanks to the use of an almost static refrigeration cycle, the performance levels remain unchanged over time and regular refill and disposal of refrigerant is not required.

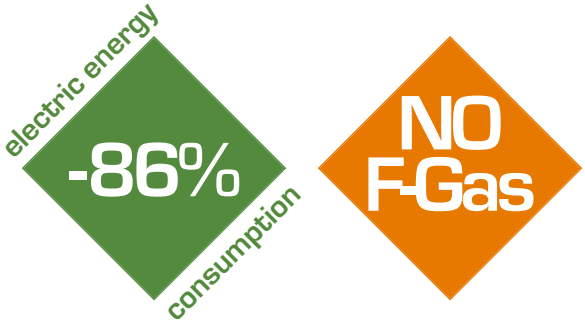
Applications

- Ideal for space cooling where electric energy is not available.
- Outdoor installation.

Versions

- Available in standard or low noise version.
- Available also in:
  - pre-assempbled units for higher capacity, combined with chillers and/or Robur boilers (p. 28-34-48);
  - integrated outdoor package with condensing boiler Gitié ACAY (p. 56).





Please also refer to planning manual. Pdf download at www.robur.com

			GA ACF
COOLING OPERATION MODE [1]			
Working point A35/W7	GUE (gas utilization efficiency)	%	71
	cooling capacity	kW	17.72
Nominal water flow rate (ΔT = 5,5 °C)		m³/h	2.77
Nominal water pressure loss		kPa	29
Minimum outlet water temperature		°C	3
Inlet water temperature	max	°C	45
	min	°C	8
Ambient operating temperature	max	°C	45
	min	°C	0
BURNER CHARACTERISTICS			
Thermal input (actual)		kW	25.0
Gas consumption (actual)	natural gas G20 [2]	m³/h	2.65
	LPG G30/G31 [3]	kg/h	1.94
ELECTRICAL CARACTERISTICS			
Voltage			230 V – 50 Hz
Nominal electrical power [4][5]	standard version	kW	0.82
	low noise version	kW	0.87
INSTALLATION DETAILS			
Operational Weight	standard version	kg	360
	low noise version	kg	360
Sound pressure Lp at 5 metres [6] Free field, at the front, direction factor 2	standard version	dB(A)	57.6
	low noise version	dB (A)	53.0
Connections	water	" F	1 1/4
	gas	" F	3/4
Electrical degree of protection		IP	X5D
Standard version size	width	mm	850
	depth	mm	1,230
	height	mm	1,445
Low noise version size	width	mm	850
	depth	mm	1,230
	height	mm	1,545

[1] As per calculation methods of EN12309.
[2] NCV 34.02 MJ/m³ (9.45 kWh/m³) at 15 °C - 1013 mbar.
[3] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[4] Data measured at +30 °C outdoor temperature.
[5] ± 10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
[6] Lw sound power standard version dB(A) 79.6 and low noise version dB(A) 75.0. Sound power values measured according to EN ISO 9614.

Solutions for cooling

with gas absorption chillers

Model	Units	Cooling capacity kW	Size w/d/h mm	Weight kg
RTCF	2 ACF	35.44	2,314/1,245/1,400	822
	3 ACF	53.16	3,610/1,245/1,400	1,232
	4 ACF	70.88	4,936/1,245/1,400	1,642
	5 ACF	88.60	6,490/1,245/1,400	2,062

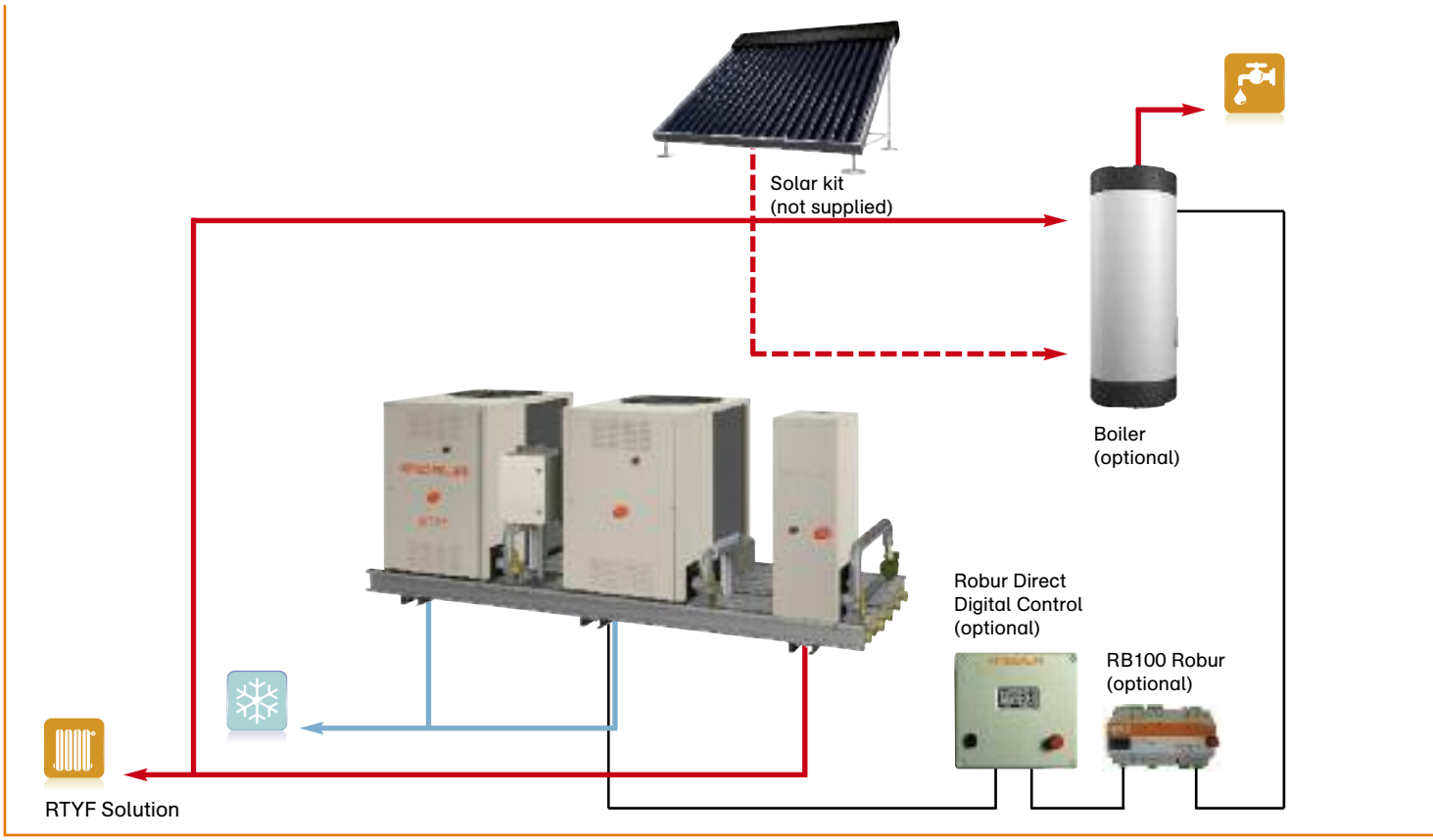
• Data refer to standard version, 2 pipes version and without circulators. Available with or without circulators, in standard or low noise versions. Please contact Robur Sales Network.

Solutions for heating, DHW production and cooling

with gas absorption chillers + condensing boilers

Model	Units	Heating capacity heating/DHW kW	Cooling capacity kW	Size w/d/h mm	Weight kg
RTYF	1 ACF + 2 AY	68.80	17.72	2,314/1,245/1,400	676
	1 ACF + 3 AY	103.20	17.72	3,382/1,245/1,400	828
	1 ACF + 4 AY	137.60	17.72	3,382/1,245/1,400	912
	2 ACF + 1 AY	34.40	35.44	3,382/1,245/1,400	973
	2 ACF + 2 AY	68.80	35.44	3,382/1,245/1,400	1,079
	2 ACF + 3 AY	103.20	35.44	4,936/1,245/1,400	1,245
	2 ACF + 4 AY	137.60	35.44	4,936/1,245/1,400	1,329
	3 ACF + 1 AY	34.40	53.16	4,936/1,245/1,400	1,391
	3 ACF + 2 AY	68.80	53.16	4,936/1,245/1,400	1,496
	3 ACF + 3 AY	103.20	53.16	4,936/1,245/1,400	1,596
	3 ACF + 4 AY	137.60	53.16	6,490/1,245/1,400	1,759
	4 ACF + 1 AY	34.40	70.88	6,490/1,245/1,400	1,811
	4 ACF + 2 AY	68.80	70.88	6,490/1,245/1,400	1,916
	4 ACF + 3 AY	103.20	70.88	6,490/1,245/1,400	2,026
	4 ACF + 4 AY	137.60	70.88	6,490/1,245/1,400	2,110

• Data refer to standard version, 4 pipes version and without circulators. Available with or without circulators, standard or low noise versions. Please contact Robur Sales Network.



Cooling in process applications, cooling in hot climates and refrigeration with low electric energy consumption.

Absorption chiller powered by natural gas

GA ACF Special Versions

Advantages

- Saving up to 86% of electricity compared with a traditional electrical system, thanks to the prevalent use of natural gas.
- It is eligible for national and local incentive programs all over Europe.
- Use of natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).
- Independent and modular, it ensures continuity of service for cooling only as and when needed. Thanks to the use of an almost static refrigeration cycle, the performance levels remain unchanged over time and regular refill and disposal of refrigerant is not required.

Applications TK Version

- Cooling in process applications. (e.g. in greenhouses for the intensive cultivation of mushrooms, rooms for maturing of cheese, etc).
- Cooling of controlled temperature rooms all year round (e.g. data reading rooms, computer rooms, laboratories).
- Cooling of rooms with high heat gains that require cooling even during cold seasons.

Applications HT Version

- Cooling of residential, commercial and industrial environments with an external air temperature up to 50 °C.

Applications LB Version

- Refrigeration where it is necessary to maintain temperatures inside the room in compliance with health and hygiene regulations.
- Refrigeration of cold rooms and counters for food preservation.
- Process refrigeration in systems requiring negative fluid temperatures.

Versions

- Available in low noise or standard versions.
- Available with pre-assembled units with higher capacity. (p. 51)



electric energy -86% consumption

NO F-Gas

3 Versions

- Process applications
- Climates up to 50 °C
- Refrigeration

Please also refer to planning manual. Pdf download at www.robur.com

			GA ACF TK	GA ACF HT	GA ACF LB
COOLING OPERATION MODE [1]					
Working point A35/W7	GUE (gas utilization efficiency)	%	71	68	53
	cooling capacity	kW	17.72	17.12	13.30 [2]
Nominal water flow rate (ΔT = 5.5 °C)		m³/h	2.77	2.67	2.60
Nominal water pressure loss		kPa	29	29	42
Minimum outlet water temperature		°C	3	5	-10
Inlet water temperature max/min		°C	45/8	45/8	45/-7
Ambient operating temperature max/min		°C	45/-12	50/0	45/0
Sound pressure Lp at 5 metres [3] - standard/low noise version - Free field, at the front, direction factor 2		dB(A)	57.6/53.0	57.6/53.0	57.6/53.0
BURNER CHARACTERISTICS					
Thermal input (actual)		kW	25.0	25.0	25.0
Gas consumption (actual)	natural gas G20 [4]	m³/h	2.65	2.65	2.65
	LPG G30/G31 [5]	kg/h	1.94	1.94	1.94
ELECTRICAL CARACTERISTICS					
Operational weight	standard version	kg	380	380	380
	low noise version	kg	380	380	380
Voltage			230 V – 50 Hz		
Nominal electrical power [6][7] - standard version		kW	0.82/0.87	0.82/0.87	0.82/0.87
Standard versione size	width	mm	850	850	850
	depth	mm	1,230	1,230	1,230
	standard version height	mm	1,290	1,290	1,290
	low noise version height	mm	1,540	1,540	1,540

[1] As per calculation methods of EN12309.
[2] Working point A35/W-5.
[3] Lw sound power ACF-TK, ACF-HT and ACF-LB standard version dB(A) 79.6; ACF-TK, ACF-HT and ACF-LB low noise version dB(A) 75.0. Sound power values measured according to EN ISO 9614.
[4] NCV 34.02 MJ/m³ (9.45 kWh/m³) at 15 °C - 1013 mbar.
[5] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[6] A reduction in the fan revolutions (air flow) is envisaged for ambient operating temperatures of less than 33 °C. This leads to a further reduction in electricity consumption levels.
[7] ± 10% depending on the power supply voltage and on the tolerance of the electrical engines.

Chillers for cooling in process applications

Model	Units	Cooling capacity kW	Size w/d/h mm	Weight kg
RTCF TK	2 ACF TK	35.44	2,314/1,245/1,400	856
	3 ACF TK	53.16	3,610/1,245/1,400	1,283
	4 ACF TK	70.88	4,936/1,245/1,400	1,710
	5 ACF TK	88.60	6,490/1,245/1,400	2,147

Chillers for cooling in hot climates

Model	Units	Cooling capacity kW	Size w/d/h mm	Weight kg
RTCF HT	2 ACF HT	34.24	2,314/1,245/1,400	856
	3 ACF HT	51.36	3,610/1,245/1,400	1,283
	4 ACF HT	68.48	4,936/1,245/1,400	1,710
	5 ACF HT	85.60	6,490/1,245/1,400	2,147

Chillers for refrigeration at negative temperatures

Model	Units	Cooling capacity kW	Size w/d/h mm	Weight kg
RTCF LB	2 ACF LB	26.60	2,314/1,245/1,400	856
	3 ACF LB	39.90	3,610/1,245/1,400	1,283
	4 ACF LB	53.20	4,936/1,245/1,400	1,710
	5 ACF LB	66.50	6,490/1,245/1,400	2,147

• Data refer to standard version, without circulators. Available with or without circulators, standard or low noise versions. Please contact Robur Sales Network.

Ideal for integrating Robur gas absorption solutions.
Heating and hot water production up to 80 °C.

Condensing boiler for outdoor installation

AY Condensing

Advantages

- Ideal integration to Robur gas absorption chillers and heat pumps for heating and production of hot water up to 80 °C.
- Ideal complement to:
  - provide peak power when climatic or economic conditions demand it;
  - complete the heating of domestic hot water production;
  - support them in supply to the AHU.
- It is eligible for national and local incentive programs all over Europe.
- Can be hydraulically and electrically coupled in one modular solution operating in cascade.

Versions

- Available also in preassembled units for higher capacity, combined with chillers and/or Robur boilers (p. 29-36-46-49-53).



System integration

4-Stars

hot water up to 80 °C

ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com

			AY 00-120
Energy class ErP			A
Nominal heating input		kW	34.9
Nominal heating capacity (1)		kW	34.4
Gas consumption	natural gas G20	m³/h	3.69
	LPG G30/G31	kg/h	2.75
Efficiency	100% of the load (2)	%	104.6
	100% of the load (1)	%	98.6
Water flow rate (ΔT = 10 °C)		l/h	2,950
Water pressure loss		kPa	40
Maximum operating pressure		bar	3
Voltage			230 V – 50 Hz
Nominal electrical power (3)		kW	0.18
Ambient temperature operating range			-20/45 °C
Connections	water	" F	1 1/4
	gas	" M	3/4
Size (4)	width	mm	410
	depth	mm	530
	height	mm	1,280

(1) Characteristics under nominal conditions: water delivery 80 °C and water return 60 °C.
(2) Characteristics under nominal conditions: water delivery 50 °C and water return 30 °C.
(3) ±10% depending on the power supply voltage and on the tolerance of the electrical motors power consumption.
(4) Size does not include exhaust flue pipe.

Solutions for heating and DHW production

with condensing boilers

Model	Units	Heating capacity heating/DHW kW	Size w/d/h(1) mm	Weight kg
RTY	2 AY	68.80	1,828/1,245/1,400	310
	3 AY	103.20	1,828/1,245/1,400	415
	4 AY	137.60	2,314/1,245/1,400	506
	5 AY	172.00	2,314/1,245/1,400	645

• Multiple pre-assembled links RTY are available with or without circulators. On request, AY00-120 units can be pre-assembled with other units (gas heat pumps, gas chillers) to create multiple assemblies configured on demand for heating, cooling and DHW production. For multiple units, please contact the Robur Sales Network.

(1) Size does not include exhaust flue pipe.

High efficiency heating, cooling and domestic hot water production.
Supplied with the main system components.

Complete system

E³

Advantages

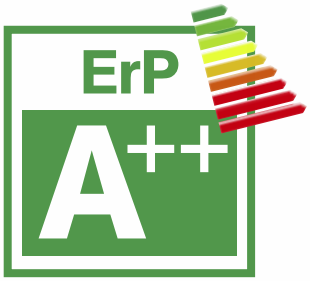
- Supplied with the main system components[1]:
  - generation system: absorption heat pumps powered by natural gas and renewable energies;
  - distribution system: electronic controlled high efficiency modulating pumps;
  - control system: (Comfort Control Panel) managing the whole generation and distribution systems.
- Available in 13 pre-designed configurations to meet every installation requirements.
- It is eligible for national and local incentive programs all over Europe.

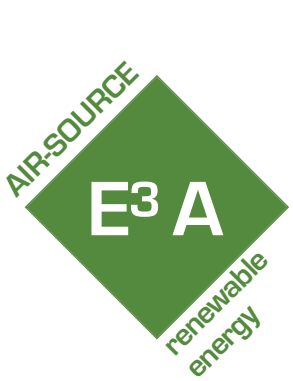
[1] E³ is a package for heating and hot water production.

Versions

- E³ A: heating system including one or more absorption heat pumps powered by natural gas and air-source renewable energy (GAHP-A p. 26).
- E³ GS: heating system including one or more absorption heat pumps powered by natural gas and ground-source renewable energy (GAHP-GS p. 38).
- E³ WS: heating system including one or more absorption heat pumps powered by natural gas and water-source renewable energy (GAHP-WS p. 41).

E³ solutions can reach A++ energy class.



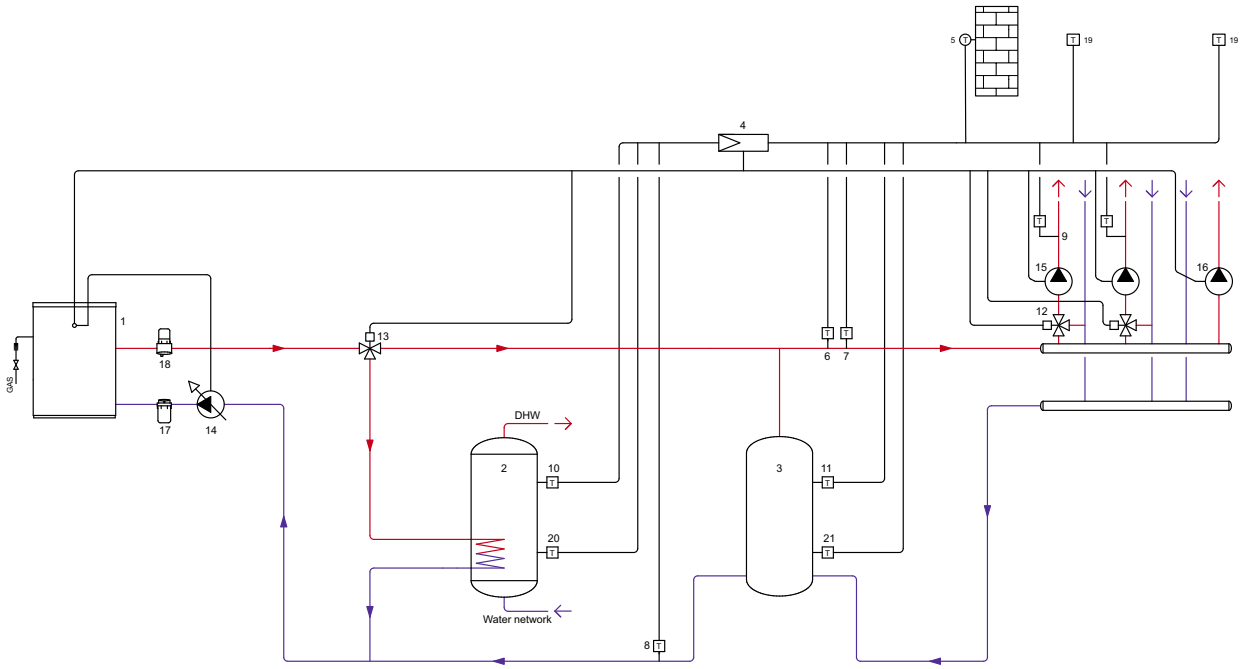






ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com



Solution nr. 3

Solutions	Description	ErP
E³ A air-water - Solution 1 FE3A000001	Single-zone heating system with compensation of the outlet temperature (climate curve)	A+
E³ A air-water - Solution 2 FE3A000002	Multi-zone heating system with compensation of the outlet temperature (climate curve)	A+
E³ A air-water - Solution 3 FE3A000003	Multi-zone heating system with compensation of the outlet temperature (climate curve) and domestic hot water production	A+
E³ A air-water - Solution 4 FE3A000004	Multi-zone heating systemwith compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panels	A+ A++
E³ A air-water - Solution 5 FE3A000005	Multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panel, back-up boiler	A+
E³ A air-water - Solution 6 FE3A000006	Modular unit and multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panel, back-up boiler	A++
E³ GS ground-source - Solution 7 FE3GS00007	Single-zone heating system with compensation of the outlet temperature (climate curve)	A++
E³ GS ground-source - Solution 8 FE3GS00008	Multi-zone heating system with compensation of the outlet temperature (climate curve)	A++
E³ GS ground-source - Solution 9 FE3GS00009	Multi-zone heating system with compensation of the outlet temperature (climate curve) and domestic hot water production	A++
E³ GS ground-source - Solution 10 FE3GS00010	Multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panels	A++
E³ GS ground-source - Solution 11 FE3GS00011	Multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panel, back-up boiler	A++
E³ GS ground-source - Solution 12 FE3GS00012	Multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panel, back-up boiler, free-cooling	A++
E³ GS ground-source - Solution 13 FE3GS00013	Modular unit and multi-zone heating system with compensation of the outlet temperature (climate curve), domestic hot water production, integration with solar panel, back-up boiler, free cooling	A++

The gas heat absorption heat pumps above mentioned for the E³ solutions are:
• Solutions from 1 to 6: low-noise GAHP-A;
• Solutions from 7 to 13: GAHP-GS, valid also with the absorption heat pumps powered by natural gas and water renewable energy source GAHP-WS.

High efficiency heating, domestic hot water production up to 80 °C and cooling with low electric energy consumption.

Gitié Trivalent Integrated Outdoor Package

with absorption heat pump powered by natural gas and air-source renewable energy

Gitié is the perfect blend of two winning technologies: the air-source absorption heat pump and the condensing boiler, both powered by natural gas.
Gitié can provide up to 3 services:

- high efficiency heating;
- hot water production up to 80 °C;
- cooling with low electric energy consumption.

Advantages

- Gitié, integrated, preassembled and custom-made in the manufacturing plant, is a fully plug-'n-play system. This can facilitate correct installation, avoiding the complexity of the integration on field of solar thermal systems.
- Gitié is the all-in-one solution replacing a boiler + solar thermal system using air-source renewable energy available 24-hours-a-day.
  For each kW of natural gas equivalent used, Gitié adds 0.5 kW of renewable energy.
- Gitié capital cost is convenient and it provides up to 40% of running cost savings if compared with similar solutions.
- It is eligible for national and local incentive programs all over Europe.
- Use of natural refrigerants not subject to normal constraints and phase-out (F-Gas Regulation exempt).

A CHOICE SMARTER THAN solar systems



ELIGIBLE
for national and local incentive programs all over Europe

Please also refer to planning manual. Pdf download at www.robur.com

AIR-SOURCE RENEWABLE ENERGY

Air is enough for heating, domestic hot water production and cooling



Applications

- Ideal for residential, industrial, commercial and hospitality facilities.
- Suitable for both new and existing buildings as it's for fitting in heating systems with low temperature (radiant heating or fan coils) or high temperature (radiators) distribution systems.
- Outdoor installation.

Versions

- Available in standard or low noise version, 2 and 4 pipes, with or without modulating circulators.

Models

- **Gitie AHAY**
  - Integrated outdoor package comprising of:
    - air-source gas absorption heat pump GAHP-A (p. 26);
    - condensing boiler (p. 52).

- **Gitie ARAY**
  - Trivalent integrated outdoor package comprising of:
    - air-source reversible gas absorption heat pump GAHP-AR (p. 32);
    - condensing boiler (p. 52).

- **Gitie ACAY**
  - Trivalent integrated outdoor package comprising of:
    - gas absorption chiller ACF (p. 47);
    - condensing boiler (p. 52).

ErP A++



ErP A+



ErP A



Components and accessories

Standard configuration

- 4-pipe service plate for water and gas connections.
- Electrical box for:
  - external control systems connections (like room thermostats, timers etc.);
  - Direct Digital Control (optional) connection;
  - water pumps connection.
- Steel rail.

Low noise version

With low-noise fan unit and a special sound-proof insulated casing. Ideal for installations where noise reduction is required.

Hydraulic kit

- 2 pipes (KIT /2 C0):
  - Single water loop;
  - Two motorized and factory wired check valves to optimize the efficiency of the system
- 2 pipes with circulators (KIT /2 C1):
  - Single water loop with circulators;
  - Two high efficiency and factory wired circulators (ErP Directive) to optimize the water flow and efficiency of the system.
- 4 pipes with circulators (KIT /4 C1):
  - Two independent water loops with circulators;
  - Two high efficiency and factory wired circulators (ErP Directive) to optimize the water flow of the system.

Accessories

- Direct Digital Control for a smart system management.
- RoburBox100 for a smart control interface of cooling and domestic hot production management (Direct Digital Control required).
- Outdoor temperature probe.
- CAN BUS cable.
- High efficiency circulators (ErP Directive) with increased pressure head.
- Vibration dampers.
- Gas/LPG conversion kit.

Sample solution

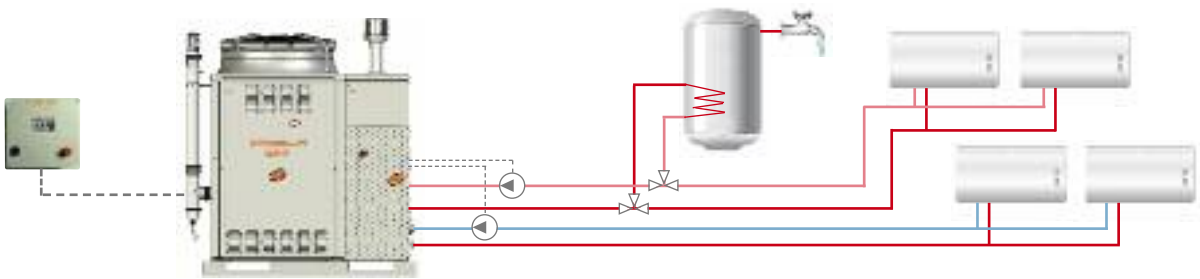
Gitié ARAY - Trivalent integrated outdoor package

comprising of air-source reversible gas absorption heat pump + condensing boiler

HEATING, COOLING AND DOMESTIC HOT WATER PRODUCTION

4-pipe version

- **Nominal heating capacity 75.7 kW.** Hot water production up to 60 °C, DHW up to 80 °C
- **Nominal heating capacity 16.9 kW.** Cold water production down to 3°C
- Two different hydronic loops: one for heating or cooling and one for DHW production or heating integration



			Gitié AHAY	Gitié ARAY	Gitié ACAY
HEATING MODE [1]					
Energy class ErP (55 °C operation)			**A++**	**A+**	**A**
Heating capacity - gas absorption heat pump (A7/W35)		kW	41.3	- -	- -
GUE gas utilization efficiency - gas absorption heat pump (A7/W35)		%	164	- -	- -
Heating capacity - reversible gas absorption heat pump (A7/W35)		kW	- -	37.8	- -
GUE gas utilization efficiency – reversible gas absorption heat pump (A7/W35)		%	- -	150	- -
Heating capacity – condensing boiler (acqua 80/60 °C)		kW	34.4	34.4	34.4
Efficiency – condensing boiler (50/30 °C)		%	104.6	104.6	104.6
Maximum outlet water temperature heating/DHW		°C	65/80	60/80	80/80
Maximum inlet water temperature heating/DHW		°C	55/70	50/70	70/70
Outdoor operating temperature (dry bulb)	max	°C	40	45	45
	min	°C	-15 [2]	-20 [2]	-20 [2]
COOLING MODE					
Cooling capacity (A35/W7)		kW	- -	16.9	17.72
GUE gas utilization efficiency		%	- -	67	71
Minimum outlet water temperature		°C	- -	3	3
Inlet water temperature max/min		°C	- -	45/6	45/6
Outdoor operating temperature (dry bulb)	max	°C	- -	45	45
	min	°C	- -	0	0
BURNER CHARACTERISTICS					
Thermal input (actual)		kW	60.1	60.1	59.9
Gas consumption (actual)	natural gas G20 [3]	m³/h	6.36	6.36	6.34
	LPG G30/G31 [4]	kg/h	4.71	4.71	4.69
ELECTRICAL CHARACTERISTICS					
Voltage			230 V – 50 Hz		
Nominal electrical power [5][6]	standard version [7]	kW	1.02	1.02	1.02
	low noise version [8] - max/min speed	kW	0.95/0.68	1.01	1.05
INSTALLATION DATA					
Weight	standard version [7]	kg	490/515	480/505	440/465
	low noise version	kg	500/525	490/515	460/485
Sound pressure Lp at 5 metres [9] Free field, at the front, direction factor 2	standard version [7]	dB(A)	57.6	57.6	57.6
	low noise version [8] - max/min speed	dB(A)	52.0	53.0	53.0
	low noise version [8] - max/min speed [10]	dB(A)	49.0	- -	- -
Connections	water outlet/inlet (4 pipes version)	" F	1 1/4	1 1/4	1 1/4
	water outlet/inlet (2 pipes version)	" F	1 1/2	1 1/2	1 1/2
	gas	" M	3/4	3/4	3/4
	exhaust pipe - gas absorption heat pump	mm	80	80	- -
	exhaust pipe - condensing boiler	mm	80	80	80
IP Class		IP	X5D	X5D	X5D
Size [11]	width	mm	1,356	1,356	1,356
	depth	mm	1,234	1,234	1,234
	standard version height	mm	1,279	1,279	1,279
	low noise version height	mm	1,508	1,508	1,508

[1] Nominal conditions according to EN 12309.
[2] Available also for lower temperature.
[3] NCV 34.02 MJ/m³ (9.45 kWh/m³) at 15 °C - 1013 mbar.
[4] NCV 46.34 MJ/kg (12.87 kWh/kg) at 15 °C - 1013 mbar.
[5] ± 10% tolerance depending on the electric voltage and engine consumption.
[6] Version with circulators: 280 W extra.
[7] Gitié AHAY standard version: A+ energy class.
[8] Low noise version with high efficiency modulating fan for lower noise emission.
[9] Lw sound power AHAY standard version dB(A) 79.6, low noise version with max speed fan dB(A) 74.0, with min speed fan dB(A) 71.0. Lw sound power ARAY standard version dB(A) 79.6, low noise version dB(A) 75.0. Lw sound power ACAY standard version dB(A) 79.6, low noise version dB(A) 75.0.Sound power values measured according to EN ISO 9614.
[10] Sound pressure data (AHAY low noise version with min speed fan) at partial load by suppliers.
[11] Size does not including exhaust pipe.

Control systems

A single device to adjust, control and manage the Robur absorption and the Robur gas boilers operation.

Direct Digital Control - DDC

Direct Digital Control is supplied as optional.

Operation

- Management of up to 16 modules (individual or pre-assembled) connected on the same hydraulic circuit and up to 48 modules, if connected to two panels extra.
- Monitoring of all units parameters.
- Set point control with sliding temperature, thanks to the climate curve function with optional outdoor probe.
- Mod-Bus communication protocol support for interface with building management systems (such as BMS, SCADA, etc.).



CCI is the interface panel, alternative to the DDC, for the modulation management of Robur absorption units.

Comfort Control Interface - CCI

Comfort Control Interface, supplied as optional, for the modulation management of Robur GAHP-A, GAHP-GS and GAHP-WS units.

Operation

- The CCI panel can control and modulate the power output up to a maximum of three units. Combined with an external electronic regulator, it can supply heating and DHW.
- Monitoring of all units parameters.
- Mod-Bus communication protocol support for interface with building management systems (such as BMS, SCADA, etc.).



The heart of the regulation system of the 13 E³ Robur solutions.

Comfort Control Panel - CCP

The Comfort Control Panel is supplied as standard for the 13 E³ Robur solutions.

Operation

- Up to 3 E³ heat pumps and boilers with climatic curve.
- Anti-legionella cycle.
- 3-way valve management for switching heating and DHW.
- Secondary distribution to different zones and DHW production.



RB100 is an interface panel, supplied as standard, for the system management of Robur absorption units and gas boilers.

Robur Box 100 - RB100

The RB100 control interface is fitted with Direct Digital Control (DDC).

Operation

RB100 combined with DDC (Direct Digital Control):

- heating, DHW and cooling mode management.
- 3-way valve management for switching heating and DHW.
- Control and error alarm.



Optional control system for the system management with Robur units and third parties appliances.

Robur Box 200 - RB200

RB200 (RoburBox200) is the control interface for systems made up of Robur chiller-heater units, absorption heat pumps and third parties appliances, fitted with Direct Digital Control (DDC):

- integration of third parties appliances, i.e. in case of retrofitting of existing systems;
- control of water circulation of primary and secundary circuits;
- 3-way valve management for switching heating and DHW;
- Mod-Bus communication protocol support for interface with building management systems (such as BMS, SCADA, etc.).
- Control and error alarm.



Accessories for Robur absorption units

UNIT CONTROL AND MANAGEMENT DEVICES

Accessory	Description	SINGLE UNIT GAHP - GA - AY	MULTIPLE UNIT GAHP - GA - AY	COMPLETE SYSTEM E³
	DDC Direct Digital Control (n. 1 DDC for max. 16 units)	•	•	
	RB100 - Robur Box 100	•	•	
	RB200 - Robur Box 200	•	•	
	CCI - Comfort Control Interface for modulation management with external regulator	•	•	
	RSI - Integrate System Controller (1)	•	•	
	CAN BUS cable for the connection of Robur units	•	•	•
	Temperature probe for DDC	•	•	
	Winter Kit for AY Condensing	•	•	•

For the choice of the suitable control device, please refer to Planning Manual.

ANTIVIBRATION DAMPERS

Accessory	Description	SINGLE UNIT GAHP - GA - AY	MULTIPLE UNIT GAHP - GA - AY	COMPLETE SYSTEM E³
	N. 4 spring vibration dampers kit	•	•	•
	N. 6 spring vibration dampers kit		•	•
	N. 8 spring vibration dampers kit		•	
	N. 10 spring vibration dampers kit		•	

CIRCULATION PUMPS

Accessory	Description	SINGLE UNIT GAHP - GA - AY	MULTIPLE UNIT GAHP - GA - AY	COMPLETE SYSTEM E³
	High efficiency modulating circulation pump	•	•	•
	Modulating system circulation pump			•
	High efficiency modulating circulation pump with increased pressure head	•	•	•

TANKS AND BUFFERS

Accessory	Description	SINGLE UNIT GAHP - GA - AY	MULTIPLE UNIT GAHP - GA - AY	COMPLETE SYSTEM E³	GITIE'
	300 l buffer tank - ErP energy class C	•	•	•	•
	500 l buffer tank - ErP energy class D	•	•	•	•
	1,000 l buffer tank		•	•	
	300 l DHW preparation tank with large coil (without integrated coil) - ErP energy class C	•	•	•	•
	500 l DHW preparation tank with large coil (without integrated coil) - ErP energy class D	•	•	•	•
	500 l DHW preparation tank with large coil (with auxiliary coil) - ErP energy class D	•	•	•	•
	750 l DHW preparation tank with large coil (with auxiliary coil)		•	•	
	Hydraulic separator "Mosè"(1), for hydraulic circuit balance, complete with air discharge valve, water discharge valve and thermal insulation	•	•	•	•

(1) Available while stocks last.

SYSTEM COMPONENTS

Accessory	Description	SINGLE UNIT GAHP - GA - AY	MULTIPLE UNIT GAHP - GA - AY	COMPLETE SYSTEM E³	GITIE'
	230V AC actuator for ON/OFF zone valves, 90 sec.	•	•	•	•
	230V AC modulating actuator for 3-way valves, 150 sec.			•	
	3-way ball valve 1"1/4	•	•	•	•
	3-way ball valve 1"1/2	•	•	•	•
	3-way valve DN 20 Kvs 6,3			•	
	3-way valve DN 25 Kvs 10			•	
	3-way valve DN 32 Kvs 16			•	
	Air separator filter 1"1/4	•		•	•
	Air vent filter 1"1/4	•		•	•
	Condensate discharge pump	•		•	•
	Water filter collector 1"1/4	•		•	•
	Ammonia discharge kit (1)	•	•	•	
	Flow control valve	•		•	•

E³ SYSTEM REGULATION

Accessory	Description	COMPLETE SYSTEM E³ A	E³ GS	E³ WS
	Central communication unit (2)	•	•	•
	Room unit basic Siemens (2)	•	•	•
	Room unit cooling Siemens (2)	•	•	•
	Sender Siemens (2)	•	•	•
	Transceiver Siemens (2)	•	•	•
	External probe Siemens (2)	•	•	•
	Immersion temperature probe (2)	•	•	•
	Solar probe Siemens (2)	•	•	•
	Strap-on temperature sensor (2)	•	•	•

ACCESSORIES FOR GITIE'

Accessory	Description	Gitié AHAY	Gitié ARAY	Gitié ACAY
	Preconfigured Direct Digital Control for a smart system management (to be ordered with the package)	•	•	•
	Preconfigured RoburBox100 for a smart control interface of cooling andDHWmanagement (Direct Digital Control required - to be ordered with the package)	•	•	•
	CAN BUS cable (Direct Digital Control required)	•	•	•
	Outdoor temperature probe	•	•	•
	GPL gas conversion kit	•	•	•
	Kit nr. 6 anti-vibration spring mountings	•	•	•
	High efficiency modulating circulators	•	•	•
	High efficiency modulating circulators with increased pressure head	•	•	•

(1) For GAHP-GS and GAHP-WS indoor installation.

(2) Available while stocks last.

ROBUR
wants to be a place of work:
Driven by the Progress
Moved by the Passion
Trusted by the Humanity
Led by the Justice
Guaranteed by the Quality
Inspired by the Beauty

Code: X-DPL222 - Rev08 - 11/2016

ROBUR
caring for the environment

Robur S.p.A.
advanced heating and cooling
technologies
Via Parigi 4/6
24040 Verdellino/Zingonia (BG) Italy
T +39 035 888111 F +39 035 884165
www.robur.com export@robur.it