ROBUR
caring for the environment

The reasons for choosing Robur heating and cooling systems fired by gas + renewable energies

Mission

Robur is dedicated to dynamic progression
in research, development and promotion of safe,
environmentally-friendly, and energy-efficient products,
through the commitment and caring
of 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 Responsability
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 good,
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 S.p.A. Chairman

ROBUR®
since 1956

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 Prize Winner of “European Quality Award”
- Robur GAHPs were included in the recommended designs group of the Environment Friendly Innovation Award
- Robur, with its reversible Gas Absorption Heat Pumps, claimed 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 the Year 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 gas-fired heat pumps as part of the “Impresa Ambiente” Prize
- Special mention in Enterprise Prize for Innovation promoted by Confindustria

2008 - Gas heat pumps E^3 won the honourable mention of the HVAC&R Innovation Prize sponsored by Costruire Impianti
- ROBUR Test Laboratories accredited by California Energy Commission (CEC)
- Gas Absorption Heat Pumps performances are tested by VDE and DVGW-Forschungsstelle

2009 - Special mention in the catagori Energy Efficiency
- Development Prize 2009 by the Foundation Sustainable Development and Ecomondo

GAHP

GAHP
Gas absorption heat pumps

The Robur gas absorption heat pump + renewable energy sources is The perfect blend of the two most common heating technologies, namely the condensing boiler and the electric heat pump.

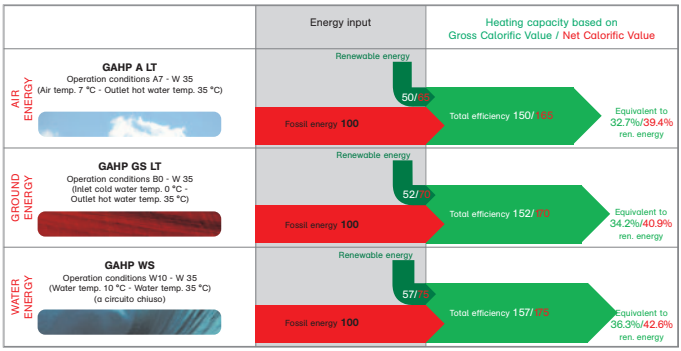
ADVANTAGES
Condensing boiler
- Natural gas fired
- DHW supply
- Only 1/10 of electricity consumption in comparison to electrical heat pumps

ADVANTAGES
Electric heat pump
- Use of renewable source energy with efficiency over 100% (Gross calorific value)
- Cooling mode also available

MINUS
Condensing boiler
- No use of renewable energy
- Efficiency lower than 100% (Gross calorific value)

MINUS
Electric heat pump
- High electrical demand
- Use of HFC fluids
- Limited operational field

Efficiency and renewable energy utilisation in gas absorption heat pumps



GAHP (Gas Absorption Heat Pump): A (Air Source), GS (Ground Source), WS (Water Source)
LT (Low Temperature)

Robur GAHPs are **ENVIRONMENTALLY FRIENDLY** using natural gas + renewable energy sources [1]

With a GAHP, every year 4.2 Tons of CO_2 emissions are saved, which are equivalent to those absorbed by 599 trees or those produced by 2 green cars; every year 1.6 TOE are saved. 4.768 [2] Gas Absorption Heat Pumps with Self-Sustainable Renewable Energy save 7,629 TEP every year and the emissions of 20,026 Tons of CO_2, which is equivalent to the emissions of 9,536 green cars or those absorbed by 2,856,032 trees covering a surface of 39,991,970 sqm

The GAHP technology is the best option to meet the objective of reducing energy consumption as required by the Kyoto Protocol. With impact on global warming close to zero (GWP - Global Warming Potential - of less than 1), the GAHP technology is the best solution to the problem of global warming due to greenhouse gases.

Note: All data are tested by certificates and approvals from ENEA for Italy, DVGW-Forschungsstelle and VDE for Germany, California Energy Commission for USA.

[1] GAHPs, using up to 40% renewable energy (air, water, ground), are recognized by RES Directive - Renewable Energy Source.

[2] Updated on 31st Aug. 2010.

Let the sun shine 24hours a day, 365days a year!
Make it possible with **Robur** heating systems

S elf-sustainable

R enewable

E nergy

Every unit using 1 kW of natural gas adds 0.5 kW of renewable energy, 24-hours-a-day available.

GAHP:
Gas absorption heat pump using up to 40% of renewable energy sources
Geothermal, water and air type available

This can be used only when you need it, thus avoiding unnecessary integration systems and/or unnecessary heat disposal (in summer).

Note: to produce 0.5 kW of energy the installation of approx. 1m² solar thermal collectors is necessary.

Robur GAHPs for COST AND ENERGY SAVINGS

GAHP technology can provide significant savings 40% on heating costs. High efficiency makes GAHP a smart and beneficial investment with a payback time of 2 to 4 years.

Robur GAHPs INCREASE PROPERTY VALUE

GAHPs are the most profitable investment to increase the value of the building. Updating the heating system only, with a small investment per square meter, will increase the building performance rating.

MFH 2 MW Project - Netherlands

Domaine La Coquillade Hotel - France

Engineering Department, Municipality of Milan - Italy

Edeka Riedel, Bad Wiessee - Germany

Southern Connecticut Gas Utility - USA

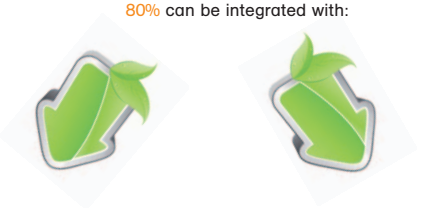
Have a look at our latest customer references
http://www.robur.com/references/

ROBUR GAHP are the **IDEAL INTEGRATION** of new installations or existing systems, such as solar systems, condensing boilers and electric heat pumps.

Open up *A NEW WAY* for solar thermal energy...
increase the rate of Self-sustainable Renewable Energy thanks to the integration with Robur Gas Absorption Heat Pumps (GAHP)

Solar thermal energy provides
20% of renewable energy of annual heating demand

80% can be integrated with:



Condensing boiler:
no use of renewable energy

Gas Absorption Heat Pump
provides up to 29% of renewable energy (36.3% on 80% integration = 29%)

Renewable energy rate 20%

Renewable energy rate 49%
20% from solar thermal energy
29% from Gas Absorption Heat Pump

GAHP Line A - RTA Series

High efficiency condensing gas absorption heat pumps + air source renewable energy for heating

Advantages

- Up to 32.7% utilisation of air source renewable energy.
- Designed to exceed peak efficiencies of 165%, guaranteeing up to 32.7% reductions in annual heating costs and in CO_2 emissions compared to the best condensing boilers.
- The most beneficial heating system to enhance the energy qualification of buildings because it permits a considerable promotion of the building's energy classification with the consequent increase in the value of the building.
- Increases the total efficiency of the heating system when it is combined or integrated with boilers with a lower energy performance.

Applications

- Ideal for heating industrial, commercial, accommodation and tertiary utilities.

The models

- HT: for the production of water at high temperature (for retrofitted radiator systems);
- LT: optimized to produce hot water at low temperature (new systems with radiant panels or fan coils).
- On request GAHP-A units can be preassembled as links with the same units (RTA Series).

			GAHP-A HT	GAHP-A LT
Working point A7/W35	G.U.E.	%	- -	165
	heating capacity	kW	- -	41.6
Working point A7/W50	G.U.E.	%	152	- -
	heating capacity	kW	38.3	- -
Outlet water temperature		°C	65	55
Inlet water temperature		°C	55	45
Outdoor operating temperature	max	°C	45	45
	min	°C	-20	-20

GAHP Line GS - RTGS Series

Condensing gas absorption heat pump + ground source renewable energy for heating

Advantages

- Up to 34.7% utilisation of ground source renewable energy.
- Exceeds peak efficiencies of 170%, guaranteeing up to 34.7% reductions in annual heating costs and in CO_2 emissions compared to condensing boilers.
- Reduction in investment costs for geothermal loops can be higher than 50%.
- It permits a considerable promotion of the building's energy classification with the consequent increase in the value of the building.

Applications

- Ideal for heating industrial, commercial, accommodation and tertiary utilities in geothermal applications. Ability to supply cooling as free-cooling mode (unit off) or in geothermal applications with active cooling (unit on).

Versions

- HT: for the production of water at high temperature (retrofitted radiator systems);
- LT: optimized to produce hot water at low temperature (new systems with radiant panels and/or fancoils).
- On request GAHP-GS units can be pre-assembled as links with the same units (RTGS Series).

			GAHP-GS HT	GAHP-GS LT
Working point B0/W35	G.U.E.	%	- -	170
	heating capacity	kW	- -	42.6
	capacity from ren. source	kW	- -	17
Working point B0/W50	G.U.E.	%	149	- -
	heating capacity	kW	37.6	- -
	capacity from ren. source	kW	12.6	- -
Outlet water temperature max		°C	65	55
Inlet water temperature max		°C	55	45

GAHP Line WS- RTWS Series

Condensing gas absorption heat pump + **water source** renewable energy for heating and cooling

Advantages

- Up to 36.3% utilisation of water source renewable energy.
- Exceeds peak efficiencies of 175%, guaranteeing up to 36.3% reductions in annual heating costs.
- It permits a considerable promotion of the building's energy classification with the consequent increase in the value of the building.

Applications

- Heating and air conditioning systems with an energy source available for recovery (preheating of DHW).
- On request GAHP-WS units can be pre-assembled as links with the same units (RTWS Series).

Working point W10/W35	G.U.E.	%	175
	heating capacity	kW	43.9
	capacity from ren.	kW	17.6
Outlet water temperature for heating	max	°C	65
Inlet water temperature for heating	max	°C	55

Simultaneous use: efficiency levels of 244%.

Advantages

- Simultaneous production of hot water up to 65 °C and cold water down to 3 °C.
- Overall efficiencies of more than 244% in case of simultaneous use.
- External sources are not required, thus reducing installation and operational costs.

Applications

- Systems that simultaneously require heating and cooling (hospitals, manufacturing process or liquid-ring-based air conditioning systems).

Working point W10/W35	overall efficiency	%	244
	heating capacity	kW	43.9

GAHP Line AR - RTAR Series

High efficiency reversible gas absorption heat pump + air source renewable energy for heating and cooling

Advantages

- Up to 25.3% utilisation of air source renewable energy.
- Designed to exceed peak efficiencies of 149%, guaranteeing up to 25.3% reductions in annual heating costs and in CO_2 emissions compared to the best condensing boilers.
- The most beneficial heating system to enhance the energy qualification of buildings, because it permits a considerable promotion of the building's energy classification with the consequent increase in the value of the building.
- Reduces electricity requirements up to 86% compared to traditional electrical systems.

Applications

- Ideal for heating and cooling industrial, commercial, accommodation and tertiary utilities.
- On request GAHP-AR units can be pre-assembled as links with the same units (RTAR Series).

Working point A7/W35	G.U.E.	%	149
	heating capacity	from 37.5 to 187.5	kW
Working point A35/W7	cooling capacity	from 16.9 to 84.5	kW
Outlet water temperature	max in heating	°C	60
	min in cooling	°C	3
Inlet water temperature	max in heating	°C	50
	min in heating	°C	2
Ambient operating temperature	max in cooling	°C	45
	min in heating	°C	-20

GA Line
ACF - RTCF Series HR Version
Gas absorption chiller-heater for cooling with heat recovery for the production of hot water

Advantages

- Production of hot water for free during cooling operation.
- Saving up to 88% of electricity compared with a traditional electrical system. Additional energy nor upgrading or modification of the electrical cabin are required.
- Complete system flexibility and modularity, ensuring continuity of service and providing the cooling output according to seasonal demands

Applications

- Cooling systems where hot water production for domestic use is required (hotels, hospitals, swimming pools, etc.).
- Post-heating circuits with A.H.U.
- On request ACF HR units can be pre-assembled as links with the same units (RTCF HR Series)

Heating capacity with heat recovery		kW	21.0
Cooling capacity without heat recovery		kW	17.72
Cooling capacity with heat recovery		kW	17.93
Nominal water flow rate		m^3/h	1.0
Water inlet temperature	max	°C	45
	min	°C	6
Hot water inlet temperature	max recovery	°C	80
	min recovery	°C	10
Ambient operating temperature	max	°C	45
	min	°C	0

GA Line ACF - RTCF Series

Chiller and chiller links for the production of cold water down to 3 °C

Advantages

- Extremely low electricity consumption: saving up to 86% of electricity compared with a traditional electrical system, thus requiring neither additional energy nor upgrading or modification of the electrical cabin.
- Independent and modular, it ensures constant performance 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

- Cooling for commercial, accommodation and industrial use.
- On request ACF units can be pre-assembled as links with the same units (RTCF Series).

Nominal cooling capacity		from 17.72 to 88.60	kW
Minimum outlet water temperature		°C	3
Ambient operating temperature	max	°C	45
	min	°C	0

GA Line Special Versions

Gas absorption chiller and chiller links for process applications, cooling in hot climates and refrigeration

Advantages

- Savings up to 86% of electricity compared with a traditional electrical system
- Independent and modular, it ensures constant performance for air conditioning only as and when needed.

TK Version applications

- Cooling in industrial process applications.
- Cooling of controlled temperature rooms throughout the year.
- Cooling of rooms with high heat gains that require cooling even during cold seasons.
- Cooling for the intensive cultivation of mushrooms or maturing of cheese.

HT Version applications

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

LB Version applications

- Refrigeration of lowtemperature environments for the food industries.
- Process refrigeration in systems requiring negative fluid temperatures.
- Ice storage systems, for the storage of cooling energy during periods of low energy needs.
- On request ACF units can be preassembled as links with the same units (RTCF Series special Versions).

ACF TK VERSION			
Nominal cooling capacity		from 17.72 to 88.60	kW
Minimum outlet water temperature		°C	3
Ambient operating temperature	max	°C	45
	min	°C	-12
ACF HT VERSION			
Nominal cooling capacity		from 17.12 to 85.60	kW
Minimum outlet water temperature		°C	5
Ambient operating temperature	max	°C	50
	min	°C	0
ACF LB VERSION			
Nominal cooling capacity		from 13.3 to 66.5	kW
Minimum outlet water temperature		°C	-10
Ambient operating temperature	max	°C	45
	min	°C	0

AY - RTY Condensing Line

Gas condensing boiler and condensing boiler links for heating

Advantages

- Controlled size for easier, quicker, and more economic transportation, handling and installation.
- Can be hydraulically and electrically coupled to a single modular heating unit operating in cascade.

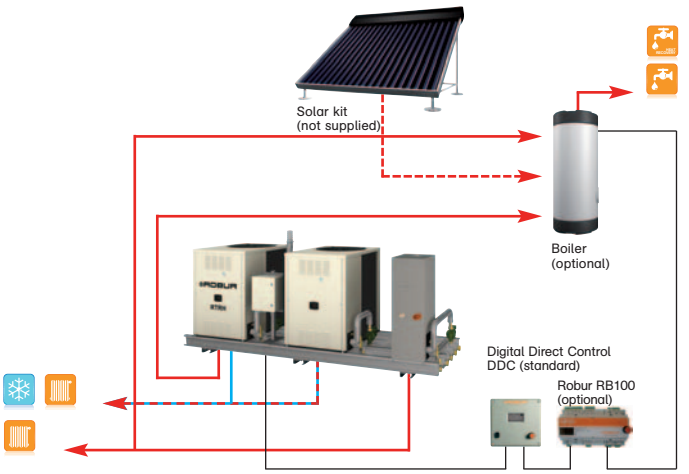
Applications

- Heating and production of hot water up to 80 °C.
- Ideal complement to Robur gas absorption chillers and heat pumps, in particular to:
  - support them in supply to the A.H.U.;
  - complete the heating of domestic hot water production;
  - provide peak power when climatic or economic conditions demand it.

Versions

- On request AY units can be pre-assembled as links with the same units (RTY Series) or with other units, with or without circulators.

Nominal heating capacity			from 34.4 to 172 kW
Efficiency	100% (80 °C - 60 °C)	%	98.6
	100% (50 °C - 30 °C)	%	104.6
Outlet water temperature max		°C	80
Ambient operating temperature	max	°C	45
	min	°C	-20



Multiple assemblies configured on demand

Gas absorption units for heating, cooling and DHW production

Absorption heating-cooling modules can be pre-assembled on a single underbase rack to make assemblies specifically configured on demand consisting of a combination of one or more heat pumps, chillers with or without heat recovery and condensing boilers.
Here above you will find an example
For specifications, please contact the Robur sales network.

E^3

The most efficient heating system with condensing gas absorption heat pumps available in air, geothermal and water source versions

E^3 is a complete heating system with:

- absorption heat pumps: for the highest efficiency;
- electronic circulation pumps: for energy and financial savings in the management and distribution systems;
- the control system: to ensure Efficiency, Economy and Ecology.

E^3 is available in 13 predesigned configurations, specifically developed for any installation and operation. The 13 solutions include, beyond gas absorption heat pumps for heat generation, also the main components of the installation, in order to ensure the maximum overall efficiency.

Advantages

- Up to 40.0% utilisation of renewable energy (ground, water and air sources).
- Designed to exceed peak efficiencies of 170%, guaranteeing up to 40% reductions in annual heating costs and in CO_2 emissions compared to the best condensing boilers.
- The most beneficial heating system to enhance the energy qualification of buildings because it permits a considerable promotion of the building's energy classification.
- For the E^3 GS version, the reduction in investment costs for geothermal loops can be higher than 50%.

The versions

- E^3 A: heating system including one or more gas absorption heat pumps + air renewable energy (GAHP-A).
- E^3 GS: heating system including one or more gas absorption heat pumps + ground renewable energy (GAHP-GS).
- E^3 WS: heating system including one or more gas absorption heat pumps + water renewable energy (GAHP-WS).

Air Handler Line

Indoor wall mounted air handler unit for heating and cooling

Advantages

- Control the air flow through two-speed ventilation.
- Adapting the air flow to the installation conditions, through the front grid with individually adjustable fins.

Applications

- Suitable for installation in medium to large settings such as exhibitions, supermarkets, showroom, craft workshops, industrial buildings, factory buildings, medium to large settings, requiring summer and winter cooling.

Versions

- CL air handler can be connected to Robur hot water production appliances (boilers and GAHP-A absorption heat pumps) and to any other system for the production of hot water.
- CR fan heaters can be connected to Robur hot and cold water production appliances (chiller-heater units and absorption heat pumps) and to any other system for the production of hot and cold water.

CL AIR HANDLER

Heating capacity (water 80/70 °C, air 15 °C, max speed)	kW	43.18
Air flow max/min	m^3/h	4,000/2,850
Nominal electrical power	kW	0.25

CR AIR HANDLER

Heating capacity (water 80/70 °C, air 15 °C, max speed)	kW	60.08
Cooling capacity (water 7/12 °C, air 27 °C, R.H. 50%, max speed)	kW	27.02
Air flow max/min	m^3/h	4,900/3,800
Nominal electrical power	kW	0.45

Gas Unit Heaters Line G Series
Condensing and modulating
gas fired unit heaters

Advantages

- Absence of intermediate fluid, low thermal inertia, no water plant and central heating.
- Perfect modulation of the heating output.
- Small size for easier, quicker, and more economic transportation, handling and installation.
- The digital chronothermostat, supplied as standard, offers important control functions, resulting in a more precise and economical use of the installation.
- Condensate siphon supplied as standard.

Applications

- Workshops and factories.
- Shopping buildings.
- Show rooms.
- Sports halls and fitness centres.

			G 30	G 45	G 60	G 100
Heat output	max	kW	29.2	43.3	56.2	90.2
	min	kW	12.6	15.6	20.2	33.5
Efficiency	max	%	105.3	104.3	104.6	105.7
	min	%	97.3	96.5	97.0	97.0
Nominal air flow		m^3/h	2,700	4,000	5,350	8,250
Temperature rise		K	31.1	31.8	30.8	32.1
Air inlet pipe diameter		mm	80	80	80	80
Exhaust air pipe diameter		mm	80	80	80	80

Gas Unit Heaters Line K Series

Wall mounted **modulating** gas unit heaters with low NO_x emissions

Advantages

- Modulation of heat output and ventilation according to ambient requirements.
- High efficiency for greater energy savings: up to 96%
- Reduced size and weight, for faster and safer installation.
  K Series heaters have a lower size/heat output ratio than other warm air heaters currently available on the market.
- Digital chronothermostat supplied as standard, offers a series of important regulation and control functions, resulting in a more precise and economical use of the heating system.

Applications

- Workshops and factories.
- Shopping buildings.
- Show rooms.
- Sports halls and fitness centres.

			K 32	K 45	K 60	K 80	K 100
Heat input	max	kW	29.6	41.6	55.2	73.6	92.0
	min	kW	17.7	25.8	33.0	44.2	53.9
Efficiency at heat output	max	%	92.5	92.5	92.0	92.0	92.0
	min	%	95.0	95.5	95.6	96	96.2
Air flow rate	max speed	m^3/h	2,700	4,000	5,350	6,300	8,250
	min speed	m^3/h	2,300	2,600	3,670	4,000	5,775
Temperature rise	max speed	K	31.0	30.8	30.6	34.6	33.0
	min speed	K	29.9	29.4	26.7	32.8	27.7
Air inlet pipe diameter		mm	80	80	80	80	80
Exhaust air pipe diameter		mm	80	80	80	80	80

Gas Unit Heaters Line K CM Series

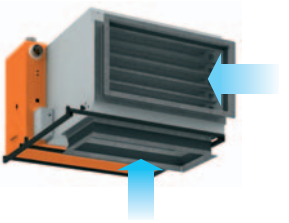
Gas unit heaters with centrifugal fan and mixing chamber

Advantages

- Designed for ducted applications to provide heating and ventilation.
- Mixing chamber consisting of fresh air and return air dampers;
- Heating efficiency up to 92.5%.

Applications

- Ideal where complete or partial air replacement is required.
- Warm air distribution through air ducting for heating more premises or in case of heating at low speed.



			K 60CM	K 80CM	K 100CM
Nominal heating capacity		kW	55.2	73.6	92.0
Efficiency		%	92.0	92.0	92.0
Nominal air flow rate [1]		m^3/h	5,350	6,300	8,045
Max available pressure head	without air filters	Pa	300	300	260
	with air filters fitted [2]	Pa	180	250	160
Temperature rise [3]		K	30.6	34.6	33.9
Installed wattage [4]		kW	1.6	2.3	2.3

[1] At maximum pressure drop.

[2] Class G3 air filters (optional).

[3] At nominal air flow rate.

[4] According to nominal air flow rate.

Gas Unit Heaters Line Evoluzione Series

Wall mounted gas unit heaters **with modern design** and low NO_x emissions

Advantages

- Modulating burner and fan according to temperature required: optimal comfort, maximum saving, lowest sound pressure.
- Suitable for premises where smart design is required.

Applications

- Exhibitions and showrooms.
- Gyms and fitness centres.
- Supermarkets and commercial settings.

			E 32	E 43	E 52
Nominal heating capacity		kW	24.2	34.2	44.5
Reduced heating capacity		kW	19.35	27.4	35.6
Reduced nominal heat output		%	93	92	92
Air flow [1]	max speed	m^3/h	2,300	3,400	4,200
	min speed	m^3/h	1,900	2,700	3,400
Temp. rise	max speed	K	31.2	29.4	31.0
	min speed	K	30.2	29.8	30.7
Air inlet pipe diameter		mm	80	80	80
Exhaust air pipe diameter		mm	80	80	80
Sound pressure [2]	in open field	dB (A)	38	40	42
	in typical installation	dB (A)	48	52	56
Sound pressure [3]	in open field	dB (A)	36	37	38
	in typical installation	dB (A)	45	47	51

[1] At 20 °C - 1013 mbar.

[2] At 6 meters (first speed).

[3] At 6 meters (second speed).

Gas Unit Heaters Line B 15 Series

Wall mounted gas unit heaters with small size and for flexible installation

Advantages

- Easy installation: the heater, equipped with its own bracket, can be installed in horizontal, inclined or vertical position according to the requirements.
- Small size and light weight.
- Low sound pressure.

Applications

Direct heating of:

- Small and medium size premises
- Shops and show rooms
- Laboratories and factories
- Fitness centres and sport halls

The installation

Thanks to the designed support, the heater can be positioned in horizontal, inclined or vertical position.

Nominal heating capacity	kW	13.8
Efficiency	%	92.0
Nominal air flow [1]	m³/h	1,900
Temperature rise	K	21.3
Installed wattage	kW	0.16

[1] At 20 °C - 1013 mbar.

Gas Unit Heaters Line F Series

Wall mounted gas unit heaters with low NO_x emissions

Advantages

- Efficiency up to 92% under every operation condition.
- Intake and exhaust ducts both only 80 mm in diameter, to make installation easier.
- The new external terminal (separate) inlet and outlet pipes with short projection (4.3 cm only from the wall): a Robur exclusive accessory.

Applications

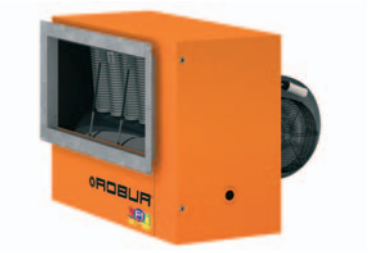
- Industrial premises and workshops
- Laboratories
- Warehouses and storage facilities
- Supermarkets and showrooms

The installations

F Series is available in wall mounted or in vertical downflow.

		F1 21	F1 31	F1 36	F1 41	F1 51	F2 60	F2 80	F2 100
Heating capacity	kW	21	28	31.8	33.8	44	55.2	73.6	92.0
Efficiency	%	91.0	91.0	91.5	91.0	91.0	92.0	92.0	92.0
Air flow [1]	m^3/h	2,000	2,700	3,000	3,400	4,200	5,350	6,300	8,250
Temperature rise	K	31.1	30.7	31.4	29.5	31.0	30.6	34.6	33.0
Air inlet pipe diameter	mm	80	80	80	80	80	80	80	80
Exhaust air pipe diam.	mm	80	80	80	80	80	80	80	80

[1] At 20 °C - 1013 mbar.



Gas Unit Heaters Line F C Series

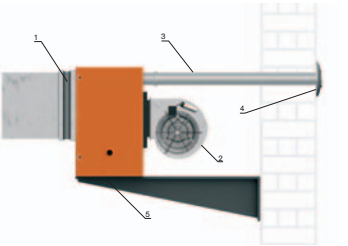
Wall mounted gas unit heaters with centrifugal fan

Advantages

- Centrifugal fan designed for ducting application.
- Heating efficiency up to 92%.

Applications

- Changing rooms.
- Rooms used as offices, for meetings and for services.
- Restaurants, bars and shops.
- Premises where air distribution at low speed is required.



1 Anti-vibration joint
2 Centrifugal fan
3 Air intake and exhaust pipes Ø 80 mm
4 External wall terminal
5 Wall support bracket

			F1 21C	F1 41C	F1 51C	F2 80C
Nominal heating capacity		kW	21.0	33.8	44.0	73.6
Efficiency		%	91	91	91	92
Air flow	free inlet	m^3/h	2,500	3,500	4,000	8,500
	at max pressure drop	m^3/h	2,000	2,600	2,900	5,800
Max available pressure head		Pa	110	120	180	250
Air inlet pipe diameter		mm	80	80	80	80
Exhaust air pipe diameter		mm	80	80	80	80
Installed wattage		W	510	650	1,100	1,200

Gas Unit Heaters Line M Series

Wall mounted gas unit heaters with atmospheric burner

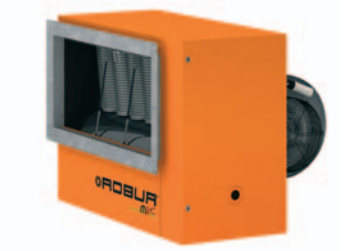
Advantages

- The simplicity and reliability of M series heaters provide a superior price/performance ratio in comparison with other heating systems.
- Wide range of models.
- Low stratification (0.3 °C/m only) thanks to the “Robur ground effect”.

Applications

- Industrial premises and workshops
- Laboratories
- Warehouses and storage facilities
- Supermarkets and showrooms
- Greenhouses and livestock facilities

		M 20 M 20 2V	M 25	M 30 M 30 2V	M 35	M 40	M 50	M 60 M 60 2V
Heating capacity	kW	18.3	25.5	30.7	37.4	42.5	50.7	63.8
Efficiency	%	88.8	88,5	88.2	88.6	88.2	88.5	88.0
Heat output (2 speed)	kW	12.8	- -	21.1	- -	- -	- -	42.0
Air flow	m^3/h	1,700	2,350	3,000	3,400	3,750	4,700	6,200
Temperature rise	K	32.0	32.0	30.3	32.6	33.6	32.0	30.5
Air inlet pipe diameter	mm	130	130	130	130	130	130	130
Exhaust air pipe diameter	mm	110	110	110	110	110	110	110



Gas Unit Heaters Line M C Series

Wall mounted gas unit heaters with centrifugal fan

Advantages

- The reliability provides a superior price/performance ratio in comparison with other heating systems.
- Centrifugal fan design for ducting applications.

Applications

- Premises where a ducted system is required.
- Premises where air distribution at low speed is required.
- Complete or partial air replacament of the rooms.

			M 20C	M 30C	M 60C
Nominal heating capacity		kW	18.3	30.7	63.8
Efficiency		%	88.8	88.2	88.0
Air flow	with free outlet	m^3/h	2,900	4,300	7,600
	at max pressure drop	m^3/h	1,600	3,100	5,800
Temperature rise	with free outlet	K	19	21	24.5
	at max pressure drop	K	34	29	32
Available pressure head		Pa	110	110	110
Air inlet pipe diameter		mm	130	130	130
Exhaust air pipe diameter		mm	110	110	110
Installed wattage		W	600	620	920

Gas Unit Heaters Line M xt Series

Wall mounted gas unit heaters

for outdoor installation

Advantages

- Direct heating system where indoor installation of natural gas systems is not permitted.
- Complete or partial air replacament of the rooms.
- Outdoor installation saves indoor space allowing for outlet air ducting.

Applications

- Rooms that need a constant air replacement (specific processes, public rooms etc.).
- Premises where indoor installation is not permitted by norm (places of public entertainment or rooms where flames may form), such as repair shops, painting shops and joiner's shops.

			M 40xt	M 50xt	M 60xt
Heating capacity		kW	42.5	50.7	63.8
Air flow		m^3/h	4,200	5,200	7,800
Max available pressure head		Pa	70	80	80
Temp. rise	nominal	K	28.4	27.3	23.0
	at max available pressure head	K	46.5	45	39.4
Air inlet pipe diameter		mm	130	130	130
Exhaust air pipe diameter		mm	110	110	110

Caldaria Line
35 Condensing Series
Combined heating systems with condensing boiler and air handler unit

Advantages

- Low energy consumption thanks to the high efficiency -from 98 to 108%- of the condensing technology.
- High system flexibility for easy integration with the heating system, thanks to the modularity of the units.
- No need for technical room.

Applications

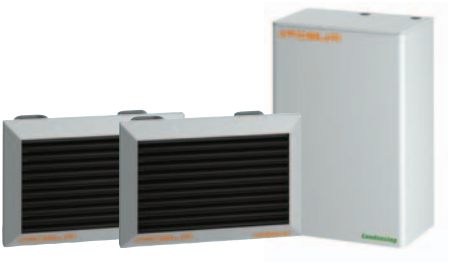
- Premises where indoor installation is not permitted by norm (textile factories, wood and paper processing and storage, varnishing, public and commercial premises).
- The boiler only can be used as heating system with any distribution system (i.e. low temperature systems) achieving up to 108% efficiency.

OUTDOOR BOILER

Heating capacity (water 80/60 °C)	100%	kW	30.9
	30%	kW	9.3
Heating capacity (water 50/30 °C)	100%	kW	34.1
	30%	kW	10.4
Heating efficiency	water 80/60 °C	%	98.0
	water 50/30 °C	%	108.1
Exhaust air pipe diameter		mm	50

INDOOR AIR HANDLER UNIT

Air flow	max	m^3/h	4,000
	min	m^3/h	1,450
Temperature rise		°C	21.5



Caldaria Line
35, 75 and 100 Condensing Series
Gas condensing boiler for outdoor installation

Advantages

- Wall mounted outdoor boiler for easier installation.
- Low energy consumption, thanks to 108% heating efficiency.
- Flexible installation makes the boiler suitable for large premises (such as factories or warehouses) and for residential and commercial premises as well.

Applications

- Premises where indoor installation is not permitted by norm (textile factories, wood and paper processing and storage, varnishing, public and commercial premises).
- Ideal for heating and DHW production in commercial premises, offices, sport halls.
- Ideal for the production of water at high temperature (for retrofitted radiator systems) and for the production of hot water at low temperature (new systems with radiant panels or fan coils).

			35	75	100
Heating capacity 100%	water 80/60 °C	kW	30.9	65.6	88.3
	water 60/40 °C	kW	32.8	72.1	95.4
	water 50/30 °C	kW	34.1	73.2	96.8
Efficiency 100%	water 80/60 °C	%	98.0	97.0	98.2
	average water T. 50 °C (60/40 °C)	%	106.7	106.6	106.1
	water 50/30 °C	%	108.1	108.3	107.7
Efficiency 30%	water 80/60 °C	%	98.8	99.4	98.7
	average water T. 50 °C (60/40 °C)	%	106.4	106.4	106.6
	water 50/30 °C	%	108.6	108.6	108.7
Exhaust air pipe diameter		pcs./mm	1/50	2/50	2/50

Caldaria Uno Line
SuperStar Series
Combined heating systems with boiler and air handler unit

Advantages

- Heating with low thermal inertia.
- Easy to install.
- Thermal output proportional to the requirement.
- High system flexibility thanks to the modularity of the units.

Applications

- Premises where indoor installation is not permitted by norm (textile factories, wood and paper processing and storage, varnishing, public and commercial premises), with no need for technical room.

Heating capacity	nominal	kW	31.8
	min	kW	9.8
Exhaust air pipe diameter		mm	80

INDOOR AIR HANDLER UNIT

Air flow	max	m³/h	4,000
	min	m³/h	2,850
Max temperature rise		°C	23

Pack Line

Condensing and modular gas thermal groups for indoor and outdoor installation

Advantages

- The pre-assembled group can be coupled with other groups for an effective indoor or outdoor technical room.
- High efficiency up to 108.7% with modulation of the output up to a ratio of 1:8.
- Regulation and setting electronic board up to 3 secundary circuits (high temperature, low temperature and DHW).

Applications

- Central heating of commercial, residential and industrial premises.
- Generation management up to 3 circuits (high temperature, low temperature and DHW).

			150 Indoor	200 Indoor	150 Inox	200 Inox
Nominal heating capacity	water 100% (80-60°C)	kW	132.5	176.6	132.5	176.6
	water 100% (50-30°C)	kW	145.3	193.6	145.3	193.6
Efficiency	at nom. heat output 80/60°C	%	98.2	98.2	98.2	98.2
	at nom. heat output 50/30°C	%	107.7	107.7	107.7	107.7
Efficiency	at reduced heat output 80/60 °C	%	98.7	98.7	98.7	98.7
	at reduced heat output 50/30 °C	%	108.7	108.7	108.7	108.7
Size	height	mm	1,480	1,480	1,480	1,480
	length	%	1,250	1,250	1,250	1,250
	depth	mm	650	650	650	650

Evaporative Cooler Line
AD 14 Series
Cool, natural, simple air distribution system

Advantages

- Low energy consumption. The only electrical consumption is given by the fan (5 speed) and a small water circulation pump. The management cost is less than 2 EUR per day.
- No specialized maintenance. The only maintenance needed is the cleaning of the filters of the evaporative pads.
- Modular and adaptable system. Each unit can operate independently or can be integrated with other units, even afterwards, to build a more complex system, without affecting simplicity and effectiveness.
- Electronic control of the system to grant efficiency and hygiene. Even if simple in the function side, the system is kept efficient and hygienic thanks to a sophisticated electronic control system, that controls every functioning condition.
- Available in down (supplied as standard), side or top discharge versions.

Applications

- Industrial buildings and warehouse
- Commercial buildings, shops and show-rooms
- Fitness center

Air flow rate		m^3/h	14,000
Ducting connection (down discharge)		mm	645x645
Electrical power	axial fan	kW	1.5
	circulation pump	kW	0.05
Weight	without water	kg	55
	with water	kg	92

Gas Convectors Line

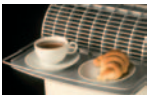
Gas convectors for the best comfort

Advantages

- Direct heating system with low thermal inertia.
- A selection of different accessories to optimize the heat output and for the best comfort.
- Quick to install thanks to the easy installation of the support bracket and to the gas and electrical connections positioned on the cover.

Applications

- Residential houses and holiday homes
- Offices, dressing rooms, factory canteens, churches and schools
- Shops, restaurants and show rooms



Food warmer

Towel warmer

Stick fragrance diffuser

Umbrella stand

CALORIO			41	42	51	52
Heating capacity	nominal	kW	2.92	3.26	4.19	4.71
	reduced	kW	- -	- -	- -	3.18
Pipe diameter	air	mm	49	49	49	49
	exhaust air	mm	35	35	35	35
Size	length	mm	553	553	553	553
	height	mm	715	715	715	715
	depth	mm	215	215	215	215

TS and SUPERCROMO			TS 2000	3001	3002	8002
Heating capacity	nominal	kW	1.69	2.32	2.32	6.98
	reduced	kW	1.12	- -	- -	4.77
Pipe diameter	air	mm	100	49	49	49
	exhaust air	mm	60	35	35	35
Size	length	mm	478	478	478	1,006
	height	mm	577	577	577	715
	depth	mm	173	173	173	208

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